| **Page** | **Section** | **Line** | **Type** | **Comment/ Rationale** | **Source of Comment (Name/Agency)** | **Suggested Disposition** | **Disposition**  **(Completed by Principal Editor)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 4-1 | 4.1 |  | ed/te | URLs are incorrect, but can be ignored for now. We will be working out the issues with the SANA Operator team. All other text is fine. | David S. Berry / NASA | Ignore URLs in this section for now. | 11-Sep-22: DLO: Agree – awaiting new references.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 4-2 | 4.3.3.3 | 4 | ed/te | The URL in this section is incorrect, but can be ignored for now. We will be working out the issues with the SANA Operator team. All other text is fine. | David S. Berry / NASA | Ignore URL in this section for now. | 11-Sep-22: DLO: Agree – awaiting new references.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 4-3 | 4.3.3.8 | 6-7 | ed/te | The URL in this section is incorrect, but can be ignored for now. We will be working out the issues with the SANA Operator team. All other text is fine. | David S. Berry / NASA | Ignore URL in this section for now. | 11-Sep-22: DLO: Agree – awaiting new references.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 39 | 4.1 |  | te | The URL to CDM/XML will be obsolete after the publication on new NDMXML. A link to qualified and unqualified version or a more general references to SANA contents will be needed. | J. M. Lozano/ESA-GMV | Consider adding both references. This will help to make people aware of the two different XML schemas. | 23-May-21: DLO: Agree – awaiting new references. This has the same confusion that we discussed for the ODM.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon".  The text has also been updated to explain the "qualified" and "unqualified" schemas. |
| 4-1 | 4.1 | Para 6 | editorial | The link to the CDM/XML XSLT converter is not valid. | F. Dreger – ESA/ESOC | Fix URL (could not find the valid path) | 20-May-21: BDS: Agree - Links have not yet been reviewed and will be corrected.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". The schemas will come first, and later (hopefully not too much later) the XSLT sheets will be posted. |
| 4-2 | 4.3.3.3 | Para 2 | editorial | The link to the CDM namespace location is not valid. | F. Dreger – ESA/ESOC | Fix URL (could not find the valid path) | 20-May-21: BDS: Agree - Links have not yet been reviewed and will be corrected.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 4-3 | 4.3.3.8 | Para 2 | editorial | The link to the CDM namespace location is not valid. | F. Dreger – ESA/ESOC | Fix URL (could not find the valid path) | 20-May-21: BDS: Agree - Links have not yet been reviewed and will be corrected.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| - | - |  | ed | The links of the CDM/XML schema, converter locations and master are outdated (e.g. sections 4.1, 4.3.3.3), but perhaps there are some places which do not need to update (e.g. Annex C subsection C2). | VB/ESA | Check if the links shall be updated, and in that case how the actual links would be: <https://sanaregistry.org/r/ndmxml/ndmxml-2.0-cdm-1.0.xsd>  <http://sanaregistry.org/r/ndmxml/ndmxml-2.0-cdm-1.0.xsl>  <http://sanaregistry.org/r/ndmxml/ndmxml-2.0-master.xsd> | 20-May-21: BDS: Agree - Links have not yet been reviewed and will be corrected if necessary.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". The schemas will come first, and later (hopefully not too much later) the XSLT sheets will be posted. |
| 4-2 | 4.3.2 | 2 | ed | The xml version should be changed to 2.0, commensurate with the version of the document. | CGramling/NASA-GSFC | Please consider updating the XML version number to align with the document. | 14-May-21: BDS: Agree - XML has not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB: Actually, in the referenced section and line, 1.0 is the appropriate value since it refers to the version of the W3C XML Standard itself. This is a misunderstanding that will be rejected. |
| 4-3 | 4.3.3.8 | 1, 4 | Ed | The CCSDS version should be updated to 2.0, commensurate with the version of the document. | CGramling/NASA-GSFC | Please consider updating the CCSDS version number in the XML to align with the document. | 14-May-21: BDS: Agree - XML has not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  The values in the referenced section and lines (1 and 4) are already correctly set (2.0 and 1.0, respectively). For line 4, as noted above, 1.0 is the appropriate value since it refers to the version of the W3C XML Standard itself. This is a misunderstanding that will be rejected. |
