

## Appendix to WVSAT ODAR - DAS Activity Log

### Case 1 WVSAT A

07 24 2021; 09:31:09AM Activity Log Started  
07 24 2021; 09:31:42AM Closed Project C:\Users\mille\Desktop\New folder  
(2)\  
08 11 2021; 11:43:48AM Activity Log Started  
08 11 2021; 11:43:48AM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A\  
08 11 2021; 11:44:13AM Mission Editor Changes Applied  
08 11 2021; 11:44:13AM Project Data Saved To File  
08 11 2021; 11:45:45AM Processing Requirement 4.6 Return Status :  
Passed

=====  
Project Data  
=====

#### \*\*INPUT\*\*

Space Structure Name = WVSAT A  
Space Structure Type = Payload  
  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Initial Mass = 1.133000 (kg)  
Final Mass = 1.133000 (kg)  
Duration = 2.000000 (yr)  
Station Kept = False  
Abandoned = True  
PMD Perigee Altitude = 518.607388 (km)  
PMD Apogee Altitude = 524.612147 (km)  
PMD Inclination = 97.073586 (deg)  
PMD RAAN = 313.616693 (deg)  
PMD Argument of Perigee = 164.044186 (deg)  
PMD Mean Anomaly = 0.000000 (deg)

#### \*\*OUTPUT\*\*

Suggested Perigee Altitude = 518.607388 (km)  
Suggested Apogee Altitude = 524.612147 (km)  
Returned Error Message = Passes LEO reentry orbit criteria.  
  
Released Year = 2033 (yr)  
Requirement = 61  
Compliance Status = Pass

=====

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

08 11 2021; 11:45:45AM \*\*\*\*\*Processing Requirement 4.7-1  
Return Status : Passed

\*\*\*\*\*INPUT\*\*\*\*

Item Number = 1

name = WVSAT A  
quantity = 1  
parent = 0  
materialID = 9  
type = Box  
Aero Mass = 1.133000  
Thermal Mass = 1.133000  
Diameter/Width = 0.114000  
Length = 0.682230  
Height = 0.030700

name = External Structure  
quantity = 1  
parent = 1  
materialID = 9  
type = Box  
Aero Mass = 0.116000  
Thermal Mass = 0.116000  
Diameter/Width = 0.111000  
Length = 0.114000  
Height = 0.012500

name = Tabs  
quantity = 2  
parent = 1  
materialID = 9  
type = Box  
Aero Mass = 0.006000  
Thermal Mass = 0.006000  
Diameter/Width = 0.014000  
Length = 0.051000  
Height = 0.003000

name = Top Solar PCB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.040000  
Thermal Mass = 0.040000  
Diameter/Width = 0.111000  
Length = 0.114000

name = RX Antenna  
quantity = 1

parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.016000  
Length = 0.023000  
Height = 0.004000

name = Sep Switches  
quantity = 2  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.000300  
Thermal Mass = 0.000300  
Diameter/Width = 0.008200  
Length = 0.009200  
Height = 0.002700

name = Solar Fold Out  
quantity = 1  
parent = 1  
materialID = 54  
type = Flat Plate  
Aero Mass = 0.015000  
Thermal Mass = 0.015000  
Diameter/Width = 0.050800  
Length = 0.118000

name = Batteries  
quantity = 6  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.008000

name = Main PCB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.060000  
Thermal Mass = 0.060000  
Diameter/Width = 0.111000  
Length = 0.114000

name = ADCS PCB  
quantity = 2  
parent = 1

materialID = 23  
type = Flat Plate  
Aero Mass = 0.010000  
Thermal Mass = 0.010000  
Diameter/Width = 0.052000  
Length = 0.108000

name = RX PCB  
quantity = 2  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.019000  
Thermal Mass = 0.019000  
Diameter/Width = 0.053000  
Length = 0.071000

name = Torquer Coils  
quantity = 3  
parent = 1  
materialID = 19  
type = Cylinder  
Aero Mass = 0.011000  
Thermal Mass = 0.011000  
Diameter/Width = 0.009000  
Length = 0.020000

name = Reaction Wheel  
quantity = 1  
parent = 1  
materialID = 19  
type = Cylinder  
Aero Mass = 0.022000  
Thermal Mass = 0.022000  
Diameter/Width = 0.014000  
Length = 0.020000

name = IR Sensor  
quantity = 1  
parent = 1  
materialID = 23  
type = Cylinder  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.009000  
Length = 0.017000

name = Fasteners / Spacers  
quantity = 4  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002250  
Thermal Mass = 0.002250

Diameter/Width = 0.007000  
Length = 0.010000  
Height = 0.007000

name = Cabling  
quantity = 1  
parent = 1  
materialID = 19  
type = Box  
Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.010000  
Length = 0.070000  
Height = 0.001000

name = Damping  
quantity = 1  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.010000  
Thermal Mass = 0.010000  
Diameter/Width = 0.010000  
Length = 0.035000  
Height = 0.005000

name = NSL-SB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.026000  
Thermal Mass = 0.026000  
Diameter/Width = 0.051000  
Length = 0.107000

name = External Structure a  
quantity = 2  
parent = 1  
materialID = 9  
type = Box  
Aero Mass = 0.055000  
Thermal Mass = 0.055000  
Diameter/Width = 0.111000  
Length = 0.114000  
Height = 0.012500

name = Top Solar PCB a  
quantity = 2  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.040000  
Thermal Mass = 0.040000

