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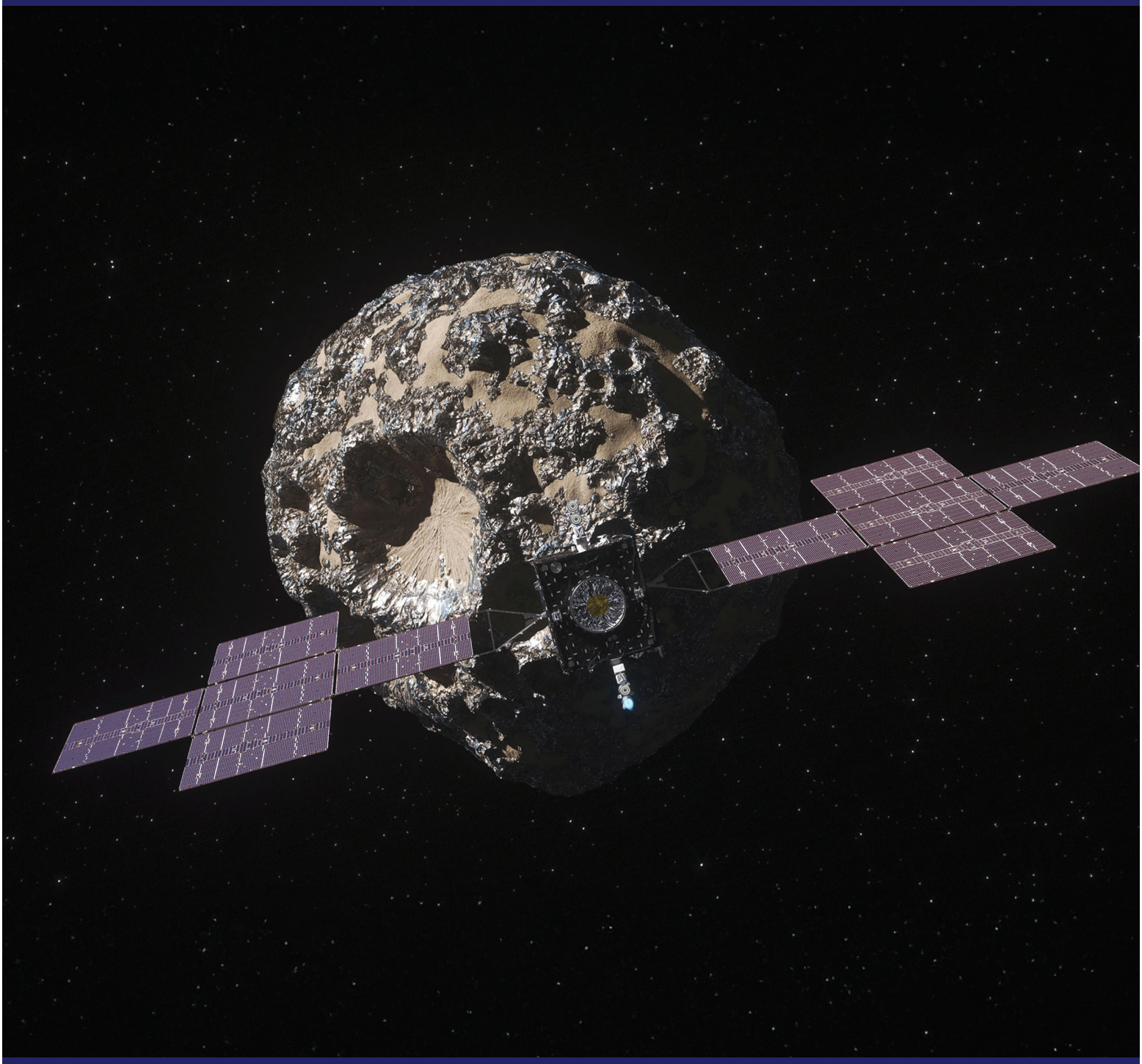
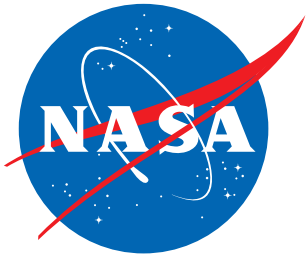
NASA's Standing Review Board Practices



July 31, 2025

IG-25-009



Office of Inspector General

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RESULTS IN BRIEF

NASA's Standing Review Board Practices

July 31, 2025 IG-25-009 (A-24-06-00-SARD)

WHY WE PERFORMED THIS AUDIT

In managing its space flight programs and projects, NASA has implemented a system of checks and balances to prevent abuse of power, encourage transparency, ensure accountability, enhance stability, improve decision-making, and promote cooperation and compromise. Independent assessment, which focuses on and promotes effective program and project management, is a key component of the independent life-cycle review process, one part of NASA's system of checks and balances. The Standing Review Board (SRB) function is the primary tool NASA relies on to achieve its independent assessment objectives. Composed of independent experts from within and outside of NASA, the SRB assesses a program's or project's programmatic and technical approach, risk posture, and progress against cost and schedule baselines. Based on the results of the assessment, they offer recommendations to NASA's senior managers to improve performance and reduce risk.

Over the past 30 years, NASA's independent assessment and SRB functions have gone through several significant changes. In 1996, the NASA Administrator formalized independent assessments and established the Independent Program Assessment Office so NASA could confidently promise its stakeholders the Agency would deliver its missions on cost and on time. After the 2003 Space Shuttle Columbia tragedy, NASA revised its governance structure to improve checks and balances and established a new requirement that called for a single SRB to evaluate programs and projects at their life-cycle milestones. In 2015, the NASA Associate Administrator issued a memorandum that decentralized SRB oversight and disbanded the Independent Program Assessment Office—which had its own staff, developed the SRB Handbook (the primary SRB guide), and managed the SRB process—and instead delegated responsibility for the SRB function to the mission directorates and centers. Then in 2022 NASA established the role of Chief Program Management Officer (CPMO) to provide support to mission directorates throughout the SRB process and maintain ownership of the SRB Handbook.

We conducted this audit to evaluate whether SRBs are providing services and recommendations that increase the likelihood of mission success. Specifically, we assessed whether the revised SRB function is effectively designed, implemented, and meeting its intended objectives. To accomplish this assessment, we reviewed key Agency documents related to the SRB process and interviewed Agency personnel associated with the CPMO as well as each mission directorate, the Office of the Chief Financial Officer, and the Office of the Chief Engineer. We judgmentally selected 30 NASA programs and projects to test whether nine of the primary steps provided in the SRB Handbook were executed and timelines were met. We also conducted an online survey of current and former SRB Chairs, Review Managers, SRB members, and program and project managers to solicit their input on the effectiveness of SRB policies and practices.

WHAT WE FOUND

The decentralization of the SRB process created an inherent gap in Agency-level oversight and authority, and potentially a governance conflict of interest by essentially giving the mission directorates complete control of the SRB process for programs and projects they oversee. We identified significant deficiencies in the mission directorates' execution of the SRB process related to a lack of documentation and untimely completion or non-execution of key steps. Additionally, we noted that mission directorate guidance was not regularly updated, used inconsistent terminology, and was not useful to SRB participants. These deficiencies appear to be the result of a lack of independent oversight following the

decentralization of the independent assessment process. The ramifications may include diminished information for decision-makers and ultimately program and project schedule delays, cost overruns, and underestimated technical readiness.

We also identified several areas where current practices are failing to provide reasonable assurance that SRB participants are the most qualified experts, consistently independent of conflicting interests, and adequately trained to accomplish their duties as members of an SRB. For example, nearly half of survey respondents reported some SRB roles, including cost, budget, and schedule expertise, were especially difficult to fill due in part to a penchant for prioritizing the use of civil servants. Regarding conflicts of interest, we found gaps in the process due to missing information in the SRB Handbook and instances of records not being properly maintained. Consequently, we question whether the preferred composition of SRBs is providing the best value to NASA decision-makers.

Life-cycle reviews conducted by SRBs are designed to provide a program or project and NASA senior management with a credible, objective assessment of the program's or project's progress, issues, risks, and status. Further, the reviews are intended to provide a credible basis for the Decision Authority to approve or disapprove the transition of the program or project to the next life-cycle phase. However, our survey found that SRB members may benefit from additional engagement with program and project personnel, more timely access to required program and project data, improved workforce availability, and the ability to express their opinions without undue influence. Ignoring these issues could result in SRB recommendations that are lacking sufficient review or do not reflect the full results of their assessment.

Lastly, mission directorates are not adequately capturing and managing lessons learned from the SRB process. NASA policy requires lessons learned to be captured, yet SRBs are generally not reviewing lessons learned before the independent review process nor are they capturing them after the independent review process is completed. In the few instances that lessons learned were captured, the process was informal or only captured locally so that lessons learned could not be shared Agency-wide. Moreover, the SRB Handbook does not include information on how to integrate the lessons learned within the independent review process. Consequently, future SRBs will not fully benefit from process improvements gained from incorporating lessons learned from previous SRBs.

WHAT WE RECOMMENDED

To ensure the effectiveness of the SRB function, we made 12 recommendations to the NASA Associate Administrator and CPMO: (1) increase the oversight role of the CPMO to address deficiencies in the execution of SRBs and provide SRB members an independent avenue to address issues; (2) update the SRB Handbook; (3) evaluate the preference for using civil servants on SRBs; (4) evaluate the potential for a formalized pipeline and recruitment process for SRB participants; (5) review existing conflict of interest policy; (6) establish a process for verifying that mission directorates are conducting conflict of interest reviews; (7) verify that contractors adhere to the conflict of interest processes; (8) determine whether there is a need for individual mission directorate SRB guidance; (9) develop a formal, role-based training program; (10) determine the optimal method(s) and frequency required to keep an SRB appropriately engaged and informed of program and project status; (11) identify obstacles that inhibit programs and projects from providing timely information to SRBs; and (12) implement a process for mission directorates to facilitate the collection and sharing of lessons learned.

We provided a draft of this report to NASA management who concurred or partially concurred with our recommendations and described planned actions to address them. We consider management's comments responsive; therefore, the recommendations are resolved and will be closed upon completion and verification of the proposed corrective actions.

For more information on the NASA Office of Inspector General and to view this and other reports visit https://oig.nasa.gov/.

TABLE OF CONTENTS

Acronyms

CPMO	Chief Program Management Officer
IRB	Independent Review Board
MSR	Mars Sample Return
NPD	NASA Policy Directive
NPR	NASA Procedural Requirements
OIG	Office of Inspector General
OSAM-1	On-orbit Servicing, Assembly, and Manufacturing 1
RFA	Request for Action
SRB	Standing Review Board
ToR	Terms of Reference

INTRODUCTION

In managing its space flight programs and projects, NASA has implemented a system of checks and balances to prevent abuse of power, encourage transparency, ensure accountability, enhance stability, improve decision-making, and promote cooperation and compromise. The independent life-cycle review process is one of five methods comprising this system of checks and balances described in NASA policy.[1] Independent assessment is a key component of this review process which focuses on and promotes effective program and project management.

The Standing Review Board (SRB) function is the primary tool NASA relies on to achieve its independent assessment objectives. An SRB is composed of independent experts from within and outside of NASA who assess a program's or project's programmatic and technical approach, risk posture, and progress against the program or project cost and schedule baseline. Based on the results of the assessment, they offer recommendations to improve performance or reduce risk from formulation through implementation.[2]

Specifically, SRBs help ensure appropriate program and project management oversight to increase the likelihood of mission success by conducting independent assessments at designated life-cycle reviews. An SRB has three primary functions: (1) to perform complete, comprehensive, and independent assessments of the program or project, (2) to develop findings and formulate recommendations based on these assessments, and (3) to report its results to the program or project and Convening Authorities.[3] Accordingly, the SRB function is a valuable control to inform decision-makers about a program's or project's cost, schedule, and technical maturity at specific points in its life cycle.

In 2015, NASA eliminated the office responsible for establishing and executing SRBs and delegated the responsibility to mission directorates and centers.[4] As such, our overall objective was to evaluate whether SRBs are providing services and recommendations that increase the likelihood of mission success. Specifically, this audit assessed whether the revised SRB function is effectively designed,

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1 NASA Policy Directive (NPD) 1000.0C, *NASA Governance and Strategic Management Handbook* (January 29, 2020).

2 The Formulation Phase of a program's or project's life cycle is when management identifies how the program or project supports the Agency's strategic needs, goals, and objectives; assesses feasibility, technology, and concepts; conducts risk assessments and team building; develops operations concepts and acquisition strategies; establishes high-level requirements and success criteria; prepares the plans, budgets, and schedules essential to the success of a program or project; and establishes control systems to ensure performance to those plans and alignment with current Agency strategies. The Implementation Phase is when the program or project executes approved plans for the development and operation of the program and project and uses control systems to ensure performance to approved plans and continued alignment with the Agency's strategic needs, goals, and objectives.

3 The Convening Authorities—composed of the Decision Authority (NASA Associate Administrator or Mission Directorate Associate Administrator), NASA Chief Engineer, Center Director, Mission Directorate Associate Administrator (if not the Decision Authority), and Chief Financial Officer—are responsible for convening program and project life-cycle reviews; establishing the Terms of Reference, including SRB review objectives and success criteria; appointing the SRB Chair; and approving SRB members. These officials receive the documented results of the life-cycle reviews.

4 Robert M. Lightfoot, Jr., NASA Associate Administrator, memorandum to officials-in-charge of Headquarters offices and NASA Center Directors, *Independent Assessment of NASA Programs and Projects* (October 26, 2015).

implemented, and meeting its intended objectives. Details of the audit's scope and methodology are outlined in Appendix A.

Background

Independent assessment is a project management tool that NASA has used for several decades to supply unbiased information on program and project progress to enhance the probability of mission success. Independent assessments became more formalized in 1996 when the NASA Administrator established the Independent Program Assessment Office so NASA could confidently promise its stakeholders the Agency would deliver its missions on cost and on time. Almost concurrently, NASA revised its top-level policy for program and project management by creating Program Management Councils. Made up of senior-level managers, these councils advise the NASA Administrator and provide approval to start a program or project as well as approval to continue the program or project at various life-cycle reviews.

Given ongoing performance and technical issues with program and project development, NASA management embraced the concept of independent assessment and would often establish multiple program and project review teams. After the 2003 Space Shuttle Columbia tragedy, NASA revised its governance structure to improve checks and balances between organizational authorities.[5] Of note, a new requirement eliminated the various earlier independent assessments and called instead for a single SRB to evaluate programs and projects at their life-cycle milestones. This new requirement was formalized in March 2007 in NASA Procedural Requirements (NPR) 7120.5D.[6]

In 2015, the NASA Associate Administrator issued a memorandum that decentralized SRB oversight with the intent of "enhancing management accountability" at the mission directorate level.[7] The memorandum disbanded the Independent Program Assessment Office—which had its own staff, developed the SRB Handbook, and managed the SRB process—and instead delegated responsibility for the SRB function to the mission directorates and centers.[8] Along with this transition, each mission directorate was tasked with creating its own guidance for implementing SRBs for its own programs and projects, shifting the SRB Handbook's role among mission directorates from policy to just general guidance.

In 2021, the NASA Deputy Administrator initiated a NASA tiger team to focus on improvements in acquisition and project management practices throughout the Agency.[9] In response to the team's findings and recognizing the need for dedicated improvement efforts within the Agency's program and project management policies and practices, in 2022 NASA established the role of Chief Program

[5] The Columbia STS-107 Space Shuttle lifted off on January 16, 2003, for a 17-day science mission featuring numerous microgravity experiments. Upon reentering the atmosphere on February 1, 2003, the Columbia orbiter and its seven crew members were lost when the orbiter suffered a catastrophic failure due to a breach that occurred during launch when falling foam from the external tank struck the reinforced carbon panels on the underside of the left wing.

[6] NPR 7120.5D, *NASA Space Flight Program and Project Management Requirements* (March 6, 2007). Effective through March 6, 2012, NPR 7120.5 has been updated twice since that time.

[7] *Independent Assessment of NASA Programs and Projects* (2015).

[8] NASA/SP-2009-10-015-HQ, *Standing Review Board Handbook* (November 12, 2009). Effective through March 6, 2012, the SRB Handbook has been updated three times since that time. The 2009 SRB Handbook provided guidelines for the setup, processes, and products of SRBs in support of the Agency's implementation of its independent life-cycle reviews requirement.

[9] Tiger teams include a diverse set of discipline experts typically not part of a program or project that assist in solving difficult or complex technical problems, or to independently verify solutions to critical problems.

Management Officer (CPMO). The CPMO has a small team within the Office of the Administrator, composed of four staff and two detailees, that provides support to mission directorates throughout the SRB process and maintains ownership of the SRB Handbook, the primary SRB guide.[10] However, the CPMO does not have its own budget, has no responsibility for the execution of SRBs, and is primarily regarded as an office of influence—one that tries to influence the behavior of mission directorates and centers without actual authority.

Policies and Procedures

NASA's governance directives call for an independent life-cycle review process to provide a credible, objective assessment of program and project requirements and an independent view of program and project performance to inform a decision as to whether to proceed to the next phase of the life cycle.[11] Independent life-cycle reviews also provide vital assurance to external stakeholders that NASA's basis for or against proceeding to the next phase is sound. This is reflected in NASA's policy that requires each program and project to perform life-cycle reviews in accordance with NASA requirements as well as applicable center practices to provide a periodic assessment of programmatic and technical status and health at specific points in the life cycle.[12] Specifically, NPR 7120.5F provides the life-cycle reviews that require SRB input, and NPR 7123.1D includes the expected maturity levels at each life-cycle review.[13]

The light and dark blue triangles in Figure 1 show the life-cycle reviews that require an SRB assessment. These include the System Requirements Review, System Definition Review, Mission Definition Review, Preliminary Design Review, Critical Design Review, System Integration Review, and Operational Readiness Review. The SRB's assessment of a program's or project's readiness at the Preliminary Design Review directly supports the establishment of a realistic cost and schedule baseline at Key Decision Point C.

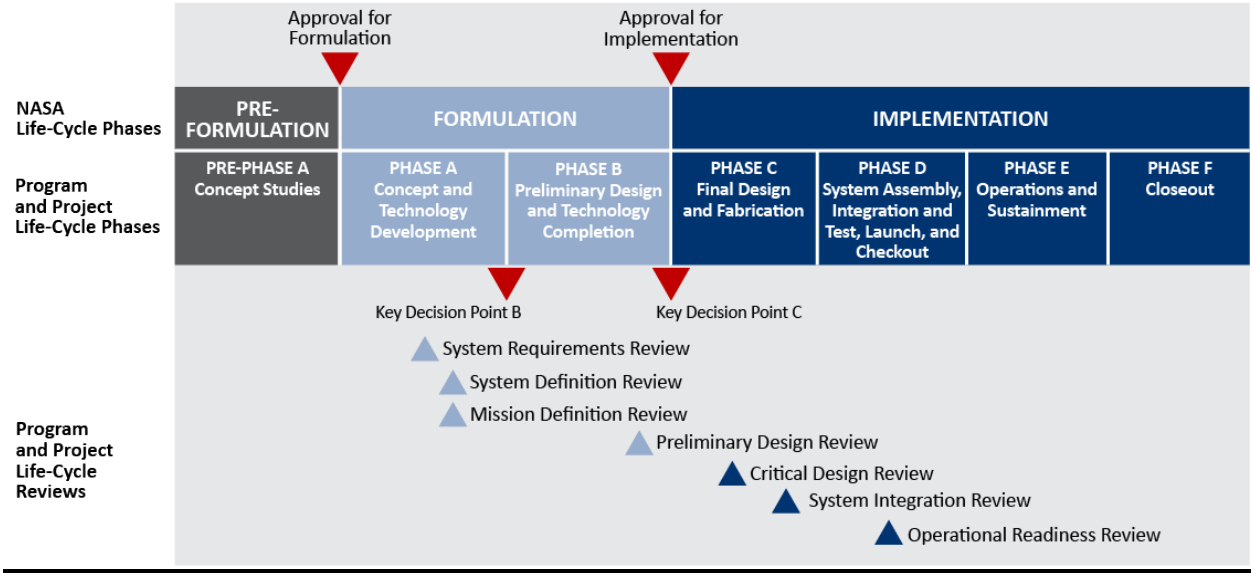
[10] The SRB Handbook provides guidance based on best practices for the planning, preparation, review, reporting, and closeout of SRB activities. The most recent version, NASA/SP-20230001306, *NASA Standing Review Board Handbook*, was issued in February 2023. The CPMO is allocated fiscal resources by the Office of the Administrator along with matrixed support from other organizations such as the Office of the Chief Financial Officer and the Office of the Chief Engineer.

[11] NPD 1000.0C, 3.4.2(a) states that programs and projects are managed based on a phased life cycle with Key Decision Points that determine the readiness to proceed to the next phase. This determination is supported by reviews, including independent assessments, conducted by independent review boards and teams through the life cycle and at Key Decision Points.