| 4-2 | 4.3.3.3 | 4 | ed/te | Link needs an update. It may also change again depending on how the ODM and ADM progress, | David S. Berry / NASA | From: "http://sanaregistry.org/r/ndmxml/ndmxml-1.0-master.xsd"  To:  "http://sanaregistry.org/r/ndmxml\_unqualified/ndmxml-2.0.0-master-2.0.xsd" | 14-May-21: BDS: Agree - SANA links have not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 4-3 | 4.3.3.8 |  | ed/te | Link needs an update. It may also change again depending on how the ODM and ADM progress, | David S. Berry / NASA | From: "http://sanaregistry.org/r/ndmxml/ndmxml-1.0-master.xsd"  To:  "http://sanaregistry.org/r/ndmxml\_unqualified/ndmxml-2.0.0-master-2.0.xsd" | 14-May-21: BDS: Agree - SANA links have not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| 43 | 4.1 |  | ty | The reference to the XML schema is wrong because it points to an xls file instead of pointing to and xsd file. | J. M. Lozano/ESA-GMV | Note: This is different from a previous comment on the versioning, but both shall be fixed changing the same reference.  When versioning is clear, update with xsd URL. | 27-Sep-21: BDS: Agree - XML has not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  All URLs have been updated to point to "nav.sanaregistry.org", which is one of the approved betas. When the post-prototype test version of the document is sent to the Secretariat, the beta name will be replaced with the Production name.  Note that the V.2 schemas are still in development, but will be ready "soon". |
| C-8 | Annex C2 | 2 | Ed | In the XML example, the version is given as 1.0. Since this will be version 2.0 of the document, should the XML version be updated to 2.0? Similarly, the CCSDS CDM VER version should be updated to 2.0. | CGramling/NASA-GSFC | Consider aligning the example version numbers w the document version number and updating to 2.0. | 14-May-21: BDS: Agree - XML has not yet been addressed as part of this update.  12-Oct-22: BDS: Agree  06-Nov-2022 DSB:  A corrected and validated XML example has been provided to replace the original. |
| 44 | 4.3.1 |  | ed | The reference to ref [6] may be misleading. The instructions are contained in sec 4.3, and the ASCII example are in G1.2-G1.4. It is not clear what can be found in ref [6]. | J. M. Lozano/ESA-GMV | Considered rewording to clarify that complete XMLNDM description are in ref [6]. | 27-Sep-21: BDS: Agree - XML has not yet been addressed as part of this update.  19-Oct-2022: NAV: New section 4 to be provided by DSB.  06-Nov-2022 DSB:  Accepted. The citation of reference [6] is removed. |
| 3-10 | 3.4 | Row 4, 5 | Ed | Sana Registry for gravity\_models and for atmosphere\_models do not yet exist | CGramling/NASA-GSFC | Perhaps the expectation is that these sana registries will be completed prir to the release of the CDM. | 14-May-21: BDS: Agree - SANA links do now exist.. |
| 3-4 & F-2 | 3-3, Table 3-3, & Annex F | Table Entry 9; AnnF: 6-25 | Ge | WRT SCREEN\_VOLUME\_FRAME: Since as a group we were trying to migrate information to SANA to avoid having to repeat info in several books, would it make sense to refer to the SANA registry for orbit-relative centers, even if the SANA registry needs updating to identify the commonality, rather than repeat the RTN and TVN frames in the CDM annex F? | C. Gramling/NASA-GSFC | Please consider if there is benefit to simply refer to SANA registry for RTN & TVN. | 27-Apr-22: BDS: BDS & DO to decide if to leave RTN/TVN definitions in Annex F.  11-Sep-22: DLO: Agree - I suggest that we adopt the SANA definitions, but limit the KVN values to only RTN and TVN as desired.  18-Oct-22: BDS: Do we therefore remove definitions of RTN and TVN from Annex F and replace annex F references with SANA reference?  19-Oct-22: NAV: Leave as is. Address SANA RSW definitions wrt. RTN and TVN.  29-Nov-22: BDS/DLO: Change is to be changed for a future modification as currently definitions are well accepted and incorporation into SAN is more complex than originally thought. |
| 3-11 | 3-4, Table 3-4 | Table Entry 1 on page | Ge | WRT ORBIT\_CENTER, The description should refer to the SANA registry for Orbit Centers for available options; <https://sanaregistry.org/r/orbit_centers/> | C. Gramling/NASA-GSFC | Please consider including the reference to the SANA registry for ORBIT\_CENTERS. | 11-Sep-22: DLO: Agree - I suggest that we adopt the SANA definitions, but limit the KVN values to only the orbit centers allowed as desired.  18-Oct-22: BDS: Currently we do not limit orbit centers, should we?  19-Oct-22: NAV: Just add SANA link. |
