# Requiring further consultation, action or group discussion:

| **Page** | **Section** | **Line** | **Type** | **Comment/ Rationale** | **Source of Comment (Name/Agency)** | **Suggested Disposition** | **Disposition**  **(Completed by Principal Editor)** |
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| N-1  N-2 | Annex N |  |  | For most of these informative references, I didn't have much luck reaching them:  N-1: OK  N-2: OK  N-3: 404 Not Found  N-4: OK  N-5: OK  N-6: 404 Not Found  N-7: N/A no link  N-8: 404 Not Found  N-9: 404 Not Found  N-10: 404 Not Found  N-11: 404 Not Found  N-12: 404 Not Found  N-13: OK (but I don't know if CCSDS would like having what appears to be marketing information in the standard.  N-14: Timed out (I've had this several times recently trying to get to ntrs.nasa.gov... maybe they've changed the site name (???)  N-15: N/A no link | Alain, Julie, David | Many of these had AGI web links... it's possible that these may not be available to the public (?). | These are in the process of getting fixed. But we may wish to consider posting a link to the references on SANA, which re-vectors the user to the CWE where the technical papers/content can be stored. |
| 46 | Tab 6-3 |  | Te | There are link to all current NDMs except TDM. Would it make sense to include one?  Taking into account future NDM in preparation, shall we define a way to manage them (i.e. NEM), if applicable, when published. | J. M. Lozano/ESA-GMV | To be discussed. | Fixed. |
| 136 | introduction |  | ed/te | “The message creator should seek to confirm with the recipient… ” :  I’m not quite sure: is “should” allowed in this normative annex ? | Alain LAMY / CNES | Check the wording | Yes, David approves. |
| 180 | Annex I |  | ge | Annex I contains lots of acronyms, but not all of them are mentioned in the document “example : CIO”.  Other acronyms are present, but only in examples : I wonder if they should appear in annex I as specific annexes exist (which direct the reader to SANA for further explanations). | Alain LAMY / CNES | For discussion: which acronyms should appear in annex I ?  I think only acronyms explicitly mentioned in the text (not examples) should be present: KVN, ODM, ISO … | Removed CIO. Will leave others until |
| 6-9 | 6.2.1 |  | te | There was formerly a statement to the effect that "at least one of the optional data sections must be provided". This was useful; though users would most likely not send simply a header and metadata, in the absence of this specification, such a degenerate OCM would be valid per the standard. | David S. Berry / NASA | Consider restoring the statement that "at least one of the optional data sections must be provided" | Degenerate case is okay, per David. |
| G-3 | Fig G-3 |  | ed/te | MAN\_REF\_FRAME: The example uses "RTN", which is not present as an entry in the SANA registry for "Orbit-Relative Reference Frames". It is only there as "others have referred to this as" for "RSW\_ROTATING". | David S. Berry / NASA | This may be worth a group discussion... do we accept "RTN" if it's "others have referred to this as"? or only "RSW\_ROTATING"? Should we just add RTN, RIC, and QSW as entries in the registry? | Fixed. |
| 6-30 | 6.2.7.8 thru 6.2.7.10 |  | te | These 3 sections seem needlessly complex, and thus subject to error, especially by the OCM consumer. | David S. Berry / NASA | Rather than have the OCM consumer try to construct the composite maneuver from some number of different maneuver blocks, have a special "composite maneuver block" that provides that information explicitly for each set of the 3 elements listed in 6.2.7.8. | The plan is to conduct testing with the current construct and verify that it is usable in its current form. |
| 6-32 | 6.2.7.16.5.1 |  | ed/te | There is a contradiction between the condition in this statement and the condition stated in Table 6-7 for the following keywords: DC\_REF\_TIME, DC\_TIME\_PULSE\_DURATION, DC\_TIME\_PULSE\_PERIOD. The text condition is "(not CONTINUOUS) and TIME"; the table condition is "(not TIME)", which implies (CONTINOUS or TIME\_AND\_ANGLE) | David S. Berry / NASA | Make the conditions consistent in the text and the table for these keywords. | Fixed. |
| 6-32 | 6.2.7.16.5.2 |  | ed/te | There is a contradiction between the condition in this statement and the condition stated in Table 6-7 for the following keywords: DC\_REF\_TIME, DC\_TIME\_PULSE\_DURATION, DC\_TIME\_PULSE\_PERIOD. The text condition is "(not CONTINUOUS) and (TIME\_AND\_ANGLE)"; the table condition is "(not TIME)", which implies (CONTINOUS or TIME\_AND\_ANGLE) | David S. Berry / NASA | Make the conditions consistent in the text and the table for these keywords. | Fixed. |
| 6-40 | 6 in general |  | te | Generally the maneuver section of the OCM seems to be still in a state of fair amount of flux, as opposed to some of the other sections. There's a large amount of re-written and/or added material in this section. | David S. Berry / NASA | Editorial comment. | Only slightly agree. I believe it has stabilized fairly well in the last 10 months. Our maneuver requirements and use cases drove this complexity, and for good reason. |
| G-5 | Fig G-4 |  | te | First Orbit State Time History: The ORB\_REF\_FRAME = TOD is not in the SANA Registry. | David S. Berry / NASA | Either:  1. Change to TOD\_EARTH  Or:  2. Add "TOD" to SANA Registry (with a note that the CENTER\_NAME keyword must be used if it's not Earth) | Fixed, but we should discuss the ramifications of SANA paring down of options to legacy messages (OPM, OMM, OEM). |

# Not requiring group discussion, in my opinion:

| **Page** | **Section** | **Line** | **Type** | **Comment/ Rationale** | **Source of Comment (Name/Agency)** | **Suggested Disposition** | | **Disposition**  **(Completed by Principal Editor)** |
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| 6-37 | Table 6-7 |  |  | In DC\_REF\_DIR and DC\_BODY\_TRIGGER should there be brackets before and after the numbers? [1.0 0.0 0.0] | Halverson, NASA | Consider | | Decision at our CCSDS Fall Mtg was to omit the use of brackets. |
| K-1 |  | last | Ed. | Table for security provisions refers to Annex L. This info is in Annex M. | Kirschbaum, SC14/WG3 | Change L to M | | Fixed |
| C-1, C-2 |  | 14 | Ed. | Potential for confusion for those using black and white printers. “As illustrated, the OEB reference frame axes (depicted in RED)” and figure C-1. | Kirschbaum, SC14/WG3 | Recommend use of dashed lines rather than color | | Fixed. |
| 177 | Annex H |  | Te | It may be useful to update the example to include an ODM different from OMM to show an example of mixed instantiation as shown un Figure 8-3. | J. M. Lozano/ESA-GMV | | Consider updating the example. | **Fixed. Mixed instantiation provided in Fig. H-2** |
