Exhibit C

Orbital Debris Assessment Report

YAM-30 Orbital Debris Assessment Report (ODAR)

YAM-30 ODAR-1.0

This report is presented in compliance with NASA-STD-8719.14C, APPENDIX A.

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Debris Assessment Software (DAS) version used in analysis: v3.2.7

Revision Record				
Revision:	Date:	Affected Pages:	Changes:	Author(s):
1.0	7/10/2026	All – Initial	DAS Software Results Orbit Lifetime Analysis	D. Morse

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ODAR Self-Assessment Evaluation:

A self-assessment is provided below in accordance with the assessment format provided in Appendix A.2 of NASA-STD-8719.14C.

ODAR Requirement	Compliant or N/A	Not Compliant	Incomplete
4.3-1.a	x		
4.3-1.b	x		
4.3-2	x		
4.4-1	x		
4.4-2	x		
4.4-3	x		
4.4-4	x		
4.5-1	x		
4.5-2	x		
4.6-1(a)-c	x		
4.6-2	x		
4.6-3	x		
4.6-4	x		
4.7-1	x		
4.8-1	x		

Assessment Report Format:

This ODAR follows the format recommended in NASA-STD-8719.14C, Appendix A.1, sections 1 through 8 for the Loft Orbital spacecraft (“YAM-30”). Sections 9 through 14 apply to the launch vehicle ODAR and are not covered here.

1. Program Management and Mission Overview

Loft Orbital is a U.S. company headquartered in San Francisco, California.

Program Manager

- Grace Robertson

Senior Management

- Alexander B. Greenberg (Co-founder & Chief Operating Officer)

Foreign Government or Space Agency Participation

- None

Mission Overview

The YAM-30 spacecraft is expected to be launched on a SpaceX Transporter mission. The deployment orbit altitude will be 510 km ± 20 km with an inclination of approximately 97.5 degrees, and following deployment, the YAM-30 spacecraft will be relocated to its operational orbit. Following deployment, the YAM-30 spacecraft will employ its propulsion capability to move to the operational orbit of 530 km x 530 km (+/- 10 km) orbital altitude but will not be actively maintaining inclination or LTAN. The transition to the operational orbit depends upon the parameters of the insertion orbit. Analysis indicates that the maximum time to achieve the planned operational orbit could be as much as 10 days (from the minimum insertion orbit). During the mission, the spacecraft will employ station keeping, as clarified below. At the end of mission (EOM), Loft Orbital will actively deorbit the spacecraft to a circular orbit of no higher than 350 km[1] and then passivate the spacecraft. If YAM-30 reaches 250 km with remaining propellant any excess propellant will be vented before passivation.

Launch

[1] YAM-30 may pause to passively deorbit through the orbital altitudes of manned spacecraft, as discussed below.

The YAM-30 spacecraft is expected to be launched aboard a Falcon-9 launch vehicle, as part of the Transporter rideshare program. The launch site will be either Vandenberg, CA or Cape Canaveral, FL.

Following are the target orbital parameters:

Deployment

- Apogee: 510 km nominal ± 20 km
- Perigee: 510 km nominal ± 20 km
- Inclination: 97.5° ± 1.0° (not maintained)
- LTAN: 10:30 ± 30 minutes (not maintained)

Operating

- Apogee: 530 km nominal ± 10 km
- Perigee: 530 km nominal ± 10 km
- Inclination: 97.5° ± 1.0° (not maintained)
- LTAN: 10:30 ± 30 minutes (not maintained)

YAM-30 has on-board propulsion and therefore may change its orbit. Loft Orbital expects the YAM-30 spacecraft to be launched into an approximate SSO orbit but does not intend to maintain SSO throughout the spacecraft lifetime. Accordingly, Loft Orbital expects the LTDN/LTAN to drift over time.

Mission Duration

The anticipated mission lifetime of YAM-30 is at most six years from launch to deorbit.

2. Spacecraft Description

Physical description of the spacecraft

Physical description of the constellation: The YAM-30 spacecraft is based on the AOS Arrow bus originally developed by Airbus for the OneWeb broadband telecommunications company.

Basic physical dimensions are 1200 mm x 1052 mm x 1036 mm with a mass of less 181.3 kg. The spacecraft is composed of the Airbus OneWeb bus and the Loft Orbital Payload Hub. The solar panels generate 500-550W of orbit average electric power which is stored in a 51Ah COTS Li-Ion unpressurized battery assembly. The bus is 3-axis stabilized, employing star trackers, magnetometers, GPS and sun sensors for attitude knowledge and reaction wheels and torque rods for attitude control. The YAM-30 spacecraft is depicted in Figure 1.

