Response to NASA OIG Report IG-24-002 pursuant to the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Public Law 117-263, Section 5274

Section 5274 of Public Law 117-263, the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 requires Offices of Inspector General (OIG) to notify all non-governmental organizations or business entities that are specifically mentioned in an OIG report. Section 5274 further requires the OIG to attach any response received from a non-governmental organization or business entity to the report in which they are mentioned. Therefore, in accordance with Section 5274, attached is a response provided to National Aeronautics and Space Administration Office of Inspector General (NASA OIG) regarding the report on *NASA's Efforts to Demonstrate Robotic Servicing of On-Orbit Satellites,* report number IG-24-002, issued October 4, 2023.

This response represents the views of Maxar Space Systems. The NASA OIG did not evaluate this response and offers no comment and makes no representations, expressed or implied, of any nature with respect to the matters stated therein.

November 1, 2023

By Email

NASA Inspector General
P.O. Box 23089
L'Enfant Plaza Station
Washington, DC 20026
HQ-Section5274Submissions@nasa.gov

Re: Response to NASA Office of Inspector General Report No. IG-24-002, titled "NASA's Efforts to Demonstrate Robotic Servicing of On-Orbit Satellites," dated October 4, 2023

Dear Madame/Sir:

Pursuant to Public Law No. 117-263, section 5274, Maxar Space Systems[1] submits this response for the purpose of clarifying and providing additional context to the above-referenced report (the "Report") published by the Office of Inspector General ("OIG") of the National Aeronautics and Space Administration ("NASA"). In summary, the Report unfairly and incorrectly characterizes several aspects of Maxar Space Systems' performance on the On-Orbit Servicing, Assembly, and Manufacturing 1 ("OSAM-1") program, which includes an attached Space Infrastructure Dexterous Robot ("SPIDER") payload. Maxar Space Systems is a prime contractor on the OSAM-1 program.

With respect to the Report, Maxar Space Systems desires that the record reflect that (1) the NASA OIG did not materially engage with Maxar Space Systems personnel to learn relevant information from Maxar Space Systems, (2) the NASA OIG failed to consider significant external causes of program delays and the fact that Maxar Space Systems' performance is not delaying the overall launch effort related to the OSAM-1 program, (3) NASA Goddard engaged in software development on its own initiative and there is no basis upon which to collect funds from Maxar Space Systems for such work, and (4) NASA selected a fixed-price contract for this important development project, which is inconsistent with guidance in the Federal Acquisition Regulation ("FAR"), and no performance issues are the result of Maxar Space Systems' lack of incentive to complete the program work.

[1] Maxar Space Systems was formerly a division of Maxar Technologies.

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1. The OIG Report Is Unfair To Maxar Space Systems And Was Prepared With Minimal Outreach To Maxar Space Systems

While the Report discusses Maxar Space Systems' performance, and is critical of Maxar Space Systems in a number of instances, the OIG had minimal engagement with Maxar Space Systems, amounting to about one hour of time over the course of a one-year effort. According to the Report itself, the OIG performed an audit of the program from September 2022 through August 2023. And, during this time, the OIG reports that it reviewed documents and interviewed NASA officials from the Space Technology Mission Directorate, OSAM-1 Project, and Goddard Procurement, as well as "[personnel from the] U.S. Geological Survey, OSAM-1 Standing Review Board, and Maxar officials." Report at section titled "Why We Performed This Audit." However, the interview of Maxar Space Systems personnel lasted approximately one hour, with three employees. Maxar Space Systems believes that had the NASA OIG engaged more purposefully with Maxar Space Systems, a number of inaccuracies and unfair statements in the Report would have been avoided. These are described below.

2. The OIG Report Fails To Fairly Consider Program Delays Resulting From Force Majeure Events And The Effect Of Critical Path Delays On The Related Servicing Payload Side Of The Program, Which Is Being Performed By Other Contractors

Among the most problematic aspects of the Report is the OIG's failure to recognize that the COVID-19 pandemic – an excusable delay under Maxar Space Systems' contracts – has significantly contributed to the delays on Maxar Space Systems' contracts for the OSAM-1 spacecraft bus and SPIDER. The Report also fails to acknowledge that Maxar Space Systems is a small part of the overall OSAM-1 and SPIDER program being administered by NASA, as Maxar Space Systems' contracts represent only about 15 percent of the overall program budget. And, the Report fails to acknowledge that the delays on Maxar Space Systems' contracts are not, in and of themselves, holding up progress on the program, given the concurrent delays in NASA Goddard's development of the servicing payload.