| 8 | TOC |  | Ge | The order of the annexes in TDM v2, ADM p1.10, NDM p1.0.3 and ODM p2.40 is not consistent. | J. M. Lozano/ESA-GMV | Modify the order in the annexes under review to align them with the recently updated docs. | | There are new appendices that have been added since the TDM and NDM were published. We’ve now also added an appendix for SANA. Given these additions, it’s not clear to me that it’s practical to focus on consistency. |
| 15 | 2.1 |  | Ge | Sec 2.1 is empty. It seems that a description is missing and/or the rest of sections should be 2.1.1, 2.1.2, etc… | J. M. Lozano/ESA-GMV | Consider adding a paragraph or removing the heading. | | Fixed. |
| 15 | 2.2 |  | Ge | Paragraph 4 and last sentence in paragraph 2 are very similar and talk about the optional covariance matrix. | J. M. Lozano/ESA-GMV | Consider merging of both in a new paragraph 3. | | Fixed. |
| 23 | 3.2.4.2 |  | Te | It is not clear, for me, the difference between C and O parameters. The “delineated condition” that makes them conditional is also not clear.  For example, spacecraft parameters are C but if there are no maneuvers, they can be added as optional. | J. M. Lozano/ESA-GMV | Consider adding a paragraph for each C block defining the condition. | | Addressed in our previous call. |
| 25 | 3.2.4.9 |  | Te | Shall all the SC Params be included? Is there a minimum list of parameters? | J. M. Lozano/ESA-GMV | Clarify which parameters are required. | | Specified by Optional/Conditional entries. |
| 39 | 5.2.5 |  | Te | All keywords in OPM, OMM are presented in a table but the keywords related with covariance are not. Their equivalents in the OCM are also presented in a table. | J. M. Lozano/ESA-GMV | Consider adding a table for the keyword in this section. | | Fixed. |
| 42 | 6.2.1.5 |  | Te | The use of “not permitted” has been replaced in other parts of the document in previous reviews. | J. M. Lozano/ESA-GMV | Change to “shall not be used.” | | Fixed. |
| 42 | 6.2.1.5 |  | Te | If duplicated time tags cannot be used, does it make sense to explain how to manage them? | J. M. Lozano/ESA-GMV | To be discussed | | Fixed. |
| 46 | Tab 6-3 |  | Te | PREVIOUS\_MESSAGE\_ID and NEXT\_MESSAGE\_ID can be moved down in the table. The description refers to the associated EPOCH which are defined 2-3 pages later. | J. M. Lozano/ESA-GMV | Modify to have IDs and EPOCHs together. | | **CCSDS Fall Mtg - Agree to leave as is.** |
| 47 | Tab 6-3 |  | Ed | ORBIT\_CATEGORY example value shall be GEO instead of EGO. | J. M. Lozano/ESA-GMV | Correct | | Fixed. |
|  | Tab 6-3  Tab 6-4 |  | Ed | Both tables have examples or default value with units, but only Table 6-4 has a “units” column. | J. M. Lozano/ESA-GMV | Consider adding a “units” column to table 6-3. | | Fixed. |
| 48 | Tab 6-3 |  | Te | IERS EOP files contain final and predicted values. The date of the EOP file used may be relevant. Should this be included in the EOP\_SOURCE or a new filed? | J. M. Lozano/ESA-GMV | To be discussed. | | Fixed (added text to suggest that the version/date be included in the EOP source name). |
| 56 | Tab 6-5 |  | Ed | Shall SOLAR\_RADIATION\_UNCERTAINTY units be %, in line qith DRAG\_UNCERTAINTY? | J. M. Lozano/ESA-GMV | Add units in “Units” column. | | Fixed. |
| 60 | Tab 6-6 |  | Ge | When the description of \*\_PREV\_ID or \*\_NEXT\_ID refers to sequence of \* time histories, this history can be split in different OCMs or it is a self-contained concept? | J. M. Lozano/ESA-GMV | Consider clarifying this concept of time histories, not sure where. | | Fixed. |
| 71 | Tab 6-8 |  | Te | The THR\_EFFIC computed from OD can be sometime bigger than 1.0. | J. M. Lozano/ESA-GMV | Reword the description to “… ranging typically between 0.0 and 1.0.” | | Fixed. |
| 77 | Tab 6-11  6.2.9.4 |  | Te | DAYS\_SINCE\_FIRST/LAST\_OBS maybe positive or negative. | J. M. Lozano/ESA-GMV | Consider adding a comment in the description or change example to avoid the reader assuming that they shall be positive. | | Fixed. |
| 89 | 8.1 | 12 | Ed | Figure 8-1 repeated three time | J. M. Lozano/ESA-GMV | Correct. | | Fixed. |
| 89 | 8.1 |  | Ge | There is no reference to NDMXML document (Ref [5]). | J. M. Lozano/ESA-GMV | Consider adding a reference to clarify how to use this section and the NDMXML together, and/or clarify the aim of each of them. | | Fixed. |
| 94 | 8.8.15 |  | Te | We can be more specific and reword as “block as specified in table 3-3. | J. M. Lozano/ESA-GMV | Consider update. | | Fixed. |
| 96 | 8.9.15 |  | Te | We can be more specific and reword as “block as specified in table 4-3. | J. M. Lozano/ESA-GMV | Consider update. | | Fixed. |
| 101 | 8.11.12 |  | Te | The section tags and data line tag are not consistent between this section and Fig G-6 (orb vs orbit, pert vs perturbations, etc ...) | J. M. Lozano/ESA-GMV | Update example with correct tags. | | Fixed. |
| 177 | Annex H |  | Te | The example does not start with the line:  <?xml version="1.0" encoding="UTF-8"?> | J. M. Lozano/ESA-GMV | Update example. | | Fixed. |
| 177 | Annex H |  | Te | It may be useful to update the example to include an ODM different from OMM to show and example of mixed instantiation as shown un Figure 8-3. | J. M. Lozano/ESA-GMV | Consider updating the example. | | Considered, but this is already demonstrated in example H-2. |
| 138 | B6 |  | ge | The SANA registry values are noted : ACC\_i, ACTUATOR\_i, etc…  It may be necessary to mention that the “i” should be replace by an actual value (assumed to be 1, 2, …) | Alain LAMY / CNES | Add a sentence to clarify the used of the values in the SANA registry | | Fixed. |
| 138 | B8 |  | ge | “In addition to the above orbit element sets, additional allowed values for the COV\_TYPE keyword includes…”  I don’t really understand the “in addition to the above orbit elements set, additional allowed values” : it seems to mean that the values for the elements set can be used which is not the case. | Alain LAMY / CNES | Check the sentence | | Fiexed. |
| 141 | C1 |  | ge | “A fixed orientation of the Optimally-Encompassing Box with respect to the user-specified “OEB\_PARENT\_FRAME” … conventions for Yaw, Pitch, and Roll angles”  You mention Euler rotations and Yaw, Pitch, Roll (probably present in an older version) but there don’t appear anywhere in the message in the current version. | Alain LAMY / CNES | Remove the notion of Euler sequence. A new sentence could be like :  A fixed orientation of the Optimally-Encompassing Box with respect to the user-specified “OEB\_PARENT\_FRAME” is defined using a quaternion that map from the user-specified OEB\_PARENT\_FRAME to the Optimally-Encompassing Box vector directions. The above figure shows the proper definitions and adopted sign conventions for Yaw, Pitch, and Roll angles | | Fixed. |
| 141 | C1 |  | ed/te | “The physical dimensions of the OEB (long, intermediate, and short dimensions) are specified”  The intermediate dimension is called OEB\_INT. But in the text above the corresponding axis was called OEB\_MED | Alain LAMY / CNES | Adopt consistent notations (for instance “INT” everywhere) | | Fixed. |
