Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Maxar License Inc.	)	File No. SAT-MOD-2021_____
	)	
Application for Modification of Authorization (Call Sign S2129)	)	

APPLICATION OF MAXAR LICENSE INC.
FOR MODIFICATION OF AUTHORIZATION

Maxar License Inc. ("Maxar") hereby seeks to modify[1] the authorization for its Earth Exploration Satellite Service ("EESS") non-geostationary satellite orbit ("NGSO") constellation (call sign 2129).[2] Specifically, Maxar seeks authority to change the orbital parameters for WorldView-Legion-1 through WorldView-Legion-6 ("Block 1") and WorldView-Legion-7 through WorldView-Legion-12 ("Block 2") (together, "WorldView Legion" or the "WorldView Legion satellites").

Maxar has made significant progress toward its deployment of WorldView Legion and currently plans to launch the first set of WorldView Legion satellites later this year. In the time leading up to launch, Maxar has continued to refine the design of WorldView Legion. This modification will serve the public interest by allowing Maxar to continue to optimize the remote sensing capabilities of its WorldView Legion system for its customers, including the U.S. government.

I. DESCRIPTION OF THE MODIFICATION REQUESTED

On June 13, 2019, the FCC authorized Maxar, under its former name DG Consents Sub,

[1] *See* 47 C.F.R. § 25.117.
[2] *See* Stamp Grant, IBFS File No. SAT-MOD-20180918-00073 (June 13, 2019) ("*Legion Grant*").

Inc., to construct, launch and operate the twelve satellites known as WorldView Legion.[3] Maxar seeks authority to modify the planned orbital configuration of the WorldView Legion satellites to accommodate Maxar's updated system design.

Specifically, Maxar seeks to modify the mission orbits contained in Table 2 of its original Worldview Legion application for both its mid-inclined orbit ("MIO") and sun-synchronous orbit ("SSO") spacecraft.[4] The following table summarizes the changes to these parameters during various operational stages, with the altered figures italicized for clarity. As reflected in Figure 1, the lower bound and upper bound of mission altitude are not changing and remain the same as currently authorized. Likewise, post-end of life ("EOL") lowering altitude, time to re-entry after lowering, total time in orbit, and the calculation notes listed below Figure 1 will not change and remain the same as currently authorized.

Figure 1. Planned Operational Orbit Configuration Pre- and Post-Modification

	Mission Altitude		**Mission Inclination**		**Post-EOL Lowering Altitude**		**Time to Re-entry After Lowering**		**Total Time in Orbit**	
	Pre-mod	Post-mod	Pre-mod	Post-mod	Pre-mod	Post-mod	Pre-mod	Post-mod	Pre-mod	Post-mod
Lower bound	450 km		45.0 deg or 97.243 deg		RE-ENTRY		N/A		10 years*	
Block 1 MIO	518 km	*450 km*	45.0 deg		RE-ENTRY		N/A		10 years*	
Block 2 MIO	518 km	*450 km*	45.0 deg	*57.0 deg*	RE-ENTRY		N/A		10 years*	
Block 1 SSO	763 km	*450 km*	98.473 deg		RE-ENTRY		N/A		10 years*	
Block 2 SSO	763 km	*600 km*	98.473 deg	*97.79 deg*	RE-ENTRY		N/A		10 years*	

[3] *See id.*
[4] *See* Application of DG Consents Sub, Inc. for Modification of Authorization, IBFS File No. SAT-MOD-20180918-00073, Ex. 43, at 7, Table 2 (filed Sept. 18, 2018) ("Legion Application"). On January 6, 2021, DG Consents Sub, Inc. notified the Commission of its name change to the current Maxar License Inc. *See* Letter from Henry Gola, Counsel to Maxar License Inc., to FCC, IBFS File No. SAT-MOD-20180918-00073 (Jan. 6, 2021).

Upper bound	870 km	45.0 deg or 98.937 deg	381 km	1.75 years	11.75 years

*Upon completion of the mission, satellites are able to lower their orbits such that re-entry will occur without need for gradual orbital decay.

Notes:
1. Propellant life is calculated assuming 3-sigma launch dispersions are removed and all remaining propellant is used to maintain the orbit throughout nominal mission life (seven years).
2. Time to re-entry is calculated from the point when all propulsive orbit maintenance ceases at end of nominal mission.
3. Actual mission duration may exceed ten years if satellite remains functional.

In accordance with Section 25.114 of the Commission's rules,[5] the technical characteristics of the proposed modification are detailed in the Schedule S portion of the FCC Form 312. Maxar completed the Schedule S to the best of its ability and within the limitations of the Commission's software. The Schedule S form software would not allow entry of an Effective Isotropic Radiated Power ("EIRP") value less than 0.0 dBW. Because the actual transmit EIRP value for the "NB" beam is -6.8 dBW, Maxar entered 0.0 dBW.