Diameter/Width = 0.111000  
Length = 0.114000

name = ISS Solar Cell a  
quantity = 2  
parent = 1  
materialID = 25  
type = Flat Plate  
Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.080000  
Length = 0.080000

name = Sep Switches a  
quantity = 4  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.000300  
Thermal Mass = 0.000300  
Diameter/Width = 0.008200  
Length = 0.009200  
Height = 0.002700

name = Solar Fold Out a  
quantity = 2  
parent = 1  
materialID = 54  
type = Flat Plate  
Aero Mass = 0.015000  
Thermal Mass = 0.015000  
Diameter/Width = 0.050800  
Length = 0.118000

name = Batteries a  
quantity = 4  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.008000

name = Main PCB a  
quantity = 2  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.060000  
Thermal Mass = 0.060000  
Diameter/Width = 0.111000  
Length = 0.114000

name = Fasteners / Spacers a  
quantity = 8  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002250  
Thermal Mass = 0.002250  
Diameter/Width = 0.007000  
Length = 0.010000  
Height = 0.007000

name = Cabling a  
quantity = 2  
parent = 1  
materialID = 19  
type = Box  
Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.010000  
Length = 0.070000  
Height = 0.001000

name = Damping a  
quantity = 2  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.010000  
Thermal Mass = 0.010000  
Diameter/Width = 0.010000  
Length = 0.035000  
Height = 0.005000

name = NSL-SB a  
quantity = 2  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.026000  
Thermal Mass = 0.026000  
Diameter/Width = 0.051000  
Length = 0.107000

\*\*\*\*\*OUTPUT\*\*\*\*  
Item Number = 1

name = WVSAT A  
Demise Altitude = 77.996239  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = External Structure

Demise Altitude = 73.349754  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Tabs  
Demise Altitude = 75.910980  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Top Solar PCB  
Demise Altitude = 76.565361  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = RX Antenna  
Demise Altitude = 77.085831  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Sep Switches  
Demise Altitude = 0.000000  
Debris Casualty Area = 0.737095  
Impact Kinetic Energy = 0.016994

\*\*\*\*\*

name = Solar Fold Out  
Demise Altitude = 0.000000  
Debris Casualty Area = 0.458903  
Impact Kinetic Energy = 0.612318

\*\*\*\*\*

name = Batteries  
Demise Altitude = 73.854301  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Main PCB  
Demise Altitude = 75.883324  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = ADCS PCB  
Demise Altitude = 77.403061  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = RX PCB



Demise Altitude = 76.417763  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Torquer Coils  
Demise Altitude = 72.289536  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Reaction Wheel  
Demise Altitude = 70.532150  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = IR Sensor  
Demise Altitude = 76.471146  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Fasteners / Spacers  
Demise Altitude = 68.849083  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Cabling  
Demise Altitude = 76.272217  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Damping  
Demise Altitude = 0.000000  
Debris Casualty Area = 0.379705  
Impact Kinetic Energy = 5.165419

\*\*\*\*\*

name = NSL-SB  
Demise Altitude = 76.458450  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = External Structure a  
Demise Altitude = 75.720787  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Top Solar PCB a

Demise Altitude = 76.565361  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = ISS Solar Cell a  
Demise Altitude = 77.236656  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Sep Switches a  
Demise Altitude = 0.000000  
Debris Casualty Area = 1.474189  
Impact Kinetic Energy = 0.016994

\*\*\*\*\*

name = Solar Fold Out a  
Demise Altitude = 0.000000  
Debris Casualty Area = 0.917805  
Impact Kinetic Energy = 0.612318

\*\*\*\*\*

name = Batteries a  
Demise Altitude = 73.854301  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Main PCB a  
Demise Altitude = 75.883324  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Fasteners / Spacers a  
Demise Altitude = 68.849083  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Cabling a  
Demise Altitude = 76.272217  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Damping a  
Demise Altitude = 0.000000  
Debris Casualty Area = 0.759409  
Impact Kinetic Energy = 5.165419

\*\*\*\*\*

name = NSL-SB a

Demise Altitude = 76.458450  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

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

08 11 2021; 11:45:45AM Project Data Saved To File  
08 11 2021; 12:17:35PM Processing Requirement 4.5-1:       Return Status :  
Passed

=====

Run Data

=====

\*\*INPUT\*\*

Space Structure Name = WVSAT A  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0061 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 1.133 (kg)  
Final Mass = 1.133 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 1.6289E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 12:18:14PM Science and Engineering - Apogee/Perigee History  
for a Given Orbit

\*\*INPUT\*\*

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)

Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Integration Time = 10.000000 (yr)

\*\*OUTPUT\*\*

Plot  
08 11 2021; 12:18:24PM Science and Engineering - Apogee/Perigee History  
for a Given Orbit

\*\*INPUT\*\*

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Integration Time = 20.000000 (yr)

\*\*OUTPUT\*\*

Plot  
08 11 2021; 12:19:36PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.000000 (yr)  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 12.922656 (yr)  
Time Spent in LEO during Lifetime = 12.922656 (yr)  
Last year of Propagation = 2033 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 12:21:28PM Project Data Saved To File  
08 11 2021; 12:21:46PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A\  
08 11 2021; 16:37:37PM Activity Log Started  
08 11 2021; 16:37:37PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A\  
08 11 2021; 16:37:45PM Saved Project As C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A2\