| 141 | C1 |  | ed | “DRAG\_AREA = DRAG\_ADDL\_AREA + …”  The formula is specific to drag, where the sentence above is not. | Alain LAMY / CNES | Change the text to make it more consistent.  For instance with:   * A formula independent from DRAG * Addition information for the specific case of DRAG if needed (with a reference to where DRAG\_ADDL\_AREA is defined) | | Fixed. |
| 140 … | Annex C |  | ge | I wonder if some of the annexes (about GDOP, magnitude, angle interpolation) should not be moved to another place (green book or equivalent), as they might or should appear in many books, and make the ODM more complex. | Alain LAMY / CNES | Consider. | | Suggest we leave in for now and can transition to other place(s) later if desired. |
| 142 | Annex C, C2 |  | ed | The unit of dSuntoTarget is not given (only one example is given) | Alain LAMY / CNES | Add unit | | Fixed. |
| 172 | C3 |  | ge | Since DC\_WIN\_OPEN <= DC\_EXEC\_START and DC\_WIN\_CLOSE >= DC\_EXEC\_STOP  What exactly are the use of DC\_WIN\_OPEN and DC\_WIN\_CLOSE ? | Alain LAMY / CNES | Just a question …  Are they really needed ? | | As explained at our previous meeting, these open/close times reflect the times when special maneuver preparatory “modes” may begin, e.g., start cat bed heaters). |
| 187 | Annex K |  | ed | Should the “editor’s comment” be kept in the final version as the document results from the work of the whole group ? | Alain LAMY / CNES | consider | | Removed. |
| 187 | Annex K, K1 | Item 2 | ed | “.” Is missing at the end of the sentence | Alain LAMY / CNES | Add “.” | | Fixed. |
| 187 | Annex K, K1 | Item 2 | ge | “Detailed description of any exceptions for keyword values not drawn from the SANA registry (sanaregistry.org)“ => annex B  ICD is only referred to in annex B6.  I supposed an explanation at the beginning of annex B should be added | Alain LAMY / CNES | Remove the reference to ICD in annex B6 and put it at the top of the section (beginning of annex B so that it applies to all sections of annex B. | | Fixed. |
| 188 | Annex L, L2 |  | ge | I don’t think the justification for SANA is quite exact: there was no explicit reference to the green book as all the values were listed in the document. | Alain LAMY / CNES | consider | | Fixed. |
| 188 | Annex L | 4 | ge | I don’t see the link between the ICD checklist, and the material in the OCM.  Add some explanation ? | Alain LAMY / CNES | Add some explanation of change the wording | | Fixed. |
| 188 | L2 | 4 | ge | It is written that the “checklist ICD” has been removed.  But annex K described ICD items. Isn’t that a “checklist ICD” ? | Alain LAMY / CNES | consider | | Fixed. |
| 190 | M2 |  | ed | “ODM Message ORIGINATORs”  Since the M in ODM means “message”, shouldn’t we say “ODM ORIGINATORs” ? | Alain LAMY / CNES | Replace “ODM Message ORIGINATORs” by “ODM ORIGINATORs” | | Fixed. |
| 191 | M2 |  | ge | The list of SANA material is not complete: In the OCM, you also have:  Atmosphere models, gravity models… (see annex B2) | Alain LAMY / CNES | Extend the list of SANA registries | | Fixed. |
| 39 (5-7) | 5.2.5.4 | 3 | ge | Should not it be “the elements of each row of covariances” instead of “the elements of each row of covariates”? | Vincent Schaeffer (CNES) |  | | Fixed. |
| 106 | Annex A |  | ge | Does this mean that the ICS is ruled by the CCSDS Blue Book? | Vincent Schaeffer (CNES) |  | | Don’t understand your question. |
| 106 | Annex A |  | ge | Is there not a risk of inconsistency between this annex and the tables defining the messages? (in particular in the ‘M’, ‘O’, ‘C’ marks) | Vincent Schaeffer (CNES) |  | | Yes, but this is as agreed at our CCSDS fall meeting. |
| 109 | A.2.6 | 25 | ge | ‘Keplerian Elements logical block’ is ‘M’, but all the content is optional. Shouldn’t this section be ‘O’ | Vincent Schaeffer (CNES) |  | | Fixed – I changed block to be optional, and sub-content to be conditional. |
| 109 | A.2.6 | 34 | ge | ‘Spacecraft Parameters logical block’ is ‘M’, but all the content is optional. Shouldn’t this section be ‘O’ | Vincent Schaeffer (CNES) |  | | Fixed – I changed block to be optional, and sub-content to be conditional. |
| 109 | A.2.6 | 35-40 | ge | These features are ‘O’ while they are ‘C’ in the table 3-3 | Vincent Schaeffer (CNES) |  | | Fixed – I changed block to be optional, and sub-content to be conditional. |
| 109 | A.2.6 | 43 | ge | Mistakes in the feature column and the Keyword column for the covariance reference frame | Vincent Schaeffer (CNES) |  | | Fixed (I think) – need you to be more specific in future, please. |
| 109 | A.2.6 | 44-64 | ge | These features are ‘O’ in this table, but are ‘C’ in the table 3-3 | Vincent Schaeffer (CNES) |  | | Table 3-3 now says, **None or all parameters of the matrix must be given.”** |
| 115 | A.2.8 | 8 and 22 | ge | Beginner question ☺  Why are there META\_START and META\_STOP keywords for OEM message, but not for OPM and OMM messages? | Vincent Schaeffer (CNES) |  | | (history, as shared by David at fall meeting) |
| 115 | A.2.8 | 21 | ge | ‘INTERPOLATION\_DEGREE’ is ‘M’ in the table, but ‘O in the table 5-3 | Vincent Schaeffer (CNES) |  | | Fixed. |
| 115-116 | A.2.8 | 24 and 28 | ge | Keywords are COV\_START and COV\_STOP in this table, but are COVARIANCE\_START and COVARIANCE\_STOP in section 5.2.5 | Vincent Schaeffer (CNES) |  | | Fixed. |
| 115-16 | A.2.8 | 24 and 28 | ge | Shouldn’t these features be ‘O’ instead of being ‘M’? | Vincent Schaeffer (CNES) |  | | Fixed. |
| 115-116 | A.2.8 | 25 and 27 | ge | Shouldn’t these features be ‘C’ instead of being ‘M’? | Vincent Schaeffer (CNES) |  | | Fixed. |
| 116 | A.2.8 | 26 | ge | Shouldn’t this feature be ‘O’ instead of being ‘M’, due to the fact that this feature says ‘if different from that of the states in the ephemeris’ | Vincent Schaeffer (CNES) |  | | Changed to “C”, since it is required if different. |
| 121 | A.2.9 |  | ge | The ‘Orbit state time history logical block’ is ‘O’ while the feature ‘Orbit state time history start’ is ‘M’. Shouldn’t the block be ‘M’ also? | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 122 | A.2.9 |  | ge | The ‘Space object physical characteristics logical block’ is ‘O’ while the feature ‘Start of a space object physical characteristics specification’ is ‘M’. Shouldn’t the block be ‘M’ also? | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 125-126 | A.2.9 |  | ge | The feature ‘COV\_START’ and ‘COV\_STOP’ are ‘M’ while the section ‘Covariance time history logical clock’ is ‘O’. Shouldn’t the COV\_START’ and ‘COV\_STOP’ features be ‘O’? | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 125-126 | A.2.9 |  | ge | Shouldn’t the features COV\_UNITS’ and ‘covariance data’ be ‘C’, depending on if we have a covariance or not? | Vincent Schaeffer (CNES) |  | | **A ‘C’ denotes keywords that are mandatory if this particular data block is included and certain conditions are met** |