[12] NPR 7120.5F, *NASA Space Flight Program and Project Management Requirements w/Change 4* (August 3, 2021), and NPR 7123.1D, *NASA Systems Engineering Processes and Requirements Updated w/Change 2* (July 5, 2023).

[13] NPR 7120.5F does not delineate a dollar threshold that would require a program or project to establish an SRB.

Figure 1: NASA Program and Project Life Cycle



Source: NASA Office of Inspector General (OIG) presentation of NPR 7120.5F.

SRBs use the following key criteria for their assessments:

- contribution to Agency strategic goals
- management approach
- technical approach
- integrated cost and schedule estimates and funding strategy
- availability of resources other than budget
- risk management approach

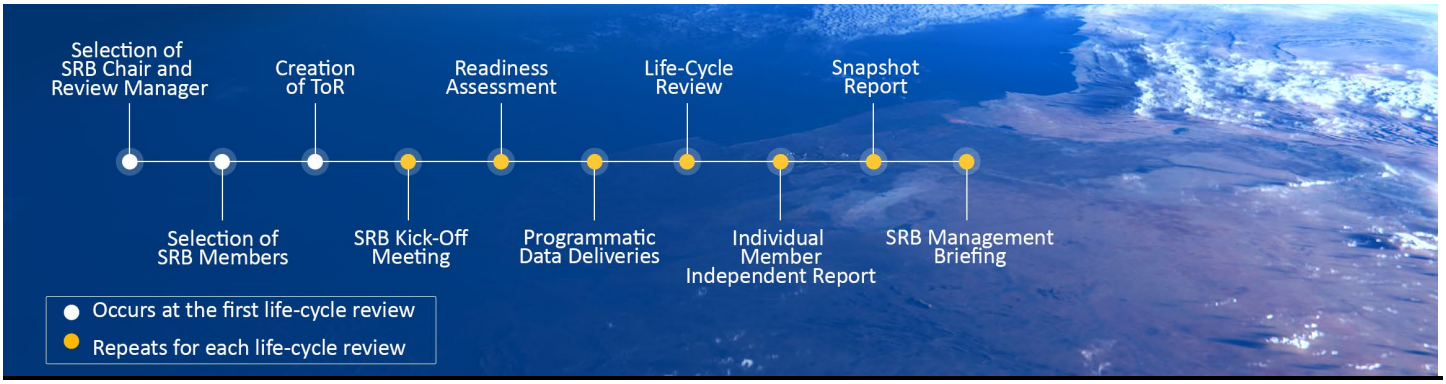
The SRB may also review the new baseline cost and schedule estimate in cases where NASA needs to rebaseline a program or project that has significantly exceeded its original cost and schedule estimate.

Current SRB Process

The Convening Authorities establish the scope and requirements for the SRB's role in the life-cycle reviews and document this information in the Terms of Reference (ToR).[14] Convening Authorities have the option to tailor the SRB's role in accordance with the characteristics of the program or project such as the life-cycle cost and schedule estimate. Convening Authorities also approve the selection of the SRB Chair and board members and are the management officials who receive the briefings and results of the SRB. SRBs serve an advisory role to the Convening Authorities; consequently, they have no programmatic or technical authority over the programs and projects they review. Figure 2 summarizes the SRB process.

[14] The ToR is the formal agreement between the SRB, Convening Authorities, and the program or project that specifies the nature, scope, schedule, and ground rules for the SRB's conduct at the life-cycle reviews.

Figure 2: SRB Process Overview



Source: NASA OIG presentation of Agency information.

The SRB process includes the following:

- **SRB Kick-Off Meeting.** A preparatory activity that precedes the active engagement of the SRB in the life-cycle review process to familiarize the SRB with the current state of the program or project under review, the current life-cycle review process, any new policies, and the expectations of NASA management.
- **Readiness Assessment.** A discussion between SRB, center, and program or project leadership to ensure programmatic and technical products will be available with the expected maturity to support the life-cycle review timelines.[15]
- **Programmatic Data Deliveries.** (1) The SRB receives access to the program's or project's cost and schedule data 100 days prior to the life-cycle review. This initial access allows the SRB to become familiar with the program or project prior to participating in reviews and to communicate issues to the program or project in advance. (2) The SRB receives its first formal data delivery 60 days prior to the life-cycle review. (3) The SRB receives the final formal data delivery 20 days prior to the life-cycle review. The final data delivery supports the final SRB risk evaluation meeting prior to the life-cycle review.
- **Life-Cycle Review.** The formal assessment the SRB performs of the program or project once the overall life-cycle review process is approved to commence.
- **Individual Member Independent Report.** SRB members are responsible for providing this report and a score card to document the member's individual assessment of the program's or project's health and maturity relative to the life-cycle review criteria.
- **Snapshot Report.** A summary of the SRB Chair's preliminary findings, which contains the life-cycle review overview, the SRB's summary findings, a discussion of significant issues and risks, and the schedule for briefing all required management councils that will lead up to the applicable governing Program Management Council.
- **SRB Management Briefing.** A report to the Convening Authorities that outlines the SRB's assessment of the program or project. This is the SRB's final product and package with annotated notes and charts from the independent programmatic analysis.

[15] Programmatic products are the cost and schedule components while technical products are the technology and hardware development components in all reviews.

- **SRB Kick-Off Meeting through SRB Management Briefing.** The steps from the SRB Kick-Off Meeting through the SRB Management Briefing repeat for each life-cycle review that requires an SRB.

For programs and Category 1 projects, the Decision Authority is the NASA Associate Administrator.[16] The NASA Associate Administrator may delegate this authority to the Mission Directorate Associate Administrator for Category 1 projects. For Category 2 and 3 projects, the Decision Authority is the Mission Directorate Associate Administrator.

SRB Composition

The SRB is composed of individuals outside of the program or project in the following roles:

- **SRB Chair.** A leader who is typically a recognized expert with relevant experience for the respective space flight program or project.
- **Review Manager.** An individual who performs the critical function of ensuring appropriate and consistent implementation of NASA policy, processes, and products for life-cycle reviews conducted by an SRB.
- **SRB Member.** An individual (civil servant, consultant, or contractor) with scientific, technical, or programmatic competency, timeliness, and independence.

Formulation of an SRB includes the identification and approval of the SRB Chair and all members and consultants to the board, assignment of the Review Manager, and development of the ToR. Following approval by the Convening Authorities, the SRB Chair and Review Manager put together the SRB membership. The nomination process of SRB members requires collaboration among the Convening Authorities. A list of candidates commensurate with the programmatic and technical aspects of the program or project is then developed. The Convening Authorities approve the list of participants.

When forming the SRB, an important aspect is determining the appropriate number of members that can meet the expectations of the life-cycle review. Minimizing the number of members is considered a best practice; however, every SRB size decision requires consideration of variables including balance, competency, timeliness, and relevance of the SRB members. The SRB typically includes between 12 and 16 participants.

Another important aspect to consider when forming the SRB is the independence of its members. NASA's Policy on Standing Review Board Composition, Balance, and Conflicts of Interest (NASA Policy on SRBs) notes that the "work of SRBs cannot be compromised by issues of bias and lack of objectivity" caused by conflicts of interest, defined as "any financial or other interest which conflicts with the individual's service on an SRB because it (1) could significantly impair the individual's objectivity or

[16] Projects are designated as Category 1, 2, or 3 based initially on (1) the project life-cycle cost estimate, the inclusion of significant radioactive material, and whether or not the system being developed is for human space flight, and (2) the priority level, which is related to the importance of the activity level to NASA, the extent of international participation (or joint effort with other government agencies), the degree of uncertainty surrounding the application of new or untested technologies, and spacecraft and payload development risk classification. The Decision Authority determines a program's or project's readiness to proceed to the next life-cycle phase and approves key program or project content, cost, schedule, and content parameters for the life cycle, which are documented at each Key Decision Point.

(2) could create an unfair competitive advantage for any person or organization."[17] The NASA Policy on SRBs lays out procedures to follow in determining whether a conflict of interest exists while also allowing approval of SRB members through a waiver process if it is in the best interest of the government to approve those members despite the presence of conflicts of interest due to their unique expertise or other factors.

[17] The NASA Policy on SRBs is an appendix in the SRB Handbook. This policy was first implemented in December 2008, issued as part of the first SRB Handbook in November 2009, and later updated in the February 2023 SRB Handbook.

DECENTRALIZATION OF THE INDEPENDENT ASSESSMENT PROCESS LIMITS AGENCY OVERSIGHT

The decentralization of the SRB process created an inherent gap in Agency-level oversight and authority, and potentially a governance conflict of interest by essentially giving the mission directorates complete control of the SRB process. We identified significant deficiencies in the mission directorates' execution of the SRB process related to a lack of documentation and untimely completion or non-execution of key steps. Additionally, we noted that mission directorate guidance was not regularly updated, used inconsistent terminology, and was not useful to SRB participants. These deficiencies appear to be the result of a lack of independent oversight following the decentralization of the independent assessment process. Weakened execution of the SRB process affects the timeliness and impact of the information provided to the Decision Authorities for properly assessing a program's or project's readiness to proceed to its next life cycle. The ramifications may include diminished information for decision-makers and ultimately program and project schedule delays, cost overruns, and underestimated technical readiness.

Oversight Gaps Following Decentralization of the SRB Process

In 2016, NASA developed a white paper to describe the principles and approach for implementing the Associate Administrator's 2015 memorandum decentralizing independent assessment.[18] The white paper stated that decentralization of the independent assessment process would clarify management responsibility and accountability to foster a more "organic" implementation within the mission directorates. These organizations were then fully accountable for establishing independent assessment of their programs and projects and for owning the results. However, there were several major risks in moving to this new model. With mission directorates overseeing their own programs and projects but also having direct input on the selection of the SRB Chair and Review Manager, this could create a scenario where the mission directorates "grade their own homework."

As NASA continued to recognize the need for dedicated improvement efforts within the Agency's program and project management policies and practices, the Agency established the CPMO role in 2022. However, according to statements made by the CPMO and in our interviews with NASA officials, we found that because the CPMO has no funding, authority, or enforcement mechanism, the responsibility of the SRBs lies with the mission directorates. In addition, NASA's 2022 High Risk Corrective Action Plan

[18] NASA Agency Program Management Council, *Independent Assessment Principles and Approach Decision Memorandum* (2016).

included a major initiative to strengthen the Agency's implementation of SRBs to improve independent assessments of major programs and projects in support of performance improvement.[19]

As part of NASA's 2024 High Risk Corrective Action Plan, several improvements to NASA's program management function were implemented, including holding Agency-wide program management symposiums, collaboratively tailoring program management policy for programs and major projects, and implementing administrative changes to NPRs. To complement these improvements, a new initiative was created to advance the state of maturity of independent assessment. While the 2024 High Risk Correction Action Plan implemented some improvements to the CPMO function, several impediments and challenges continued. Specifically, the independent assessment initiative within the 2024 plan noted "the decentralized model set forth in 2015 led to diversification of independent assessment implementation and necessitates a much greater degree of coordination across the multiple MDs [mission directorates]. The decentralized model also creates difficulties in driving toward cohesive agency solutions." Based on these continuing challenges, we believe limited Agency-level oversight and authority has been a consistent issue since the decentralization of the independent assessment process in 2015.

Deficiencies in SRB Life-Cycle Review Execution

We noted several deficiencies in the execution of the SRBs that are attributable to a lack of adherence to SRB Handbook procedures and accountability to and oversight by the CPMO. NPR 7120.5F establishes when programs and projects must perform life-cycle reviews and refers to the SRB Handbook for further guidance on conducting these reviews. While all mission directorates use the SRB Handbook, it is, in essence, only a best practices document, and not policy enforceable by the CPMO.

The SRB Handbook establishes a set of milestones leading up to the life-cycle review. Based on these milestones, we judgmentally selected 30 programs and projects to test whether the steps were executed and timelines were met. The sample was generally stratified to obtain a representative sample based on the number of programs and projects by mission directorate. Details of the sample testing's scope and methodology are outlined in Appendix A. Table 1 shows a breakdown of the mission directorates and the number of programs and projects tested.

[19] Since 1990, the Government Accountability Office has listed NASA's contract or acquisition management, which includes program and project management concerns, on its High-Risk List, a report that identifies areas of the federal government at high risk for waste, fraud, abuse, mismanagement, or otherwise needing transformation. In response to its high risk designation, NASA has implemented a series of Corrective Action Plans with specific initiatives and areas of emphasis that the Agency commits to pursuing as it matures its acquisition management, program and project management, and related surveillance of contractors.

Table 1: Mission Directorate Breakdown of Programs and Projects Tested

Mission Directorate	Number of Programs and Projects Tested
Aeronautics Research Mission Directorate	3
Exploration Systems Development Mission Directorate	5
Science Mission Directorate	15
Space Operations Mission Directorate	4
Space Technology Mission Directorate	3
Total	**30**

Source: NASA OIG presentation of OIG sampling results.

For the 30 programs and projects selected, we reviewed general program and project documentation, such as the ToR, and life-cycle specific documentation for the System Requirements Review, Preliminary Design Review, and Critical Design Review. There was a total of 72 life-cycle reviews included within the 30 programs and projects. We noted the following exceptions to the SRB Handbook's life-cycle review milestones in our evaluation:

- 11 of 30 programs and projects (or 36.7 percent) did not have a signed ToR in place prior to the SRB's first life-cycle review, the System Requirements Review. Having a signed ToR prior to this review is important to the SRB process because it is the formal agreement between the SRB, Convening Authorities, and program or project that specifies the nature, scope, schedule, and ground rules for the conduct of the life-cycle reviews by the SRB.
- 22 of 72 life-cycle reviews (or 30.6 percent) did not prepare the readiness assessment 30 to 90 days before the life-cycle review, as suggested in the SRB Handbook. The readiness assessment discussion ensures life-cycle programmatic and technical products will be available and updated to support life-cycle review timelines. A successful readiness assessment is a prerequisite for the program or project to advance to the life-cycle review under the planned timeline.
- 53 of 72 life-cycle reviews (or 73.6 percent) were not assessed for timeliness of data drops because there was either no supporting documentation or evidence that the documentation provided to us was adequate to make a proper determination of timeliness. The SRB Handbook recommends that programs and projects submit to the SRB three sets of data leading up to each life-cycle review 100 days, 60 days, and 20 days prior to the review. Receiving all required data in a timely manner is critical to allow the SRB ample time for programmatic and risk analysis in evaluating if a program or project is ready to proceed to its life-cycle review. Any delays in data delivery can delay the SRB's review and ultimately the program's and project's schedule.
- 29 of 72 life-cycle reviews (or 40.3 percent) did not complete the Snapshot Report within the required 24 to 48 hours following the review. The Snapshot Report contains the life-cycle review overview, the SRB's summary findings, a discussion of significant issues and risks, and the schedule for briefing all required management councils. The timeliness of providing this information to the Convening Authorities and Decision Authority is essential to efficient and effective management of programs and projects.

In addition to the exceptions noted during our review of program and project documentation, we created a survey and asked current and former SRB Chairs, Review Managers, SRB members, and program and project managers questions about their observations in the execution of SRBs

(see Appendix B for the survey methodology). In the survey, 137 of 159 respondents (or 86.2 percent) believed the timelines set out in the SRB Handbook are sufficient. However, 59 of 125 respondents (or 47.2 percent) stated the lack of agreements, assessments, data, and reports or timeliness in receiving this information has negatively impacted the quality of the life-cycle review. Issues with timely access to data was shared during an initial independent assessment survey conducted by the CPMO in 2023. Specifically, respondents noted that programs, projects, and SRB Chairs needed to be more accountable for ensuring data is delivered on the agreed-to time frames and too much time is spent "negotiating" what data will be provided.

Requests for Action (RFA) are issues or concerns reported by individual SRB members during the life-cycle review that must be addressed, agreed upon, and closed by the program or project. For example, an RFA from the Electrified Powertrain Flight Demonstration's second System Requirements Review noted the project's Risk Management Plan was outdated and needed to be updated to correct references and address post-formulation activities, roles, and responsibilities.[20] More than half of survey respondents, 76 of 123 (or 61.8 percent), stated the RFA process could be improved, with some responses indicating that having one repository system for inputting, tracking, and closing RFAs would be helpful.

Based on the results from our program and project testing and the feedback we received from our survey, these deficiencies can be attributed to the CPMO not having the authority to execute oversight and enforce SRB Handbook procedures. The result is that SRBs are potentially not being properly executed, increasing the program's or project's risk of future cost, schedule, and performance issues.

Mission Directorate SRB Guidance Can Be Improved

After decentralization of the SRB function in 2015, mission directorates had the responsibility to supplement the SRB Handbook with their own mission directorate-specific guidance. This included the ability to tailor application of the existing SRB Handbook to meet their directorate's needs. However, mission directorate guidance is not regularly updated, uses inconsistent terminology, and is often found to not be useful to SRB participants.

Outdated Mission Directorate Guidance

Of NASA's five mission directorates, two have outdated SRB policies and procedures. Specifically, one mission directorate does not have its own guidance but uses 2017 guidance from a disbanded mission directorate. Another mission directorate's guidance, issued in 2018, references an outdated NPR, SRB Handbook, and table highlighting the Convening Authorities for SRBs. In interviews with senior NASA officials from both mission directorates, the main reason they provided for not updating SRB policies and procedures is because their organizations have been or are currently undergoing reorganizations, so priority has been given to determining the new organization structure. One senior official noted that their mission directorate was working on an independent assessment implementation plan, but it has yet to be baselined.

[20] The Electrified Powertrain Flight Demonstration project conducts ground and flight tests of electrified aircraft propulsion technologies to enable a new generation of electric-powered aircraft.

Inconsistencies Across Mission Directorates

While the unique nature of programs and projects across mission directorates is expected, a baseline set of best practices should be maintained to ensure Agency-level consistency. In accordance with NASA Policy Directive (NPD) 1000.0C, integrating the CPMO function will help assure consistent application of principles that establish a standard of uniformity in managing programs and projects at NASA. Additionally, NASA's 2024 High Risk Corrective Action Plan encourages the use of more standardized language to enable cross-agency collaboration and communication as part of the Agency's initiative to advance the state of maturity of independent assessments. We noted inconsistent use of terminology when referencing the SRB process and inconsistent implementation of the best practice of maintaining a skills database of SRB members.

Consistency and uniformity are key to the SRB process when the program or project, Convening Authorities, Technical Authorities, and other appropriate stakeholders are briefed on the results and conclusions of the SRB. However, some mission directorates used different terms in their guidance and practice when referring to an SRB and its function. These include Independent Review Board (IRB) and Independent Review Team—terms for different bodies used by mission directorates for specific types of reviews.[21] One senior NASA official expressed concerns to this end and suggested it would be in the best interest of NASA to use consistent terminology for the SRB and independent review function.

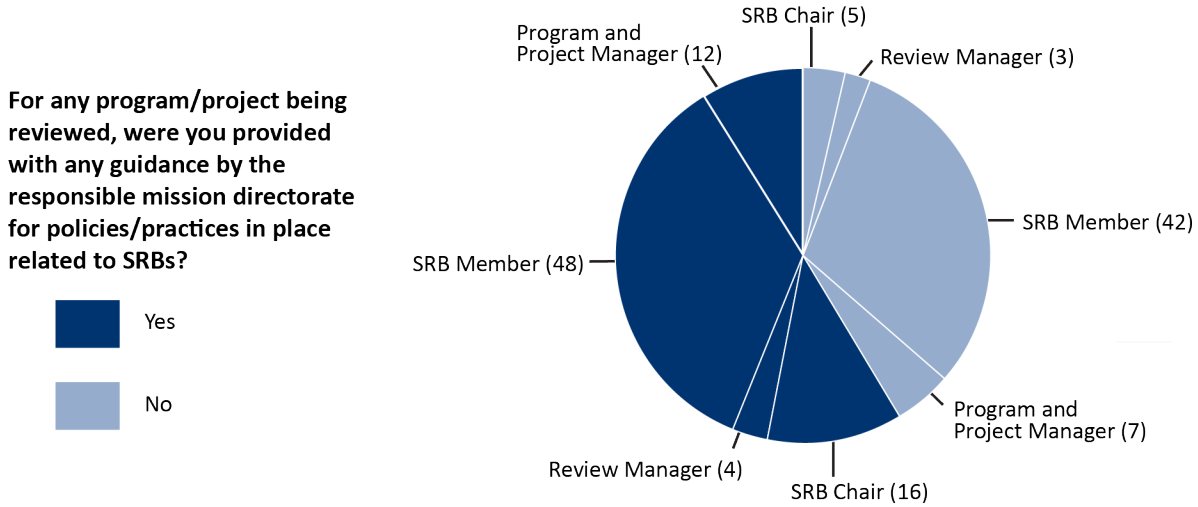
Additionally, mission directorates are inconsistent in their approach to maintaining a skills database of SRB members that can be used by future programs and projects for more efficient formulation and execution of SRBs. In interviews with several NASA officials, they agreed a skills database, including all previous SRB members and their subject matter expertise, would be a mission directorate best practice. In reviewing each mission directorate's SRB guidance, we found only one mission directorate required and maintained a skills database; however, it was outdated and incomplete. NASA's 2024 High Risk Corrective Action Plan lists maintaining one or more centralized databases of qualified, interested, and available personnel for review roles as part of NASA's initiative to advance the state of maturity of independent assessments, further supporting this best practice. Not maintaining an up-to-date and complete skills database that can be shared across mission directorates is a missed opportunity to leverage the investment, expertise, and experience developed from past SRBs. While mission directorates have discretion in tailoring SRBs to the characteristics of the program or project, a uniform policy would ensure a more efficient use of resources and enhance sharing of best practices.