| 3-11 | 3-4, Table 3-4 | Table Entry 2 and 4 on page | Ge | WRT REF\_FRAME, The description should refer to the SANA registry for Celestial Body Reference Frames for available options; <https://sanaregistry.org/r/celestial_body_reference_frames/>  On restricting the values: While perhaps not necessary at this time, with the projected increase in the number of objects in cislunar space, it may be more meaningful to define the object state vectors a lunar [inertial] reference frame.  Ditto for ALT\_COV\_REF\_FRAME | C. Gramling/NASA-GSFC | Please consider including the reference to the SANA registry. Also consider opening the possibilities for the ref frame (or wait until next update of CDM ☺) | 11-Sep-22: DLO: Agree - I suggest that we adopt the SANA definitions, but limit the KVN values to only the reference frames allowed as desired.  18-Oct-22: BDS: We currently allow GCRF, EME2000 and ITRF, do we want to open it up for cislunar space now?  19-Oct-22: NAV: Add SANA link for definitions, leave cislunar for next update. |
| B-1 | B1 |  | te | I believe this section may be copied from the ODM, and not applicable to the CDM due to the restricted set of values allowed for reference frames in the CDM | David S. Berry / NASA | Recommend deleting Section B1. | 27-Apr-22: BDS: Annex was added for OEB\_PARENT\_FRAME definition, is it needed? DO to comment as Annex B is opening reference to all definitions instead of restricted CDM definitions.  To discuss as a group. Currently, SCREEN\_VOLUME\_FRAME is constrained to RTN and TVN, but OEB\_etc is not.  19-Oct-22: NAV: Keep as is |
| B-2 | B2 |  | te | I believe this section may be copied from the ODM, and not applicable to the CDM due to the restricted set of values allowed for reference frames in the CDM | David S. Berry / NASA | Recommend deleting Section B2. | 27-Apr-22: BDS: Per above discussion.  19-Oct-22: NAV: Keep as is |
| 3-14 | Table 3-5 |  | ed/te | OBS\_AVAILABLE, OBS\_USED: the language used here in the table has changed from the original CDM, and is different from that used in the ODM for the same keywords. The original CDM doesn't specify in the table whether the observations available/used were from the recommended OD span or the actual OD span, but specifies the recommended OD span in annex E. The ODM specifies the ACTUAL span, this version of CDM specifies the RECOMMENDED span. | David S. Berry / NASA | I think the ACTUAL span should be the reference for the OBS\_AVAILABLE and OBS\_USED, as in the ODM. Using the ACTUAL makes more sense, but we may want to discuss this in a telecon. | 11-Sep-22: DLO: Agree, should be consistent with ODM as long as it doesn’t lead to compatibility issues with previous CDM version.  18-Oct-22: BDS: Annex F definitions were removed as they were not felt to add value, do we want to just add ACTUAL to the table?  19-Oct-22: NAV: Change recommended to actual. |
| 3-22 | Table 3-5 |  | te | DCP\_SENSITIVITY\_VECTOR\_\*: It might be worth adding a brief section in annex F describing how to apply these keywords in practice, rather than just referring readers to the informative reference. | David S. Berry / NASA | Consider | 26-Jul-22: BDS: This keyword was requested by 18 SDS, and NASA, and its application is not familiar to us.  19-Oct-22: DLO: to get more detailed definition from US Space Force and put in Annex F. |
| H-2 | Annex H | H18, H19 | Ed | The entries for references H18 (Hejduk) and H19 (Casali) follow a different bibliographic entry method. H1-H17 follow Last Name, First Initial; H18 is First Initial, Last Name, and H19 is First Name, Last Name. | C. Gramling/NASA-GSFC | Please consider making the entries follow a unified format. | 27-Apr-22: BDS: Agree |
| C-4; C-5 | Annex C | 3, 4; 33, 34 | Ed, te | The COMMENTs for Object 1 and Object 2 identify Apogee Altitude and Perigee Altitude. But, there are specific keywords available for these parameters: APOAPSIS\_HEIGHT and PERIAPSIS \_HEIGHT. It seems that the example should encourage the adopter of the standard to use available keywords for parameters rather than place them in comment fields. | CGramling/NASA-GSFC | Please consider modifying the example to use the keywords defined in the message rather than a comment field for those very same parameters. | 14-May-21: BDS: Examples will be updated to V2 format in due course, we have not done this yet.  12-Oct-22: BDS: Agree. NOTE: Annex C is now Annex G. |