08 11 2021; 16:37:45PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A\

**Case 1 WVSAT B**

08 11 2021; 12:36:46PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\  
08 11 2021; 12:39:13PM Activity Log Started  
08 11 2021; 12:39:13PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\  
08 11 2021; 12:39:36PM Mission Editor Changes Applied  
08 11 2021; 12:39:36PM Project Data Saved To File  
08 11 2021; 12:39:49PM Processing Requirement 4.6 Return Status :  
Passed

=====  
Project Data  
=====

**\*\*INPUT\*\***

Space Structure Name = WVSAT B  
Space Structure Type = Payload  
  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Initial Mass = 0.840000 (kg)  
Final Mass = 0.840000 (kg)  
Duration = 2.000000 (yr)  
Station Kept = False  
Abandoned = True  
PMD Perigee Altitude = 518.607388 (km)  
PMD Apogee Altitude = 524.612147 (km)  
PMD Inclination = 97.073586 (deg)  
PMD RAAN = 313.616693 (deg)  
PMD Argument of Perigee = 164.044186 (deg)  
PMD Mean Anomaly = 0.000000 (deg)

**\*\*OUTPUT\*\***

Suggested Perigee Altitude = 518.607388 (km)  
Suggested Apogee Altitude = 524.612147 (km)  
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2033 (yr)  
Requirement = 61  
Compliance Status = Pass

=====

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

08 11 2021; 12:39:49PM \*\*\*\*\*Processing Requirement 4.7-1  
Return Status : Passed

\*\*\*\*\*INPUT\*\*\*\*

Item Number = 1

name = WVSAT B  
quantity = 1  
parent = 0  
materialID = 9  
type = Box  
Aero Mass = 0.840000  
Thermal Mass = 0.840000  
Diameter/Width = 0.114000  
Length = 0.682230  
Height = 0.012500

name = External Structure  
quantity = 3  
parent = 1  
materialID = 9  
type = Box  
Aero Mass = 0.055000  
Thermal Mass = 0.055000  
Diameter/Width = 0.111000  
Length = 0.114000  
Height = 0.012500

name = Top Solar PCB  
quantity = 3  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.040000  
Thermal Mass = 0.040000  
Diameter/Width = 0.111000  
Length = 0.114000

name = ISS Solar Cell  
quantity = 3  
parent = 1  
materialID = 25  
type = Flat Plate  
Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.080000  
Length = 0.080000

name = Sep Switches  
quantity = 6

parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.000300  
Thermal Mass = 0.000300  
Diameter/Width = 0.008200  
Length = 0.009200  
Height = 0.002700

name = Solar Fold Out  
quantity = 3  
parent = 1  
materialID = 54  
type = Flat Plate  
Aero Mass = 0.015000  
Thermal Mass = 0.015000  
Diameter/Width = 0.050800  
Length = 0.118000

name = Batteries  
quantity = 6  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.008000

name = Main PCB  
quantity = 3  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.060000  
Thermal Mass = 0.060000  
Diameter/Width = 0.111000  
Length = 0.114000

name = Fasteners / Spacers  
quantity = 12  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002250  
Thermal Mass = 0.002250  
Diameter/Width = 0.007000  
Length = 0.010000  
Height = 0.007000

name = Cabling  
quantity = 3  
parent = 1

materialID = 19  
type = Box  
Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.010000  
Length = 0.070000  
Height = 0.001000

name = Damping  
quantity = 3  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.010000  
Thermal Mass = 0.010000  
Diameter/Width = 0.010000  
Length = 0.035000  
Height = 0.005000

name = NSL-SB  
quantity = 3  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.026000  
Thermal Mass = 0.026000  
Diameter/Width = 0.051000  
Length = 0.107000

\*\*\*\*\*OUTPUT\*\*\*\*  
Item Number = 1

name = WVSAT B  
Demise Altitude = 77.993835  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = External Structure  
Demise Altitude = 75.157394  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Top Solar PCB  
Demise Altitude = 76.168373  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = ISS Solar Cell  
Demise Altitude = 0.000000  
Debris Casualty Area = 1.387200  
Impact Kinetic Energy = 0.063712







Returned Error Message: Object reentered  
08 11 2021; 12:52:46PM Science and Engineering - Apogee/Perigee History  
for a Given Orbit

\*\*INPUT\*\*

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.006100 (m<sup>2</sup>/kg)  
Start Year = 2021.800000 (yr)  
Integration Time = 15.000000 (yr)

\*\*OUTPUT\*\*

Plot  
08 11 2021; 12:53:00PM Project Data Saved To File  
08 11 2021; 12:53:11PM Activity Log Started  
08 11 2021; 12:53:11PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\  
08 11 2021; 12:53:24PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\  
08 11 2021; 17:00:04PM Activity Log Started  
08 11 2021; 17:00:04PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\  
08 11 2021; 17:00:14PM Saved Project As C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B2\  
08 11 2021; 17:00:14PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B\

**Case 1 WVSAT C,D**

07 24 2021; 11:50:24AM Activity Log Started  
07 24 2021; 11:54:07AM Activity Log Started  
07 24 2021; 11:54:07AM Opened Project C:\Users\mille\Desktop\New folder  
(4)\  
07 24 2021; 11:54:18AM Processing Requirement 4.6 Return Status :  
Passed

=====  
Project Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D  
Space Structure Type = Payload  
  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)

Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.008500 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Initial Mass = 1.500000 (kg)  
Final Mass = 1.500000 (kg)  
Duration = 2.000000 (yr)  
Station Kept = False  
Abandoned = True  
PMD Perigee Altitude = 517.194132 (km)  
PMD Apogee Altitude = 523.241302 (km)  
PMD Inclination = 97.072511 (deg)  
PMD RAAN = 313.751234 (deg)  
PMD Argument of Perigee = 162.829475 (deg)  
PMD Mean Anomaly = 0.000000 (deg)

\*\*OUTPUT\*\*

Suggested Perigee Altitude = 517.194132 (km)  
Suggested Apogee Altitude = 523.241302 (km)  
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2028 (yr)  
Requirement = 61  
Compliance Status = Pass

=====

===== End of Requirement 4.6 =====  
07 24 2021; 11:54:18AM \*\*\*\*\*Processing Requirement 4.7-1  
Return Status : Passed

\*\*\*\*\*INPUT\*\*\*\*\*

Item Number = 1  
  
name = WVSAT C/D  
quantity = 1  
parent = 0  
materialID = 8  
type = Box  
Aero Mass = 1.500000  
Thermal Mass = 1.500000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000  
  
name = 1U CubeSat Chassis  
quantity = 1  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.360000

Thermal Mass = 0.360000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000

name = Simplex TX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = Simplex RX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = 1U Solar Array  
quantity = 4  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.028000  
Thermal Mass = 0.028000  
Diameter/Width = 0.080000  
Length = 0.100000

name = Sep Switches  
quantity = 2  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.010250  
Length = 0.020000  
Height = 0.006500

name = PIN Diode  
quantity = 1  
parent = 1  
materialID = 19  
type = Flat Plate  
Aero Mass = 0.005000

Thermal Mass = 0.005000  
Diameter/Width = 0.015000  
Length = 0.025000

name = Spring Plungers  
quantity = 2  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.004000  
Length = 0.020000

name = Dual Lipo Battery Pack  
quantity = 6  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.017000

name = NSL EPS + S3 + RX  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.214000  
Thermal Mass = 0.214000  
Diameter/Width = 0.075000  
Length = 0.075000  
Height = 0.020000

name = Fasteners / Spacers  
quantity = 30  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002500  
Thermal Mass = 0.002500  
Diameter/Width = 0.005000  
Length = 0.025000

name = Cabling  
quantity = 1  
parent = 1  
materialID = 19  
type = Cylinder  
Aero Mass = 0.100000  
Thermal Mass = 0.100000  
Diameter/Width = 0.020000

Length = 0.500000

name = Magnetorquer - Long  
quantity = 2  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.122000  
Thermal Mass = 0.122000  
Diameter/Width = 0.020000  
Length = 0.057000  
Height = 0.018000

name = Magnetorquer - Short  
quantity = 4  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.030000  
Thermal Mass = 0.030000  
Diameter/Width = 0.020000  
Length = 0.120000  
Height = 0.012000

name = ADCS PCB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.024000  
Thermal Mass = 0.024000  
Diameter/Width = 0.051000  
Length = 0.070000

name = RBF Switch Assembly  
quantity = 1  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.010000  
Length = 0.012000  
Height = 0.010000

name = Diag Assembly  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.012000  
Length = 0.012000

Height = 0.012000  
  
name = 1U Rail Tabs  
quantity = 2  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.016000  
Thermal Mass = 0.016000  
Diameter/Width = 0.015000  
Length = 0.113000  
Height = 0.004000

name = Extra Mass Added  
quantity = 1  
parent = 1  
materialID = 19  
type = Box  
Aero Mass = 0.230000  
Thermal Mass = 0.230000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.016000

\*\*\*\*\*OUTPUT\*\*\*\*  
Item Number = 1

name = WVSAT C/D  
Demise Altitude = 77.993370  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U CubeSat Chassis  
Demise Altitude = 74.579887  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex TX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex RX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U Solar Array  
Demise Altitude = 77.500694  
Debris Casualty Area = 0.000000



Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Sep Switches  
Demise Altitude = 76.374245  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = PIN Diode  
Demise Altitude = 76.862518  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Spring Plungers  
Demise Altitude = 76.107460  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Dual Lipo Battery Pack  
Demise Altitude = 76.611984  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = NSL EPS + S3 + RX  
Demise Altitude = 74.321121  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Fasteners / Spacers  
Demise Altitude = 76.280540  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Cabling  
Demise Altitude = 77.263580  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Long  
Demise Altitude = 67.066696  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Short  
Demise Altitude = 0.000000  
Debris Casualty Area = 1.658006

Impact Kinetic Energy = 7.240037

\*\*\*\*\*

name = ADCS PCB  
Demise Altitude = 77.199356  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = RBF Switch Assembly  
Demise Altitude = 76.732712  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Diag Assembly  
Demise Altitude = 77.247299  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = 1U Rail Tabs  
Demise Altitude = 76.919083  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Extra Mass Added  
Demise Altitude = 71.110817  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

=====  
07 24 2021; 11:54:18AM Project Data Saved To File  
07 24 2021; 11:54:34AM Closed Project C:\Users\mille\Desktop\New folder  
(4)\  
07 24 2021; 11:55:43AM Activity Log Started  
07 24 2021; 11:55:43AM Opened Project C:\Users\mille\Desktop\New folder  
(4)\  
07 24 2021; 11:55:52AM Processing Requirement 4.6 Return Status :  
Passed