SRB Participants Do Not Find Mission Directorate Guidance Useful

Results from our survey of SRB Chairs, Review Managers, SRB members, and program and project managers largely showed mission directorate SRB guidance is not distributed, used, or effective. In the survey, 57 of 137 respondents (or 41 percent) said they were not provided with any mission directorate guidance on SRBs. Figure 3 shows a breakdown of these survey responses.

[21] An IRB and Independent Review Team are typically commissioned by a Convening Authority with a specific scope and finite duration to evaluate specific concerns about a program or project, as opposed to an SRB that is an advisory body that follows a program or project through its life cycle and is responsible for conducting life-cycle reviews.

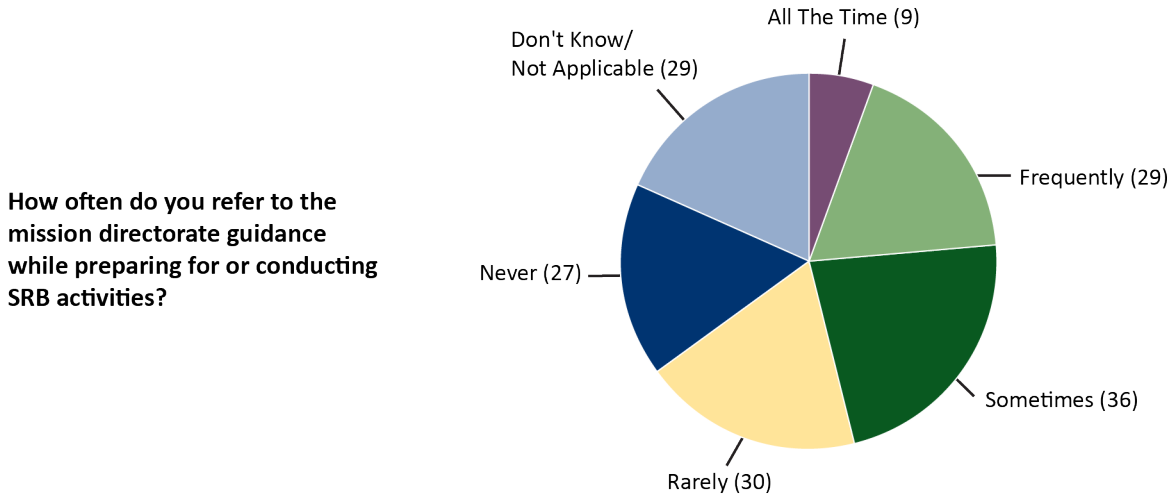
Figure 3: Mission Directorates Providing SRB Guidance



Source: NASA OIG presentation of OIG survey results.

In the same survey, 86 of 160 respondents (or 54 percent) answered with rarely, never, or don't know/not applicable when asked how often they refer to mission directorate guidance on SRBs. Figure 4 shows a breakdown of these survey responses.

Figure 4: Frequency of SRBs using Mission Directorate Guidance

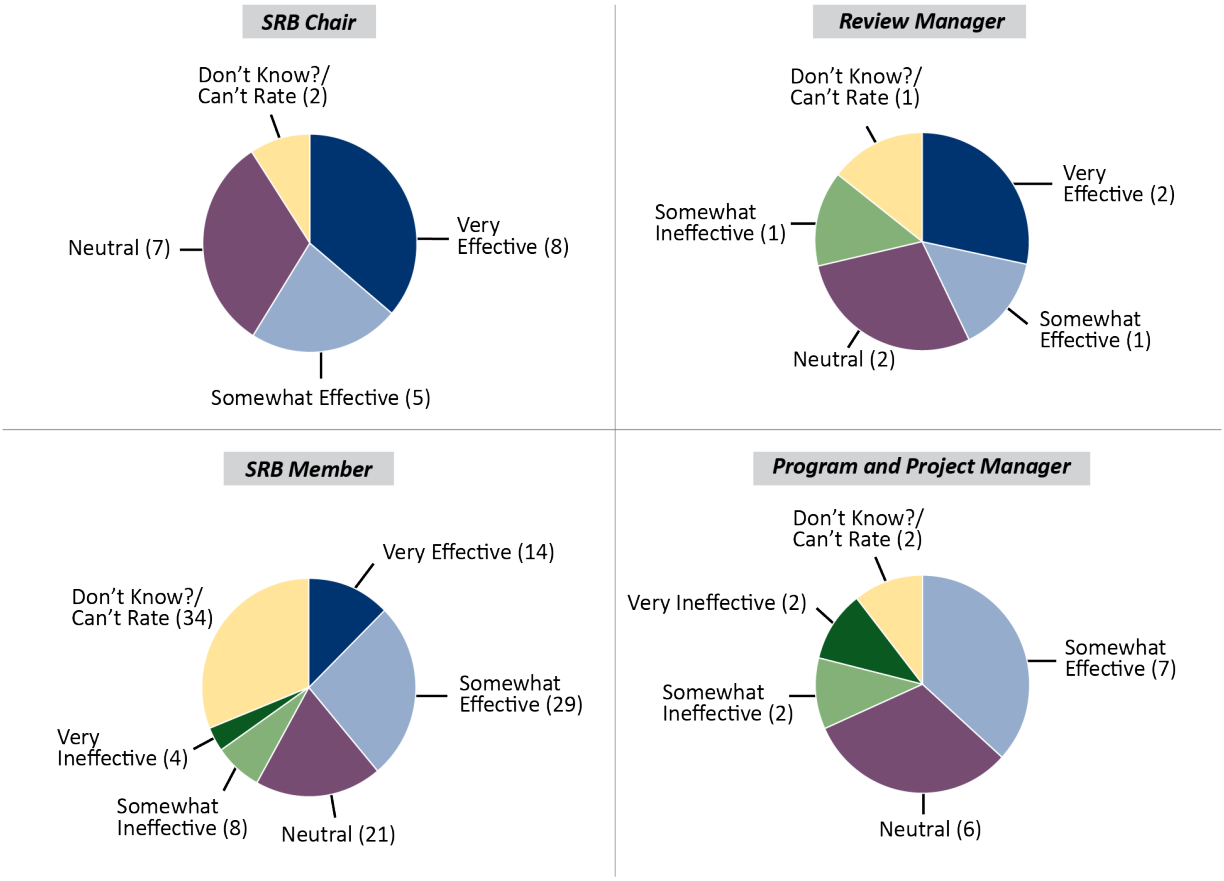


Source: NASA OIG presentation of OIG survey results.

Lastly, the survey showed that 92 of 158 respondents (or 58 percent) found the mission directorate SRB guidance to be very ineffective, somewhat ineffective, neutral, or don't know/can't say. Figure 5 shows a breakdown of these survey responses.

Figure 5: Effectiveness of Mission Directorate SRB Guidance

For mission directorate SRB guidance, how would you rate the effectiveness of each of the following in terms of their helpfulness in preparing and supporting your role as <role>?



Source: NASA OIG presentation of OIG survey results.

The SRB Handbook is referenced in NPR 7120.5F for guidance on the planning, preparation, review, reporting, and closeout of SRB activities. Further, each program's or project's ToR specifies the nature, scope, schedule, and ground rules for the conduct of the life-cycle reviews by the SRB for the program or project to follow. Consequently, and as confirmed with our survey results, mission directorate guidance serves very little additional purpose or value.

IMPROVED SRB COMPOSITION AND TRAINING CAN ADD GREATER VALUE TO LIFE-CYCLE REVIEWS

The SRB Handbook states that SRBs should be composed of highly qualified members and consultants-to-the-board from various sectors (i.e., academia, industry, nonprofit organizations, and government). SRB participants must also be free of bias and conflicts of interest. However, we identified several areas where current practices are failing to provide reasonable assurance that the participants are the most qualified experts, consistently independent of conflicting interests, and adequately trained to accomplish their duties as members of an SRB. Consequently, we question whether the preferred composition of SRBs is providing the best value to NASA decision-makers.

Composition and Balance of the SRB

Membership Formulation and Retention Issues

The NASA Policy on SRBs states that "When considering SRB membership, a well-rounded, diverse set of backgrounds can provide the most versatile perspective of opinions. Members should be selected both from within the Agency and from external sources, including such communities as private industry, academia, and other government agencies, including the Department of Defense (DoD)." The Policy also notes that "The technical skills and perspectives of these individuals are essential to the ability of NASA to consistently produce accurate and objective assessments of NASA programs and projects." Based on our survey results of SRB Chairs, Review Managers, SRB members, and program and project managers, we believe the Agency has more work to do to attain its desired state for SRBs.

Regarding how SRBs are constructed, 10 of 145 SRB Chairs, Review Managers, and SRB members (or 6.9 percent) reported experiencing pressure they considered inappropriate to either participate or not participate in SRB-related activities. Among the SRB Chairs and Review Managers, however, 6 of 30 (or 20 percent) reported experiencing pressure they considered inappropriate or excessive from Agency or program and project management to either select or not select specific individuals for membership on an SRB.

Greater challenges were reported in filling critical SRB roles. For example, nearly half of survey respondents, 12 of 28 (or 42.9 percent), reported some SRB roles were especially difficult to fill. The most identified areas were in programmatics, including cost, budget, and schedule expertise. Technical disciplines mentioned included electrical, systems engineering, and subsystems. Additionally, 4 of 29 respondents (or 13.8 percent) reported the frequency of identifying a potential SRB member who could not be appointed due to a conflict of interest as "often." Also, 5 of 27 respondents (or 18.5 percent) reported using the waiver process after a conflict of interest was identified, but of those who reported experiencing a conflict of interest issue, 15 of 21 respondents (or 83.3 percent) were able to identify an alternate SRB member.

Preference for Civil Servants over Contractors

The SRB Handbook states a preference for using civil service personnel over contractors when establishing an SRB.[22] This preference has flowed down into mission directorate-level SRB implementation guidance as well, which includes statements such as "Membership priority must be given to civil servants" and "Careful consideration should be given for staffing of SRBs with civil servant personnel with augmentation from contract staff only as necessary." However, this preference for civil servants may conflict with an attempt to include members from other sectors, such as academia, industry, and nonprofit organizations.

Respondents to our survey of SRB participants provided their perspective on the use of contractors:

- 7 of 25 respondents (or 28 percent) indicated they felt either somewhat or strongly discouraged from using a contract to recruit potential SRB members. That said, of those respondents who provided additional comments, the most common responses stated they preferred to use civil servants and that contractors should only be used when civil servants are not available. Others noted that using contractor support creates additional administrative burden, takes a long time to get members started, and can be expensive or cost prohibitive. However, respondents with experience using contractors generally expressed satisfaction with those experiences. Positive comments about the use of contractors included that they could bring additional expertise to a board and contractors have at times been retired civil servants with NASA experience.
- 12 of 27 respondents (or 44.4 percent) reported observing differences in the availability and amount of time board members were able to dedicate to SRB-related activities if they were a civil servant compared to a contractor. Many respondents noted that for civil servants, membership on an SRB is an additional duty on top of their existing responsibilities, and that contractors, due to the nature of their obligation, place more of a priority on SRB activities.
- 3 of 19 respondents (or 15.8 percent) replied 'yes' to the question "Do you feel that the amount of funding provided to procure SRB members from a contractor limits your ability to identify independent potential Board members?" 11 of 20 respondents (or 55 percent) stated that having additional funding to select SRB members provided by a contractor would produce a more effective and well-rounded board.
- 5 of 28 respondents (or 17.9 percent) replied 'Yes' to the question "In your experience as <role>, were there times when NASA's preference for using civil servants rather than contractors on an SRB had a negative impact on your ability to establish the required Board membership?" Respondents noted these impacts included less desirable or missing expertise on some boards.
- 13 of 27 respondents (or 48.2 percent) indicated some perceived issue or limitation due to the civil servant preference. Respondents expressed a need for maximum flexibility in recruitment and a general desire to have independent people with the best expertise serving on a board, regardless of the source.

[22] The SRB Handbook states, "NASA prefers CS [Civil Service Consensus Board] or CS2 [Civil Service Consensus Board with Expert Support] boards since civil service members are generally more current on Agency policy, procedures, and culture. Experience demonstrates that a consensus board leads to a more meaningful discussion of the review findings and recommendations, especially where dissenting opinions are discussed. NC [Non-Consensus Mixed Board] boards are typically used when the required expertise of a member cannot be obtained from the civil service workforce."

Additionally, interviews with Agency and mission directorate officials revealed that while they first prefer to select members from the civil service over contractors when establishing an SRB, they also voiced concerns about the potential impact of the civil servant preference on future SRB recruitment efforts due to workload (availability) and retention (retirement) issues. In particular, the increased use of contracting in cost and schedule analysis could help to mitigate these potential resource constraints.

In our judgment, the preference for using civil servants may be leading the Agency to ignore outside expertise, which possibly makes it more challenging to select contractors to serve on an SRB. This approach may require additional resources, but it could ultimately result in more comprehensive information provided to the Decision Authority at the conclusion of the SRB review process.

Conflict of Interest Policy and Process

The NASA Policy on SRBs notes that SRB reports must be the result of a process that is generally free of bias caused by conflicts of interest. This Policy lays out procedures to follow in determining whether a conflict of interest exists and also states, "No individual that has a conflict of interest that is significant enough . . . to likely impair their judgment . . . can be appointed to serve (or continue to serve) on an SRB." The Policy does allow for approval of SRB members with conflicts of interest through a waiver process if it is in the best interest of the government to appoint those members despite the conflict due to their unique expertise or other factors.

Additionally, the SRB Handbook restates many of the points described in the NASA Policy on SRBs and provides further details on the conflict waiver process requirements. The Handbook also states that a civil servant must not participate in any SRB activity until the Agency determines they have no financial interests that will create a conflict with their service on an SRB. Related to contractors, the Handbook holds contracting officers responsible for facilitating the screening of a proposed contractor prior to initiating any work on SRB activities. Further, NPR 7120.5F requires the conflict of interest procedures detailed in the SRB Handbook be strictly adhered to. However, we found the conflict of interest review process as it is currently being executed may not provide reasonable assurance that conflicts for SRB nominees will be disclosed, identified, or mitigated in all cases.

Current Policy on SRB Members Only Designates Vetting Processes for Civil Servants and Contractors

The SRB Handbook references two main categories of potential board members: civil servants and contractors. The NASA Policy on SRBs uses the terminology of federal and non-federal members, but then describes processes related to non-federal members in a contracting context and notes that conflict waivers for these individuals are to be issued by the Assistant Administrator for Procurement. Our review of the ToR documents identified multiple SRB members with reported affiliations outside of this civil servant and contractor dichotomy. Specifically, we identified personnel with reported affiliations from international partners and academic institutions, as well as other entities, such as consultants and members from private industry.

NASA's Policy on SRBs does not explicitly refer to these affiliations or indicate how they should be vetted for conflicts of interest. Therefore, we believe the policy is not optimally designed to ask potential members relevant questions based on all types of affiliation that would provide insight into potential conflicts of interest. Consequently, the information provided by the members may not be sufficient to

determine the existence of conflicts, potential conflicts may not be disclosed and evaluated, and an individual's recommendations as part of an SRB might not be free from bias.

Required Background Disclosure Forms Are Missing from the Current Version of the SRB Handbook

The SRB Handbook and the NASA Policy on SRBs require non-civil service individuals being vetted for potential membership on an SRB to complete and submit a background disclosure and non-disclosure agreement—the Background Information and Confidential Conflict of Interest Disclosure form and Non-Disclosure Agreement—as part of the review process.[23] These forms were included in the December 2016 Revision B version of the SRB Handbook but not in the current February 2023 Revision C version. Additionally, the Non-Disclosure Agreement included in the Revision B version references NPR 1600.01, which was consistent with policy language in Revision B, but this policy was changed to reference NPR 2810.7 in the Revision C version of the Handbook. Because other sections of the SRB Handbook refer to the availability of these forms multiple times, it is important that the correct version of these forms be included for use in the conflict of interest vetting process.

Required Forms Are Not Consistently Used in the Conflict Review Process

The Aerospace Corporation and Cornell Technical Services—the two contractors referenced in the Agency's Conflicts Clearance Review Process training and in mission directorate guidance for SRB member recruitment—are not using the Background Information and Confidential Conflict of Interest Disclosure form during the conflict of interest screening process for the members they obtain. Instead, each contractor has developed its own process for SRB applicants using a web-based internal training and certification system to collect the information requested on this form. After reviewing the materials provided by each contractor in support of their processes, we determined that several questions included on the required Background Information and Confidential Conflict of Interest Disclosure form do not appear to be directly addressed in the contractors' processes, but in most instances they could be considered indirectly addressed through broader, less specific questions. If information required to determine the existence of conflicts of interest is not provided, potential conflicts may not be disclosed and evaluated and an individual's recommendations as part of an SRB could potentially be biased.

Conflict of Interest Review Records Are Not Properly Retained

Based on the individuals identified as SRB members in the ToR documents we reviewed, we generated a random sample of members to test whether conflict of interest reviews were conducted in accordance with Agency policy. However, we could not confirm that conflict of interest reviews were consistently conducted because NASA officials were unable to provide many of the records needed to conduct the testing, such as correspondence with the relevant NASA legal office. We received some documentation from the legal offices that originally conducted the conflict of interest review for civil servants, indicating

[23] The NASA Policy on SRBs states that "To facilitate collection of this information from non-federal members, the 'Background Information and Confidential Conflict of Interest Disclosure' form (attached) **will be used** by appropriate contracting officers and contractors to collect the information." [emphasis added] The SRB Handbook also states that "Appendix D contains a copy of the NASA forms for Background Information, Confidential Conflict of Interest Disclosure, and Non-Disclosure Agreement (NDA) that all non-civil service members who serve on an SRB **must** complete." [emphasis added]

the results of these reviews may not have been retained at the mission directorate or program or project level. In fact, some of the mission directorate responses to our request for records stated there was no formal documentation retained or they simply would not be able to provide the data requested.

Nonetheless, our testing revealed several instances where conflict of interest documentation and processes were flawed. For example, a center legal office did not acquire and review the OGE Form 450, Confidential Financial Disclosure Report, for a civil servant from another federal agency. In another case, a civil servant provided a self-certification that was not reviewed by a legal office.[24] Lastly, we found an instance where the employee involved in the original conflict of interest review had left the Agency so documentation confirming the review was conducted was not available.

NASA's Records Retention Schedules require that conflict of interest vetting records be retained for 6 years following the conflict of interest review and the determination or issuance of a waiver or other related record.[25] Without a reliable confirmation that the required conflict of interest review was conducted, Agency management may not be able to conduct its oversight function to verify these reviews were completed or confirm their results. Additionally, these retention schedules are maintained under NASA Records Management requirements in part to ensure the legal and financial rights of the government are protected. Without these records, holding SRB members accountable for any conflict of interest-related commitments may not be possible and any legal issues related to violation of applicable non-disclosure agreements may not be able to be pursued.

Inadequate SRB Training and Guidance

The NASA Policy on SRBs states that "All individuals selected to serve on SRBs must be highly qualified in terms of knowledge, training, and experience—often highly specialized and particularized—to address the tasks assigned to the SRB properly." The 2016 NASA Agency Program Management Council's Independent Assessment Principles and Approach Decision Memorandum assigned responsibility for SRB-related training to mission directorates and centers, with assistance from the Office of the Chief Financial Officer.

However, training for SRB participants is inconsistent and lacking. During interviews with mission directorate officials, most stated they do not provide formal training for SRBs. Relevant training materials that we identified were in many cases outdated and did not reflect current policy or practice. These materials also tended to focus on supporting the Review Manager or other internal mission directorate function and were missing information regarding the SRB Chair or SRB member function. We identified one course specific to independent assessments available in the NASA-wide training system and determined that only 13 individuals had completed this course in the previous 5 years. Lastly, respondents to our survey indicated that the SRB Handbook, while helpful, was missing information that would benefit them in their respective roles.

In our survey of SRB participants, 70 of 126 respondents (or 55.6 percent) said that sufficient training is not provided to SRB members to enable them to conduct a robust, independent assessment of a program's or project's readiness to continue development. Among the various roles surveyed, this sentiment was highest among SRB members with 56 of 90 (or 62.2 percent) responding about this

[24] This mission directorate's implementation guidance permits self-certifications with no legal office review for certain types of independent assessments.