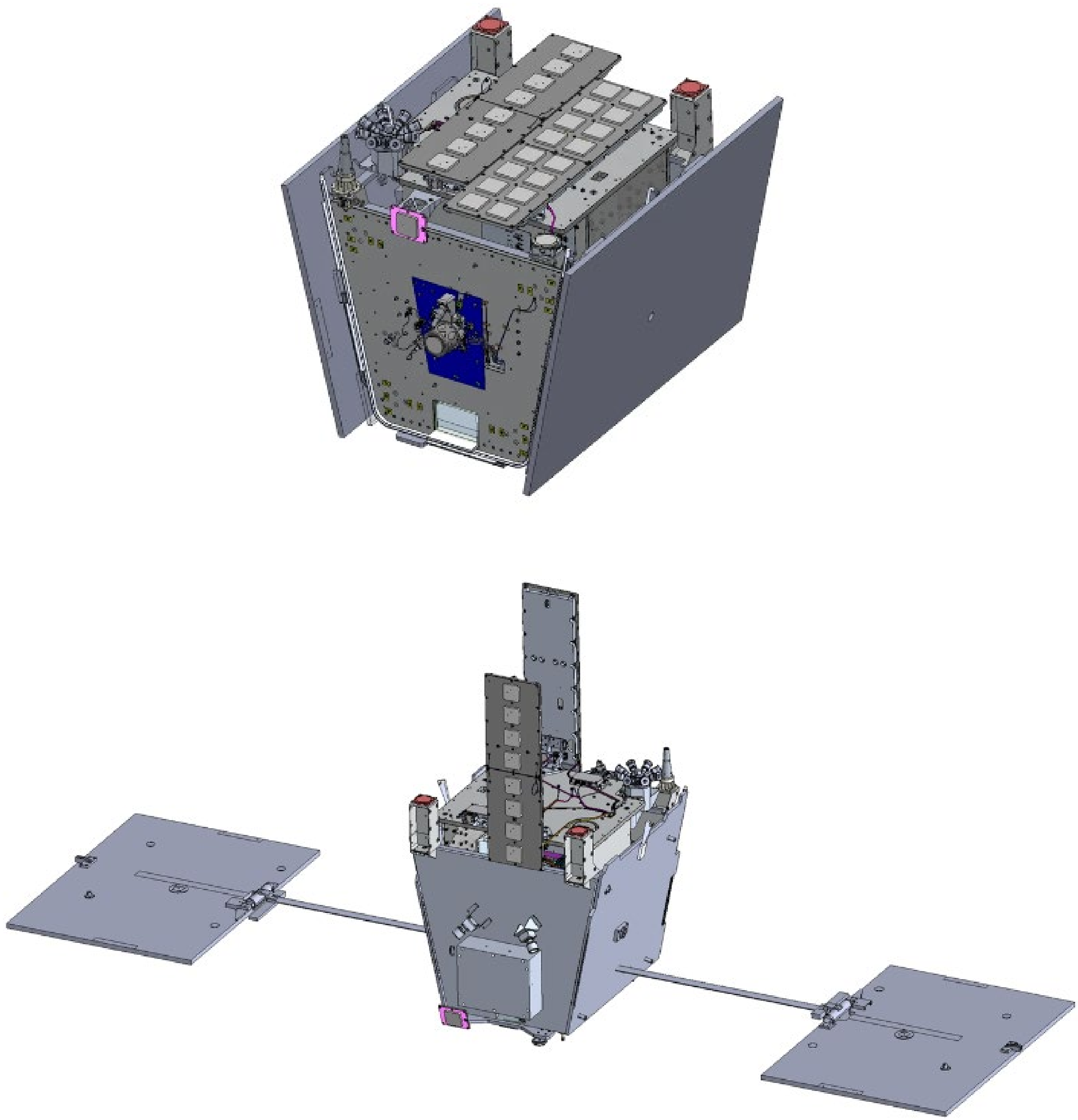

Figure 1 YAM-30 Spacecraft Configuration

Spacecraft Mass

- Wet Mass: 181.3 kg (including growth margin)
- Dry Mass: 175.3 kg (tank is capable of handling up to 6 kg of propellant and this analysis assumes a worst-case scenario of carrying a full propellant load)

Description of propulsion system

The YAM-30 spacecraft will include a BUSEK, BHT-350 Xenon-Ion Hall Effect Thruster (Xenon HET). The Xenon tank capacity is 14 kg max tank capacity (incl. residuals), and this spacecraft is expected to carry 6 kg of propellant. The HET total impulse is 57 kNs and provides a thrust of 13.6 mN @ 954.8s of ISP. The following table shows the propellant and Delta-V budget for the YAM-30 spacecraft.

Operation	Delta-V	Propellant
Initial Orbit Transfer	22 m/s	0.5 kg
Station Keeping	100.1 m/s	2.4 kg
Collision Avoidance	3.4 m/s	0.1 kg
Disposal	100 m/s	2.4 kg
Leakage		0.6 kg
Totak		6.0 kg

Figure 2 Propellant / Delta-V Budget

Fluids Planned to be On-board

0.351kg of ammonia in sealed heat pipes

Up to 6 kg Xenon propellant

Fluids in Pressurized Batteries: None

The YAM-30 spacecraft uses unpressurized standard COTS Lithium-Ion batteries. Total unit dimensions 338mm x 275mm x 120mm and mass of 9.648 kg.

Attitude Control System:

The long axis of the YAM-30 spacecraft can be oriented parallel to the nadir vector during imaging or other payload operations, but the spacecraft will typically be oriented in a nadir-pointing attitude.

The YAM-30 spacecraft attitude will be controlled initially by torque rods, which will allow the spacecraft to be aligned relative to the Earth's magnetic field. These will allow the spacecraft to detumble and align with the magnetic field.

- A *safe mode* is optimized for solar power generation from the spacecraft. The spacecraft's deployable panel will be oriented towards the sun. This mode will make use of magnetometers, sun sensors, reaction wheels, and magnetic torquers to orient the spacecraft correctly.
- A *targeted tracking mode* will allow the spacecraft Nadir panel to be directed at any location on the Earth's surface. This mode will make use of reaction wheels and a star tracker to orient the spacecraft.
- An *LVLH mode* keeps the Nadir panel pointed towards the Earth's surface. This mode will make use of reaction wheels and a star tracker to orient the spacecraft. This is the primary ACS mode of the YAM-30 spacecraft during nominal operations

Description of any range safety or other pyrotechnic devices

None. The YAM-30 spacecraft will be separated from the launch vehicle using a deployer with debris free actuation.

Description of the electrical generation and storage system

Standard COTS Li-Ion battery cells are charged before payload integration and provide 51 Ah of electrical energy during the eclipse portion of the spacecraft's orbit. Six strings of 18/19 GaAs solar cells generate average on-orbit power of approximately 500-550 W. The charge/discharge cycle is managed by the electronic power system which is monitored by the flight computer.

Identification of any other sources of stored energy not noted above

Reaction wheels store kinetic energy but will be disconnected from power at the end of the operational lifetime.

Identification of any radioactive material on board

None

Address the trackability of the spacecraft. Spacecraft operating in low-Earth orbit will be presumed trackable if each individual spacecraft is 10 cm or larger in its smallest dimension, excluding deployable components:

The spacecraft is in low-Earth orbit and has a smallest dimension measuring at least 10 cm. Thus, it is trackable.

The statement shall also disclose the following:

How the operator plans to identify the spacecraft following deployment and whether spacecraft tracking will be active or passive:

Spacecraft tracking will be active. Prior to deployment an initial ephemeris is produced by the launch service that will be used to schedule a contact time window with the ground station. The accuracy of the ephemeris will depend on the launch vehicle's performance, delays, and deployment times. A more accurate ephemeris will be made available shortly after deployment. After deployment when the spacecraft establishes contact with the nearest available Loft Orbital contracted ground station, active spacecraft tracking will be employed to enhance and maintain spacecraft ephemeris data. The collected data will be used to identify the spacecraft from two-line element sets once they become available by the 18th/19th Space Defense Squadron (SDS).

Whether, prior to deployment, the spacecraft will be registered with the 18th Space Control Squadron or successor entity:

Prior to deployment, the spacecraft will be registered with the 18th/19th SDS via their Satellite Registration Form and Space Situational Awareness (SSA) Sharing Agreement.

The extent to which the spacecraft operator plans to share information regarding initial deployment, ephemeris, and/or planned maneuvers with the 18th Space Control Squadron or successor entity, other entities that engage in space situational awareness or space traffic management functions, and/or other operators:

Loft Orbital intends to provide the $18^{th}/19^{th}$ SDS information regarding initial deployment, owner/operator (O/O) ephemeris, and planned maneuvers. This is intended to provide better space situational awareness and improve the accuracy of conjunction analysis (CA). The higher accuracy O/O ephemeris will improve the quality of the CA and reduce the frequency of Conjunction Data Messages (CDMs). Loft Orbital intends to share ephemeris with other operators on an as-needed basis.

Planned Proximity Operations

None

3. Spacecraft Debris Released During Normal Operations

Assessment of Spacecraft Compliance with Requirements 4.3-1 and 4.3-2

Requirement 4.3-1: Mission Related Debris Passing Through LEO

- **Compliance statement:** No release of debris will occur during the lifetime of YAM-30. Additionally, there is no probable scenario for unintentional debris generation.

Requirement 4.3-2: Mission Related Debris Passing Near GEO

- **Compliance statement:** This requirement is not applicable to this mission profile.

4. Spacecraft Intentional Breakups and Potential for Explosions

Potential causes of spacecraft breakup during deployment and mission operations

There is no credible scenario that would result in spacecraft breakup during normal deployment operations.

Summary of failure modes and effects analyses of all credible failure modes which may lead to an accidental explosion

In-mission failure of a battery cell protection circuit could lead to a short circuit resulting in overheating and a very remote possibility of battery cell explosion. The battery safety systems discussed in the FMEA (see requirement 4.4-1 below) describe the combined faults that must occur for any of seven (7) independent, mutually exclusive failure modes to lead to explosion. In addition to the battery protection mentioned above, the YAM-30 battery unit features two temperature sensors which monitor battery cells for high temperatures.

Plan for any designed spacecraft breakup

There are no planned breakups.