On page 8 of the Report, the OIG recognizes that the OSAM-1 project "experienced schedule delays and cost increases due to the COVID-19 pandemic," and page 9 of the Report includes a chart listing the direct and indirect impacts of COVID-19 on the OSAM-1 program in general. Yet in the very next section starting on page 10, the OIG asserts that "much of the project's cost growth and schedule delays can be traced to Maxar's poor performance on the spacecraft bus and SPIDER contracts with each deliverable approximately 2 years behind schedule," without any mention of the pandemic. The subsequent discussion of these contracts also includes no discussion of the impact of COVID-19 on Maxar Space Systems' progress.

The reality is that COVID-19 has been a significant cause of the delays and increased costs on both the spacecraft bus and SPIDER contracts. As noted in the Report, performance of the spacecraft bus contract continued between 2020 and 2023, and "SPIDER was added to the mission in January 2020" – the same month that then-Secretary of Health and Human Services ("HHS") Alex Azar declared a public health emergency. The pandemic caused a particularly severe interruption in Maxar Space Systems' business and operations, given the company's manufacturing operations are located entirely in California. On March 4, 2020, Governor Newsom declared a state of emergency in California, and 15 days later, he ordered all Californians to shelter

at home, thereby restricting all non-essential travel and activities. Santa Clara County and Los Angeles County, where Maxar Space Systems performed all of the manufacturing related to the spacecraft bus and SPIDER contracts, both issued additional stay-at-home orders in late 2020. The state of emergency in California continued until February 28, 2023, and the public health emergency expired on May 11, 2023.

These government directives had a significant impact on Maxar Space Systems' progress on the spacecraft bus and SPIDER contracts, as much of the work on these contracts must be performed in-person at the company's production facilities. Moreover, Maxar Space Systems' supplier base was severely impacted by the pandemic as well. Indeed, all of the COVID-19 impacts listed in the OIG's Report as impacting the general OSAM-1 mission contributed in a significant manner to the delays on the spacecraft bus and SPIDER contracts. These included work stoppages and on-site work restrictions at Maxar Space Systems' facilities (resulting in loss of efficiency), interruptions and prolonged disturbances of supply chains, work stoppages and delays at vendors, and increased difficulty and delays in collaboration due to working in a virtual environment. *See* Report at 9. Much of the system design work was performed during the pandemic, which disrupted standard collaborative design processes and required Maxar Space Systems to overhaul its processes while continuing work. Other impacts included personnel missing time due to illness, as well as staffing and efficiency challenges due to mask and vaccine mandates as well as social distancing requirements. Limitations on the number of personnel allowed in work areas further contributed to a loss of productivity. While the Report mentions in a footnote (n.32 on page 9) that Maxar Space Systems submitted requests for equitable adjustment ("REAs") for the cost-related impacts of COVID-19 on both the spacecraft bus and SPIDER contracts, the Report includes no acknowledgement that the pandemic was a significant contributor to the schedule delays on these contracts, makes no attempt to quantify those delays, and simply concludes (incorrectly) that Maxar Space Systems bears overwhelming responsibility for program delays.

Moreover, the OIG Report does not acknowledge that the delays encountered by NASA in connection with the development of the servicing payload – a separate system of the OSAM-1 spacecraft – limited the advancement of the OSAM-1 program even in the absence of delays on Maxar Space Systems' spacecraft bus and SPIDER contracts. As explained in the Report, the servicing payload is "the system responsible for rendezvous and refueling Landsat 7," and it "has continued to cost more and take longer than anticipated." Report at 4. NASA Goddard itself is managing the development of the servicing payload, working with other contractors.[2] The Report does include a short section discussing the delays with the servicing payload, noting that NASA officials attributed the delays to "supply chain issues and over-subscribed vendors." Report at 11-12. But the OIG then quickly pivots to a much longer criticism of Maxar Space Systems' performance on the spacecraft bus and SPIDER contracts, without mentioning that the critical path delays on the servicing payload side of the program are more or at least equally to blame for the

[2] The Report goes out of its way to mention that Maxar Space Systems has a role in the servicing payload development effort, noting that the servicing payload "relies on contributions from Maxar, other contractors, and in-house development of subsystems by Goddard personnel." Report at 8. In keeping with the OIG's general theme of unfairly targeting Maxar Space Systems, the OIG declines to mention that Maxar Space Systems has a significantly smaller role on the servicing payload than the unnamed "other contractors."

delayed completion of the OSAM-1 spacecraft. Indeed, even if Maxar Space Systems had completed its work on the spacecraft bus and SPIDER on the schedule initially contemplated by those contracts, OSAM-1 would be unable to launch due to ongoing delays in the completion of the servicing payload.