=====  
Project Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D  
Space Structure Type = Payload

Perigee Altitude = 525.000000 (km)

Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.008500 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Initial Mass = 1.500000 (kg)  
Final Mass = 1.500000 (kg)  
Duration = 2.000000 (yr)  
Station Kept = False  
Abandoned = True  
PMD Perigee Altitude = 517.094198 (km)  
PMD Apogee Altitude = 523.341924 (km)  
PMD Inclination = 97.072511 (deg)  
PMD RAAN = 313.751223 (deg)  
PMD Argument of Perigee = 163.607242 (deg)  
PMD Mean Anomaly = 0.000000 (deg)

\*\*OUTPUT\*\*

Suggested Perigee Altitude = 517.094198 (km)  
Suggested Apogee Altitude = 523.341924 (km)  
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2028 (yr)  
Requirement = 61  
Compliance Status = Pass

=====

===== End of Requirement 4.6 =====  
07 24 2021; 11:55:52AM \*\*\*\*\*Processing Requirement 4.7-1  
Return Status : Passed

\*\*\*\*\*INPUT\*\*\*\*

Item Number = 1  
  
name = WVSAT C/D  
quantity = 1  
parent = 0  
materialID = 8  
type = Box  
Aero Mass = 1.500000  
Thermal Mass = 1.500000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000  
  
name = 1U CubeSat Chassis  
quantity = 1  
parent = 1  
materialID = 8  
type = Box

Aero Mass = 0.360000  
Thermal Mass = 0.360000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000

name = Simplex TX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = Simplex RX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = 1U Solar Array  
quantity = 4  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.028000  
Thermal Mass = 0.028000  
Diameter/Width = 0.080000  
Length = 0.100000

name = Sep Switches  
quantity = 2  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.010250  
Length = 0.020000  
Height = 0.006500

name = PIN Diode  
quantity = 1  
parent = 1  
materialID = 19  
type = Flat Plate

Aero Mass = 0.005000  
Thermal Mass = 0.005000  
Diameter/Width = 0.015000  
Length = 0.025000

name = Spring Plungers  
quantity = 2  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.004000  
Length = 0.020000

name = Dual Lipo Battery Pack  
quantity = 6  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.017000

name = NSL EPS + S3 + RX  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.214000  
Thermal Mass = 0.214000  
Diameter/Width = 0.075000  
Length = 0.075000  
Height = 0.020000

name = Fasteners / Spacers  
quantity = 30  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002500  
Thermal Mass = 0.002500  
Diameter/Width = 0.005000  
Length = 0.025000

name = Cabling  
quantity = 1  
parent = 1  
materialID = 19  
type = Cylinder  
Aero Mass = 0.100000  
Thermal Mass = 0.100000

Diameter/Width = 0.020000  
Length = 0.500000

name = Magnetorquer - Long  
quantity = 2  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.122000  
Thermal Mass = 0.122000  
Diameter/Width = 0.020000  
Length = 0.057000  
Height = 0.018000

name = Magnetorquer - Short  
quantity = 4  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.030000  
Thermal Mass = 0.030000  
Diameter/Width = 0.020000  
Length = 0.120000  
Height = 0.012000

name = ADCS PCB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.024000  
Thermal Mass = 0.024000  
Diameter/Width = 0.051000  
Length = 0.070000

name = RBF Switch Assembly  
quantity = 1  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.010000  
Length = 0.012000  
Height = 0.010000

name = Diag Assembly  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.012000

Length = 0.012000  
Height = 0.012000

name = 1U Rail Tabs  
quantity = 2  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.016000  
Thermal Mass = 0.016000  
Diameter/Width = 0.015000  
Length = 0.113000  
Height = 0.004000

name = Extra Mass Added  
quantity = 1  
parent = 1  
materialID = 19  
type = Box  
Aero Mass = 0.230000  
Thermal Mass = 0.230000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.016000

\*\*\*\*\*OUTPUT\*\*\*\*  
Item Number = 1

name = WVSAT C/D  
Demise Altitude = 77.993370  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U CubeSat Chassis  
Demise Altitude = 74.579887  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex TX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex RX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U Solar Array  
Demise Altitude = 77.500694

Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Sep Switches  
Demise Altitude = 76.374245  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = PIN Diode  
Demise Altitude = 76.862518  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Spring Plungers  
Demise Altitude = 76.107460  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Dual Lipo Battery Pack  
Demise Altitude = 76.611984  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = NSL EPS + S3 + RX  
Demise Altitude = 74.321121  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Fasteners / Spacers  
Demise Altitude = 76.280540  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Cabling  
Demise Altitude = 77.263580  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Long  
Demise Altitude = 67.066696  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Short  
Demise Altitude = 0.000000



Debris Casualty Area = 1.658006  
Impact Kinetic Energy = 7.240037

\*\*\*\*\*  
name = ADCS PCB  
Demise Altitude = 77.199356  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = RBF Switch Assembly  
Demise Altitude = 76.732712  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Diag Assembly  
Demise Altitude = 77.247299  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U Rail Tabs  
Demise Altitude = 76.919083  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Extra Mass Added  
Demise Altitude = 71.110817  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

=====  
07 24 2021; 11:55:52AM Project Data Saved To File  
08 11 2021; 12:53:24PM Activity Log Started  
08 11 2021; 12:53:24PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD\  
08 11 2021; 12:53:53PM Processing Requirement 4.6 Return Status :  
Passed