List of components which shall be passivated at End of Mission (EOM) including method of passivation and amount which cannot be passivated

- **Reaction Wheels** – reaction wheels will be spun down and the spacecraft will be controlled via torque rods
- **Sealed Heat Pipes** – no passivation is planned or required
- **Batteries** – batteries will be drawn down and then isolated from the EPS to passivate at EOM, once spacecraft has been deorbited and any remaining propellant has been vented.

Rationale for Non-Passivation

N/A

Assessment of Spacecraft Compliance with Requirements 4.4-1 through 4.4-4

Requirement 4.4-1: Limiting the risk to other space systems from accidental explosions during deployment and mission operations while in orbit about Earth or the Moon

- *For each spacecraft and launch vehicle orbital stage employed for a mission, the program or project shall demonstrate, via failure mode and effects analyses or equivalent analyses, that the integrated probability of explosion for all credible failure modes of each spacecraft and launch vehicle is less than 0.001 (excluding small particle impacts) (Requirement 56449).*

Compliance statement:

Required Probability: 0.001
Expected probability: 0.000; COMPLIANT.

Supporting Rationale and FMEA details:

Battery explosion:

Effect: All failure modes below might theoretically result in battery explosion with the possibility of orbital debris generation. However, in the unlikely event that a battery cell does explosively rupture, the small size, mass, and potential energy, of the selected COTS batteries is such that while the spacecraft could be expected to vent gases, most debris from the battery rupture should be contained within the vessel due to the lack of penetration energy.

Probability: Extremely Low. It is believed to be a much less than 0.1% probability that multiple independent (not common mode) faults must occur for each failure mode to cause the ultimate effect (explosion).

Failure mode 1: Internal short circuit.

Mitigation 1: Qualification and acceptance shock, vibration, thermal cycling, and vacuum tests followed by maximum system rate-limited charge and discharge to prove that no internal short circuit sensitivity exists.

Combined faults required for realized failure: Environmental testing AND functional charge/discharge tests must both be ineffective in discovery of the failure mode.

Failure Mode 2: Internal thermal rise due to high load discharge rate.

Combined faults required for realized failure: Spacecraft thermal design must be incorrect AND external over-current detection and disconnect function must fail to enable this failure mode.

Failure Mode 3: Excessive discharge rate or short circuit due to external device failure or terminal contact with conductors not at battery voltage levels (due to abrasion or inadequate proximity separation).

Mitigation 3: This failure mode is negated by a) qualification-tested short circuit protection on each external circuit, b) design of battery packs and insulators such that no contact with nearby board traces is possible without being caused by some other mechanical failure, c) obviation of such other mechanical failures by proto qualification and acceptance environmental tests (shock, vibration, thermal cycling, and thermal-vacuum tests).

Combined faults required for realized failure: An external load must fail/short-circuit AND external over-current detection and disconnect function failure must all occur to enable this failure mode.

Failure Mode 4: Inoperable vents.

Mitigation 4: Battery vents are not inhibited by the battery holder design or the spacecraft.

Combined effects required for realized failure: The final assembler fails to install proper venting.

Failure Mode 5: Crushing

Mitigation 5: This mode is negated by spacecraft design. There are no moving parts in the proximity of the batteries.

Combined faults required for realized failure: A catastrophic failure must occur in an external system AND the failure must cause a collision sufficient to crush the batteries leading to an internal short circuit AND the spacecraft must be in a naturally sustained orbit at the time the crushing occurs.

Failure Mode 6: Low level current leakage or short-circuit through battery pack case or due to moisture-based degradation of insulators.

Mitigation 6: These modes are negated by a) battery holder/case design made of non-conductive plastic, and b) operation in vacuum such that no moisture can affect insulators.

Combined faults required for realized failure: Abrasion or piercing failure of circuit board coating or wire insulators AND dislocation of battery packs AND failure of battery terminal insulators AND failure to detect such failure modes in environmental tests must occur to result in this failure mode.

Failure Mode 7: Excess temperatures due to orbital environment and high discharge combined.

Mitigation 7: The spacecraft thermal design will negate this possibility. Thermal rise has been analyzed in combination with space environment temperatures showing that batteries do not exceed normal allowable operating temperatures which are well below temperatures of concern for explosions.

Combined faults required for realized failure: Thermal analysis AND thermal design AND mission simulations in thermal-vacuum chamber testing AND overcurrent monitoring and control must all fail for this failure mode to occur.

Requirement 4.4-2: Design for passivation after completion of mission operations while in orbit about Earth or the Moon

- *Design of all spacecraft and launch vehicle orbital stages shall include the ability to deplete all onboard sources of stored energy and disconnect all energy generation* *sources when they are no longer required for mission operations or post-mission disposal or control to a level which cannot cause an explosion or deflagration large enough to release orbital debris or break up the spacecraft (Requirement 56450).*

- **Compliance statement:** YAM-30's battery charge circuits include overcharge protection and a parallel design to limit the risk of battery failure. However, in the unlikely event that battery cell does explosively rupture, the small size, mass, and potential energy, of these small batteries is such that while the spacecraft could be expected to vent gases, most debris from the battery rupture should be contained within the vessel due to the lack of penetration energy.

Requirement 4.4-3: Limiting the long-term risk to other space systems from planned breakups

- **Compliance statement:** This requirement is not applicable. There are no planned breakups.

Requirement 4.4-4: Limiting the short-term risk to other space systems from planned breakups

- **Compliance statement:** This requirement is not applicable. There are no planned breakups.

5. Spacecraft Potential for On-Orbit Collisions

Requirement 4.5-1: Limiting debris generated by collisions with large objects when operating in Earth orbit

- *For each spacecraft and launch vehicle orbital stage in or passing through LEO, the program or project shall demonstrate that, during the orbital lifetime of each spacecraft and orbital stage, the probability of accidental collision with space objects larger than 10 cm in diameter is less than 0.001 (Requirement 56506).*
- **Compliance statement:** Large object impact and debris generation probability: 6.4635E-05. This was based upon a worst-case scenario of the YAM-30 spacecraft being deployed to a maximum orbital altitude of 530 km, station keeping there for 5 years, conducting a PMD to 350 km x 350 km and then passively deorbiting.

Requirement 4.5-2: Limiting the probability of damage from small objects when operating in Earth or lunar orbit

- *For each spacecraft, the program or project shall demonstrate that, during the mission of the spacecraft, the probability of accidental collision with orbital debris and meteoroids sufficient to prevent compliance with the applicable post-mission disposal requirements is less than 0.01 (Requirement 56507).*
- **Compliance Statement:**
  Small Object Impact and Debris Generation Probability: 0.0021789; compliant.
  To meet the FCC's six-year orbital lifetime requirement, YAM-30 operate for 5 years after deployment and then conduct a PMD maneuver down to 350 km (circular). From the PMD orbit, YAM-30 will passively deorbit in approximately four months. Accordingly, Loft Orbital has calculated the small object collision probability assuming a 5-year mission lifetime. See Figure 5 in Section 6 below for demonstration of ~4 months passive deorbit after the PMD Maneuver.
  Small Object Impact and Debris Generation Probability: This analysis made conservative assumptions regarding which components include critical surfaces and the effective cross-sectional areas of these critical surfaces. The bus supplier provided a deorbit reliability analysis. From this analysis, all single point failure components were included in the collision with small object analysis. The spacecraft will be operated during the majority of the mission in a 3-axis stabilized orientation with the +X panel in the direction of motion (referred to as V in the NASA DAS User Guide). Also, the +Z panel (referred to as U in the NASA DAS User Guide) reflects the Zenith surface of the spacecraft, thus the -Z panel reflects the Nadir surface. The highest critical surface risk of collision with small objects is the battery which is mounted outside of the +X panel. One could easily argue that the battery assembly should not be included in this analysis, given that it is composed of a large number of redundant battery cells. Out of an abundance of caution, the battery assembly was included in the analysis and further the cross-sectional area of the battery assembly critical surface reflects 50% of the cross-sectional area of battery assembly box. While it would stand to reason that there may be some circuits in the battery assembly which could disable the spacecraft if penetrated by a small object, the fraction of the overall surface area which would reflect an actual

