CDM Requested Revisions:

# From ESA (SDO collision avoidance people):

* covariance confidence/realism – current hot topic in collision avoidance (explained later), which could be accomplished with one new keyword
* information about next update – very useful for maneuver planning or go/no-go decisions
* some clarification on AREA\_PC use (maybe make a requirement it is the area used for Pc?) and add a range of areas
* Have a “Next release of CA”
* Eliminate using message IDs in a comment field (as JSpOC is doing now, where they have one message ID in a comment, and one in the actual message using the ID keyword)
* Other small improvements (some caused by JSpOC use)



# From NASA/CARA:

* The CDM message should be changed to include full precision (15 digits?) for the state error covariance matrices.
* Allow for the modeling of constant-duration thrust in 3 dimensions (RTN).  Currently the CDM only supports the in-track modeling.
* We would like to see consistency of the covariance to the supplied state. Ideally this would be an equinoctial state (including retrograde flag) with an equinoctial covariance. However, at a minimum it would be beneficial to have ECI covariances to go along with ECI state. This rotation and covariance requires the least amount of calculations to compute Pc.
* By default the CDMs should come in ECI instead of TDR.
* Expanded significant digits. The CDM does not expand to the same significant digits as internal 18 SPCS Astrodynamics Support Workstation (ASW) .CNJ files. The lower significant digits have been shown to cause non-positive definite covariances.
* Add Dynamic consider parameters. Two components for both objects, frontal area and density forecast.
* Add Individual object HBR

# From AGI

The CDM should provide a reference to a specific CCSDS data products which represent the data used in the analysis. In particular, if an screening is ephemeris-based, that ephemeris should be linked/included, rather than extracting a instantaneous value (position, velocity, covariance) at TCA using some unspecified process. Of late, we have run into repeated instances of ephemerides we send to JSpOC for screening are not matching the state shown in the CDM. Without the specific ephemeris (or source) being used, it is virtually impossible to determine the cause of the problem.

The orbital data products need not be limited to the OEM format—the OPM or OMM formats could be used, as well. And in cases where the source of the orbital data does not want to provide sufficient detail to replicate the orbit (e.g., SP with DCA), the analysis could be performed with an ephemeris generated from the appropriate model and that ephemeris provided with the CDM.

We’re not seeing the utility of the EPHEMERIS\_NAME keyword as it stands. It seems like more options would be needed to make it useful. For example, how would one know if a TLE or SP-based orbit solution were used?

We have seen many cases where results do not match and the differences are often in the tens of kilometers. This could be caused by improper interpolation of ephemerides that contain maneuvers, but without the actual ephemeris, it is impossible to tell or independently verify the CDM results.

# From USAF

The CDM should accommodate new 9-digit SSC identifiers. We should also ensure that all current uses of comment fields to convey information are accommodated as proper entries in the CDM; check with 18SPCS and NASA/CARA.