[25] NASA Records Retention Schedules 1441.1, *Schedules Approved by the Archivist of the United States* (December 10, 2024).

concern. Respondents identified various topic areas where additional training would be helpful, including general training, roles and responsibilities, programmatic (including cost, risk, and schedule), tailoring, RFAs, and completing Individual Member Independent Reports.

In addition, general comments from the respondents on the training process included suggestions for formalizing the training process, completing training and orientation for first-time SRB members and participants, and possibly developing a mentorship or shadowing process that would create a pipeline of trained future members. These themes and others were also captured by the CPMO in the 2023 survey they conducted of the independent assessment community and stakeholders (including SRB Chairs, SRB Deputy Chairs, and Review Managers; mission directorate and center management; and program and project management) and at an Independent Assessment Roundtable in 2024.[26]

When asked about the helpfulness of the SRB Handbook in their role, the majority of respondents to our survey, 88 of 134 (or 65.7 percent), reported finding it either very or somewhat helpful. However, 31 of 81 respondents (or 38.3 percent) indicated that information was missing from the Handbook that would be helpful to them in their respective roles. The most common suggestions for improving the usefulness of the Handbook included updating the content more frequently, creating summaries of Handbook content, providing additional details helpful to the Review Manager and program and project manager roles, including more process information such as flow charts, adding templates and examples, and adding more information on tailoring. Several respondents suggested the Handbook should be included in a required training to ensure SRB members are aware of the content. Additionally, some respondents appeared unaware the Handbook existed with 19 of 57 respondents (or 33.3 percent) who provided general thoughts and comments in this area indicating they had not seen, or in some cases, heard of the Handbook.

[26] In January 2024, the CPMO convened more than 60 members of the NASA independent assessment community with the intent to strengthen the SRB process through discussions.

IMPROVEMENTS NEEDED TO ENSURE ADEQUACY OF SRB ENGAGEMENT AND FIDELITY OF INFORMATION PROVIDED TO DECISION-MAKERS

Life-cycle reviews conducted by SRBs are designed to provide a program or project and NASA senior management with a credible, objective assessment of the program's or project's progress, issues, risks, and status. Further, the reviews are intended to provide a credible basis for the Decision Authority to approve or disapprove the transition of the program or project to the next life-cycle phase. However, we found SRB members may benefit from additional engagement with program and project personnel, more timely access to required program and project data, improved workforce availability, and the freedom to express their opinions without undue influence. Ignoring these issues could result in SRB recommendations to decision-makers that are lacking sufficient review or do not reflect the full results of their assessment.

Frequency of SRB Engagement

A large majority of survey respondents, 114 of 134 (or 85.1 percent), believed the SRB assessment process could be improved by holding additional meetings with the program or project between life-cycle reviews. However, there was no consensus on the recommended cadence of when these meetings should occur. The most frequently suggested intervals included quarterly, semiannually, at the midpoint between life-cycle reviews, when there are significant changes to program or project plans, and when there is greater than a 1-year gap between reviews. Many respondents stated that conducting informal tag-ups, allowing SRB members to attend regular status or subsystem reviews, or including SRB Chairs and/or SRB members on the distribution of regular monthly or quarterly status reports could be sufficient for the board to remain engaged.

Conversely, 4 of 6 Agency and Directorate Program Management Council respondents (or 66.7 percent) did not believe the SRB assessment process could be improved by holding additional meetings between life-cycle reviews. In addition, some survey respondents expressed concerns that too many meetings would place a burden on programs and projects and might compromise SRB member independence due to too much interaction with the program or project. The majority opinion was that SRB interactions with programs and projects should be appropriate for and scalable to the program's or project's scope, complexity, and cost.

In Appendix C, we provide examples of programs and projects that could have potentially benefitted from additional SRB engagement between life-cycle reviews.

Availability of Data During Life-Cycle Reviews

Timely availability of program and project data for SRB members helps ensure the robustness of their life-cycle review, and subsequently, the accuracy and value of information the SRBs provide to decision-

makers. However, 17 of 132 survey respondents (or 12.9 percent) stated they had been denied access to some requested or required information or the information was delayed ("severely delayed" according to one respondent) during the life-cycle review or during development of the SRB's overall conclusion. Most often this information included financial and schedule data. More broadly, nearly half of respondents, 59 of 125 (or 47.2 percent), reported a lack of information or timeliness in providing the information negatively impacted the quality of a review. Respondents noted that a lack of timeliness increased the difficulty of the assessment, resulting in SRBs conducting additional work, the issuance of RFAs, delayed review results, and rushed or incomplete assessment results. To avoid negative impacts, respondents reported working extra hours including holidays and weekends. In some cases, reviews were postponed.

Workforce Availability

The 2016 Independent Assessment Principles and Approach Decision Memorandum called for "involvement in independent assessment from talent across the Agency to enhance synergies and learning between diverse mission areas and to achieve efficiencies" and "personnel with the pre-requisite expertise performing in-line programmatic work in other projects or mission areas are 'tapped' to provide SRB support." However, Agency workforce issues may be negatively impacting the availability or ability of personnel to serve on SRBs.

More than one quarter of survey respondents, 31 of 112 (or 27.7 percent), indicated that their regular NASA duties do not allow them to dedicate an appropriate amount of time to SRB-related activities. Reported impacts included conflicts due to travel and meeting times and the need for extra time to work on SRB duties to stay current. Additionally, 21 of 67 respondents (or 31.3 percent) reported the current SRB process places more demands on their time when compared to their first service on an SRB in that same role. This rate was highest for Review Managers, 2 of 4 (or 50 percent), and SRB Chairs, 3 of 8 (or 37.5 percent). This was ascribed to a variety of factors including reviews of larger and more complicated programs and projects, but also the need to invest more time in preparation, training others, and particularly an increase in the formality of the review process and higher number of meetings. Although 7 of 10 respondents (or 70 percent) stated that availability issues did not have any impact on the ability of their SRB to conduct a full, independent life-cycle assessment for the program or project, those with impacts reported the need to delegate work to others, general inefficiencies, and ultimately some missing data inputs.

Survey results also indicated some difficulty and concerns in retaining SRB members after appointment for the duration of a program's or project's development, which in some cases can be more than a decade. For example, retirement was mentioned by 9 of 34 respondents (or 26.5 percent), but not as frequently as availability due to a promotion, reassignment, or other job changes as noted by 12 of 34 respondents (or 35.3 percent). General availability and changes in existing duties were also mentioned by 9 of 34 respondents (or 26.5 percent). We believe these factors may result in negative impacts to the quality of information the SRB provides to the Decision Authority.

Pressure to Change Scores and Recommendations

A 2023 CPMO survey revealed concerns about the independence of assessments. This includes presentations from independent assessment teams to Agency stakeholders prior to Key Decision Point reviews that may allow stakeholders to potentially soften or change the context of an independent assessment team's report.

In our survey to SRB Chairs, we asked whether they had ever felt "pressured" by a Review Manager, program or project manager, or other NASA personnel to change scores or recommendations on the Snapshot or final report. 5 of 23 SRB Chairs (or 21.7 percent) reported they had felt pressured, most often to change the forcefulness of the language or the scoring. We asked a similar question of SRB members and 12 of 109 (or 11 percent) reported having felt pressured. Though less frequent, but more concerning, 7 of 111 SRB members (or 6.3 percent) felt pressured by SRB Chairs to change scoring on an Individual Member Independent Report or to close, withdraw, or not submit an RFA.

Although the number of positive responses to these questions may not be significant, their presence in relation to the independence of SRB recommendations concerns us. The independent assessment process includes multiple controls throughout the formulation and conduct of an SRB, but a threat to a board's independence at the reporting stage undermines each of the controls that come before it. This in turn may ultimately lead to recommendations to the Agency's Decision Authorities that do not accurately reflect the results of the assessment of a program's or project's maturity and readiness to enter the next phase of its development and implementation life cycle.

SRB Process Lacks a Method to Document and Implement Lessons Learned

Mission directorates are not adequately capturing and managing lessons learned from the SRB process in accordance with NASA directives and requirements. NASA policy requires lessons learned to be captured, yet SRBs are generally not reviewing lessons learned before the independent review process nor are they capturing them after the independent review process is completed. In the few instances that lessons learned were captured, the process was informal or captured locally only so that lessons learned could not be shared Agency-wide. Moreover, the SRB Handbook does not include information on how to integrate the lessons learned within the independent review process. Consequently, future SRBs will not fully benefit from process improvements gained from incorporating lessons learned from previous SRBs.

SRBs Are Not Applying Lessons Learned Processes

The NASA Governance and Strategic Management Handbook highlights the importance of incorporating the knowledge gained through experience to support continuous improvement in implementing NASA missions.[27] NPD 7120.6A cites the Strategic Management Handbook to emphasize it is NASA policy to ensure the Agency's technical and project knowledge is captured and accessible across all mission directorates and centers.[28] NASA policy requirements call for mission directorates to capture lessons learned from independent assessments.[29]

Historically, NASA's principal mechanism for collecting and sharing lessons learned from Agency programs and projects is an online database called the Lessons Learned Information System. Our review of the system for SRB-related lessons learned returned very limited results suggesting that the system is not widely used for SRB processes. Appendix C includes three recent NASA missions we reviewed for SRB implications and potential lessons learned.

Mission directorate officials advised there was no meaningful lessons learned process specific to the SRB and independent life-cycle review process. This information was supported by our survey where 92 of 139 respondents (or 66 percent) stated there was no, or only occasional, use of lessons learned before the review process and 93 of 157 respondents (or 59 percent) stated they did not, or only occasionally, collected them after completion of the review process. See Table 2 for a detailed breakdown of the responses to these two questions.

[27] NPD 1000.0C provides details about the Agency's structure, values, management priorities, and processes including lessons learned.

[28] NPD 7120.6A, *Knowledge Policy for Programs and Projects w/Change 1* (December 16, 2019).

[29] NPR 7120.5F specifically calls for mission directorates to capture lessons learned from independent reviews, with support from centers. NPR 7120.8A, *NASA Research and Technology Program and Project Management Requirements (Revalidated w/change 5)* (September 14, 2018), similarly states that programs and projects should continuously capture and document lessons learned within the context of reviews including independent assessments and reviews.

Table 2: SRB Lessons Learned in Practice

Response Category	Percentage for Lessons Learned Shared Before a Review	Percentage for Lessons Learned Collected After a Review
Don't Know/Not Applicable	7%	14%
Never/Rarely	33%	30%
Occasionally	33%	29%
Often/Always	27%	27%
Total	**100%**	**100%**

Source: NASA OIG analysis of OIG survey responses.

More concerning, in the 102 written responses we received to our open-ended survey questions, nearly half revealed the lessons learned process was either not done or was informal. For example:

- [The lesson learned process] seems random. In my experience we capture lessons [but] don't learn them and don't review them.
- [The lessons learned are] not captured except in people's memories and meeting notes. The most valuable lessons learned are often captured and maintained outside any formal system.

Additionally, the other half of those written responses indicated that while lessons learned were captured formally, they resided in some combination of the project file or other local database. NASA policy requirements state that the Agency's program and project knowledge should be captured and accessible across all mission directorates and centers. Keeping the information in a project file or local database provides little assurance that the lessons learned will be adequately distributed at the larger institutional level and be available to inform future SRBs.

Lack of SRB Handbook Guidance for Lessons Learned

The SRB Handbook does not incorporate an SRB lessons learned process for the mission directorates to implement and share the lessons Agency-wide. Moreover, the SRB Handbook is itself, at least in part, a collection of lessons learned and not having an SRB lessons learned process makes additions between updated Handbook versions less effective. Generally, mission directorates rely on the centers implementing a program or project to have built up knowledge to perform lessons learned. Only two of the five mission directorates have even started to build processes to capture and integrate SRB experiences into usable guidance.

However, we found there were efforts by the CPMO to capture process improvements. For example, the NASA Independent Assessment Roundtable in 2024 recommended a feedback loop following the life-cycle review process—a quick and simple feedback mechanism for teams to provide input on the review process immediately after its completion could help make improvements to the SRB process. Similarly, the Office of the Chief Financial Officer's guide that is specific for programmatic members of SRBs recommends that within a month of completing the life-cycle review process, the programmatic members should document analysis lessons learned, issues, and successes.

Not having a more structured process for the collection of lessons learned reduces the Agency-wide benefit of those lessons for independent reviews. Moreover, it reduces the CPMO's ability to evaluate and integrate the best process improvements into Agency-wide guidance.

CONCLUSION

The current responsibility and ownership structure for the SRB function wherein mission directorates have been delegated both responsibility and accountability has created a potential governance conflict of interest and lacks effective checks and balances. The CPMO's oversight role, as merely an office of influence, does not provide the needed checks and balances to ensure effective SRBs are consistently performed across all mission directorates. Under the current structure, there are significant deficiencies in the execution of SRBs for NASA programs and projects. These include the untimely completion of key deliverables such as the ToR, the SRB Chair's readiness assessment, data drops from programs and projects, and the SRB's Snapshot Reports.

Our survey of SRB participants noted significant issues that may ultimately lead to recommendations to the Agency's Decision Authorities that do not accurately reflect the results of the assessment of a program's or project's maturity and readiness to enter the next phase of its development and implementation life cycle. These include the composition and balance of the SRB membership, inadequate training, availability of data, availability of workforce, pressure to change scores and recommendations, processing conflict of interest reviews, and lack of a formal lessons learned process. Moreover, the current structure does not provide an independent avenue for SRB members to communicate and address issues during and after the reviews.

Gaps and deficiencies in the SRB function can result in ineffective independent life-cycle reviews, a key component of the system of checks and balances NASA has implemented to encourage transparency, ensure accountability, enhance stability, improve decision-making, and help programs and projects meet cost and schedule commitments.

RECOMMENDATIONS, MANAGEMENT'S RESPONSE, AND OUR EVALUATION

Although there are many unknowns regarding NASA's budget in the upcoming years, to ensure the effectiveness of the SRB function, we recommended the NASA Associate Administrator:

1. Increase the oversight role of the CPMO to address deficiencies in the execution of SRBs and provide SRB members an independent avenue to communicate and address issues during and after the SRBs.

In addition, we recommended the CPMO work with the Mission Directorate Associate Administrators, Office of the General Counsel, Contracting Officers, and other offices, as necessary, to:

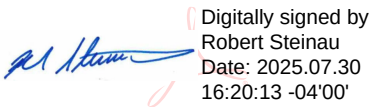
2. Update the SRB Handbook to reflect current policy, processes, and practices.
3. Evaluate whether the preference for using civil servants is necessary for all disciplines. If not necessary, consider promoting the use of contractors for board membership in disciplines where the pool of civil servant expertise may be limited.
4. Evaluate the potential for developing a more formalized pipeline and recruitment process for SRB participants that could include maintaining a skills database of past members.
5. Review existing conflict of interest policy and processes and consider:
    a. clarifying terminology and developing definitions to aid Agency personnel in consistently identifying which affiliation types are included in existing categories and the review process used for each, and/or
    b. expanding the number of affiliation categories to account for, at a minimum, international partner agencies.
6. Establish a process for verifying that mission directorates are conducting the required conflict of interest reviews timely and implement record retention policies regarding SRB conflict of interest review documents.
7. Verify that contracts used to engage SRB members through contractors adhere to the conflict of interest processes established in the SRB Handbook.
8. Determine whether there is a need for individual mission directorate guidance for SRB execution or if individualized mission directorate tailoring can be more effectively accomplished in the ToR. If mission directorate guidance is determined to be needed, update them accordingly and establish a frequency for their review and updating.
9. Develop a formal, role-based training program with a focus on first time members in SRB roles.
10. Determine the optimal method(s) and frequency required to keep an SRB appropriately engaged and informed of program and project status between life-cycle reviews and implement an applicable procedure in the SRB Handbook or other policy or guidance.

11. Identify obstacles that inhibit programs and projects from providing timely information to SRBs and implement solutions so that timelines agreed to for data deliverables are met.
12. Implement a process for mission directorates to facilitate the collection and sharing of lessons learned and document that process in the SRB Handbook.

We provided a draft of this report to NASA management who concurred or partially concurred with our recommendations and described planned actions to address them. We consider management's comments responsive; therefore, the recommendations are resolved and will be closed upon completion and verification of the proposed corrective actions.

Management's comments are reproduced in Appendix D. Technical comments provided by management and revisions to address them have been incorporated as appropriate.

If you have questions about this report or wish to comment on the quality or usefulness of this report, contact Laurence Hawkins, Audit Operations and Quality Assurance Director, at 202-358-1543 or laurence.b.hawkins@nasa.gov.



Robert H. Steinau
NASA OIG Senior Official

APPENDIX A: SCOPE AND METHODOLOGY

We performed this audit from April 2024 through July 2025 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

In this audit, we evaluated whether SRBs are providing services and recommendations that increase the likelihood of mission success. To perform this audit, we reviewed key agency documents related to the SRB process including NASA Policy Directives and NASA Procedural Requirements. We interviewed Agency personnel associated with the CPMO as well as each mission directorate, the Office of the Chief Financial Officer, and the Office of the Chief Engineer. We also obtained and reviewed Agency guidance and related documentation regarding SRBs, including multiple versions of the Agency's SRB Handbook and current versions of the mission directorate SRB guidance related to independent assessments as well as training documentation. We obtained and reviewed ToR documents for the population of programs and projects included in the scope of this review, and reviewed information provided by contractors involved in the SRB membership formulation process to determine their compliance with NASA's conflict of interest vetting requirements. We also reviewed and queried internal databases related to SRB membership and lessons learned.

As part of our fieldwork, we conducted sample testing regarding internal compliance with the Agency's requirements for the preparation and execution of life-cycle reviews as well as conflict of interest vetting for proposed SRB members. We judgmentally selected 30 NASA programs and projects across the Agency's five mission directorates to test whether the nine steps provided in the SRB Handbook were executed and timelines were met. Specifically, the testing verified whether:

- the first signed ToR was completed in a timely manner
- the first signed ToR had a completed skills matrix
- the first signed ToR had a completed SRB member contact list
- SRB tailoring was approved by appropriate officials
- the readiness assessment was completed at least 30 days prior to the life-cycle review
- the life-cycle review agenda was completed at least 30 days prior to the review
- the 100-, 60-, and 20-day data drops were completed prior to the life-cycle review
- RFAs were closed prior to the life-cycle review
- the Snapshot Report was completed within 24 to 48 hours following the life-cycle review

The sample was generally stratified to obtain a representative sample based on the number of programs and projects by mission directorate.

For the conflict of interest testing, we judgmentally selected a sample of 46 SRB Chairs and members listed on the ToR documents with an effective date of 2020 or later to test whether conflict of interest

reviews were completed timely. The sample was stratified among the various affiliation groups identified in this report to obtain a representative sample for each affiliation type.

We also conducted an online survey of current and former SRB Chairs, Review Managers, SRB members, and program and project managers to solicit their input on issues related to the steps performed in this audit. Participant data was drawn from the ToR documents provided by the mission directorates. The survey was conducted in October and November 2024. By the time the online portal was closed, 189 respondents had completed the survey.

In addition to this survey, we distributed a questionnaire to a judgmentally selected sample of 30 members of the Agency Program Management Council and the various mission directorate-level Directorate Program Management Councils. Responses to this questionnaire were compiled manually.

Finally, for three programs and projects—Mars Sample Return (MSR), On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1), and Psyche—we reviewed information developed during reviews by IRBs and other review teams. We determined if there was a connection between issues identified during the development of these missions and issues identified during our review of the SRB process.

Assessment of Data Reliability

We assessed the reliability of the ToR data by (1) performing electronic testing to check for obvious errors in accuracy and completeness, (2) reviewing related and existing documentation, including information about the data and the system, and (3) interviewing Agency officials knowledgeable about the data. When we found discrepancies, we identified these findings as discrepancies between the ToR and the source database when matching email address information. We worked with the Systems, Applications, and Products in Data Processing information technology team to identify and determine the extent of these discrepancies. Following our assessment, we determined the data was sufficiently reliable for the purpose of reviewing SRB member data and ensuring the accuracy of the survey population, and no further issues were identified.

Additionally, we assessed the reliability of the Qualtrics survey software data used to complete our online survey by reviewing (1) completed surveys and (2) the ability for Qualtrics to manage the complete process of sending and anonymously tracking responses. When we found discrepancies, identified as related to inconsistencies in the completeness of survey responses and potential issues with incomplete data from the identified survey population, we examined the potential impact to our audit findings. No impact was noted as each question stood on its own. We allowed for the filtering of data based on respondent type ('role') and whether they were internal or external to NASA. Each survey respondent was tied back to the source database for active account and email validation. Following our assessment, we determined the data was sufficiently reliable for the purpose of analyzing the sentiment for the effectiveness and efficiency of the SRB function, which supported the audit objectives.