critical surface would likely reflect no more than 1-5% of the surface area of the entire battery assembly. This same general approach was also used for the following electronic components: flight computer (which is also redundant), other electronics (most of which are not critical surfaces), propulsion system, GPS, TT&C, SADA and PCDU. For each of these electronic assemblies the assumed area of the critical surface was the cross-section area of the assembly. The list of components/assemblies containing or reflecting a critical surface, the mounting location and the effective surface area used in the DAS model are listed below in Figure 1.

Component	Mounting Location	Interior vs. Exterior	Surface Area (m^2)
Propellant Tank	-X Panel	Interior	0.08
Thruster	-X Panel	Exterior	0.015
XFS	-X Panel	Interior	0.015
PPU	-X Panel	Interior	0.08
GPS Antennas	+Z Panel	Exterior	0.0032
GPS LNA	+Z Panel	Interior	0.0032
TT&C Antenna	+Z/-Z Panel	Exterior	0.01
Flight Computer	+Z Panel	Interior	0.004
Other Electronics	+Z Panel	Interior	0.02
PCDU	+Z Panel	Interior	0.047
Battery	+X Panel	Exterior	0.069
TT&C Hybrid Coupler	+X Panel	Exterior	0.0012
SADA	+Z Panel	Interior	0.0072

Figure 3 Collision With Small Objects - Critical Surfaces

A further analysis was conducted to demonstrate the reliability of being able to operate at the end of this period. The bus supplier conducted a detailed deorbit reliability analysis and determined that the bus reliability is 97% at the end of a ten-year mission, which is a conservative estimate because YAM-30 only needs to operate for 5 years before conducting a PMD maneuver. Details of the deorbit reliability analysis are provided in Figure 2 below.

Detailed description and assessment of efficacy of any planned debris avoidance capability intended to help in meeting requirement 4.5-1

Loft Orbital will engage with USSPACECOM to coordinate collision avoidance activities.

TABLE 5: BASIC REPORTING CRITERIA		
	Space-Track Criteria	Emergency Criteria
Notification Method	Conjunction Data Message (CDM)	Conjunction Data Message (CDM) & Close Approach Notification (CAN) email
Near Earth: HAC	TCA ≤ 3 days and Overall miss ≤ 1km and Probability of Collision ≥ e^-7	TCA ≤ 3 days, Overall miss ≤ 1km and Probability of Collision ≥ e^-4
Near Earth O/O Ephemeris	TCA ≤ 3 days and Overall miss ≤ 1km and Probability of Collision ≥ e^-7	TCA ≤ 3 days and Overall miss ≤ 1km and Probability of Collision ≥ e^-4

Loft Orbital has analyzed the updated processes and protocols at USSPACECOM with the 18th and 19th Space Defense Squadrons roles and responsibilities. In the context of receiving CDM and CAN emails, and in close coordination with USSSPACECOM and other operators, Loft Orbital intends to alter the orbit altitude at TCA of the YAM-30 spacecraft to facilitate conjunction/collision avoidance.

Prior to launch, Loft Orbital will coordinate with the 18th/19th SDS to share critical information about the propulsion capabilities of the YAM-30 spacecraft. Following launch and deployment, Loft Orbital will conduct a complete checkout of the YAM-30 spacecraft, including evaluation of the HET propulsion system. Depending upon the outcome of each initial checkout, Loft Orbital will update 18th/19th SDS about the maneuvering capabilities of the YAM-30 spacecraft.

Upon receipt of a conjunction data message (CDM), Loft Orbital will submit updated ephemeris information to Space-track.org for review by 18th/19th SDS. This will take place within four hours of receipt of the CDM message. If the CDM indicates that the risk of conjunction is with another operational spacecraft, Loft Orbital will also contact the other spacecraft operations team within 8 hours of receipt of the CDM, realizing that the other team may not respond promptly. The purpose of this outreach, for each CDM, is to maximize the time for responsive action and to allow for a wider range of responses. CDM are typically issued 72 hours prior to the time of closest approach (TCA).

Response when risk threshold is reached, next steps:

Upon submission of updated YAM-30 ephemeris data to 18th/19th SDS, the assessment on probability of collision (Pc) will be refined at 18th/19th SDS. If the Pc drops based on higher fidelity orbit information, then no further actions will be needed in response to that CDM. Loft Orbital assumes that an updated Pc will be received within 8 hours of providing update ephemeris, given the 8-hour cycle for Concern List screenings. Assuming a CDM 72-hours before TCA, the Loft Orbital process should allow a refined determination if action is required 60 hours before TCA. In light of the fact that the proposed orbit change maneuvers must be started at least 2.5 hours before TCA, this provides 57.5 hours to coordinate optimum maneuver planning between all affected parties and to monitor the evolution of the Pc calculations to determine if any collision avoidance maneuver is even warranted.

If the Pc stays the same or increases, after 18th/19th SDS incorporates the latest ephemeris into its evaluation, then Loft Orbital will take further actions, which will be predicated on collaboration with any other affected spacecraft operators and based on analysis of the projected new space track of the appropriate YAM-30 spacecraft that would come from proposed collision avoidance maneuvers. Loft Orbital will adjust its projected orbit to avoid collisions. If the other spacecraft operator identified by the CDM concurs with Loft Orbital that its spacecraft's orbit should be adjusted, and that is the only object that is the subject of the CDM, then Loft Orbital will take no action and monitor the situation to accommodate the other spacecraft operator's collision avoidance maneuver.

When Loft Orbital determines that the proper course of action is to adjust the orbit/trajectory of the applicable YAM-30 satellite, it will take the following steps:

The first step is to review the current threat risk with updated information from 18th/19th SDS. The threshold for initiating the following maneuvers is: Pc > 1e-4. In the event that the Pc exceeds that threshold, then Loft Orbital will work through the options below, at each point checking with 18th/19th SDS to ensure that the proposed response will not cause any further risks of collision prior to engaging in the actions:

- Loft Orbital will conduct two 8-minute propulsion maneuvers, phased ½ half orbit apart to either raise or lower the orbit altitude by up to 200m (whichever will be most effective at reducing Pc) at the Time of Closest Approach (TCA). These propulsion maneuvers can be executed as late as 1.5 orbits (less than 2.5 hours) before TCA. Moving the orbit altitude by 200 m should be sufficient to reduce Pc < 1e-4 in most or all circumstances. Of course, Loft Orbital will conduct a maneuver based upon guidance from the 18th/19th SDS which in most cases may require far less delta-V to reduce the Pc to an optimum (or sufficiently safe) value.
- In the event that the Loft Orbital YAM-30 propulsion capability is not operational, Loft Orbital will coordinate with the 18th/19th SDS to provide information regarding the YAM-30 spacecraft's ability to employ differential drag to alter its trajectory. Such an approach will be slower and significantly less effective than employing electric propulsion, but the YAM-30 spacecraft has deployable solar arrays which enable a significant difference between the minimum and maximum drag configurations.