| 125-126 | A.2.9 |  | ge | Key words are ‘COV\_START’ and ’COV\_STOP’ in OCM, while they are ‘COVARIANCE\_START’ and COVARIANCE\_STOP’ in the OEM. Shouldn’t the key words be homogenized? | Vincent Schaeffer (CNES) |  | | We agreed to keep the keywords different, as consistent with other published standards use COV\_REF\_FRAMEetc. |
| 127-128 | A.2.9 |  | ge | The features ‘MAN\_START’ and ‘MAN\_STOP’ should be ‘O’ due to the fact that the ‘Maneuver time history logical block is ‘O’? | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 127 | A.2.9 |  | ge | The feature ‘Identification number for this maneuver’ is ‘O’ in this table, but ‘M’ in table 6-7. | Vincent Schaeffer (CNES) |  | | Fixed. |
| 127 | A.2.9 |  | ge | The feature ‘Maneuver device identifier’ should be ‘O’ due to the fact that the ‘Maneuver time history logical block is ‘O’? (Same remark in the table 6-7) | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 128 | A.2.9 |  | ge | ‘MAN\_COMPOSITION’, ‘MAN\_UNITS’ and ‘maneuver time history data’ features are ‘M’. Shouldn’t they be ‘C’ depending whether there is a ‘MAN\_START’ and ‘MAN\_STOP’ feature? | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 129 | A.2.9 |  | ge | The ‘PERT\_START’ keyword in ‘M’, but the section is ‘O’ | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 129 | A.2.9 |  | ge | Keyword ‘CENTER\_NAME’ is present in this table, but not in the table 6-10 | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 131 | A.2.9 |  | ge | Keyword ‘PERT\_STOP’ is ‘M’, but the section is ‘O’ | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 132 | A.2.9 |  | ge | The section ‘Orbit determination parameters logical block’ is ‘O’ in this table, but some features are ‘M’ like ‘OD\_START’, ‘OD\_STOP’ and ‘OD\_ID’. | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 132 | A.2.9 |  | ge | Keywords ‘OD\_METHOD’ and ‘OD\_EPOCH’ are ‘O’ in this table, but ‘M’ in table 6-11. | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 135 | A.2.9 |  | ge | The ‘User Defined Parameters logical block’ is ‘O’, but some features are ‘M’ like ‘USER\_START’ and ‘USER\_STOP’. | Vincent Schaeffer (CNES) |  | | Added, “**An ‘M’ denotes mandatory keywords that must be included in this section if that particular data section is included.”** |
| 3-4 | 3.2.3 | 10 | ed | The reference for the UNOOSA designator index is wrong: [2] | Braun/ESA | Change to [3] | | Fixed. |
| 4-7 | 4.2.4.9 |  | ed | The part of the sentence “described in an ICD” is usually replaced by “mutually agreed between message exchange partners” | Braun/ESA | Consider | | The User-defined parameters section is the single category where we’d decided to retain mention of the ICD. |
| 6-9 | 6.2.1 |  |  | The text above Table 6-1 just describes M and O, but not C. |  | Include definition for C | | Fixed. |
| 6-9 | 6.2.1 |  |  | In Table 6-1, use User-Defined for consistency |  | Suggest making all instances of User-Defined the same | | Fixed. |
| 6-10 | 6.2.1.2 |  |  | The definitions of M,O, C are here. Perhaps if they are included above this second definition can be removed. |  | Suggest defining in one place | | Fixed. |
| 6-10 | 6.2.1.2 |  |  | Change ‘denote’ to ‘denotes’ after ‘C’ in the last sentence |  | Fix | | Fixed. |
| 6-19 | Table 6-4 |  |  | Here ‘SIMULATED’ is used for ORB\_BASIS and ‘SIMULATION’ is used for COV\_BASIS. |  | Use same term for both. I think we decided on SIMULATED in the recent meeting. | | Fixed. |
| 6-20 | Table 6-4 |  |  | Not sure why both keywords are in the same row with only one description |  | Suggest having two separate keywords, each with its own description | | Fixed. |
| 6-21 | Table 6-4 |  |  | Seems like ORB\_UNITS could cause problems for someone trying to read this message. If the message generator uses different units than what are given in the SANA table, then the recipient may need to change processing if they are using the orbit data in other calculations. |  | I missed the final discussion on this topic. If the group decided to keep units then disregard. I think they will not be included in the ACM, but the ACM doesn’t have quite so many options. | | Fixed – all valid points, which is ultimately why we changed \_UNITS entries to be informative (and optional) |
| 6-24 | Table 6-5 |  |  | Seems like SOLAR\_RAD\_UNCERTAINTY should have units of % similar to DRAG\_UNCERTAINTY |  | Fix | | Fixed. |
| 6-24 | Table 6-5 |  |  | Suggest using one of the examples in the description in the Example column. ‘CMGS’ is not an attitude control type. |  | Fix | | Fixed, but I’d like more information on why you feel that CMGS is not an attitude control type. |
| 6-24 | Table 6-5 |  |  | Looks like a typo for the Units and Example for ATT\_ACTUATOR\_TYPE. Shouldn’t be ‘deg’ or ‘0.3’. |  | Fix | | Fixed. |
| 6-24 | Table 6-5 |  |  | Should the units for AVG\_MANEUVER\_FREQ be /yr? Not per yr |  | Consider | | Fixed. |
| 6-24 | 6.2.6.13 |  |  | Add Section before 7.5 |  | Fix | | Fixed. |
| 6-29 | Table 6-6 |  |  | Same comment as above or ORB\_UNITS applies to COV\_UNITS |  |  | | Fixed – all valid points, which is ultimately why we changed \_UNITS entries to be informative (and optional) |
| 6-34 | Table 6-7 |  |  | Since you mention ‘ALL’ in the description maybe include it as an example? |  | Consider | | Fixed. |
| 6-35 | Table 6-7 |  |  | The use of ‘time history’ seems to be used mostly without being capitalized, and in MAN\_REF\_FRAME description it is ‘Maneuver Time History’ |  | Consider making all the same for consistency | | Fixed. |
| 6-36 | Table 6-7 |  |  | The variable to indicate relative time in seconds is ‘YYY’. Consider something else since Y is generally used to refer to year. |  | Consider | | Fixed. |
| 6-37 | Table 6-7 |  |  | In DC\_REF\_DIR and DC\_BODY\_TRIGGER should there be brackets before and after the numbers? [1.0 0.0 0.0] |  | Consider | | Decision was to not use brackets (further reinforced by specific request from OreKit testers) |
| 6-37 | Table 6-7 |  |  | Indicate what body frame is associated with DC\_BODY\_TRIGGER. Other keywords that could be in a body frame specify the frame, e.g. SC\_BODY\_1 |  | Consider | | Fixed. |
| 6-38 | Table 6-7 |  |  | Same comments as above on MAN\_UNITS |  |  | | Fixed – all valid points, which is ultimately why we changed \_UNITS entries to be informative (and optional) |
| 6-40 | 6.2.8 |  |  | First subsection needs to be fixed. |  | Fix | | Fixed. |
| 6-42 | Table 6-10 |  |  | Extra “ at the end of the example for SW\_DATA\_EPOCH |  | Fix | | Fixed. |
| 6-42 | Table 6-10 |  |  | Do you have a reference for the terms included parenthesis in SW\_INTERP\_METHOD? |  | Consider | | Fixed. |
| 6-47 |  |  |  | Make all instances ‘User-Defined’ for consistency |  | Fix | | Fixed. |
| 7-6 | 7.6.8.2 |  | Editorial | The example says: meter per second is km/s | Frank Dreger, ESA/ESOC | Change to “kilo”meters per second or to “m/s” | | Fixed. |
| 2-6 | 2.2 | 4 | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H."  Also, change "may" to "can". | | Fixed. |