Review of Internal Controls

We assessed internal controls to satisfy the audit's objectives and that were determined to be significant within the context of the overall objective of NASA's management of its SRB processes. Specifically, we assessed whether NASA's current independent review goals are being met through processes associated with decentralization, Agency oversight and culture, CPMO authority, resources allocation, independence, training, policy and procedures, and frequency of application in accordance

with the internal control components and underlying principles as per the Government Accountability Office's *Standards for Internal Control in the Federal Government*.[30] Internal control weaknesses were identified and discussed in this report. Our recommendations, if implemented, will improve those identified weaknesses. However, because our review was limited to these internal control components and underlying principles, it may not have disclosed all internal control deficiencies that may have existed at the time of this audit.

Prior Coverage

During the last 5 years, the Office of Inspector General has not issued any reports of significant relevance to the subject of this report. The Government Accountability Office has issued one relevant report, *NASA: Assessments of Major Projects* (GAO-20-405, April 29, 2020), which can be accessed at https://www.gao.gov.

[30] Government Accountability Office, *Standards for Internal Control in the Federal Government* (GAO-14-704G, September 10, 2014).

APPENDIX B: SURVEY OF SRB PARTICIPANTS

Methodology

We developed an online survey that was distributed to participants associated with SRBs since 2016 when the SRB process was decentralized.[31] Those participants include current and former SRB Chairs, Review Managers, SRB members, and program and project managers who are part of the SRB or have roles in the SRB process, either in support functions or as participants in the reviews the SRBs conduct.

The population includes all individuals serving in these roles on a related program's or project's ToR document. This documentation was provided by NASA's mission directorates in response to our request for the initial ToRs for those programs and projects that were required by NPR 7120.5E and NPR 7120.5F to conduct any SRB life-cycle reviews during or after 2016. We compiled data from the ToRs and all members of the population were included in the sample so long as they were (1) still NASA employees (if their participation in SRB activities was as a civil service member) and (2) their contact information was available.

Survey questions were developed and directed to individual participants based on their roles on SRBs. Because of the possibility or likelihood that SRB-affiliated individuals may have served in different roles on different SRBs at different points in time, the audit team developed a hierarchical approach for assignment of individuals to a specific survey group: (1) SRB Chairs, (2) Review Managers, (3) SRB members, and (4) program and project managers. In other words, if the same individual served in different roles on different SRBs, they were assigned to the highest role ever held as determined by this hierarchy.

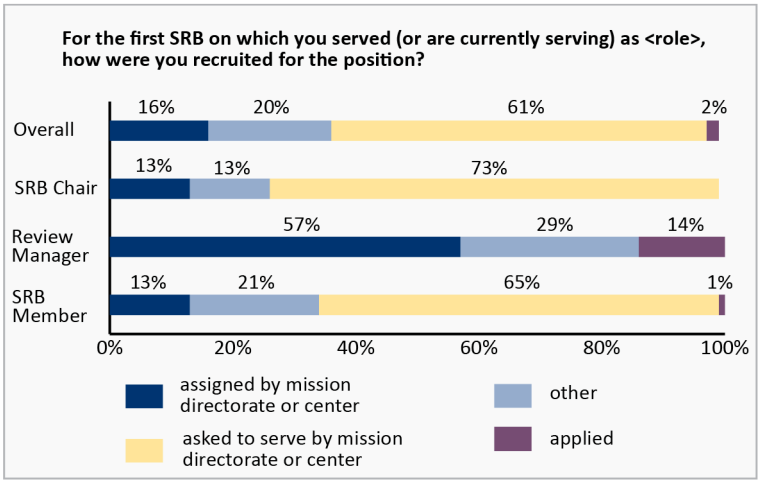
Because of the length of the survey, we did not require particular questions be answered, meaning that respondents could complete the survey without answering all questions. As a result, the number of respondents can vary significantly between questions and any analysis reflecting a number or percentage of respondents is specific only to the number or percentage of respondents who answered that particular question.

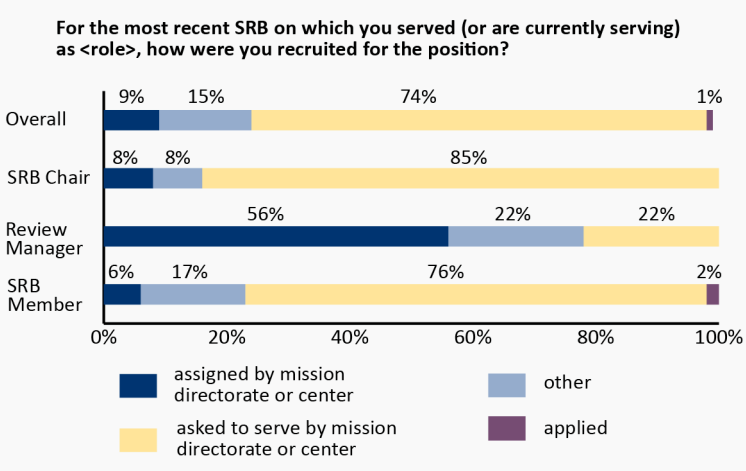
The following pages include responses to 47 of the multiple choice questions asked in the survey. The graphics depict the percentage of respondents that answered each of the choices provided; however, due to rounding, the percentages in the graphics may not add up to 100 percent.

[31] A separate questionnaire was distributed to a sample of members of the Agency Program Management Council and the various Directorate Program Management Councils for Agency-level input. Their responses were analyzed separate from the survey described here.

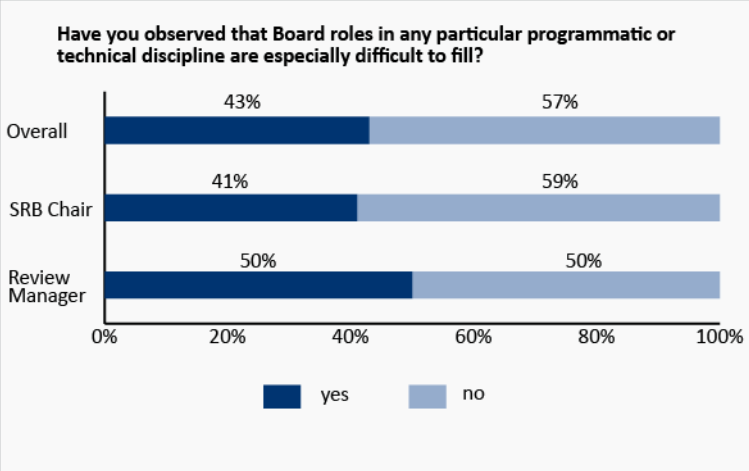
Multiple Choice Survey Question Responses

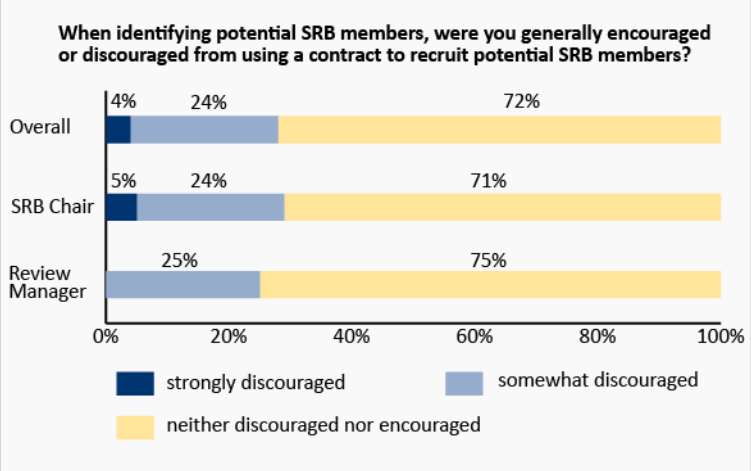
Group 1: General SRB Information

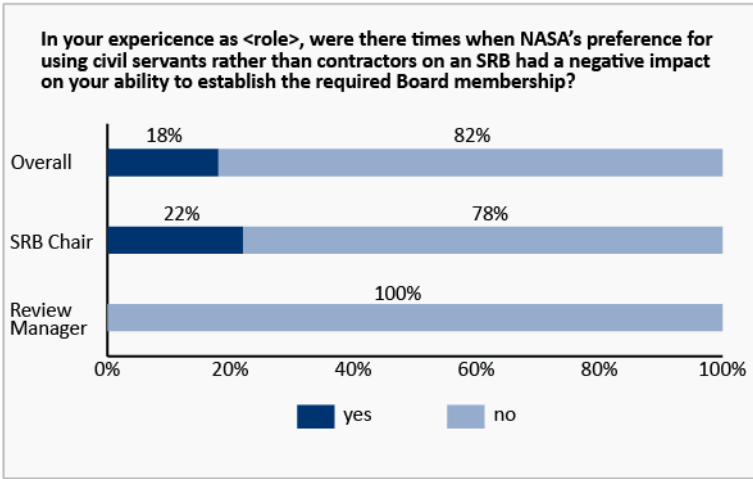


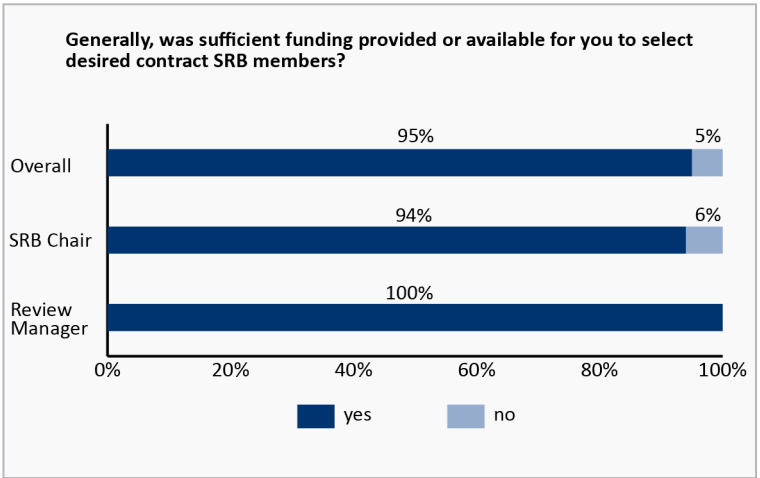


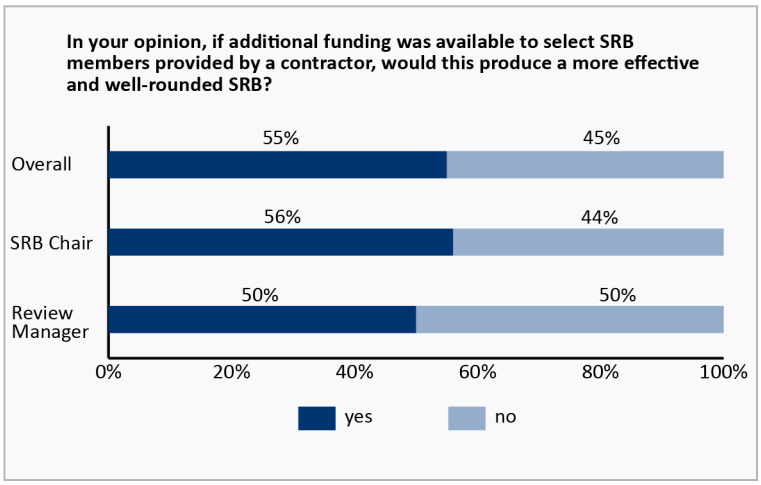
Group 2: SRB Member Selection and Participation

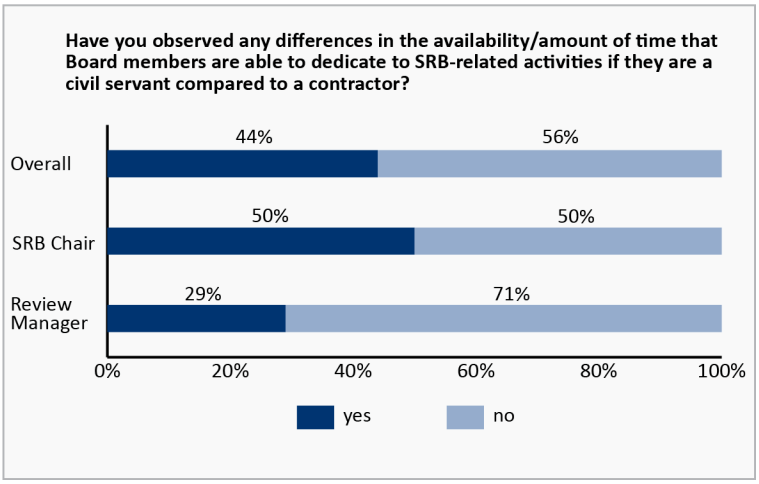


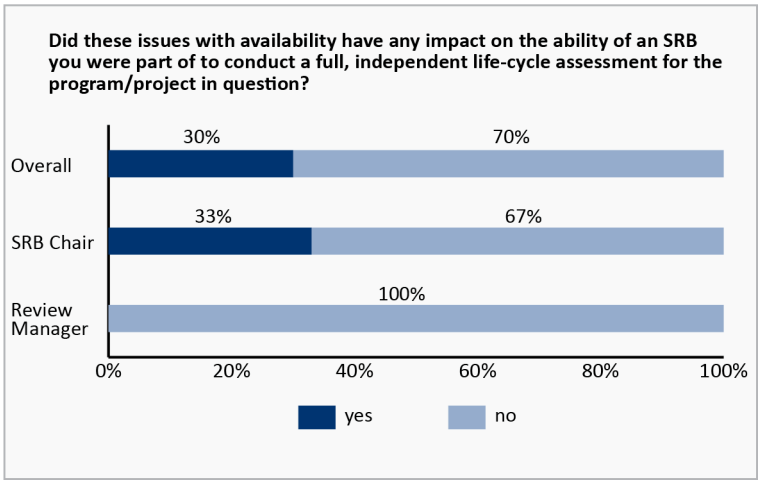


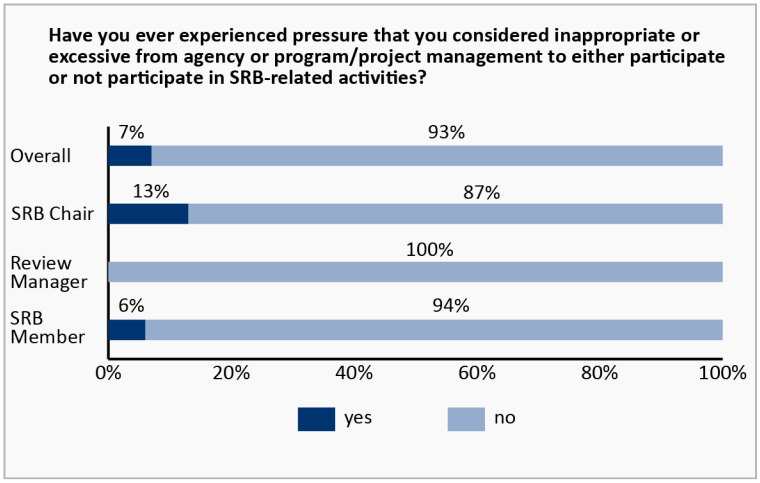




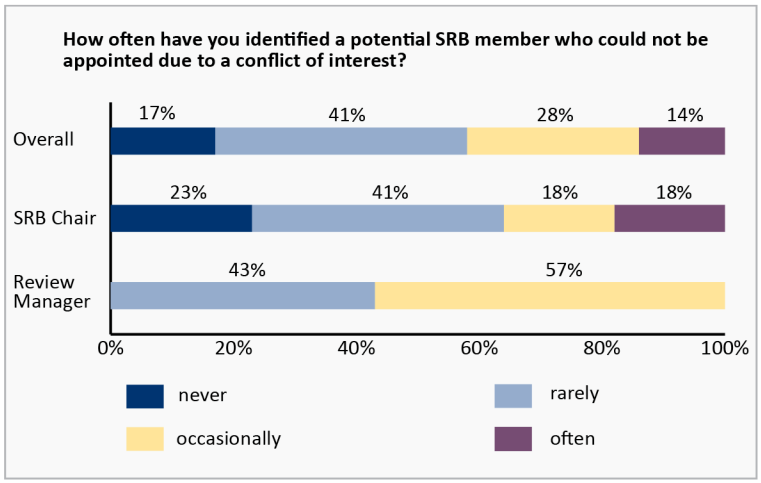


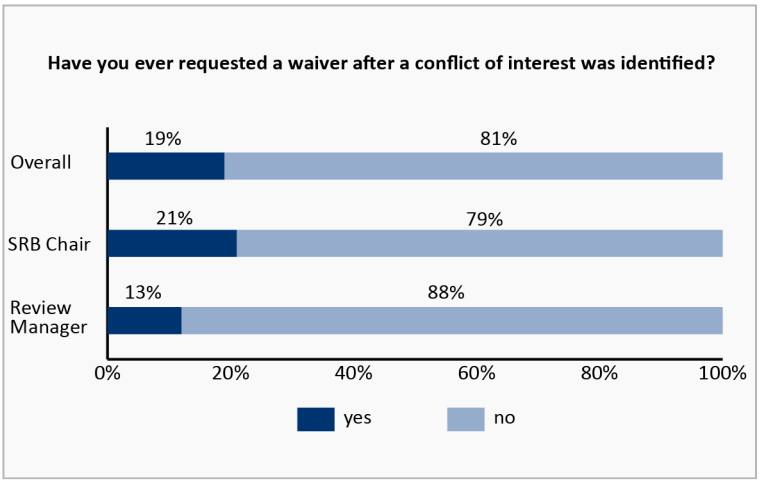


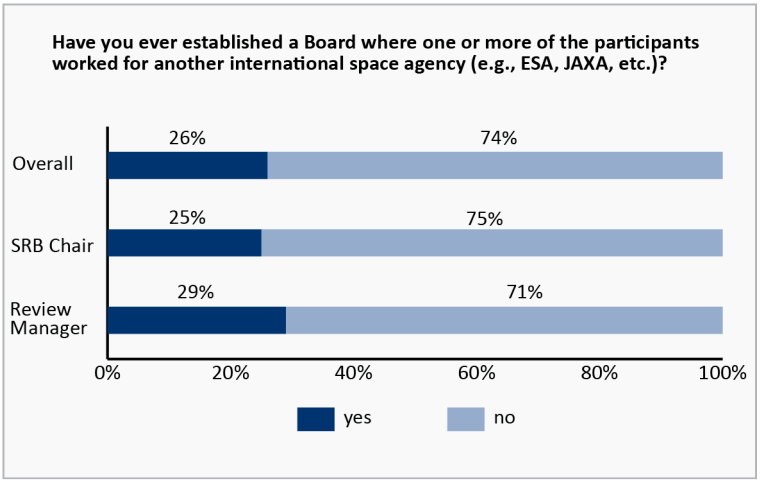


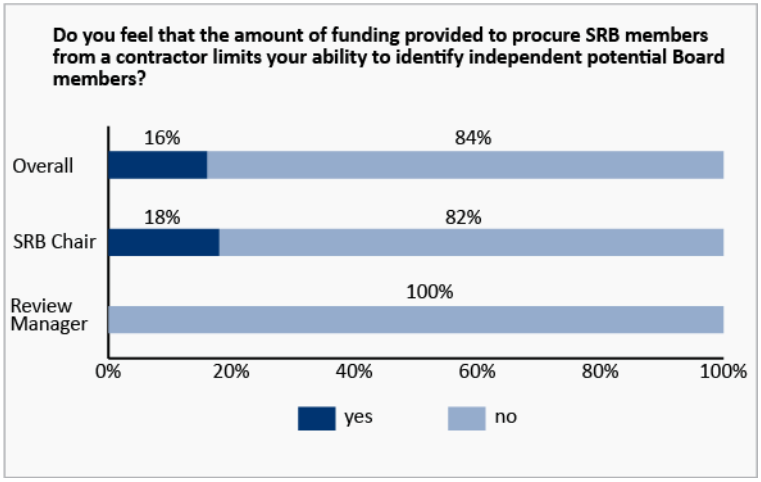


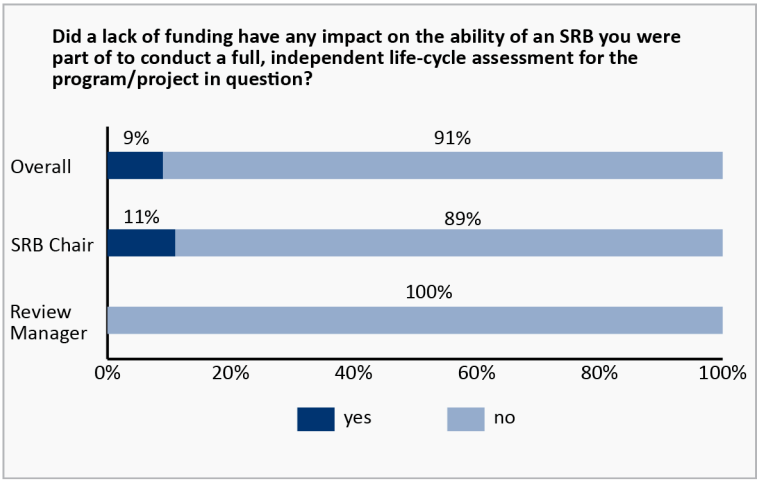
Group 3: SRB Independence and Conflicts of Interest