Throughout this process, Loft Orbital will remain in active communication with 18th/19th SDS to ensure that its responses are reviewed and assessed. After the end of its operational life the YAM-30 spacecraft will be actively deorbited to just above the ISS orbit and the orbit of Tiangong, the Chinese space station, and allowed to passively deorbit through those respective orbits.[2] As can be seen in Figure 3 below, the orbit stays nearly circular, thus limiting the period of time when conjunctions may occur. Loft Orbital intends to monitor the location of the YAM-30 spacecraft and work closely with organizations, such as the 18th Space Defense Squadron and SpaceNav, to avoid potential collisions. With respect to the ISS, Loft Orbital will also engage with NASA during the deorbit process through the ISS orbit.

Certify that upon receipt of a space situational awareness conjunction warning, the operator will review and take all possible steps to assess the collision risk, and will mitigate the collision risk if necessary

[2] Loft Orbital understands that NASA would prefer not to have spacecraft actively deorbit through the ISS orbit as this reduces NASA's ability to accurate predict conjunctions with the ISS. This same approach will be employed when passing through the orbits of all manned spacecraft.

Upon receipt of a space situational awareness conjunction warning, Loft Orbital certifies that it will attempt to contact the operator of any active spacecraft involved in such a warning, share ephemeris data and other appropriate operational information with any such operator in order to avoid a collision. The YAM-30 spacecraft has maneuvering capabilities and will employ those capabilities to adjust its orbit to address potential conjunctions, as described above.

6. Spacecraft Post-Mission Disposal Plans and Procedures

Description of spacecraft disposal option selected

Consistent with NASA-STD 8719.4C, YAM-30 will be disposed of via atmospheric reentry. After approximately 5 years on orbit, the YAM-30 spacecraft will conduct a PMD maneuver to lower the orbit to 350 km x 350 km to ensure that the mission lifetime is kept under 6 years from launch to atmospheric reentry.

Systems or Components Required to Accomplish Post-mission Disposal Maneuvers

The subsystems required for deorbit are listed in the ten-year reliability analysis shown below in Figure 2.

Subsystem/Equipment	Red	m	n	p	Deorbitation	Conf change wrt SK
TOTAL BUS					0,970 434	
AOCS					0,998 845	
Reaction Wheel (RW)	HOT	3	4	1	0,998 948	
Magnetometer (MM)	COLD	1	2	1	1,000 000	
Magnetotorquer (MT)	COLD	1	2	1	1,000 000	
Star Tracker (OH)	HOT	1	2	1	0,999 897	
Coarse Sun Sensor (CSS)	COLD	1	2	2	1,000 000	
GPS	COLD	1	2	1	0,999 999	
GPS LNA	SPF	1	1	1	0,999 987	
GPS Antenna	SPF	1	1	1	0,998 828	
Processing					0,999 803	
OBC	HOT	1	2	1	0,999 828	x
OBC	HOT	1	2	1	0,999 976	
Power Supply					0,990 174	
PCDU: SA sections	HOT	5	6	1	0,999 997	
PCDU: whole distrib	SPF	1	1	1	0,993 593	
PCDU: TM/TC channels	HOT	1	2	1	0,999 997	
Battery					0,999 819	
Solar Array	HOT	5	6	1	0,999 917	
SADA-A	COLD	1	2	1	0,999 999	
SADA-B	SPF	1	1	2	0,996 829	
Mechanism					0,998 819	
SADS	SPF	1	1	1	0,998 728	
TT&C (Ground / Space)					0,999 203	
TTC (Rx + Tx channels)	HOT	1	2	1	0,999 281	
Coupler	SPF	1	1	1	0,999 986	
TM/TC antenna	SPF	1	1	2	0,999 936	
Thermal Control					0,999 999	
Heaters (bus unit)	HOT	1	2	9	1,000 000	
Heaters (PAM)	HOT	1	2	3	1,000 000	
Thermistors	HOT	1	2	22	0,999 999	
PROPULSION					0,983 335	
PPU	SPF	1	1	1	0,997 474	
HET (thruster)	SPF	1	1	1	0,991 890	
XFS	SPF	1	1	1	0,993 887	
Tank	SPF	1	1	1	0,999 972	

Figure 4 Deorbit Reliability Analysis

Post-mission Disposal Maneuver Plan

As discussed above in Section 5, a PMD maneuver is necessary to comply with FCC regulations requiring a maximum six-year lifetime from launch until atmospheric reentry. 47 C.F.R. § 25.122(c)(2). YAM-30 will conduct a PMD at end of mission to lower the orbit altitude to a 350 km circular orbit.

Calculation of area-to-mass ratio after post-mission disposal

The final area-to-mass ratio is calculated using the dry mass of the vehicle and the average cross-sectional area. Average cross-sectional area is calculated using the equation for estimated average cross-sectional area for non-convex shapes from NASA-STD-8179.14C: $A_{avg} = (A_{max} + A_1 + A_2)/2$, where A_{max} is the maximum cross-sectional area, and A_1 and A_2 are the cross-sectional areas for the two viewing directions orthogonal to the maximum cross sectional area viewing direction.

YAM-30 area-to-mass ratio calculation (stowed):

- Spacecraft mass: 181.3 kg (wet mass)
- Cross-sectional area: 2.03 m^2 (average)
- Area-to-mass ratio: 0.011197 m^2/kg (final)

YAM-30 area-to-mass ratio calculation (deployed):

- Spacecraft mass: 181.3 kg (wet mass)
- Cross-sectional area: 2.59 m^2 (average)
- Area-to-mass ratio: 0.014286 m^2/kg (final)

Assessment of spacecraft compliance with ODAR requirements 4.6-1 to 4.6-4

Requirement 4.6-1(a): Disposal for space structures in or passing through LEO

- **Compliance statement:** The YAM-30 reentry is COMPLIANT. As discussed above in Section 5, after five years of mission operations, a PMD will be conducted to lower the orbit altitude to 350 km circular, then the satellite will passively deorbit within ~4 months as shown below in Figure 5.