| 2-6 | 2.3 | 4 | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H."  Also, change "may" to "can". | | Fixed. |
| 2-7 | 2.4 | 4 | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H."  Also, change "may" to "can". | | Fixed. |
| 2-7 | 2.5 | 4 | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H."  Also, change "may" to "can". | | Fixed. |
| 3-1 | 3.1.5 | NOTE | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. Also, this note duplicates a note from Section 2.2 (intentional?). | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H." | | Fixed. |
| 3-1 | 3.1.5 | 2 | te/ed | In a "NOTE" we are not supposed to use normative language. | David S. Berry / NASA | From: "may"  To: "can" | | Fixed. |
| 3-2 | 3.2.1 |  | te/ed | I don't think it's necessary to call out "User-Defined Parameters" in this basic structural list... they are "data" too, just like the "Standard Defined Parameters". | David S. Berry / NASA | Remove the "with optional User-Defined Parameters" text. | | Fixed. |
| 3-3 | 3.2.3.1 | Note line 2 | ed | The numbering of the "References" section has changed | David S. Berry / NASA | From: 1.7  To: 1.6 | | Fixed. |
| 3-4 | Table 3-2 |  | ed | OBJECT\_ID: A new value was added, not in the existing format, so it should be shown as an example value for the keyword. | David S. Berry / NASA | Add "UNKNOWN" in "Examples of Values" column. | | Fixed. |
| 3-4 | Table 3-2 |  | te | It's not clear why all the "BARYCENTER" examples were removed, since these values are also in SANA registry. | David S. Berry / NASA | Consider adding back at least one "BARYCENTER" example. | | Fixed. |
| 3-8 | 3.2.4.11 | 1 | te | "is allowed" is not normative language. | David S. Berry / NASA | Restore the language "may be provided if necessary" that was previously used in this section. | | Fixed. |
| 4-1 | 4.1.5 | NOTE | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. Also, this note duplicates a note from Section 2.3 (intentional?). | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H." | | Fixed. |
| 4-1 | 4.1.5 | 2 | te/ed | In a "NOTE" we are not supposed to use normative language. | David S. Berry / NASA | From: "may"  To: "can" | | Fixed. |
| 4-2 | 4.2.1 |  | te/ed | I don't think it's necessary to call out "User-Defined Parameters" in this basic structural list... they are "data" too, just like the "Standard Defined Parameters". | David S. Berry / NASA | Remove the "with optional User-Defined Parameters" text. | | Fixed. |
| 4-4 | Table 4-2 |  | ed | OBJECT\_ID: A new value was added, not in the existing format, so it should be shown as an example value for the keyword. | David S. Berry / NASA | Add "UNKNOWN" in "Examples of Values" column. | | Fixed. |
| 4-6 | Table 4-3 |  | te/ed | COV\_REF\_FRAME consistency. It is listed as "optional" in the OPM covariance matrix, but "conditional" in the OMM covariance matrix. | David S. Berry / NASA | Make the M/O/C consistent for this keyword. | | Fixed. |
| 5-1 | 5.1.3 | NOTE | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. Also, this note duplicates a note from Section 2.4 (intentional?). | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H." | | Fixed. |
| 5-1 | 5.1.3 | 2 | te/ed | In a "NOTE" we are not supposed to use normative language. | David S. Berry / NASA | From: "may"  To: "can" | | Fixed. |
| 5-3 | 5.2.3.2 | Note line 3 | ed | The numbering of the "References" section has changed | David S. Berry / NASA | From: 1.7  To: 1.6 | | Fixed. |
| 5-4 | Table 5-3 |  | ed | OBJECT\_ID: A new value was added, not in the existing format, so it should be shown as an example value for the keyword. | David S. Berry / NASA | Add "UNKNOWN" in "Examples of Values" column. | | Fixed. |
| 5-7 | 5.2.5.3 | NOTE | ed/te | In a "NOTE" we are not supposed to use normative language. Additionally, this NOTE merely restates the last statement of the normative content of 5.2.5.3 | David S. Berry / NASA | Either (a) the NOTE should be deleted, or (b) the content of the NOTE should replace the current last sentence of 5.2.5.3. | | Fixed. |
| 6-8 ff |  |  | ed | OCM General comment. In several of the tables, the "Description" starts with the word "Optional". | David S. Berry / NASA | Remove the leading "Optional" where it occurs. The "M/O/C" column setting should be sufficient. Removing the leading "Optional" also avoids contradiction between the "Description" and the "M/O/C" column | |  |
| 6-8 | 6.1.2 | NOTE | te/ed | I would not suggest to a user of the standard that they figure out how to do something only from an example. Also, this note duplicates a note from Section 2.5 (intentional?). | David S. Berry / NASA | From: "... as shown in ANNEX H."  To: "... as described in 8.12 and shown in Annex H." | | Fixed. |
| 6-8 | 6.1.2 | 3 | te/ed | In a "NOTE" we are not supposed to use normative language. | David S. Berry / NASA | From: "may"  To: "can" | | Fixed. |
| 6-10 | 6.2.1.2 |  | ed | Subject/verb agreement. | David S. Berry / NASA | From: "A ‘C’ denote keywords"  To: "A ‘C’ denotes keywords" | | Fixed. |
| 6-10 | 6.2.1.2 | 5 | ed/te | For keywords that have a default, the keyword will not appear in the message. It might be useful to users to have an explicit statement that the default must be used in OCM processing if these keywords do not appear in an OCM. | David S. Berry / NASA | From: "that value shall be used"  To: "that value shall be used in OCM processing" or something to that effect | | Fixed. |
| 6-11 | 6.2.3.4 | Note line 3 | ed | The numbering of the "References" section has changed | David S. Berry / NASA | From: 1.7  To: 1.6 | | Fixed. |
| 6-12  6-13 | Table 6-3 |  |  | It's not clear to me why the source for the OBJECT\_NAME and INTERNATIONAL\_DESIGNATOR are different. | David S. Berry / NASA | Resolve inconsistency by stating a "definitive" source. If the existing text is retained, then there should be guidance for the user as to which source to use if the source identified for OBJECT\_NAME and the source identified for INTERNATIONAL\_DESIGNATOR disagree. | | Clarified the sources to include UNOOSA, the spacecraft operator, a State Actor, or a commercial SSA provider (via CATALOG\_NAME). |
| 6-17 | 6.2.4.4 | 4 & 5 | ed/te | ORB\_BASIS\_ID is specified for two of the characteristics in the list. | David S. Berry / NASA | I think the first should simply be ORB\_BASIS | | Fixed. |
| 6-19 | Table 6-4 |  | ed/te | INTERPOLATION\_DEGREE: M/O/C is marked as "O" but should probably be "C" given that the Desription cites a condition for using it. | David S. Berry / NASA | From: M/O/C = "O"  To: M/O/C = "C" | | Fixed. |
| 6-20 | Table 6-4 |  | ed/te | ORB\_FRAME\_EPOCH is marked "O" in the M/O/C column, but should be "C" since it's conditional | David S. Berry / NASA | From: M/O/C = "O"  To: M/O/C = "C" | | Fixed. |
| 6-22 | Table 6-5 |  |  | OEB\_PARENT\_FRAME: The default "RIC" is not present as an entry in the SANA registry for "Orbit-Relative Reference Frames". It is only there as "others have referred to this as" for "RSW\_ROTATING". | David S. Berry / NASA | Change default to RSW\_ROTATING. | | Fixed. |