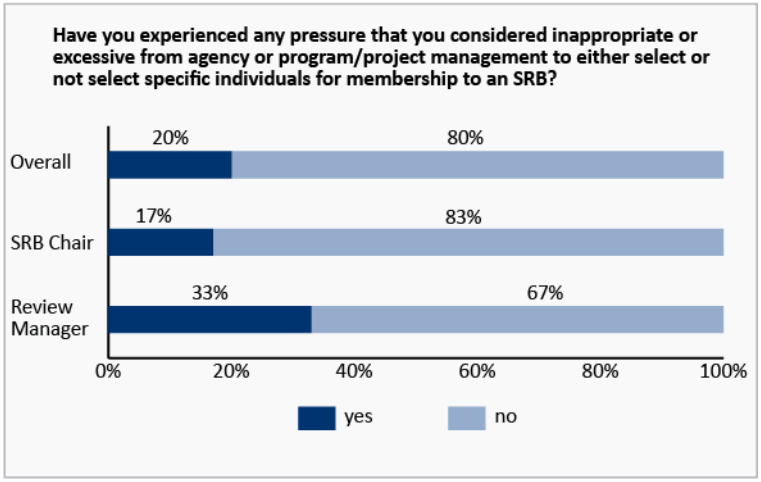




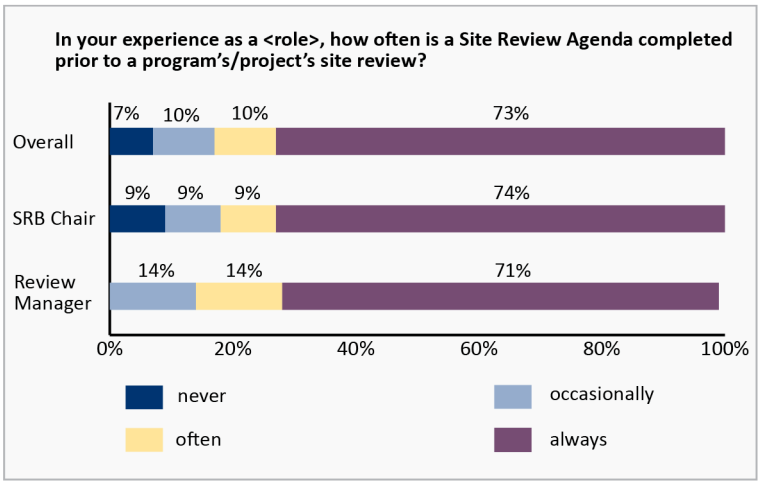


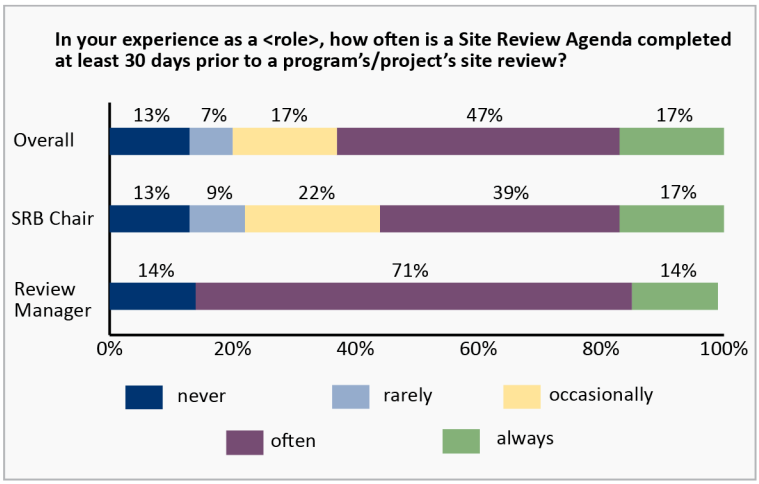


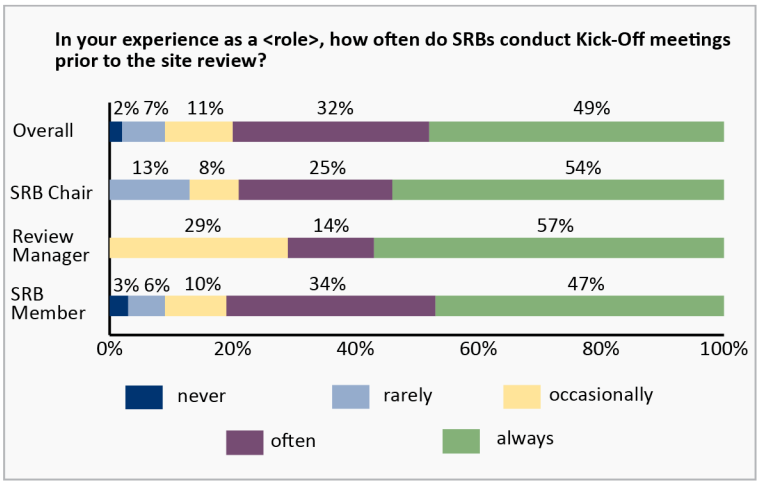


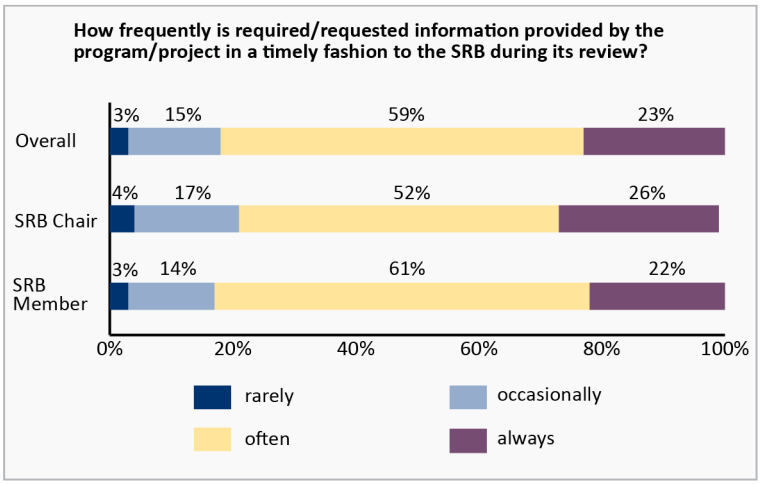


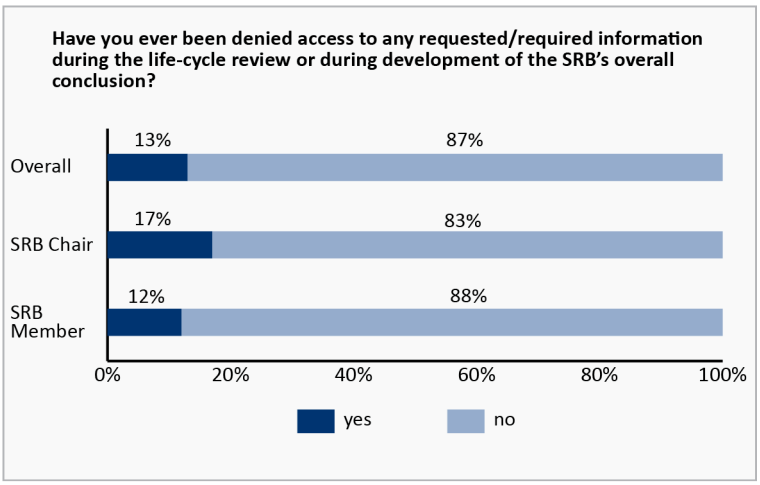
Group 4: Preparation for and Conducting SRB Reviews

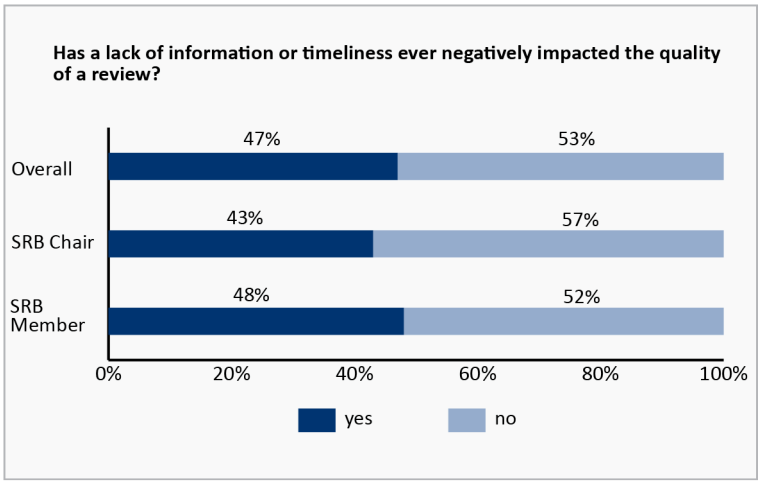


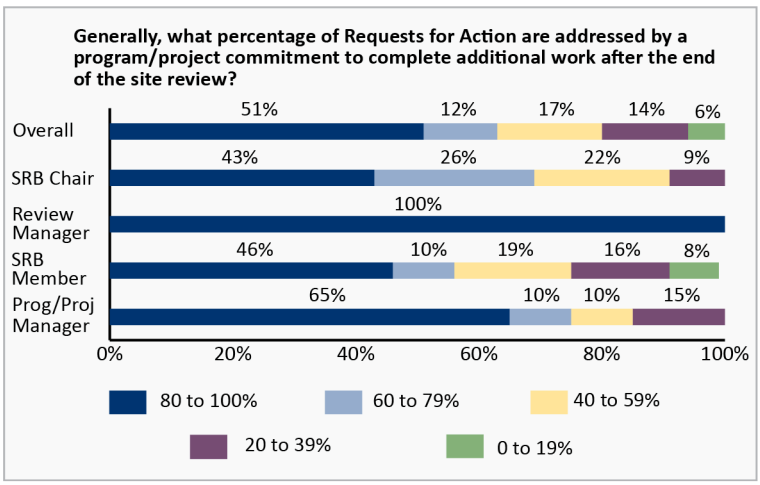


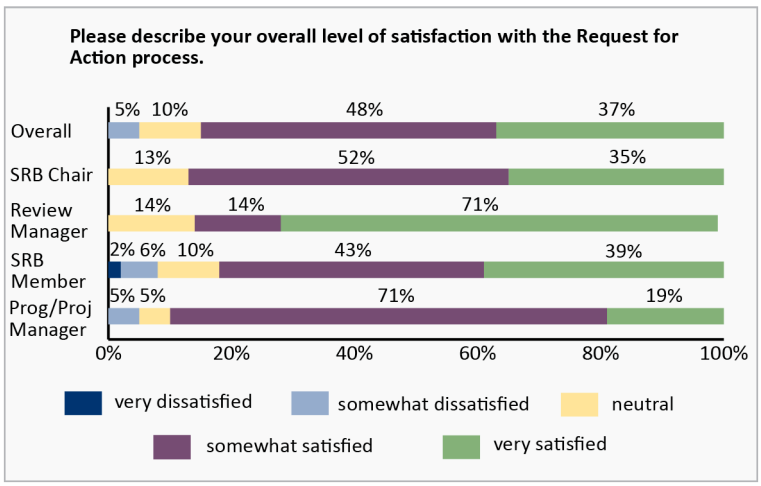

In your experience as a <role>, how often do SRBs conduct Kick-Off meetings prior to the site review?
Overall
2%
7%
11%
32%
49%
SRB Chair
13%
8%
25%
54%
Review Manager
29%
14%
57%
SRB Member
3%
6%
10%
34%
47%
0%
20%
40%
60%
80%
100%
never
rarely
occasionally
often
always


How frequently is required/requested information provided by the program/project in a timely fashion to the SRB during its review?
Overall
3%
15%
59%
23%
SRB Chair
4%
17%
52%
26%
SRB Member
3%
14%
61%
22%
0%
20%
40%
60%
80%
100%
rarely
occasionally
often
always

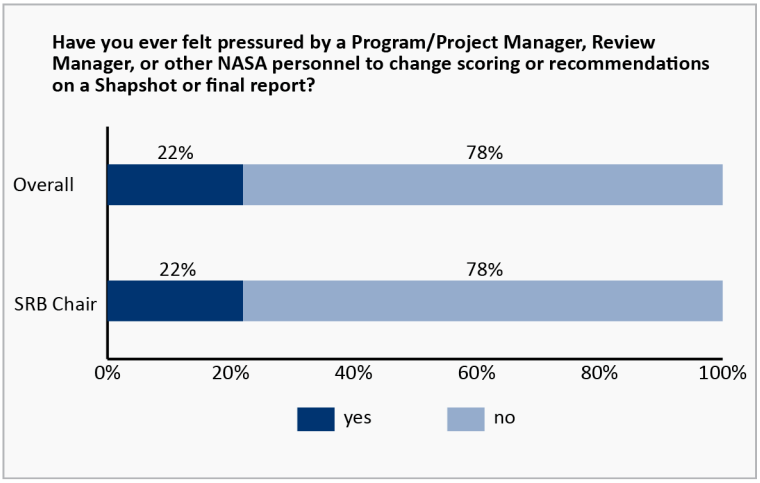

Have you ever been denied access to any requested/required information during the life-cycle review or during development of the SRB's overall conclusion?
Overall
13%
87%
SRB Chair
17%
83%
SRB Member
12%
88%
0%
20%
40%
60%
80%
100%
yes
no

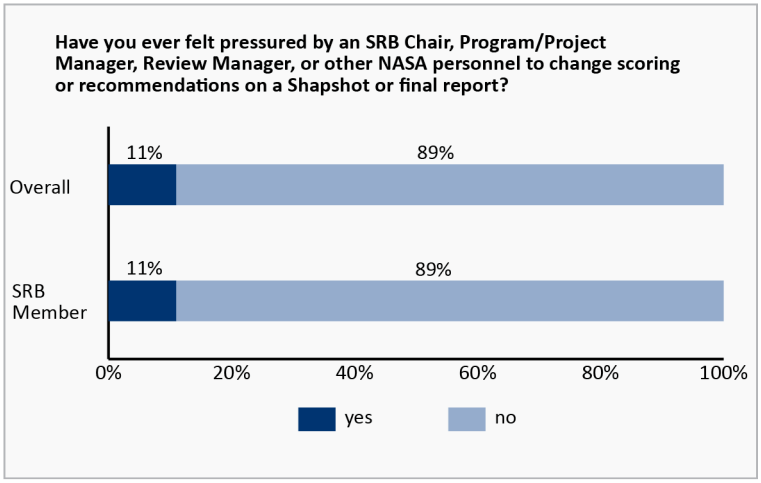

Has a lack of information or timeliness ever negatively impacted the quality of a review?
Overall
47%
53%
SRB Chair
43%
57%
SRB Member
48%
52%
0%
20%
40%
60%
80%
100%
yes
no

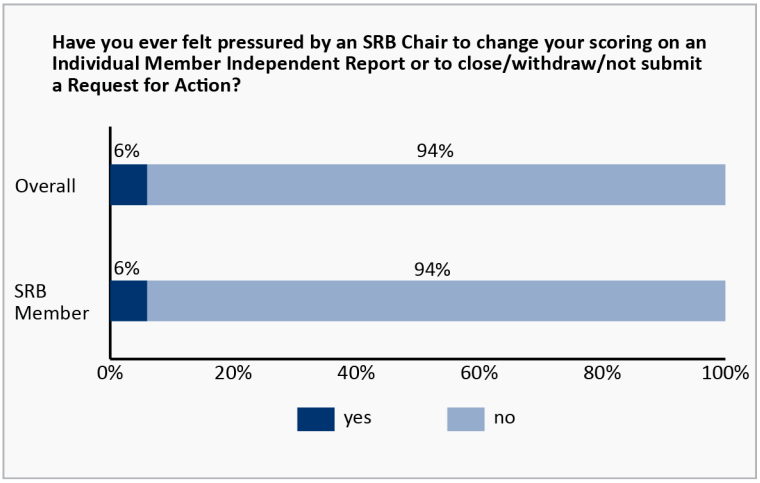

Generally, what percentage of Requests for Action are addressed by a program/project commitment to complete additional work after the end of the site review?
Overall
51%
12%
17%
14%
6%
SRB Chair
43%
26%
22%
9%
Review Manager
100%
SRB Member
46%
10%
19%
16%
8%
Prog/Proj Manager
65%
10%
10%
15%
0%
20%
40%
60%
80%
100%
80 to 100%
60 to 79%
40 to 59%
20 to 39%
0 to 19%

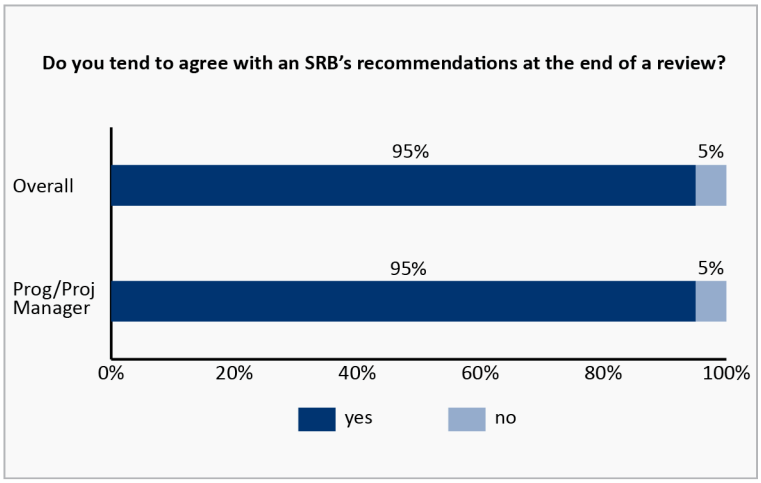

Please describe your overall level of satisfaction with the Request for Action process.
Overall
5%
10%
48%
37%
SRB Chair
13%
52%
35%
Review Manager
14%
14%
71%
SRB Member
2%
6%
10%
43%
39%
Prog/Proj Manager
5%
5%
71%
19%
0%
20%
40%
60%
80%
100%
very dissatisfied
somewhat dissatisfied
neutral
somewhat satisfied
very satisfied

