Homework #7

Justin Millsap

Due: Monday, March, 18 2024 at 7:00 pm

Problem 1: You are an ISS Crew member. You get a message "We have a Red Threshold in the Pizza Box." What does this mean?

Solution:

When an ISS Crew member is in a "Red Threshold in the Pizza Box" this means he/she must perform a debris avoidance maneuver unless it would increase the ISS risk. The crew can also deploy into docked Soyuz return vehicles.

Problem 2: What is the approved method for disposing of a satellite in Geosynchronous Orbit at End of Live? Why is this method preferred?

Solution:

In Geosynchronous Orbit at the end of life, the method preferred for disposing satellites is to speed and boost the S/V into a higher orbit, safely above the needed Geosynchronous altitude.

Problem 3: What 2007 event dramatically increased the amount of orbital debris in the LEO region?

Solution:

In 2007 the Chinese anti-satellite intercept of Fengyun FY-1C with kinetic kill device caused the amount of orbital debris in LEO to increase.

Problem 4: Define the components of the Total Meteoroid Flux Model at Solar Latitude λ .

Solution:
The Total Meteoroid Flux model equation is:

$$F_{st}(m,\lambda) = F(m)_{\max}\left[\frac{ZHR(\lambda)}{ZHR'_{\max}}\left(10^{-b(\lambda_{\max}-\lambda)}\right) + \frac{ZHR(\lambda)}{ZHR''_{\max}}\left(10^{-b(\lambda_{\max}-\lambda)}\right)\right] \tag{1}$$

Where: $F_{st}(m,\lambda)$: This is the cumulative particle flux of meteoroids $F(m)_{\max}$: This represents the maximum cu
$ZHR(\lambda)$: Zenithal Hourly Rate at solar latitude $\lambda_{\max}$: This is the solar latitude.