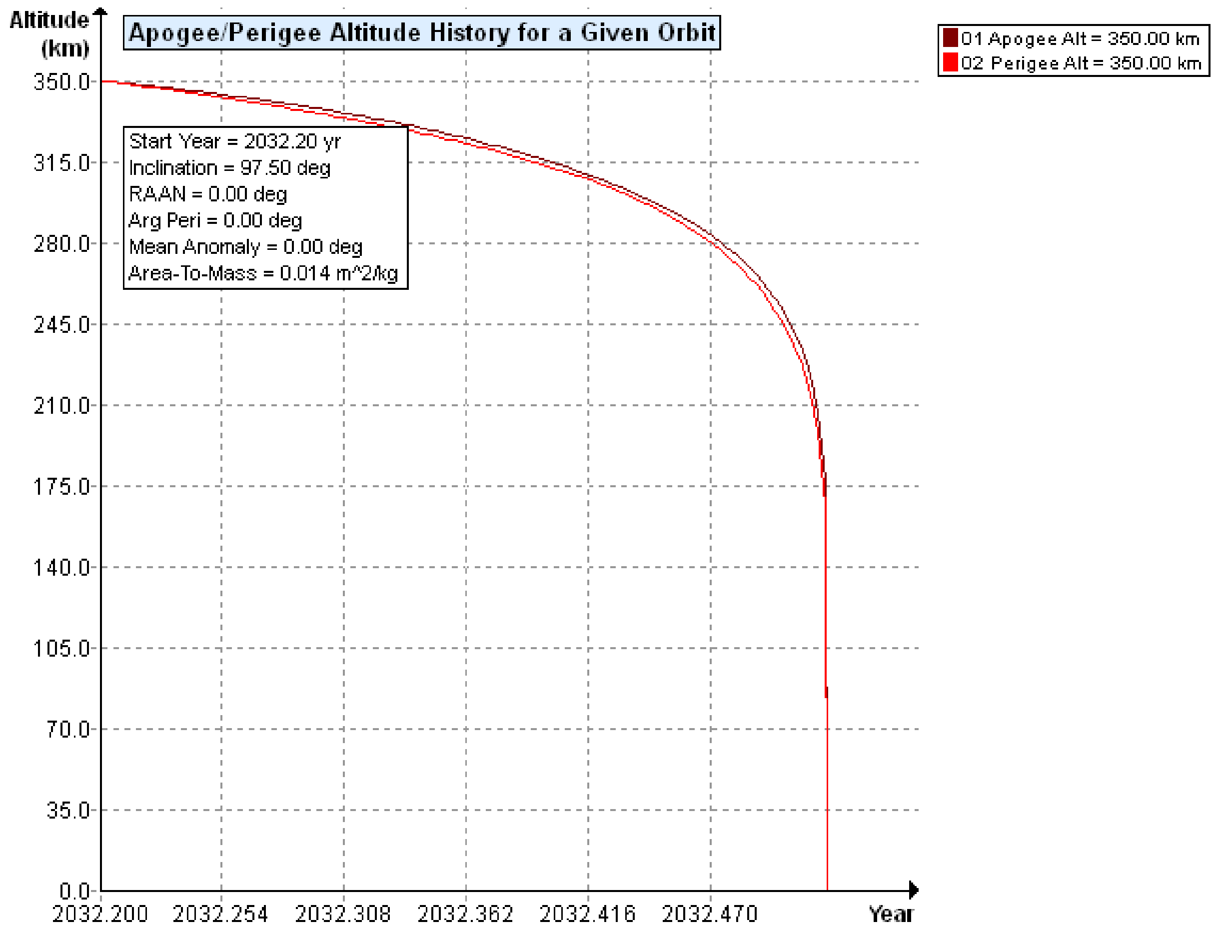

Figure 5 Orbital Decay Profile from PMD Orbit

Requirement 4.6-2: Disposal for space structure near GEO

- **Compliance statement:** Not applicable

Requirement 4.6-3: Disposal for space structures between LEO and GEO

- **Compliance statement:** Not applicable

Requirement 4.6-4: Reliability of post-mission disposal operations

Compliance statement:

As discussed above, YAM-30 is compliant with FCC six-year deorbit requirement. 47 C.F.R. § 25.122(c)(2).

7. Spacecraft Reentry Hazards

Summary of objects expected to survive uncontrolled reentry

DAS v3.2.7 reports that no components survive reentry with energy greater than 15 joules.

Compliance Assessment for Requirement 4.7-1

Limit the risk of human casualty.

Requirement 4.7-1(a):

- *The potential for human casualty is assumed for any object with an impacting kinetic energy in excess of 15 joules. For uncontrolled reentry, the risk of human casualty from surviving debris shall not exceed 0.0001 (1:10,000) (Requirement 56626).*
- **Compliance statement:** The calculated risk of human casualty is 0.

Requirement 4.7-1(b):

- **Compliance statement:** Not applicable since controlled reentry is not an element of the end of mission disposal plan

Requirement 4.7-1(c):

- **Compliance statement:** Not applicable since controlled reentry is not an element of the end of mission disposal plan

8. Special Classes of Space Missions

Not applicable.

Analysis using DAS v3.2.7

07 01 2026; 10:11:49AM Project Data Saved To File

07 01 2026; 10:11:59AM Processing Requirement 4.3-1: Return Status : Not Run

======================

No Project Data Available

======================

=============== End of Requirement 4.3-1 ===============

07 01 2026; 10:12:02AM Processing Requirement 4.3-2: Return Status : Passed

======================

No Project Data Available

======================

=============== End of Requirement 4.3-2 ===============

07 01 2026; 10:30:14AM Processing Requirement 4.5-1: Return Status : Passed

==============

Run Data

==============

****INPUT****

Space Structure Name = YAM-30

Space Structure Type = Payload

Perigee Altitude = 540.000 (km)

Apogee Altitude = 540.000 (km)

Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass Ratio = 0.0143 (m^2/kg)

Start Year = 2027.200 (yr)

Initial Mass = 181.300 (kg)

Final Mass = 175.300 (kg)

Duration = 5.000 (yr)

Station-Kept = True

PMD Perigee Altitude = 350.000 (km)

PMD Apogee Altitude = 350.000 (km)

PMD Inclination = 97.500 (deg)

PMD RAAN = 0.000 (deg)

PMD Argument of Perigee = 0.000 (deg)

PMD Mean Anomaly = 0.000 (deg)

Long-Term Reentry = False

****OUTPUT****

Collision Probability = 6.4635E-05

Returned Message: Normal Processing

Date Range Message: Normal Date Range

Status = Pass

==============

=============== End of Requirement 4.5-1 ===============

07 01 2026; 10:31:08AM Project Data Saved To File

07 01 2026; 10:43:48AM Requirement 4.5-2: Compliant

==

Spacecraft = YAM-30 - Small Objects

Critical Surface = Tank

==

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0800 (m^2)

Vector = (0.000000 (u), -1.000000 (v), 0.000000 (w))

CS Pressurized = Yes

Outer Wall 1 Density: 0.360 (g/cm^2) Separation: 0.100 (cm)

Outer Wall 2 Density: 1.080 (g/cm^2) Separation: 1.000 (cm)

****OUTPUT****

Probability of Penetration = 1.5421E-07 (1.5421E-07)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = Thruster

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 1.350 (g/cm^2)

CS Surface Area = 0.0150 (m^2)

Vector = (0.000000 (u), -1.000000 (v), 0.000000 (w))

CS Pressurized = No

****OUTPUT****

Probability of Penetration = 3.8592E-07 (3.8592E-07)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = Computer

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0040 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.620 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 4.8920E-08 (4.8920E-08)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = OtherElectronics

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0200 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1   Density: 1.620 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2   Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 2.4460E-07 (2.4460E-07)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = Battery

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0034 (m^2)

Vector = (0.000000 (u), 1.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.947 (g/cm^2) Separation: 1.000 (cm)

****OUTPUT****

Probability of Penetration = 1.9256E-03 (1.9275E-03)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = PCDU

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0469 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.620 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 5.7329E-07 (5.7329E-07)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = GpsAntenna1

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0016 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1   Density: 0.540 (g/cm^2) Separation: 0.500 (cm)

****OUTPUT****

Probability of Penetration = 5.4859E-06 (5.4859E-06)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = GpsAntenna2

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0016 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 0.540 (g/cm^2) Separation: 0.500 (cm)

****OUTPUT****

Probability of Penetration = 5.4859E-06 (5.4859E-06)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = TTCAntenna

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0100 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 0.540 (g/cm^2) Separation: 0.500 (cm)

****OUTPUT****

Probability of Penetration = 3.4286E-05 (3.4287E-05)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = XFS

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0150 (m^2)