Group 5: Pressures on SRBs and SRB Products

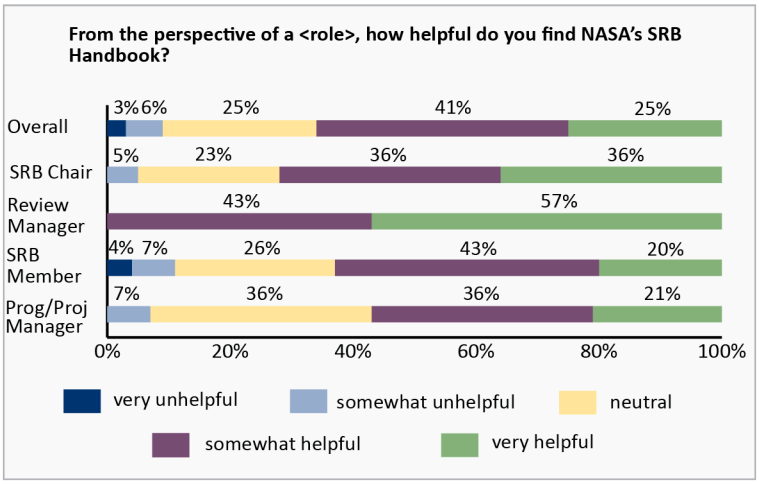


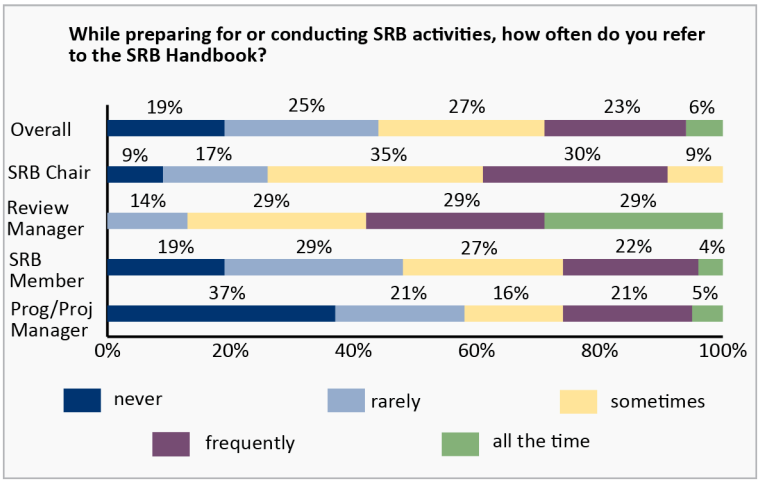


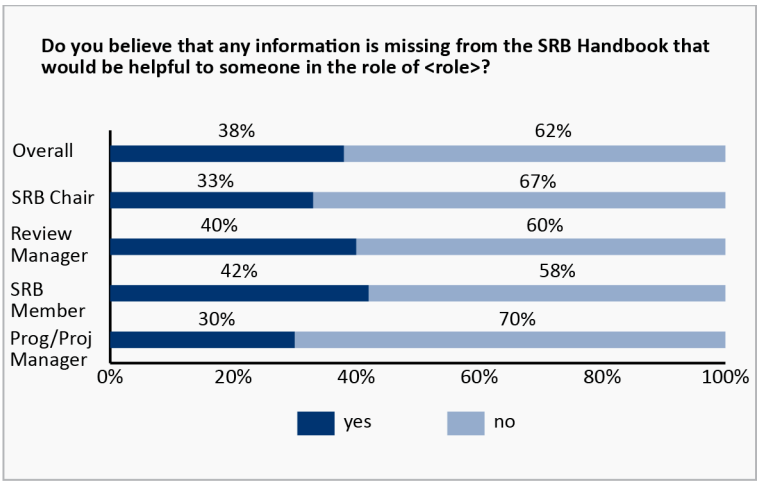


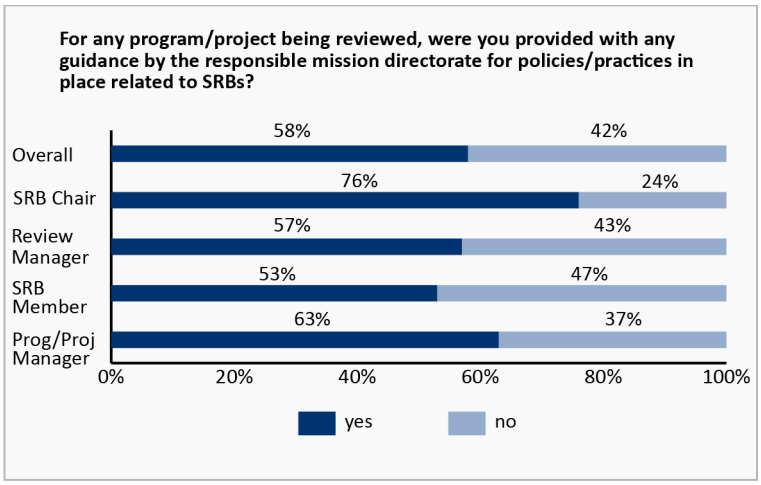


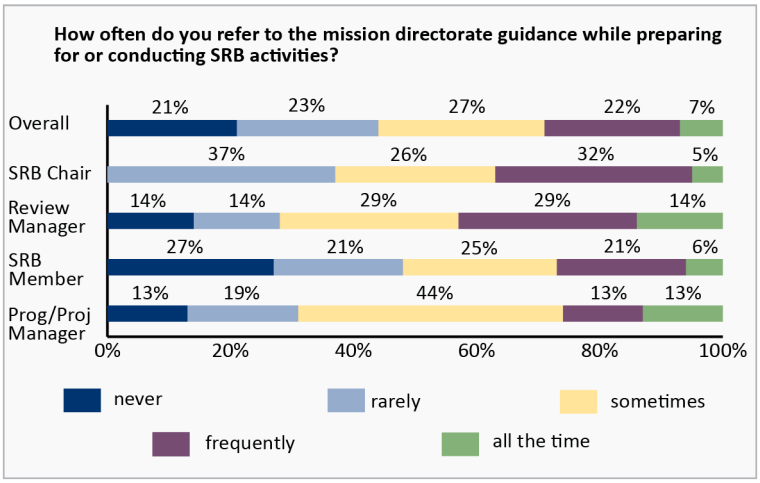
Group 6: SRB Guidance and Training Materials

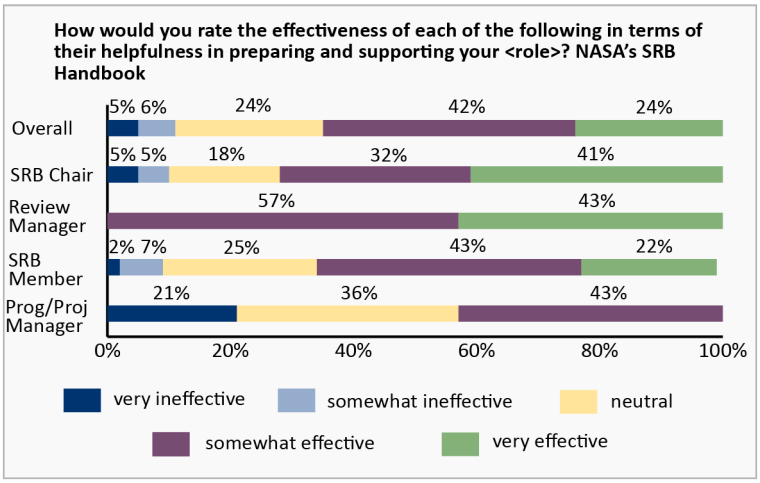


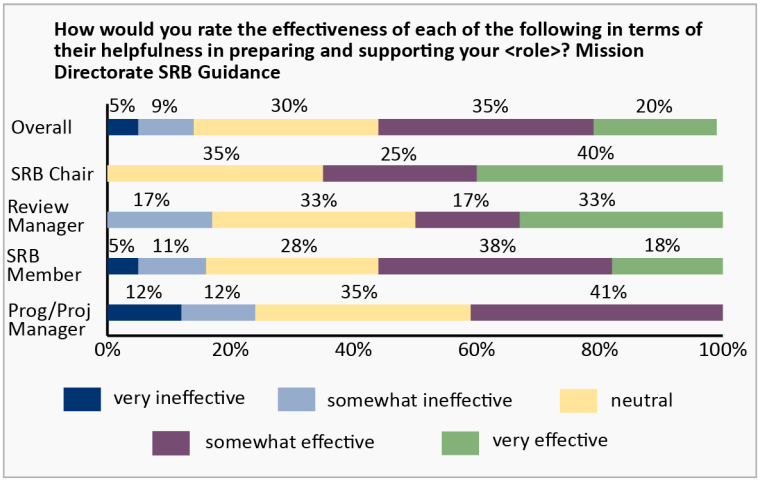


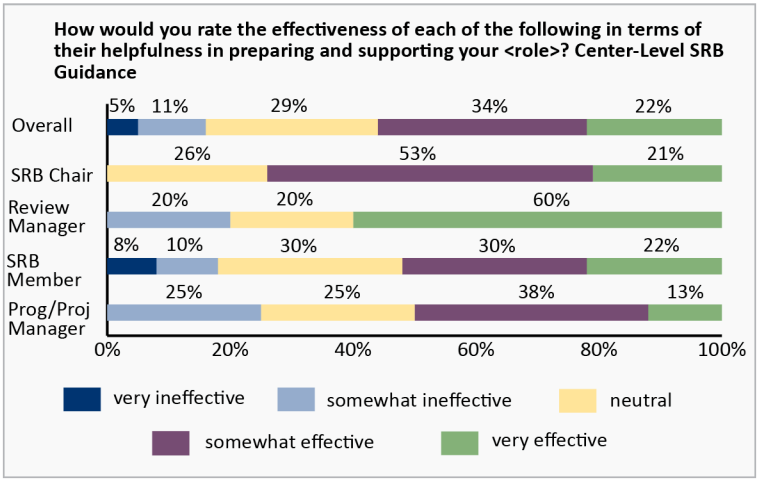

Do you believe that any information is missing from the SRB Handbook that would be helpful to someone in the role of <role>?
Overall
38%
62%
SRB Chair
33%
67%
Review Manager
40%
60%
SRB Member
42%
58%
Prog/Proj Manager
30%
70%
0%
20%
40%
60%
80%
100%
yes
no

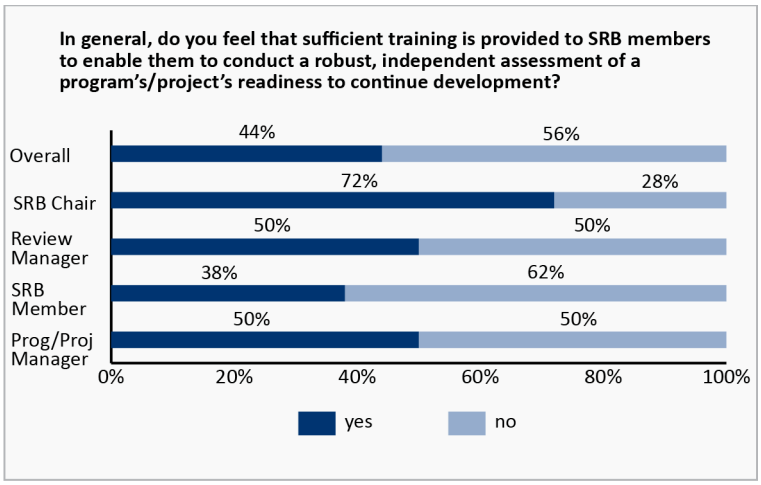

For any program/project being reviewed, were you provided with any guidance by the responsible mission directorate for policies/practices in place related to SRBs?
Overall
58%
42%
SRB Chair
76%
24%
Review Manager
57%
43%
SRB Member
53%
47%
Prog/Proj Manager
63%
37%
0%
20%
40%
60%
80%
100%
yes
no


How often do you refer to the mission directorate guidance while preparing for or conducting SRB activities?
Overall
21%
23%
27%
22%
7%
SRB Chair
37%
26%
32%
5%
Review Manager
14%
14%
29%
29%
14%
SRB Member
27%
21%
25%
21%
6%
Prog/Proj Manager
13%
19%
44%
13%
13%
0%
20%
40%
60%
80%
100%
never
rarely
sometimes
frequently
all the time

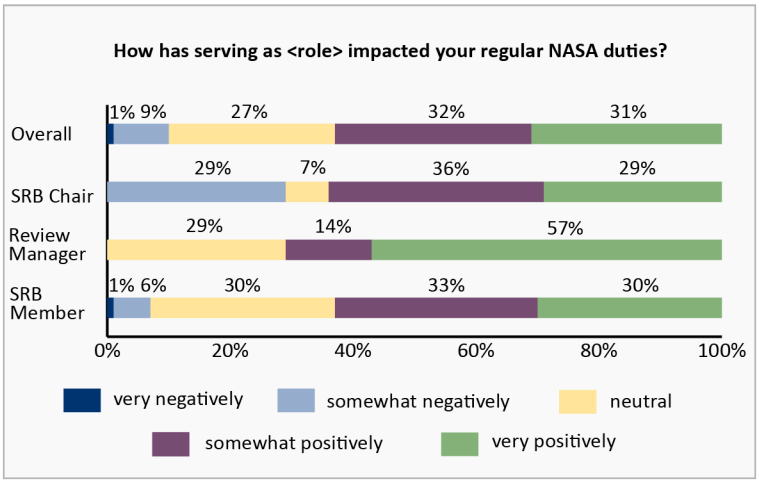

How would you rate the effectiveness of each of the following in terms of their helpfulness in preparing and supporting your <role>? NASA's SRB Handbook
Overall
5%
6%
24%
42%
24%
SRB Chair
5%
5%
18%
32%
41%
Review Manager
57%
43%
SRB Member
2%
7%
25%
43%
22%
Prog/Proj Manager
21%
36%
43%
0%
20%
40%
60%
80%
100%
very ineffective
somewhat ineffective
neutral
somewhat effective
very effective

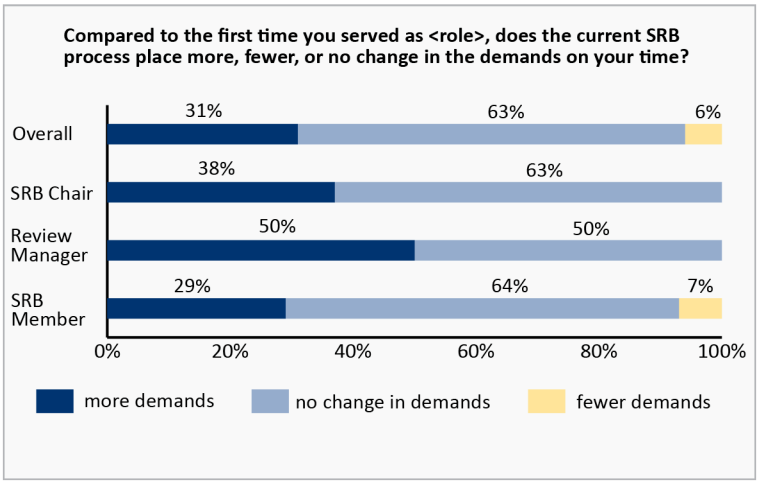

How would you rate the effectiveness of each of the following in terms of their helpfulness in preparing and supporting your <role>? Mission Directorate SRB Guidance
Overall
5%
9%
30%
35%
20%
SRB Chair
35%
25%
40%
Review Manager
17%
33%
17%
33%
SRB Member
5%
11%
28%
38%
18%
Prog/Proj Manager
12%
12%
35%
41%
0%
20%
40%
60%
80%
100%
very ineffective
somewhat ineffective
neutral
somewhat effective
very effective

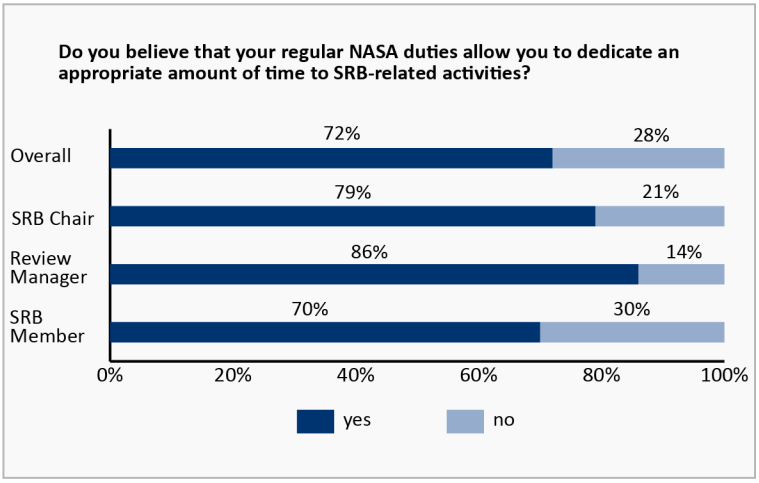

How would you rate the effectiveness of each of the following in terms of their helpfulness in preparing and supporting your <role>? Center-Level SRB Guidance
Overall
5%
11%
29%
34%
22%
SRB Chair
26%
53%
21%
Review Manager
20%
20%
60%
SRB Member
8%
10%
30%
30%
22%
Prog/Proj Manager
25%
25%
38%
13%
0%
20%
40%
60%
80%
100%
very ineffective
somewhat ineffective
neutral
somewhat effective
very effective



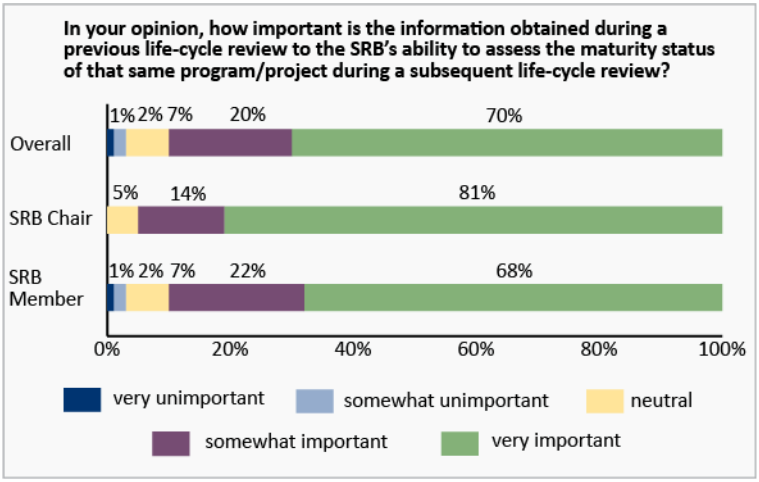
Group 7: Impact of SRB Service

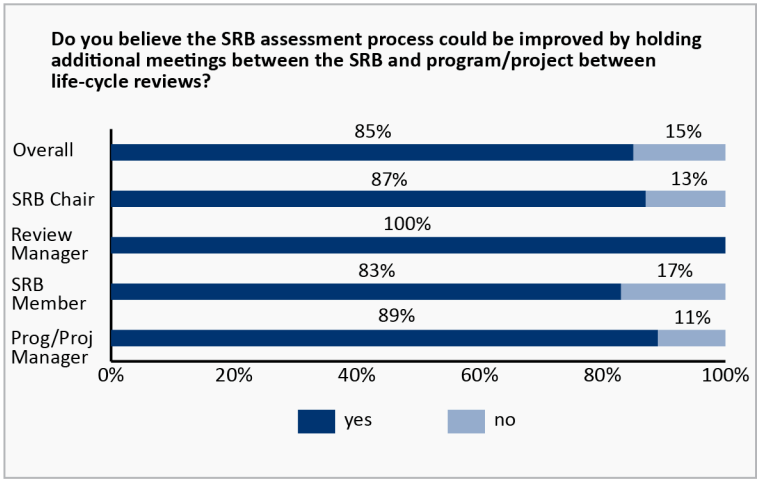


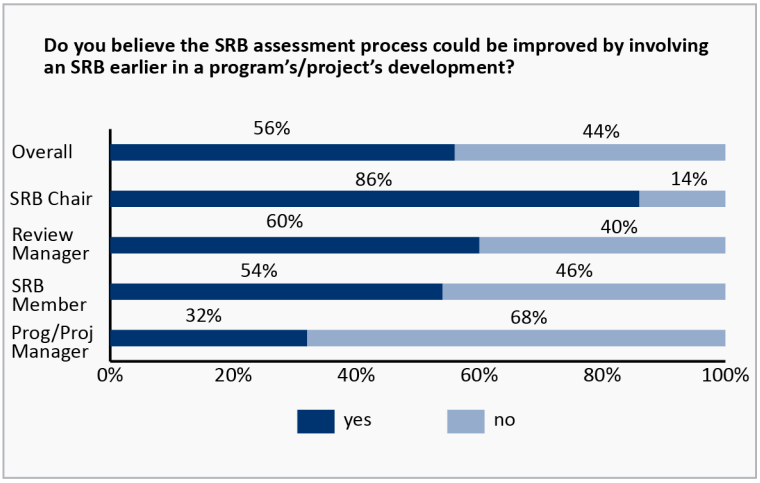




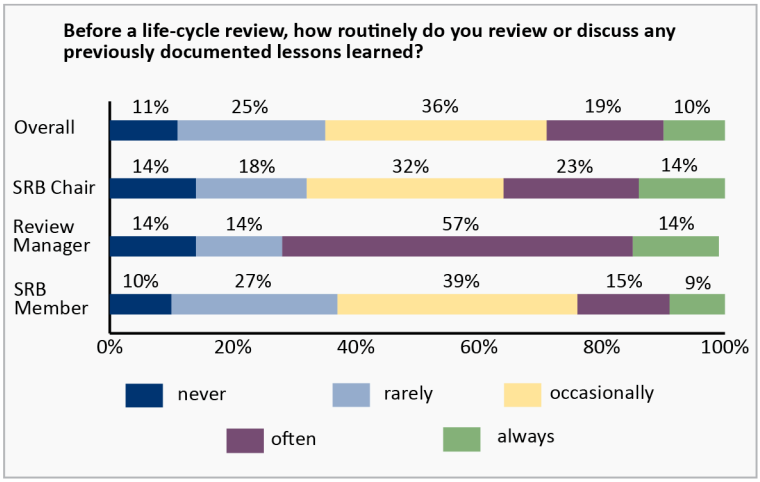
Group 8: SRB Timing and Frequency

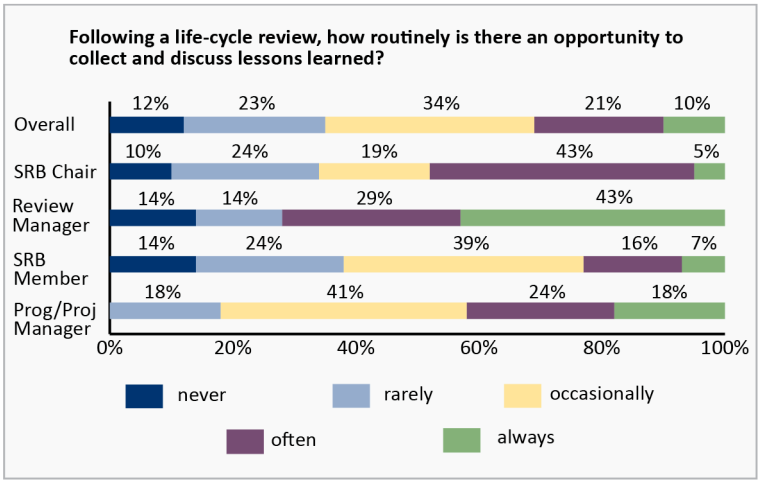




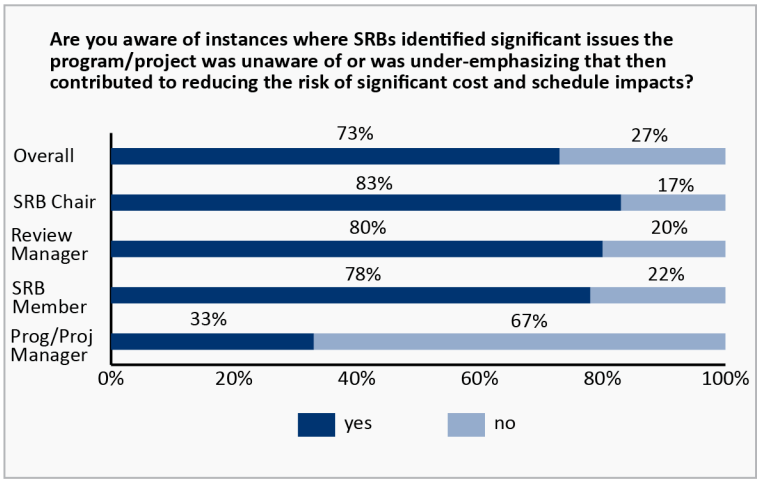


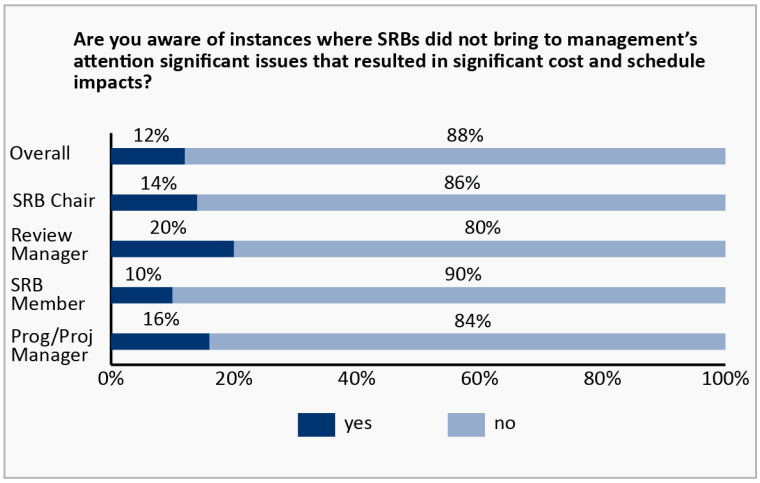
Group 9: Lessons Learned





Group 10: Identifying Issues





APPENDIX C: CASE STUDIES

As part of this audit, we assessed whether there were any recent NASA missions with either significant problems or positive outcomes that could be tied to the execution of their SRBs. To accomplish this, we surveyed SRB members and examined the history of three NASA programs or projects. Overall, we found the SRB respondents felt very strongly that SRBs identified significant issues the program or project was unaware of, or was under-emphasizing, that then contributed to reducing the risk of significant cost and schedule impacts. Of the 137 respondents, 100 (or 73 percent) felt this to be the case.