| 6-25 | 6.2.6.4 |  | ed | List numbering starts at 7 | David S. Berry / NASA | Restart list numbering at 1 | | Fixed. |
| 6-26 | 6.2.6.12.2 |  | ed | The meaning of "LTM" is implied here, and is fairly obvious, but should probably be added to the acronyms annex. | David S. Berry / NASA | Add "LTM" to Annex I | | Fixed. |
| 6-28 | Table 6-6 |  | ed/te | COV\_BASIS, list item #2 "DETERMINED\_OD". The "Note" contains a "shall". | David S. Berry / NASA | Remove the word "Note:".  Then the "shall" will be proper. | | Fixed. |
| 7-4 | 7.5.10 | NOTE |  | References a specific page number ("as specified on page 3-6 of reference [2]" in a document outside Nav WG control. | David S. Berry / NASA | Perhaps better to just state "in section 3.5" or "in Annex A" instead of "on page 3-6". | | Fixed. |
| 7-6 | 7.6.8 | NOTE | ed/te | Uses "^" for exponentiation, not "\*\*" as specified in 7.6.8.2. | David S. Berry / NASA | From: "km/s^2"  To: "km/s\*\*2" | | Fixed. |
| 7-6 | 7.6.8.2(j) |  | ed/te | Says "meters per second is km/s", which is not strictly correct. | David S. Berry / NASA | From: "meters per second is km/s"  To: Either "kilometers per second is km/s" OR  "meters per second is m/s" | | Fixed. |
| 8-1 | 8.1 |  |  | "Figure 8-1" is repeated 3 times shortly before the figure. | David S. Berry / NASA | No idea how this happened, but it's probably my fault. Delete 2 of them. | | Fixed. |
| A-5 | A2.6 |  | ed | Line Item 43: "Feature" is missing, and the keyword COV\_REF\_FRAME appears in that column. "COMMENT" appears as the keyword. | David S. Berry / NASA | Looks like columns got offset a bit. | | Fixed. |
| A-5,  A-6,  A-8,  A-9,  A-11 | A2.6  A2.7  A2.8 |  |  | Missing column headers | David S. Berry / NASA | Use "Repeat Header Rows" feature on each separate table in Annex A. | | Fixed. |
| A-10 | A2.8 | Line Item 21 | ed/te | INTERPOLATION\_DEGREE: is shown as mandatory, but should be optional | David S. Berry / NASA | On INTERPOLATION\_DEGREE, change "Status M/O/C" from "M" to "O" | | Fixed. |
| A-10 | A2.8 | Line Item 24 | ed/te | Keyword shown is COV\_START, but should be COVARIANCE\_START | David S. Berry / NASA | From: COV\_START  To: COVARIANCE\_START | | Fixed. |
| A-11 | A2.8 | Line Item 28 | ed/te | Keyword shown is COV\_STOP, but should be COVARIANCE\_STOP | David S. Berry / NASA | From: COV\_STOP  To: COVARIANCE\_STOP | | Fixed. |
| A-11 | A2.8 | Line Item 26 | ed/te | COV\_REF\_FRAME is shown as "Mandatory", but should be either "Optional" or "Conditional". | David S. Berry / NASA | Change "Status M/O/C" from "M" to "O" or "C". | | Fixed. |
| A-2 | A2.9 | Line Item 12 thru O |  | Line Items 8 through 11 match the OCM Metadata Table in 6.2.3, but there are a few mismatches in Line Items  ORIGINATOR\_POC (Line Item 14) through CATALOG\_NAME (Line Item 30) match the order of the OCM metadata, but the Line Item numbers will need to be adjusted given movement of  "ALTERNATE\_NAMES" to appear after "OBJECT\_NAME", and order change of "INTERNATIONAL\_DESIGNATOR" and "OBJECT\_DESIGNATOR". | David S. Berry / NASA |  | | Fixed. |
| A-3,  A-4  META | A2.9 |  |  | Missing column headers | David S. Berry / NASA | Use "Repeat Header Rows" feature on each separate table in Annex A. | | Fixed. |
| A-3 | A2.9 |  | ed/te | Line Item 31 ALTERNATE\_NAMES. The feature description doesn't describe the keyword. | David S. Berry / NASA | Provide correct feature description. | | Fixed. |
| A-3 | A2.9 |  | te | Line Item 41 TIME\_SYSTEM: this applies to more than just EPOCH\_TZERO, but that is stated in the "Feature" description. | David S. Berry / NASA | From: Time system of EPOCH\_TZERO  To: Time system for all OCM data. | | Fixed. |
| A-5 | A2.9 |  | ed/te | ORB\_REF\_FRAME is shown as "M" in the ICS, but "O" in Table 6-4 | David S. Berry / NASA | Resolve inconsistency (probably "O" in ICS given that the keyword has a default in Table 6-4 | | Fixed. |
| A-7 | A2.9 |  | ed | SOLAR\_RAD\_NOM has been changed to SOLAR\_RAD\_COEFF\_NOM in Table 6-5 | David S. Berry / NASA | Correct name ICS table | | Fixed. |
| A-3 MAN | A2.9 |  | ed/te | MAN\_ID: shown as Mandatory in Table 6-7, but optional in the ICS table. | David S. Berry / NASA | Change "Status M/O/C" from "O" to "M" in the ICS | | Fixed. |
| A-5  PERT | A2.9 |  | ed | CENTER\_NAME has been removed from Table 6-10, but it still appears in the  ICS. | David S. Berry / NASA | Remove "CENTER\_NAME" from the Perturbations table in the ICS. | | Fixed. |
| A-7  PERT | A2.9 |  | ed | The "Feature" column for the PERT\_STOP keyword says it is "Perturbations Data Block Start" | David S. Berry / NASA | From: "Start"  To: "End" or something like that. | | Fixed. |
| A-8  OD | A2.9 |  | ed/te | OD\_METHOD, OD\_EPOCH: Shown as Mandatory in Table 6-11, optional in the ICS. | David S. Berry / NASA | Change "Status M/O/C" from "O" to "M" in the ICS for these 2 keywords. | | Fixed. |
| B-1 | Annex B | Title | ed/te | The title is a bit unwieldy, and even at that it is a partial list of values for OCM components | David S. Berry / NASA | From: existing title  To: something more generic, e.g., "SANA Registry Sources for Selected Keyword Values" | | Fixed. |
| G-1 | Fig G-1 |  | ed | ORB\_BASIS has value not in values list | David S. Berry / NASA | From: SIMULATION  To: SIMULATED | | Fixed. |
| G-1 | Fig G-1 |  | te | Since the CENTER\_NAME is not provided, it is Earth (default), and the vectors are beneath the surface of planet. | David S. Berry / NASA | Could add CENTER\_NAME = MERCURY or PLUTO, and change the reference frame.  Or  Change the vectors to be above surface of Earth. | | Fixed. |
| G-2 | Fig G-2 |  | te | ORB\_TYPE = CARTPVA, but ORB\_UNITS does not include the acceleration units. | David S. Berry / NASA | Add the km/s\*\*2 units for the acceleration components, (or remove the ORB\_UNITS keyword since I thought we decided to make that keyword optional again) | | Fixed. |
| G-2 | Fig G-2 |  | te | Since the CENTER\_NAME is not provided, it is Earth (default), and the vector is beneath the surface of planet. | David S. Berry / NASA | Could add CENTER\_NAME = MERCURY or PLUTO, and change the reference frame.  Or  Change the vector to be above surface of Earth. | | Fixed. |
| G-3 | Fig G-3 |  | te | Since the CENTER\_NAME is not provided, it is Earth (default), and the vectors are beneath the surface of planet. | David S. Berry / NASA | Could add CENTER\_NAME = MERCURY or PLUTO, and change the reference frame.  Or  Change the vectors to be above surface of Earth. | | Fixed. |
| G-3 | Fig G-3 |  | ed | Uses SOLAR\_RAD\_COEFF keyword, but it has been changed to SOLAR\_RAD\_COEFF\_NOM | David S. Berry / NASA | From: SOLAR\_RAD\_COEFF To: SOLAR\_RAD\_COEFF\_NOM | | Fixed. |
| G-3 | Fig G-3 |  | ed/te | No time tag format is shown in the "MAN\_COMPOSITION" string, as specified in 6.2.7.14 | David S. Berry / NASA | Add "TIME\_RELATIVE" to MAN\_COMPOSITION as first element. | | Fixed. |