Vector = (0.000000 (u), -1.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.776 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 4.7637E-09 (4.7637E-09)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = PPU

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0800 (m^2)

Vector = (0.000000 (u), -1.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.620 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 2.4244E-08 (2.4244E-08)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = SADA

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.540 (g/cm^2)

CS Surface Area = 0.0072 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 2.730 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 1.0424E-08 (1.0424E-08)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = Coupler

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.270 (g/cm^2)

CS Surface Area = 0.0012 (m^2)

Vector = (0.000000 (u), 1.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 1.620 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 2.000 (cm)

****OUTPUT****

Probability of Penetration = 1.7035E-04 (1.7036E-04)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = TTCAntenna2

===

****INPUT****

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0100 (m^2)

Vector = (-1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1   Density: 0.540 (g/cm^2) Separation: 0.500 (cm)

OUTPUT

Probability of Penetration = 3.4286E-05 (3.4287E-05)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

===

Spacecraft = YAM-30 - Small Objects

Critical Surface = GPSLNA

===

INPUT

Apogee Altitude = 540.000 (km)

Perigee Altitude = 540.000 (km)

Orbital Inclination = 97.500 (deg)

RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)

Mean Anomaly = 0.000 (deg)

Final Area-To-Mass = 0.0143 (m^2/kg)

Initial Mass = 175.300 (kg)

Final Mass = 175.300 (kg)

Station Kept = Yes

Start Year = 2027.200 (yr)

Duration = 5.000 (yr)

Orientation = Fixed Oriented

CS Areal Density = 0.360 (g/cm^2)

CS Surface Area = 0.0032 (m^2)

Vector = (1.000000 (u), 0.000000 (v), 0.000000 (w))

CS Pressurized = No

Outer Wall 1 Density: 0.270 (g/cm^2) Separation: 1.000 (cm)

Outer Wall 2 Density: 0.270 (g/cm^2) Separation: 0.500 (cm)

****OUTPUT****

Probability of Penetration = 2.4366E-06 (2.4366E-06)

Returned Error Message: Normal Processing

Date Range Error Message: Normal Date Range

=============== End of Requirement 4.5-2 ===============

07 01 2026; 10:44:00AM Processing Requirement 4.6 Return Status : Passed

==============

Project Data

==============

****INPUT****

Space Structure Name = YAM-30

Space Structure Type = Payload

Perigee Altitude = 540.000000 (km)

Apogee Altitude = 540.000000 (km)

Inclination = 97.500000 (deg)

RAAN = 0.000000 (deg)

Argument of Perigee = 0.000000 (deg)

Mean Anomaly = 0.000000 (deg)

Area-To-Mass Ratio = 0.014286 (m^2/kg)

Start Year = 2027.200000 (yr)

Initial Mass = 181.300000 (kg)

Final Mass = 175.300000 (kg)

Duration = 5.000000 (yr)

Station Kept = True

Abandoned = False

Long-Term Reentry = False

****OUTPUT****

Suggested Perigee Altitude = 350.000000 (km)

Suggested Apogee Altitude = 350.000000 (km)

Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2032 (yr)

Requirement = 61

Compliance Status = Pass

=============

=============== End of Requirement 4.6 ===============

07 01 2026; 10:44:08AM *********Processing Requirement 4.7-1

Return Status : Passed

**************INPUT******

Item Number = 2

name = YAM-30

quantity = 1

parent = 0

materialID = 5

type = Box

Aero Mass = 175.300003

Thermal Mass = 175.300003

Diameter/Width = 1.000000

Length = 1.000000

Height = 1.000000

name = Spacecraft_OW

quantity = 1

parent = 1

materialID = 5

type = Box

Aero Mass = 87.729000

Thermal Mass = 15.000000

Diameter/Width = 0.750000

Length = 0.750000

Height = 0.750000

name = Walls

quantity = 6

parent = 2

materialID = 5

type = Flat Plate

Aero Mass = 12.121500

Thermal Mass = 1.685000

Diameter/Width = 0.780000

Length = 0.780000

name = Payload Antenna

quantity = 2

parent = 3

materialID = 5

type = Box

Aero Mass = 12.350000

Thermal Mass = 12.350000

Diameter/Width = 0.400000

Length = 0.700000

Height = 0.100000

name = Electronic Boxes

quantity = 6

parent = 3

materialID = 5

type = Box

Aero Mass = 2.385000

Thermal Mass = 2.385000

Diameter/Width = 0.125000

Length = 0.375000

Height = 0.063000

name = SPT Thruster Baseplate

quantity = 1

parent = 3

materialID = 66

type = Flat Plate

Aero Mass = 0.037000

Thermal Mass = 0.037000

Diameter/Width = 0.120000

Length = 0.140000

name = SPT XFS Steel

quantity = 1

parent = 3

materialID = 58

type = Box

Aero Mass = 1.000000

Thermal Mass = 1.000000

Diameter/Width = 0.100000

Length = 0.150000

Height = 0.050000

name = SPT Ceramic

quantity = 1

parent = 3

materialID = 40

type = Cylinder

Aero Mass = 0.040000

Thermal Mass = 0.040000

Diameter/Width = 0.030000

Length = 0.022000

name = Tank Carbon

quantity = 1

parent = 3

materialID = -1

type = Cylinder

Aero Mass = 2.332000

Thermal Mass = 0.745000

Diameter/Width = 0.160000

Length = 0.500000

name = Tank Shell

quantity = 1

parent = 9

materialID = 5

type = Cylinder

Aero Mass = 1.587000

Thermal Mass = 1.587000

Diameter/Width = 0.156000

Length = 0.500000

name = Reaction Wheel

quantity = 4

parent = 3

materialID = 58

type = Cylinder

Aero Mass = 2.500000

Thermal Mass = 2.500000

Diameter/Width = 0.065000

Length = 0.095000

name = Battery

quantity = 1

parent = 3

materialID = 5

type = Box

Aero Mass = 9.500000

Thermal Mass = 9.500000

Diameter/Width = 0.230000

Length = 0.300000

Height = 0.100000

name = SADA

quantity = 1

parent = 3

materialID = 58

type = Cylinder

Aero Mass = 0.700000

Thermal Mass = 0.700000

Diameter/Width = 0.022000

Length = 0.230000

name = M0 PAM X/Y Walls

quantity = 4

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 9.188125

Thermal Mass = 1.030000

Diameter/Width = 0.560000

Length = 0.670000

name = 1-Slice FPS

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 0.405000

Thermal Mass = 0.405000

Diameter/Width = 0.100000

Length = 0.115000

Height = 0.030000

name = BRACKET BULKHEAD PAM

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 0.150000

Thermal Mass = 0.150000

Diameter/Width = 0.150000

Length = 0.150000

name = PAM Mezzanine and Stiffener

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 8.437600

Thermal Mass = 8.437600

Diameter/Width = 0.660000

Length = 0.670000

name = BRACKET HDRM

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 0.300000

Thermal Mass = 0.300000

Diameter/Width = 0.150000

Length = 0.300000

name = BRACKET BRIDGE PY

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 1.355800

Thermal Mass = 1.355800

Diameter/Width = 0.100000

Length = 0.440000

name = BRACKET BRIDGE MY

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 1.347600

Thermal Mass = 1.347600

Diameter/Width = 0.100000

Length = 0.440000

name = L-SHAPE_SURFACE_HP

quantity = 4

parent = 14

materialID = -1

type = Flat Plate

Aero Mass = 0.284000

Thermal Mass = 0.284000

Diameter/Width = 0.264000

Length = 0.387000

name = DCDC Converters (QTY 2)