3. NASA Goddard's Involvement In Software Development Was At Its Own Initiative And Not An Event For Which NASA Can Bill Maxar Space Systems

Within the "What We Recommended" section of the Report, the NASA OIG suggests to NASA leadership that it should seek approximately $2 million from Maxar Space Systems for flight software development work performed by NASA personnel:

> To increase transparency, accountability, and oversight of NASA contracts, we recommended that NASA leadership: (1) recoup the costs of the supplemental labor and services provided by NASA to Maxar to complete the work on the spacecraft bus contract; (2) ensure all work is contractually agreed upon and integrated into the contract SOW, and all changes are appropriately reflected in the SOW with adjustments to the contract value …

Maxar Space Systems respectfully disagrees with this recommendation because it is inconsistent with the parties' contracts and appears to have been made without a complete understanding of the context of the flight software development efforts.

As a preliminary matter and as noted above, the COVID-19 pandemic spanned from at least January 31, 2020 when HHS first declared a public health emergency through May 11, 2023 when the Biden Administration finally ended the national emergency. Also as noted above, the pandemic had a devastating effect on the progress of Maxar Space Systems' and NASA's work. It was during this time period, according to the Report, that NASA provided "unplanned labor and services" to supplement Maxar Space Systems' efforts to develop OSAM-1 spacecraft bus flight software between January 2022 and May 2023, and that such work is "valued at approximately $2 million" and for the express purpose "to help reduce impacts to the mission schedule." Report at "What We Found" section. In other words, the Report states that this additional effort expended by NASA for the purpose of reducing schedule delays occurred during the latter part of the pandemic for the express purpose of mitigating delays. In this context, the contracts absolve Maxar Space Systems from responsibility for delays as these delays are a result of a force majeure event.

Specifically, the contracts include a standard FAR clause that expressly provides that, among other events, epidemics and quarantine restrictions constitute excusable delays. That clause, FAR 52.249-9, Default (Fixed-Price Research and Development) (APR 1984), relieves Maxar Space Systems from liability for any excess costs arising from causes beyond its control and without its fault or negligence, such as epidemics or quarantine restrictions. FAR 52.249-9(c)(5) and (6). Thus, efforts by NASA to reduce schedule delays during a pandemic would not be properly charged to Maxar Space Systems under the contracts. When NASA OIG personnel met with Maxar Space Systems personnel for approximately one hour to discuss this massive program, there was very little discussion about the background of the flight software efforts or the delays incurred by Maxar Space Systems due to the pandemic. And, there was no discussion about

the contract provisions that excuse any delays resulting from the pandemic. NASA's decision to add its own resources to expedite performance and overcome issues that resulted from the global pandemic was a business decision within the purview of NASA program management, and Maxar Space Systems fully cooperated with NASA in those efforts, but the recommendation that Maxar Space Systems must now pay for those efforts is incorrect as a matter of contract and unfair to Maxar Space Systems under the circumstances.

In addition, the Report does not acknowledge that the involvement of NASA personnel in software development efforts actually changed the contract, causing significant expense to Maxar Space Systems. The Report does not mention that the original baseline for the OSAM-1 flight software assumed a commercial approach, which is evidenced in § 1.3.1 of the spacecraft bus contract's Statement of Work ("SOW") that expressly invokes commercial practices and clarifies that NASA's intent on the OSAM-1 program was not to impose NASA practices on Maxar Space Systems:

> It is the Government's intent to acquire a qualified spacecraft bus with high reliability developed with standard industry processes. . . . The Contractor may follow equivalent institutional/industry practices, spacecraft quality control, and product assurance processes to be used in lieu of the guidelines and requirements in NASA mission assurance and engineering principles and practices documents referenced in this SOW. The Government's intent is not to add to the Contractor's normal processes, but to obtain visibility into the Contractors' processes.

Yet, notwithstanding this provision in the SOW, through NASA personnel working on flight software efforts, Maxar Space Systems' planned performance was indeed changed.