| G-3 | Fig G-3 |  | ed/te | Units on "DEPLOY\_DV\_CDA" are shown in Table 6-9 as "m\*\*2", but in the MAN\_UNITS are shown as "cm\*\*2/kg" | David S. Berry / NASA | Change final entry in MAN\_UNITS string to "m\*\*2". | | Fixed. |
| G-3 | Fig G-3 |  | te | It seems odd that both maneuver specifications have the same MAN\_ID since the purposes are quite different, but I suppose the main spacecraft could be thrusting while deploying the cubesats. The times match up. | David S. Berry / NASA | Maybe add a comment that this is a compound maneuver. | | Added comment. Yes, this is precisely the intent. |
| G-4 | Fig G-3 |  | te | OD\_METHOD is not present, but is shown as mandatory in Table 6-11 | David S. Berry / NASA | Add OD\_METHOD | | Fixed. |
| G-11  G-12 | Annex G |  |  | In the XML schema, several of the required tags have been shortened, in keeping with one of the goals of the OCM. | David S. Berry / NASA | From: <orbit></orbit>, <perturbations></perturbations>,  <userDefinedParameters>, </userDefinedParameters>  To: <orb></orb>, <pert></pert>, <user></user> | | Fixed. |
| G-11 | Annex G |  |  | In the XML schema, several of the required tags have been shortened, in keeping with one of the goals of the OCM. | David S. Berry / NASA | From: <orbitLine></orbitLine>  To: <orbLine></orbLine> | | Fixed. |
| K-1 | Annex K |  |  | Annex K lists "Annex B" for "Detailed description of any exceptions for keyword values not drawn from the SANA registry", but the only part of Annex B that mentions an ICD is B6. | David S. Berry / NASA | Either:  1) Expand notice in Annex B about values for other registries, or  2) Change "Annex B" to "B6". | | Fixed. |
| L-1 | Annex L |  |  | The SANA registry URL contains an ellipsis. | David S. Berry / NASA | Spell out entire SANA Registry URL | | Fixed. |
| Several | Several |  | ed/te | I cited one instance of this in Part 1 of this CRM, but have observed several additional instances of using "is allowed" in the OCM. | David S. Berry / NASA | In general, the phrase "is allowed" should be replaced by the phrase "may be provided" or "may be <preferred alternative verb choice>. | | Fixed. |
| Several | Severa |  | ed | There are 6 instances of "user defined" parameters in the document; there are 7 instances of "user-defined". | David S. Berry / NASA | In general, pick one format, either "user defined" without hyphen or "user-defined" with hyphen. Take your pick but make them all consistent. | | Fixed. |
| 6-31  6-38 | 6.2.7.14  MAN\_COMPOSITION |  | te | 6.2.7.14 and MAN\_COMPOSITION contradict each other with respect to whether or not the time tag format is part of the MAN\_COMPOSITION string or not. | David S. Berry / NASA | Resolve contradiction. | | Fixed. |
| 6-31 | 6.2.7.14 |  | te | It's not clear what would be the purpose of having both TIME\_ABSOLUTE and TIME\_RELATIVE specified in the same MAN\_COMPOSITION. | David S. Berry / NASA | Consider whether allowing both in the same maneuver line is a needlessly complex and a potential source of error. Isn't one sufficient to do the job? | | This is typically conveyed as part of launch operations, where T+ counts and UTC times are both displayed. |
| 6-33 | Table 6-7 |  | ed | MAN\_ID: is the only keyword in the document for which the "Description" starts with "MANDATORY". | David S. Berry / NASA | Remove "MANDATORY"... the M/O/C column should be sufficient. (A similar change was already made on MAN\_DEVICE\_ID for P2.40.) | | Fixed. |
| 6-35 | Table 6-7 |  | ed/te | DC\_TYPE: The "Examples of values" shows a value that is not in the set of presumably normative values. | David S. Berry / NASA | Remove "PHASE\_ANGLE" from the list of examples. | | Fixed. |
| 6-37 | Table 6-7 |  | ed/te | DC\_PA\_START\_ANGLE: has 2 references to a previous keyword name that no longer exists in this version. | David S. Berry / NASA | From: "DC\_PA\_START"  To: Either "DC\_PA\_START\_ANGLE"  Or  something like "This value..." | | Fixed. |
| 6-37 | Table 6-7 |  | ed | DC\_PA\_START\_ANGLE: has a typo | David S. Berry / NASA | From: "occurance"  To: "occurrence" | | Fixed. |
| 6-37 | Table 6-7 |  | ed/te | DC\_PA\_STOP\_ANGLE: has 2 references to a previous keyword name that no longer exists in this version. | David S. Berry / NASA | From: "DC\_PA\_STOP"  To: Either "DC\_PA\_STOP\_ANGLE"  Or  something like "This value..." | | Fixed. |
| 6-35 thru  6-37 | Table 6-7 |  | ed/te | There are 9 instances in the maneuver table where it is stated that "This value shall be provided if...". I think more properly, the statement should be "This keyword shall be provided if...". | David S. Berry / NASA | From: "This value shall be provided if"  To: "This keyword shall be provided" | | Fixed. |
| 6-39  6-40 | Table 6-8  Table 6-9 |  | te | TIME\_ABSOLUTE: Do these attributes actually have units? | David S. Berry / NASA | Question for discussion... when we put a unit of "s" ona value, it implies a duration; whereas an absolute time, or epoch, is in principle instantaneous and thus has no duration. In these tables, should "s" be replaced by "n/a" for TIME\_ABSOLUTE? | | Fixed. |
| 6-40 | 6.2.8 |  |  | Between 6.2.8 and 6.2.8.1, there is a line of text that is intended to be 6.2.8.1, but is included in the Title. | David S. Berry / NASA | Change line type accordingly. | | Fixed. |
| 6-42 | Table 6-10 |  | ed/te | The Description "Epoch when the Space Weather data file was obtained" could be interpreted as when the originator of the OCM acquired the file, but I think the intent is to provide the epoch of the data in the file, not the epoch when the originator acquired the file. | David S. Berry / NASA | From: "Epoch when the Space Weather data file was obtained."  To:  "Epoch when the Space Weather data was obtained."  or  "Epoch when the data in the Space Weather data file was obtained." | | Fixed. |
| 6-42 | Table 6-1 |  | te | Somewhere in this section (or perhaps in 1.5.1) the definition of "SFU" in SI units should be provided since it is not specifically defined in the SI units brochure. | David S. Berry / NASA | Add in an appropriate place (perhaps 1.5.1) "10−22 W/(m\*\*2\*Hz)" | | Fixed. |
| 6-44 | 6.2.9.5 |  | ed/te | Based on the statement here about "If an orbit determination parameters section is included in the message, a corresponding perturbations section shall be included...", should the M/O/C column in Table 6-1 be marked "C" for the Perturbations Parameters? | David S. Berry / NASA | Consider... it seems to fit the definition we have established for "C" in the OCM tables. | | Fixed. |
| 6-44 | Table 6-11 |  | ed/te | OD\_ID: M/O/C column says "Mandatory", Description text says "Optional". | David S. Berry / NASA | Resolve inconsistency by removing the word "optional" from the Description (note this is consistent with Annex A) | | Fixed. |