=====  
Project Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D  
Space Structure Type = Payload

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)

Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.008500 (m<sup>2</sup>/kg)  
Start Year = 2021.000000 (yr)  
Initial Mass = 1.500000 (kg)  
Final Mass = 1.500000 (kg)  
Duration = 2.000000 (yr)  
Station Kept = False  
Abandoned = True  
PMD Perigee Altitude = 517.194132 (km)  
PMD Apogee Altitude = 523.241302 (km)  
PMD Inclination = 97.072511 (deg)  
PMD RAAN = 313.751234 (deg)  
PMD Argument of Perigee = 162.829475 (deg)  
PMD Mean Anomaly = 0.000000 (deg)

\*\*OUTPUT\*\*

Suggested Perigee Altitude = 517.194132 (km)  
Suggested Apogee Altitude = 523.241302 (km)  
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2028 (yr)  
Requirement = 61  
Compliance Status = Pass

=====

===== End of Requirement 4.6 =====  
08 11 2021; 12:53:53PM \*\*\*\*\*Processing Requirement 4.7-1  
Return Status : Passed

\*\*\*\*\*INPUT\*\*\*\*

Item Number = 1  
  
name = WVSAT C/D  
quantity = 1  
parent = 0  
materialID = 8  
type = Box  
Aero Mass = 1.500000  
Thermal Mass = 1.500000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000  
  
name = 1U CubeSat Chassis  
quantity = 1  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.360000

Thermal Mass = 0.360000  
Diameter/Width = 0.100000  
Length = 0.100000  
Height = 0.100000

name = Simplex TX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = Simplex RX Antenna  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.014000  
Thermal Mass = 0.014000  
Diameter/Width = 0.030000  
Length = 0.030000  
Height = 0.009000

name = 1U Solar Array  
quantity = 4  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.028000  
Thermal Mass = 0.028000  
Diameter/Width = 0.080000  
Length = 0.100000

name = Sep Switches  
quantity = 2  
parent = 1  
materialID = 54  
type = Box  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.010250  
Length = 0.020000  
Height = 0.006500

name = PIN Diode  
quantity = 1  
parent = 1  
materialID = 19  
type = Flat Plate  
Aero Mass = 0.005000

Thermal Mass = 0.005000  
Diameter/Width = 0.015000  
Length = 0.025000

name = Spring Plungers  
quantity = 2  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002000  
Thermal Mass = 0.002000  
Diameter/Width = 0.004000  
Length = 0.020000

name = Dual Lipo Battery Pack  
quantity = 6  
parent = 1  
materialID = 5  
type = Box  
Aero Mass = 0.027000  
Thermal Mass = 0.027000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.017000

name = NSL EPS + S3 + RX  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.214000  
Thermal Mass = 0.214000  
Diameter/Width = 0.075000  
Length = 0.075000  
Height = 0.020000

name = Fasteners / Spacers  
quantity = 30  
parent = 1  
materialID = 54  
type = Cylinder  
Aero Mass = 0.002500  
Thermal Mass = 0.002500  
Diameter/Width = 0.005000  
Length = 0.025000

name = Cabling  
quantity = 1  
parent = 1  
materialID = 19  
type = Cylinder  
Aero Mass = 0.100000  
Thermal Mass = 0.100000  
Diameter/Width = 0.020000

Length = 0.500000

name = Magnetorquer - Long  
quantity = 2  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.122000  
Thermal Mass = 0.122000  
Diameter/Width = 0.020000  
Length = 0.057000  
Height = 0.018000

name = Magnetorquer - Short  
quantity = 4  
parent = 1  
materialID = 46  
type = Box  
Aero Mass = 0.030000  
Thermal Mass = 0.030000  
Diameter/Width = 0.020000  
Length = 0.120000  
Height = 0.012000

name = ADCS PCB  
quantity = 1  
parent = 1  
materialID = 23  
type = Flat Plate  
Aero Mass = 0.024000  
Thermal Mass = 0.024000  
Diameter/Width = 0.051000  
Length = 0.070000

name = RBF Switch Assembly  
quantity = 1  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.010000  
Length = 0.012000  
Height = 0.010000

name = Diag Assembly  
quantity = 1  
parent = 1  
materialID = 23  
type = Box  
Aero Mass = 0.003000  
Thermal Mass = 0.003000  
Diameter/Width = 0.012000  
Length = 0.012000

Height = 0.012000  
  
name = 1U Rail Tabs  
quantity = 2  
parent = 1  
materialID = 8  
type = Box  
Aero Mass = 0.016000  
Thermal Mass = 0.016000  
Diameter/Width = 0.015000  
Length = 0.113000  
Height = 0.004000

name = Extra Mass Added  
quantity = 1  
parent = 1  
materialID = 19  
type = Box  
Aero Mass = 0.230000  
Thermal Mass = 0.230000  
Diameter/Width = 0.050000  
Length = 0.050000  
Height = 0.016000