During their one-hour discussion with OIG representatives, Maxar Space Systems personnel attempted to explain that the software being developed for the OSAM-1 program was based on Maxar Space Systems legacy commercial software, and naturally, NASA personnel were not familiar with that software nor with Maxar Space Systems' practices. Also, during their one-hour discussion with NASA OIG representatives, Maxar Space Systems personnel tried to explain that Maxar Space Systems received approximately 1,000 comments back from NASA once the original software package was delivered—those comments were far more extensive than reasonably anticipated and most were the result of the application of principles inconsistent with the commercial practices contemplated by the SOW. Again, this is a development contract, and Maxar Space Systems recognizes NASA's right to change the contract to address its requirements. Consistent with the fact that the SOW contemplated that Maxar Space Systems would follow its commercial practices, almost two and one-half months before the NASA OIG published the Report, Maxar Space Systems submitted an REA to the contracting officer seeking additional compensation related to unanticipated cost increases and schedule impacts resulting from scope increases to the commercial approach to software design and verification and validation ("V&V")

that the contract permitted Maxar Space Systems to employ, but which were changed.[3] None of these critical points are reflected in the Report, however.

4. Through No Fault of Maxar Space Systems, The Program's Contract Type Is Inconsistent With The Development Work Effort

Finally, the Report takes issue with NASA's use of firm-fixed price ("FFP") contracts without incentives or award fees for the spacecraft bus and SPIDER, asserting 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 due to its FFP nature and cost and schedule overruns." Report, "What We Found" section. This discussion is misguided on several fronts and the selection of contract type was not in Maxar Space Systems' control.

First, to the extent that the NASA OIG believes the unprofitable nature of the contracts is problematic, the incorporation of incentives or award fees to a FFP contract would not have solved this problem. The fact that Maxar Space Systems is not, according to the Report, earning a profit on the spacecraft bus and SPIDER contracts in no way means that Maxar Space Systems is not motivated to complete the work as soon as possible and without continuing to incur significant additional costs. The NASA OIG's assertion to the contrary is illogical, as any contractor working on an unprofitable contract will be motivated to complete the work as efficiently as possible to minimize its losses. But aside from the financial considerations, Maxar Space Systems takes pride in its work and highly values its partnership with NASA across multiple programs. Maxar Space Systems has dedicated (and continues to dedicate) significant resources to the OSAM-1 program and is committed to ensuring that the program succeeds.

Instead of utilizing an FFP contract at all, with or without incentives or award fees, NASA arguably should have used a cost reimbursement contract. An FFP contract is not an appropriate contract vehicle for a development effort such as the spacecraft bus and SPIDER. While the FAR places the responsibility for determining the appropriate contract type on the contracting officer, the FAR also states, "[a]lthough the Government ordinarily prefers fixed-price arrangements in contracting, this preference applies in R&D contracting only to the extent that goals, objectives, specifications, and cost estimates are sufficient to permit such a preference. The precision with which the goals, performance objectives, and specifications for the work can be defined will largely determine the type of contract employed. The contract type must be selected to fit the work required." FAR 35.006(b). Based on this guidance, FAR Part 35 recommends the use of cost reimbursement contracts for development work, but NASA was not amenable to such a structure for the OSAM-1 and SPIDER programs. Specifically, FAR 35.006(c) states: "Because the absence of precise specifications and difficulties in estimating costs with accuracy (resulting in a lack of confidence in cost estimates) normally precludes using fixed-price contracting for R&D, the use of cost-reimbursement contracts is usually appropriate." (internal FAR references omitted). NASA's FAR supplement does not contain any contrary guidance or any provisions recommending the use of FFP contracts for development work. Indeed, the Report itself

[3] To be clear, Maxar Space Systems submitted the REA before it had any knowledge that the NASA OIG was planning to recommend that Maxar Space Systems should reimburse costs to NASA for the work of its software developers.

acknowledges that NASA typically uses cost-type contracts for development projects. *See* Report at 14.

5. Conclusion

Maxar Space Systems respectfully thanks the NASA OIG for the opportunity to provide these comments on the Report. The OSAM-1 program exemplifies NASA's commitment to exploring the unknown in air and space, innovating for the benefit of humanity, and inspiring the world through discovery. Maxar Space Systems is proud to support NASA in this and other ventures and is eager to complete its work on the OSAM-1 program.

Sincerely,

/s/ Justin Silver

Justin Silver
General Counsel

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