| 6-47 | Table 6-11 |  | ed/te | The M/O/C for "USER\_DEFINED\_x" should be "M", not "O". As stated in 6.2.1.2, for all sections of the OCM, "An 'M' denotes mandatory keywords that must be included in this section if that particular data section is included." It wouldn't make sense to include a User Defined Parameters section but not speciify any user defined parameters. | David S. Berry / NASA | Change M/O/C for this keyword to "M". | | Fixed. |
| C-2 | C1 | bottom | te | I've had questions about the DRAG\_ADDL\_AREA for some time, in particular, how is it calculated? The equation added at the bottom of the page makes it appear to me to have a "fudge factor" character, perhaps added to make an equation or solution balance, or something. The equation reflects how to calculate a cross-sectional area based on the orientation of the OEB and an arbitray unit vector, but says nothing about how that "additional area" is calculated. If the box is truly "optimally enclosing and based on the descriptions at the top of the page, it seems to me that the value of DRAG\_ADDL\_AREA would always be <= 0. If the box were truly "enclosing" there wouldn't be anything "sticking out" the way I read paragraphs 2, 3, and 4 in this section. The question remains... how is it calculated? or is it just a SWAG? If it's always <=0, is the keyword named properly? | David S. Berry / NASA | Provide an example where DRAG\_ADDL\_AREA > 0. Explain how DRAG\_ADDL\_AREA is calculated. | | Added extensive discussion and examples in Annex C1, and changed the keywords to DRAG\_CONST\_AREA and SRP\_CONST\_AREA. |
| C-3 |  |  |  | Two of the variables discussed relate to "intensity", and show units in watts. But the SI unit for intensity is W/m\*\*2. | David S. Berry / NASA | Are the units shown actually watts? If so, is is correct to call these measurements of "intensity"? | | Fixed. |
| C-3 |  |  |  | The definition for EEntranceAperture "Target’s specific entrance aperture radiance" seems to use the word "Target" ambiguously... shouldn't this be the "Sensor's specific entrance aperture radiance"? The definition as written seems to imply that sunlight enters an aperture associated with what is labelled "Satellite Target" in the diagram, and this doesn't seem relevant. | David S. Berry / NASA | Confirm correct definition of EEntranceAperture | | Fixed. |
| C-3 |  |  |  | The equation for Etarget contains an argument theta (𝜃) to the 𝜏Atmosphere(𝜃) function that is undefined in the annex. | David S. Berry / NASA | Explain the argument theta (𝜃) | | Fixed. |
| C-3 |  |  |  | It's not clear why the function "Phase(𝜑)" is so named given that the definition of 𝜑 is given as "Phase or Critical Angle to the Sun". So "Phase(𝜑)" almost translates as "Phase of Phase Angle". Since "Phase(𝜑)" is a reflectance function 0 < Phase(𝜑) <= 1, and so is 𝜌, it's not clear what is the difference between "Phase(𝜑)" and 𝜌 (except that there is a formula for Phase(𝜑) and not for 𝜌. One of these seems unnecessary. | David S. Berry / NASA | For your consideration. | | Clarified. But “geometric reflectance” characterized by Phase denotes the portion of energy that can be reflected based upon being Sun-facing, whereas the Target reflectance is a function of materials properties. |
| G-5 | Fig G-4 |  | te | First Orbit State Time History: Since the CENTER\_NAME is not provided, it is Earth (default), and the vectors are beneath the surface of planet. | David S. Berry / NASA | Could add CENTER\_NAME = MERCURY or PLUTO, and change the reference frame.  Or  Change the vectors to be above surface of Earth. | | Fixed. |
| G-5 | Fig G-4 |  | te | Second Orbit State Time History: Uses an ORB\_TYPE that is not in SANA Registry | David S. Berry / NASA | From: KPLR  To: KEPLERIAN | | Fixed. |
| G-5 | Fig G-4 |  | ed/te | Second Orbit State Time History: Uses "nd" in ORB\_UNITS. | David S. Berry / NASA | This is better specified here (and throughout the document) as "n/a" since there are at least 2 places in the document where it stated with respect to units that "n/a" means there are no units applicable, and that is consistent with other Nav WG documents. The abbreviation as "nd" could potentially be interpreted as 8.64e-5 seconds (i.e., a "nanoday"). NOTE: I didn't write up a few of these that appear in example G-3 since we had talked about this in the Fall meetings, but thought it might be good to do a reminder here. | | Fixed. |
| G-5 | Fig G-4 |  | ed/te | Maneuver uses frame "RTN"... and units "nd". | David S. Berry / NASA | See previous question about using a frame that's not explicitly listed in the SANA Registry and comments about "nd" | | Fixed. |
| G-5 | Fig G-4 |  | ed/te | Uses "SOLAR\_RAD\_COEFF" but that keyword has apparently been changed to "SOLAR\_RAD\_COEFF\_NOM". | David S. Berry / NASA | Either fix example with documented keyword or revert to "SOLAR\_RAD\_COEFF" as is used in all the other ODMs. Since there is no apparent way to specify a "non-nominal solar radiation coefficient", I would favor reverting the keyword for consistency's sake. | | Fixed, replacing SOLAR\_RAD\_COEFF\_NOM with SOLAR\_RAD\_COEFF globally. |
| G-7 | Fig G-5 |  | te | In the Orbit State Time History, the vectors are beneath the surface of planet. | David S. Berry / NASA | Could change CENTER\_NAME to MERCURY or PLUTO, and change the reference frame.  Or  Change the vectors to be above surface of Earth. | | Fixed. |
| G-7 | Fig G-5 |  | ed/te | Uses "SOLAR\_RAD\_COEFF" but that keyword has apparently been changed to "SOLAR\_RAD\_COEFF\_NOM". | David S. Berry / NASA | Either fix example with documented keyword or revert to "SOLAR\_RAD\_COEFF" as is used in all the other ODMs. Since there is no apparent way to specify a "non-nominal solar radiation coefficient", I would favor reverting the keyword for consistency's sake. | | Fixed. |
| G-7 | Fig G-5 |  | te | In the second covariance section, the frame is EFG. The formulation in the SANA Celestial Body Reference Frame Registry shows 6 elements: E, F, G, Edot, Fdot, Gdot. The example shows only 3 COV\_UNITS (km, km, km); the number of elements in the covariance matrix (6) is consistent with 3 COV\_UNITS, but not the SANA Celestial Body Reference Frames Registry frame formulation, which would require 21 elements in the covariance matrix. | David S. Berry / NASA | Either the entry in the SANA Celestial Body Reference Frame Registry is incorrect, or the example G-5 is incorrect. | | Fixed. |
| G-7 | Fig G-5 |  | te | In the second covariance section, the COV\_REF\_FRAME is EFG, and so is the COV\_TYPE. The SANA Orbital Elements Registry does not list EFG as a valid orbital element set (thus it cannot be used as the covariance line type). | David S. Berry / NASA | If EFG can be used as the COV\_TYPE, then it should be added to the SANA Orbital Elements Registry. | | Fixed. |
| G-10 | Annex G |  | ed/te | Here's another miss from my checkout of example G-6: in the XML line id="CCSDS\_OCM\_VERS" version="P2.39", the P2.39 should not appear. | David S. Berry / NASA | From: P2.39  To: 3.0 | | Fixed. |