\*\*\*\*\*OUTPUT\*\*\*\*  
Item Number = 1

name = WVSAT C/D  
Demise Altitude = 77.993370  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U CubeSat Chassis  
Demise Altitude = 74.579887  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex TX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = Simplex RX Antenna  
Demise Altitude = 76.887932  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*  
name = 1U Solar Array  
Demise Altitude = 77.500694  
Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Sep Switches  
Demise Altitude = 76.374245  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = PIN Diode  
Demise Altitude = 76.862518  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Spring Plungers  
Demise Altitude = 76.107460  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Dual Lipo Battery Pack  
Demise Altitude = 76.611984  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = NSL EPS + S3 + RX  
Demise Altitude = 74.321121  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Fasteners / Spacers  
Demise Altitude = 76.280540  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Cabling  
Demise Altitude = 77.263580  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Long  
Demise Altitude = 67.066696  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Magnetorquer - Short  
Demise Altitude = 0.000000  
Debris Casualty Area = 1.658006

Impact Kinetic Energy = 7.240037

\*\*\*\*\*

name = ADCS PCB  
Demise Altitude = 77.199356  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = RBF Switch Assembly  
Demise Altitude = 76.732712  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Diag Assembly  
Demise Altitude = 77.247299  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = 1U Rail Tabs  
Demise Altitude = 76.919083  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

name = Extra Mass Added  
Demise Altitude = 71.110817  
Debris Casualty Area = 0.000000  
Impact Kinetic Energy = 0.000000

\*\*\*\*\*

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

08 11 2021; 12:53:53PM Project Data Saved To File  
08 11 2021; 13:00:48PM Processing Requirement 4.5-1:           Return Status :  
Passed

=====  
Run Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0085 (m<sup>2</sup>/kg)



Start Year = 2021.000 (yr)  
Initial Mass = 1.500 (kg)  
Final Mass = 1.500 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 1.9981E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 13:01:50PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.800000 (yr)  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.008500 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 6.965092 (yr)  
Time Spent in LEO during Lifetime = 6.965092 (yr)  
Last year of Propagation = 2028 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 13:02:42PM Science and Engineering - Apogee/Perigee History  
for a Given Orbit

\*\*INPUT\*\*

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.008500 (m<sup>2</sup>/kg)  
Start Year = 2021.800000 (yr)  
Integration Time = 10.000000 (yr)

\*\*OUTPUT\*\*

Plot  
08 11 2021; 16:33:16PM Project Data Saved To File  
08 11 2021; 16:37:12PM Activity Log Started  
08 11 2021; 16:37:12PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD\  
08 11 2021; 16:37:37PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD\  
08 11 2021; 17:07:04PM Activity Log Started  
08 11 2021; 17:07:04PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD\  
08 11 2021; 17:07:51PM Mission Editor Changes Applied  
08 11 2021; 17:07:51PM Project Data Saved To File  
08 11 2021; 17:12:13PM Processing Requirement 4.5-1:       Return Status :  
Passed

=====  
Run Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D case2  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0174 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 1.500 (kg)  
Final Mass = 1.500 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 2.7623E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 17:12:49PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.800000 (yr)

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.011600 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 5.070500 (yr)  
Time Spent in LEO during Lifetime = 5.070500 (yr)  
Last year of Propagation = 2026 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 17:13:44PM Saved Project As C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD2\  
08 11 2021; 17:13:44PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD\

**Case 2 WVSAT A**

08 11 2021; 16:37:45PM Activity Log Started  
08 11 2021; 16:37:45PM Project Files copied from  
C:\Users\mille\Desktop\WVSAT DAS\WVSAT A\  
08 11 2021; 16:37:45PM Project Data Saved To File  
08 11 2021; 16:38:07PM Mission Editor Changes Applied  
08 11 2021; 16:38:07PM Project Data Saved To File  
08 11 2021; 16:38:33PM Mission Editor Changes Applied  
08 11 2021; 16:38:33PM Project Data Saved To File  
08 11 2021; 16:38:51PM Processing Requirement 4.5-1:           Return Status :  
Incomplete

=====

Run Data

=====

Assessment not run or incomplete

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

08 11 2021; 16:42:14PM Processing Requirement 4.5-1:           Return Status :  
Passed

=====

Run Data

=====

\*\*INPUT\*\*

Space Structure Name = WVSAT A case2  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)

Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0291 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 1.133 (kg)  
Final Mass = 1.133 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 2.7113E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 16:58:41PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.000000 (yr)  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.029100 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 3.559206 (yr)  
Time Spent in LEO during Lifetime = 3.559206 (yr)  
Last year of Propagation = 2024 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 16:59:54PM Project Data Saved To File  
08 11 2021; 16:59:57PM Activity Log Started  
08 11 2021; 16:59:57PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A2\  
08 11 2021; 17:00:04PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT A2\

**Case 2 WVSAT B**

08 11 2021; 17:00:14PM Activity Log Started  
08 11 2021; 17:00:14PM Project Files copied from  
C:\Users\mille\Desktop\WVSAT DAS\WVSAT B\  
08 11 2021; 17:00:14PM Project Data Saved To File



Time Spent in LEO during Lifetime = 2.518823 (yr)  
Last year of Propagation = 2024 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 17:06:48PM Project Data Saved To File  
08 11 2021; 17:06:51PM Activity Log Started  
08 11 2021; 17:06:51PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B2\  
08 11 2021; 17:07:04PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT B2\