In its original application for WorldView Legion, Maxar provided an orbital debris mitigation plan,[6] which the Commission accepted in granting the application.[7] With the exception of the operational altitudes outlined above, nothing in this modification alters that mitigation plan. Specifically, the physical characteristics of the spacecraft, plans to coordinate, and information sharing, as well as the accuracy of orbital parameters and anticipated re-entry, remain the same.

II. GRANT OF THE MODIFICATION WILL SERVE THE PUBLIC INTEREST.

In analyzing applications for space station modifications, "the Commission has determined that spacecraft design decisions should be left to each space station licensee, because the licensee is in a better position to determine how to tailor its system to meet the particular needs of its

[5] 47 C.F.R. § 25.114(c).
[6] *See* Legion Application, at 4-5.
[7] *See generally Legion Grant*.

customer base."[8] This "flexible" policy "allow[s] satellite operators to respond promptly to changing technological . . . conditions."[9] Accordingly, "[i]f a [modification] proposal will not cause interference to other licensed operations, the Commission generally authorizes it if it is otherwise in the public interest."[10]

Here, grant serves the public interest because modification will allow Maxar to more effectively deploy the WorldView Legion system, which will in turn provide immense value for remote sensing customers. In addition to its general "flexible" position on satellite modifications, the Commission has "repeatedly recognized that[] [g]iven the fairly lengthy time period required to construct a satellite, licensees often file requests to modify the technical design of their satellites as they are being built," which "allow[s] the licensee to take advantage of the latest technology in providing service to the public."[11] Since filing the original Legion Application, Maxar has continued to refine the operational parameters for the WorldView Legion system, and this modification will allow the company to take advantage of this innovation.

Moreover, grant of the modification will not impact the interference environment. The modified WorldView Legion system will continue to meet power flux density limits in Table 21-4 of Article 21 of the ITU Radio Regulations to protect terrestrial services and No. 22.5 of the Radio Regulations to protect GSO FSS (E-s) and the meteorological-satellite service (E-s). Maxar will also continue to coordinate its use of the 8025-8400 MHz band to avoid interference with

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[8] *DigitalGlobe, Inc.*, Order and Authorization, 20 FCC Rcd 15696, ¶ 9 (I.B. 2005) ("*DigitalGlobe, Inc.*").

[9] *Assignment of Orbital Locations to Space Stations in the Domestic Fixed-Satellite Service*, Memorandum Opinion and Order, 3 FCC Rcd 6972, ¶ 2 (1988); *see also DigitalGlobe, Inc.*, at ¶ 9.

[10] *DigitalGlobe, Inc.*, at ¶ 9 (citing *EarthWatch Inc.*, Order and Authorization, 16 FCC Rcd 15985, ¶ 10 (I.B. 2001)).

[11] *Teledesic LLC*, Order and Authorization, 14 FCC Rcd 2261, ¶ 5 (I.B. 1999) (internal citations omitted).

other EESS systems.

WorldView Legion will enable Maxar to deliver unprecedented performance and value for its remote sensing customers by enabling significantly more accurate, comprehensive, and timely pattern-of-life and human geography analysis than the currently available systems. WorldView Legion will offer more frequent monitoring for enhanced support of emergency response, maritime surveillance, infrastructure and other remote monitoring needs. Legion will also provide coverage from sunup to sundown and reduce the windows between data collects, allowing for more persistent monitoring of critical areas of interest. The revisit rate of WorldView Legion for a specific geographic area enables more real-time, actionable analysis to deliver insights into rapid change faster, and Maxar will be able to more quickly and accurately generate and regenerate a 3D skin of the Earth. Promptly granting this modification will facilitate the rapid deployment of this technology in the configuration best suited to serve customers.

III. REQUESTS FOR WAIVER

A. Maxar Requests Waiver of the Modified Processing Round Requirements in Sections 25.156 and 25.157.

The Commission has routinely granted waivers of the modified processing round requirements[12] for EESS operators, including for WorldView Legion, because of "the opportunity for additional entrants to operate in [the 8025-8400 MHz band]."[13] Likewise, grant of this modification will not preclude subsequent EESS applicants from operating in the 8025-8400 MHz band or cause harmful interference to other EESS systems currently operating in the band. Therefore, good cause exists for the Commission to continue to waive the modified processing rules for purposes of processing this modification.

[12] *See* 47 C.F.R. §§ 25.156, 25.157.
[13] *Legion Grant*, at ¶ 5.

B. Maxar Requests Waiver of the Default Service Rules in Section 25.217(b).

Maxar also requests a waiver of the default service rules under Section 25.217(b).[14] The Commission has granted waivers for EESS operators, including for Maxar for its initial authority to launch and operate WorldView Legion, because they "must comply with technical requirements in Part 2 of the Commission's rules and power flux-density limits, which should prevent harmful interference to other operations in the band."[15] The same rationale applies to this modification. Accordingly, good cause exists for the Commission to grant waiver of the default service rules.

IV. CONCLUSION

For the reasons set forth above, Maxar respectfully requests that the Commission grant this modification application.

Respectfully submitted,

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[14] *See* 47 C.F.R. § 25.217(b).
[15] *Legion Grant*, at ¶ 6.