We also inquired if there were instances where SRBs did not bring to management's attention significant issues that resulted in significant cost and schedule impacts. Overwhelmingly, 122 of 138 respondents (or 88 percent) were not aware of such cases. We also received 100 written responses in total with these two questions. There were three main themes to the many provided examples that emphasized the SRB's benefits:

1. The experience of SRB team members in technical, safety and mission assurance, and programmatic are critical with one response noting that "Members of the SRB communicated technical issues they had encountered over their career and passed that knowledge on to engineers supporting the current project."
2. Programmatic value is often in risk identification where programs and projects underestimate cost and schedule with one response stating that "It's often not about purely being unaware, but more about being optimistic of the risk associated with an item. This happens often with cost and schedule estimates."
3. Technical risk identification where programs and projects underestimate hurdles as one respondent said "There are a lot of instances where the SRB has identified an issue and wrote an RFA. The project believed they were on top of it and closed the RFA . . . the SRB had landed on something that really did need attention, and because the project thought they were on top of it but weren't, ultimately had significant cost and schedule impacts. The SRB could flag key RFAs that they would like a follow-up." and "I believe the project was aware [of] but downplayed the problems in order to proceed with development. Detecting the problems did not take significant detective work."

We also reviewed three recent missions to see if connections could be made to the survey responses and our own previous audit work:

- **Mars Sample Return (MSR)**. A joint mission between NASA and the European Space Agency to acquire and return to Earth a collection of samples from the surface of Mars.
- **On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1).** A mission to rendezvous with, refuel, and relocate a satellite to demonstrate the feasibility of on-orbit refueling, satellite relocation, and life extension.
- **Psyche**. A mission to study Psyche, a metal-rich asteroid located in the main asteroid belt between Mars and Jupiter.

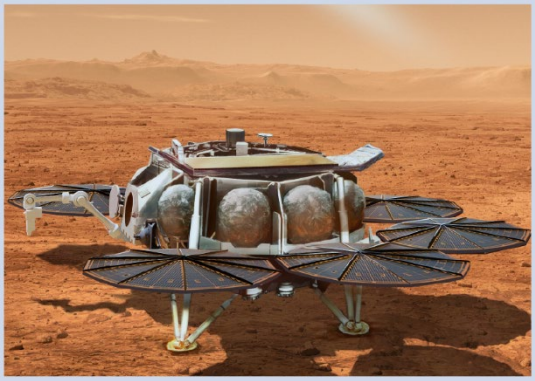
We found that between the survey responses, our prior audits, and the SRB and Independent Review Board (IRB) documentation, there were three major takeaways:

1. Technical RFAs should be tracked and dispositioned in a closed loop—meaning programs and projects cannot close them unilaterally. The RFAs should also have clarity in risk level and be addressed if appropriate.
2. Programmatic RFAs should not be overridden by non-programmatic SRB members. Moreover, the programmatic SRB members should be provided sufficient and timely data, and if there are risks that will not be incorporated into a probabilistic cost and schedule model, then they need to be tracked and properly resolved.
3. There are benefits to more frequent and earlier interactions in technology readiness assessments, project management, systems engineering, and safety and mission assurance. The increased insight may reduce risk that significant issues are missed.

Mars Sample Return Program

Mission. The MSR Program is a partnership between NASA, under the Science Mission Directorate, and the European Space Agency to return Martian geological samples to Earth for scientific study. One of the most technically complex, operationally demanding, and ambitious robotic science missions ever undertaken by NASA, the MSR Program consists of two major flight projects: the Earth Return Orbiter and Sample Retrieval Lander. The MSR Program represents the second and third phases of the four-phased MSR Campaign: (1) collecting of samples by the Mars Perseverance rover, (2) landing a sample retrieval vehicle on Mars, (3) sending an orbiter to return samples to Earth, and (4) examining the samples.

Artist's Rendering of the Sample Retrieval Lander on the Martian Surface



Source: NASA/ESA/JPL-Caltech.

Challenges. We reported that the MSR Program is facing significant obstacles completing its Formulation Phase, specifically establishing a stable design with realistic cost and schedule estimates.[32] In July 2022, MSR completed its System Requirements Review as part of the Formulation Phase, estimating a return of Martian samples to Earth in late 2033.

In 2023, the Science Mission Directorate convened an IRB to assess the mission due to mounting technical, schedule, and cost concerns. MSR's life-cycle cost estimate had grown from between $3.4 billion to $4.9 billion in December 2020 to between $5.9 billion to $6.2 billion in September 2022. In September 2023, the IRB issued findings and recommendations, stating the complexity of MSR's mission would drive costs to between $8 billion to $11 billion. In response, NASA paused the mission to evaluate new architectures and expected to select a path forward for MSR sometime in 2026. On May 30, 2025, NASA released its fiscal year 2026 budget request that proposed canceling the mission.

SRB Implications. More frequent and earlier interactions in technology readiness assessments, project management, systems engineering, and safety and mission assurance would reduce the risk that significant issues are missed. In its review, the IRB noted the MSR Program "has struggled with performing independent reviews in a way that is consistent with the NPR 7120.5F requirement such that

[32] NASA Office of Inspector General (OIG), *Audit of the Mars Sample Return Program* (IG-24-008, February 28, 2024).

all the key program elements receive thorough and independent review." To address these shortcomings, the IRB recommended NASA establish MSR as a tightly coupled program with the Sample Retrieval Lander, Mars Ascent Vehicle, and Capture, Containment, and Return System as separate projects each having its own SRB.[33] In this way, all key elements of the MSR Program would be subject to a uniform standard of review with individual cost and schedule estimates.

On-orbit Servicing, Assembly, and Manufacturing 1

Mission. OSAM-1, a Technology Demonstration Mission within the Space Technology Mission Directorate, planned to demonstrate the capability to autonomously refuel and extend the life of on-orbit satellites using the U.S. Geological Survey's Earth-observing Landsat 7, originally launched in 1999, as a test bed. OSAM-1 would rendezvous with the satellite to inspect, capture, refuel, and adjust the orbits. OSAM-1 would also demonstrate on-orbit assembly and installation of an antenna using the Space Infrastructure Dexterous Robot, a robotic arm.

Artist's Rendering of On-orbit Servicing, Assembly, and Manufacturing 1 (OSAM-1)

Source: NASA.

Challenges. OSAM-1 began in 2016 as Restore-L, which passed Key Decision Point B in April 2017 with an estimated cost of up to $753 million and a targeted launch readiness date between June and December 2020. A year later, the preliminary estimate had grown to $1 billion. The project was approved to enter Phase C, the start of the Implementation Phase, in June 2020 with an Agency Baseline Commitment of $1.8 billion and a launch readiness date of no later than September 2025.[34] However, there were additional cost and schedule overruns that soon necessitated a new baseline commitment. In April 2022, the Agency rebaselined OSAM-1 to $2.1 billion and pushed the launch date to December 2026. Prior to Key Decision Point D, an IRB was formed, and it recommended OSAM-1 be discontinued citing poor cost and schedule outlook and a dubious benefit to a U.S. space industry that had evolved beyond OSAM-1's primary objective. In February 2024, the Agency Program Management Council approved termination of the OSAM-1 project.

SRB Implications. The SRB may have under emphasized the cost and schedule risk. In their February 2022 OSAM-1 Critical Design Review Summary Report, the SRB concluded that the project satisfied all review success criteria. The board did note that the schedule was aggressive with several key development risks where subsystems were not at Critical Design Review levels.[35] Moreover, the SRB would later note that the contract structure lacked the ability to incentivize the contractor's performance, particularly in cases such as this where the contractor is not profiting from the contract

[33] NPR 7120.5F defines a tightly coupled program as a program having multiple projects that execute portions of a mission or missions, with no single project capable of implementing a complete mission.

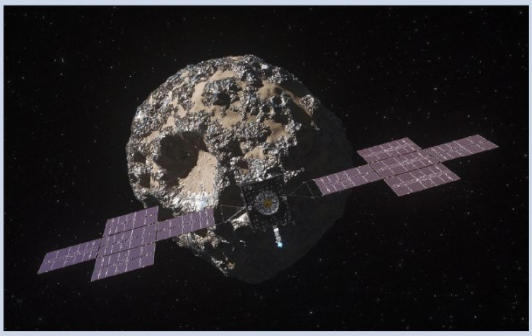
[34] The Agency Baseline Commitment establishes and documents project requirements, cost, schedule, and technical content that forms the basis for NASA's commitment to the Office of Management and Budget and Congress.

[35] The second design review, the Critical Design Review, is to demonstrate the design is sufficiently mature to proceed to full-scale fabrication, assembly, integration, and testing. The review assesses that the technical effort is on track to meet performance requirements within identified cost and schedule constraints.

due to its firm-fixed-price structure after the contractor experienced cost and schedule overruns.[36] More frequent and earlier interactions may have been beneficial as the project stated the big gaps in SRB involvement between the major life-cycle reviews may have inhibited the quality of the reviews.[37]

Psyche

Artist's Rendering of the Psyche Spacecraft Approaching the Asteroid Psyche



Source: NASA/JPL-Caltech/ASU.

Mission. Psyche, a Science Mission Directorate project managed by the Jet Propulsion Laboratory, will be the first mission to visit a metal-rich asteroid and aims to understand iron cores, a component of the early building blocks of planets. The asteroid Psyche is in the main asteroid belt between Mars and Jupiter.

Challenges. During development, the Psyche team encountered a significant number of technical issues and worked to resolve them to meet their planned launch in the fall of 2022. However, in June 2022, the project determined that its planned launch date was not viable due to several issues, mainly the late delivery of the Guidance, Navigation, and Control flight software and testing. Subsequently, in October 2022, NASA delayed the launch by 14 months to October 2023 and the project's new life-cycle cost was set at $1.1 billion.

While Psyche eventually launched in October 2023, due to the launch delay, the spacecraft will now arrive at the asteroid in 2029, more than 3 years later than previously planned. This creates different conditions that will require a longer mission at the asteroid to ensure all science requirements are met. As a result, the life-cycle cost estimate is now $1.2 billion, an increase of almost 25 percent over the original life-cycle estimate.

As a result of missing the 2022 launch window, an IRB was convened to investigate the causes for the delay and provide recommendations for corrective action. The Psyche IRB agreed the late delivery of the software and testing maturity were the main causes of the Psyche launch delay. The IRB also noted additional challenges outside of the project's control. The IRB made several recommendations to the Jet Propulsion Laboratory including improving the hiring and retention of key technical personnel, increasing oversight of projects, and revisiting its current hybrid work policies.

SRB Implications. The IRB noted that Psyche's problems exposed challenges in the current SRB process. The SRB had cited schedule performance as the largest risk coming out of gate reviews. The IRB also challenged NASA that technical RFAs need to be tracked and dispositioned in a close-loop system to ensure that responses to SRB-reported issues and concerns would be thoroughly reviewed by the SRB on a regular basis until a satisfactory resolution is achieved. More frequent and earlier interactions may have been beneficial since the IRB also stated that adding programmatic and technical status updates between the current gate reviews would allow the SRB to achieve deeper insight into project programmatic and technical status.

[36] A firm-fixed-price contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost in performing the contract. This contract type places upon the contractor maximum risk and full responsibility for all costs and resulting profit or loss.

[37] NASA OIG, *NASA's Efforts to Demonstrate Robotic Servicing of On-Orbit Satellites* (IG-24-002, October 4, 2023).

APPENDIX D: MANAGEMENT'S COMMENTS

National Aeronautics and Space Administration

Office of the Administrator
Mary W. Jackson NASA Headquarters
Washington, DC 20546-0001

July 24, 2025

TO: Assistant Inspector General for Audits (Acting)

FROM: Associate Administrator (Acting)

SUBJECT: Agency Response to OIG Draft Report, "NASA's Standing Review Board Practices" (A-24-06-00-SARD)

The National Aeronautics and Space Administration (NASA) appreciates the opportunity to review and comment on the Office of Inspector General (OIG) draft report entitled, "NASA's Standing Review Board Practices" (A-24-06-00-SARD), dated June 23, 2025.

In this draft report, the OIG found gaps and deficiencies in the Standing Review Board (SRB) function that could result in ineffective independent life-cycle reviews of NASA's programs and projects. The OIG makes one recommendation addressed to NASA's Associate Administrator and 11 recommendations addressed to the Agency's Chief Program Management Officer (CPMO) to ensure the effectiveness of the SRB function.

Specifically, the OIG recommends the NASA Associate Administrator:

Recommendation 1: Increase the oversight role of the CPMO to address deficiencies in the execution of SRBs and provide SRB members an independent avenue to communicate and address issues during and after the SRBs.

> **Management's Response:** NASA partially concurs with this recommendation. NASA agrees with the intent of the recommendation to address deficiencies and provide an independent avenue to communicate and address issues but is not able to concur with increasing the CPMO's oversight role as the means to achieve the intent. NASA will take this recommendation under advisement as part of the Agency's ongoing assessment of overall NASA governance and will provide clarifying language in the SRB Handbook on the role CPMO currently has in leading independent assessment integration for the Agency, which positions the Agency to meet the intent of the recommendation. NASA concurs that the CPMO should be available to SRB members to provide an independent avenue to communicate and address issues that arise regarding SRBs and independent assessment, which the CPMO function already provides today.
>
> **Estimated Completion Date:** March 27, 2026.

In addition, the OIG recommends the CPMO work with the Mission Directorate Associate Administrators, Office of the General Counsel, contracting officers, and other offices, as necessary, to:

Recommendation 2: Update the SRB Handbook to reflect current policy, processes, and practices.

> **Management's Response:** NASA concurs with this recommendation and is updating the SRB Handbook to reflect current policy, processes, and practices.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 3: Evaluate whether the preference for using civil servants is necessary for all disciplines. If not necessary, consider promoting the use of contractors for board membership in disciplines where the pool of civil servant expertise may be limited.

> **Management's Response:** NASA concurs with this recommendation and will evaluate whether the preference for using civil servants is necessary for all disciplines.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 4: Evaluate the potential for developing a more formalized pipeline and recruitment process for SRB participants that could include maintaining a skills database of past members.

> **Management's Response:** NASA concurs with this recommendation and will evaluate the potential for developing a more formalized pipeline and recruitment process for SRB participants.
>
> **Estimated Completion Date:** July 31, 2026.

Recommendation 5: Review existing conflict of interest policy and processes and consider:

a. clarifying terminology and developing definitions to aid Agency personnel in consistently identifying which affiliation types are included in existing categories and the review process used for each, and/or
b. expanding the number of affiliation categories to account for, at a minimum, international partner agencies.

> **Management's Response:** NASA concurs with this recommendation and will clarify terminology and develop definitions to assist with identifying which affiliation types are included in existing categories, expand those categories as needed, and review the processes for all.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 6: Establish a process for verifying that mission directorates are conducting the required conflict of interest reviews timely and implement record retention policies regarding SRB conflict of interest review documents.

> **Management's Response:** NASA concurs with this recommendation and will establish processes to verify mission directorates are timely conducting required conflict of interest reviews and implement record retention policies in conformance with legal requirements for SRB conflict of interest review documents.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 7: Verify that contracts used to engage SRB members through contractors adhere to the conflict of interest processes established in the SRB Handbook.

> **Management's Response:** NASA concurs with this recommendation and will verify that contracts used to engage SRB members through contractors adhere to the conflict of interest processes established in the SRB Handbook.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 8: Determine whether there is a need for individual mission directorate guidance for SRB execution or if individualized mission directorate tailoring can be more effectively accomplished in the Terms of Reference. If mission directorate guidance is determined to be needed, update them accordingly and establish a frequency for their review and updating.

> **Management's Response:** NASA concurs with this recommendation and will assess the need for individual mission directorate guidance.
>
> **Estimated Completion Date:** March 27, 2026.

Recommendation 9: Develop a formal, role-based training program with a focus on first time members in SRB roles.

> **Management's Response:** NASA concurs with this recommendation and will work to develop virtual and/or hybrid role-based instruction with a focus on first-time members.
>
> **Estimated Completion Date:** July 31, 2026.

Recommendation 10: Determine the optimal method(s) and frequency required to keep an SRB appropriately engaged and informed of program and project status between life-cycle reviews and implement an applicable procedure in the SRB Handbook or other policy or guidance.

Management's Response: NASA concurs with this recommendation and will describe in the next version of the SRB Handbook the range of options and associated tradeoffs for SRB engagement that is available to convening authorities.

Estimated Completion Date: March 27, 2026.

Recommendation 11: Identify obstacles that inhibit programs and projects from providing timely information to SRBs and implement solutions so that timelines agreed to for data deliverables are met.

Management's Response: NASA concurs with this recommendation and will provide additional guidance in the next version of the SRB Handbook to mitigate obstacles that impede timely provision of data deliverables to the SRB.

Estimated Completion Date: March 27, 2026.

Recommendation 12: Implement a process for mission directorates to facilitate the collection and sharing of lessons learned and document that process in the SRB Handbook.

Management's Response: NASA concurs with this recommendation and will add guidance in the next version of the SRB Handbook regarding the collection and sharing of lessons learned as it pertains to SRBs.

Estimated Completion Date: March 27, 2026.

We have reviewed the draft report for information that should not be publicly released. As a result of this review, we have not identified any information that should not be publicly released.

Once again, thank you for the opportunity to review and comment on the subject draft report. If you have any questions or require additional information regarding this response, please contact Kevin Gilligan at (202) 358-4544.

Vanessa E. Wyche

Vanessa E. Wyche

cc:
Chief Program Management Officer/Mr. Gilligan (Acting)
General Counsel/Ms. Lan
Associate Administrator for Aeronautics Research Mission Directorate/Mr. Pearce
Associate Administrator for Exploration Systems Development Mission Directorate/Dr. Glaze (Acting)
Associate Administrator for Science Mission Directorate/Dr. Fox
Associate Administrator for Space Operations Mission Directorate/Mr. Bowersox
Associate Administrator for Space Technology Mission Directorate/Mr. Turner
Assistant Administrator for Procurement/Ms. Smith Jackson

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(Assignment No. A-24-06-00-SARD)