## Case 2 WVSAT C,D

08 11 2021; 17:13:44PM Activity Log Started  
08 11 2021; 17:13:44PM Project Files copied from  
C:\Users\mille\Desktop\WVSAT DAS\WVSAT CD\  
08 11 2021; 17:13:44PM Project Data Saved To File  
08 11 2021; 17:13:50PM Activity Log Started  
08 11 2021; 17:13:50PM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD2\  
08 11 2021; 17:14:29PM Saved Project As C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT ABCD\  
08 11 2021; 17:14:29PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD2\  
08 12 2021; 11:32:52AM Activity Log Started  
08 12 2021; 11:32:52AM Opened Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT CD2\  
08 12 2021; 11:37:40AM Processing Requirement 4.5-1:       Return Status :  
Passed

=====  
Run Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D case2  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0174 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 1.500 (kg)  
Final Mass = 1.500 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 2.7623E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 12 2021; 11:39:08AM Mission Editor Changes Applied  
08 12 2021; 11:39:08AM Project Data Saved To File  
08 12 2021; 11:46:21AM Processing Requirement 4.5-1:       Return Status :  
Passed

=====

Run Data

=====

\*\*INPUT\*\*

Space Structure Name = WVSAT C/D case2  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0116 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 1.500 (kg)  
Final Mass = 1.500 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 2.2761E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 12 2021; 11:47:21AM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.800000 (yr)

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.011600 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 5.070500 (yr)  
Time Spent in LEO during Lifetime = 5.070500 (yr)  
Last year of Propagation = 2026 (yr)  
Returned Error Message: Object reentered  
08 12 2021; 11:47:46AM Science and Engineering - Apogee/Perigee History  
for a Given Orbit

\*\*INPUT\*\*

Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Mean Anomaly = 0.000000 (deg)  
Area-To-Mass Ratio = 0.011600 (m<sup>2</sup>/kg)  
Start Year = 2021.800000 (yr)  
Integration Time = 10.000000 (yr)

\*\*OUTPUT\*\*

Plot  
08 12 2021; 11:48:12AM Project Data Saved To File

### Case 3 All

08 11 2021; 17:14:29PM Activity Log Started  
08 11 2021; 17:14:29PM Project Files copied from  
C:\Users\mille\Desktop\WVSAT DAS\WVSAT CD2\  
08 11 2021; 17:14:29PM Project Data Saved To File  
08 11 2021; 17:15:35PM Mission Editor Changes Applied  
08 11 2021; 17:15:35PM Project Data Saved To File  
08 11 2021; 17:35:50PM Processing Requirement 4.5-1: Return Status :  
Passed

=====  
Run Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT ABCD undeployed stack  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)



Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0026 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 4.973 (kg)  
Final Mass = 4.973 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 5.6975E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 17:36:07PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.800000 (yr)  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)  
Area-To-Mass Ratio = 0.002600 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 22.390144 (yr)  
Time Spent in LEO during Lifetime = 22.390144 (yr)  
Last year of Propagation = 2044 (yr)  
Returned Error Message: Object reentered  
08 11 2021; 17:36:45PM Project Data Saved To File  
08 11 2021; 17:36:49PM Saved Project As C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT ABCD4\  
08 11 2021; 17:36:49PM Closed Project C:\Users\mille\Desktop\WVSAT  
DAS\WVSAT ABCD\

**Case 4 All**

08 11 2021; 17:36:49PM Activity Log Started

08 11 2021; 17:36:49PM Project Files copied from  
C:\Users\mille\Desktop\WVSAT DAS\WVSAT ABCD\  
08 11 2021; 17:36:49PM Project Data Saved To File  
08 11 2021; 17:37:29PM Mission Editor Changes Applied  
08 11 2021; 17:37:29PM Project Data Saved To File  
08 11 2021; 17:37:36PM Mission Editor Changes Applied  
08 11 2021; 17:37:36PM Project Data Saved To File  
08 11 2021; 17:43:45PM Processing Requirement 4.5-1:       Return Status :  
Passed

=====  
Run Data  
=====

\*\*INPUT\*\*

Space Structure Name = WVSAT ABCD undeployed stack tumbling  
Space Structure Type = Payload  
Perigee Altitude = 525.000 (km)  
Apogee Altitude = 525.000 (km)  
Inclination = 97.000 (deg)  
RAAN = 0.000 (deg)  
Argument of Perigee = 0.000 (deg)  
Mean Anomaly = 0.000 (deg)  
Final Area-To-Mass Ratio = 0.0095 (m<sup>2</sup>/kg)  
Start Year = 2021.000 (yr)  
Initial Mass = 4.973 (kg)  
Final Mass = 4.973 (kg)  
Duration = 2.000 (yr)  
Station-Kept = False  
Abandoned = True

\*\*OUTPUT\*\*

Collision Probability = 6.8907E-07  
Returned Message: Normal Processing  
Date Range Message: Normal Date Range  
Status = Pass

=====

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

08 11 2021; 17:44:11PM Science and Engineering - Orbit Lifetime/Dwell  
Time

\*\*INPUT\*\*

Start Year = 2021.800000 (yr)  
Perigee Altitude = 525.000000 (km)  
Apogee Altitude = 525.000000 (km)  
Inclination = 97.000000 (deg)  
RAAN = 0.000000 (deg)  
Argument of Perigee = 0.000000 (deg)

Area-To-Mass Ratio = 0.009500 (m<sup>2</sup>/kg)

\*\*OUTPUT\*\*

Orbital Lifetime from Startyr = 6.072553 (yr)

Time Spent in LEO during Lifetime = 6.072553 (yr)

Last year of Propagation = 2027 (yr)

Returned Error Message: Object reentered

08 11 2021; 17:49:03PM Project Data Saved To File