quantity = 2

parent = 14

materialID = 5

type = Box

Aero Mass = 0.230000

Thermal Mass = 0.230000

Diameter/Width = 0.060000

Length = 0.110000

Height = 0.020000

name = DCDC Converter Bracket

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 0.080000

Thermal Mass = 0.080000

Diameter/Width = 0.048000

Length = 0.114000

name = GPNT

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 0.358000

Thermal Mass = 0.358000

Diameter/Width = 0.080000

Length = 0.100000

Height = 0.034000

name = GIG Switch

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 1.200000

Thermal Mass = 1.200000

Diameter/Width = 0.140000

Length = 0.140000

Height = 0.050000

name = GIG Switch Plate

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 0.360000

Thermal Mass = 0.360000

Diameter/Width = 0.150000

Length = 0.150000

name = Power Breakout Box

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 0.398000

Thermal Mass = 0.398000

Diameter/Width = 0.113700

Length = 0.170000

Height = 0.032000

name = Primary Signal Breakout Box

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 0.540000

Thermal Mass = 0.540000

Diameter/Width = 0.137000

Length = 0.210000

Height = 0.030000

name = Secondary Signal Breakout Box

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 0.323000

Thermal Mass = 0.323000

Diameter/Width = 0.120000

Length = 0.158000

Height = 0.030000

name = HS100 Imager

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 1.580000

Thermal Mass = 1.580000

Diameter/Width = 0.098300

Length = 0.176500

Height = 0.098300

name = HS100 Brackets

quantity = 1

parent = 14

materialID = 5

type = Flat Plate

Aero Mass = 0.561500

Thermal Mass = 0.561500

Diameter/Width = 0.100000

Length = 0.300000

name = LDRS Chassis

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 5.370000

Thermal Mass = 5.370000

Diameter/Width = 0.185000

Length = 0.333000

Height = 0.113700

name = LDRS Transmit Assembly

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 4.186000

Thermal Mass = 4.186000

Diameter/Width = 0.158800

Length = 0.251000

Height = 0.084500

name = Hyper Thermal Strap

quantity = 6

parent = 14

materialID = -1

type = Flat Plate

Aero Mass = 0.214000

Thermal Mass = 0.214000

Diameter/Width = 0.080000

Length = 0.150000

name = RadPC Payload

quantity = 1

parent = 14

materialID = 5

type = Box

Aero Mass = 2.800000

Thermal Mass = 2.800000

Diameter/Width = 0.166900

Length = 0.188000

Height = 0.139700

name = GPNT Antenna

quantity = 1

parent = 1

materialID = 5

type = Box

Aero Mass = 0.360000

Thermal Mass = 0.360000

Diameter/Width = 0.080000

Length = 0.100000

Height = 0.034000

name = LDRS Tx Antenna

quantity = 1

parent = 1

materialID = 5

type = Box

Aero Mass = 0.730000

Thermal Mass = 0.730000

Diameter/Width = 0.114000

Length = 0.339100

Height = 0.114000

name = LDRS Rx Antenna

quantity = 1

parent = 1

materialID = 5

type = Box

Aero Mass = 0.730000

Thermal Mass = 0.730000

Diameter/Width = 0.114000

Length = 0.305800

Height = 0.114000

name = PAM Shelf

quantity = 1

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 6.200000

Thermal Mass = 6.200000

Diameter/Width = 0.660000

Length = 0.670000

name = M0 PAM +Z Panel

quantity = 1

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 2.129595

Thermal Mass = 2.129595

Diameter/Width = 0.655000

Length = 0.750000

name = PAM +Z Brackets

quantity = 4

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 0.105000

Thermal Mass = 0.105000

Diameter/Width = 0.100000

Length = 0.150000

name = S-Band Antenna (Nadir)

quantity = 1

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 0.136000

Thermal Mass = 0.136000

Diameter/Width = 0.100000

Length = 0.100000

name = S-Band Antenna Bracket (Nadir)

quantity = 1

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 0.399000

Thermal Mass = 0.399000

Diameter/Width = 0.100000

Length = 0.100000

name = HS100 Baffle

quantity = 1

parent = 1

materialID = 5

type = Cylinder

Aero Mass = 0.782000

Thermal Mass = 0.782000

Diameter/Width = 0.140000

Length = 0.200000

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Item Number = 2

name = YAM-30

Demise Altitude = 77.999999

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Spacecraft_OW

Demise Altitude = 74.697908

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Walls

Demise Altitude = 73.826890

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Payload Antenna

Demise Altitude = 62.979887

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Electronic Boxes

Demise Altitude = 68.465314

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = SPT Thruster Baseplate

Demise Altitude = 0.000000

Debris Casualty Area = 0.474446

Impact Kinetic Energy = 0.732227

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name = SPT XFS Steel

Demise Altitude = 60.170660

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = SPT Ceramic

Demise Altitude = 70.791613

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Tank Carbon

Demise Altitude = 73.482134

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Tank Shell

Demise Altitude = 70.785279

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Reaction Wheel

Demise Altitude = 49.527416

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = Battery

Demise Altitude = 56.464532

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = SADA

Demise Altitude = 62.365586

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = M0 PAM X/Y Walls

Demise Altitude = 77.274388

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = 1-Slice FPS

Demise Altitude = 74.088417

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = BRACKET BULKHEAD PAM

Demise Altitude = 76.228370

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = PAM Mezzanine and Stiffener

Demise Altitude = 69.519324

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = BRACKET HDRM

Demise Altitude = 76.179757

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = BRACKET BRIDGE PY

Demise Altitude = 72.067224

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = BRACKET BRIDGE MY

Demise Altitude = 72.094758

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = L-SHAPE_SURFACE_HP

Demise Altitude = 77.112410

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = DCDC Converters (QTY 2)

Demise Altitude = 74.680607

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

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name = DCDC Converter Bracket

Demise Altitude = 75.782442

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = GPNT

Demise Altitude = 73.995047

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = GIG Switch

Demise Altitude = 71.350722

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = GIG Switch Plate

Demise Altitude = 74.759542

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = Power Breakout Box

Demise Altitude = 75.218039

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = Primary Signal Breakout Box

Demise Altitude = 75.090324

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = Secondary Signal Breakout Box

Demise Altitude = 75.486162

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = HS100 Imager

Demise Altitude = 72.240273

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = HS100 Brackets

Demise Altitude = 74.526282

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = LDRS Chassis

Demise Altitude = 69.072709

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = LDRS Transmit Assembly

Demise Altitude = 67.984807

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = Hyper Thermal Strap

Demise Altitude = 76.653932

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = RadPC Payload

Demise Altitude = 70.782174

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = GPNT Antenna

Demise Altitude = 74.781293

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = LDRS Tx Antenna

Demise Altitude = 76.702630

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = LDRS Rx Antenna

Demise Altitude = 76.610708

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = PAM Shelf

Demise Altitude = 72.779234

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = M0 PAM +Z Panel

Demise Altitude = 76.452202

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = PAM +Z Brackets

Demise Altitude = 77.112146

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = S-Band Antenna (Nadir)

Demise Altitude = 76.282817

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = S-Band Antenna Bracket (Nadir)

Demise Altitude = 73.162819

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

name = HS100 Baffle

Demise Altitude = 74.974499

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

****

=============== End of Requirement 4.7-1 ===============

07 01 2026; 10:44:08AM Project Data Saved To File

END OF ODAR