| C-11 | Annex C2 | 41, 42 | Ed, te | The COMMENTS used indicate the apogee and perigee altitude. However, the updated CDM includes keywords for APOAPSIS\_HEIGHT and PERIAPSIS\_HEIGHT. It seems worthwhile to have the examples use the available keywords in the updated standard to encourage their use rather than place the data in comment fields. | CGramling/NASA-GSFC | Please consider modifying the example to use the keywords defined in the message rather than a comment field for those very same parameters. | 14-May-21: BDS: Examples will be updated to V2 format in due course, we have not done this yet.  12-Oct-22: BDS: Agree NOTE: Annex C is now Annex G. |
| 3-5 | Table 3-3 |  | te | COLLISION\_PROBABILITY: I think some more instruction on how to assign the value if COLLISION\_PERCENTILE is desirable. | David S. Berry / NASA | Clarify usage. Provide at least one example, and perhaps a plot in Annex F | 30-June-21: DLO: Agree - Added clarifying language  06-Oct-21: NAV WG: Make sure an example in the Annex has a good example |
| G-1 | Ref [G2] |  | ed | I believe there's a new version about to be released. | David S. Berry / NASA | Check with Dan since it's coming out of one of his SC14 WGs. | 30-June-21: DLO: Not yet released, but close. |
| C-3 | C2 | 8 | Te/ed | For COLLISION\_PROBABILITY\_METHOD, several options are already registered in the Sana Registry.  https://sanaregistry.org/r/cdm\_cpm/ | Hideaki Hinagawa/JAXA | Can we delete this item because the list is already registered? Or we keep the item for more update of the list. | 27-Apr-22: BDS: Update C2 to say “are registered” and add items missing which are referenced in CDM. |
| C-3 | C2 | 7 | Te/ed | For CATALOG\_NAME, several options are already registered in the Sana Registry. https://sanaregistry.org/r/cdm\_catalog/ | Hideaki Hinagawa/JAXA | Can we delete this item because the list is already registered? Or we keep the item for more update of the list. | 27-Apr-22: BDS: Same as above. |
| J-1 | J1 | New | Te | List is missing APPROACH\_ANGLE, SCREEN\_TYPE, general improvements in defining Collision Probability parameters and Covariance, reference to SANA registries for parameters common among CCSDS messages, incorporation of additional information for OD/catalogue (OD\_EPOCH, MIN\_MEDIAN\_MAX\_UPDATE\_INTERVAL).  No significant changes were made to HBR, Mahalanobis Distance, or dynamic consider parameters; unclear why they need to be in the list.  The statement preceding the list indicates a change to M/O/C categorization. However, the list includes items with parameter changes or updates as well as clarified descriptions. Perhaps the introductory language should be conclude with a period vs a colon. | C. Gramling/NASA-GSFC | Perhaps clarify the level of detail the items in the list capture or restructure the list. | 27-Apr-22: BDS: Tidy up text for high level sections  12-Oct-22: BDS: Do a diff on V1 and include all changes. |
| 3-8 | 3.4 |  |  | The NOTE is confusing. It says Tables 3-4 and 3-5 will be used to define Object 1 and Object 2 depending on the OBJECT keyword. The keyword can only be OBJECT 1 or OBJECT 2. Section 3.5 says there will be two separate data blocks for Object 1 and Object 2. Should it instead say that there will be a Metadata section for each object with a corresponding Data section? | Julie Halverson/NASA |  | 27-Apr-22: BDS: Agree |
| F-5 |  |  |  | Suggest adding a term/definition that is equal to the integral. SEDR\_AVE = integral | Julie Halverson/NASA |  | 27-Apr-22: BDS: Agree |
| F-7 |  |  |  | There is an angle, theta, included in the E\_target fraction that is not defined. tau\_atmosphere(theta) | Julie Halverson/NASA |  | 22-Apr-22: BDS: Remove theta so in line with ODM definition. |
| 3-10 | 3.4 |  |  | Add comment to EPHEMRIS\_NAME that users are encouraged to use ODM\_MSG\_LNK for linked ODM ephemeris data to be in line with TDM V3. | Brian Swinburne |  | 18-Oct-22: BDS: Agree – Add something along the following:  BDS suggested text “Users are encouraged to use the ODM\_MSG\_LNK keyword for ODM formatted ephemeris and in this case setting EPHEMERIS\_NAME to ODM.”  ODM\_MSG\_LNK then becomes conditional on EPHEMEIRS\_NAME=ODM  Move EPHEMERIS\_NAME to before ODM\_MDG\_LINK  JC suggested text “Message originators are encouraged to employ ODM\_MSG\_LINK to reference ephemerides in ODM format. Otherwise, the EPHEMERIS\_NAME  keyword should be used to reference ephemeris files that are not in ODM format (for backward compatibility purposes).”  Plus in ODM\_MSG\_LNK add note: “NOTE: Where ephemeris is supplied in non-ODM format see EPHEMERIS\_NAME keyword below.”  08-Nov-22: BDS: Went with BDS suggestion as JC suggestion too strong and does not cater for EPHEMERIS\_NAME being used as a switch in the CDM for either ephemeris or OD. |
| G | General |  |  | Update examples in Annex G as this has not yet been done during this update. | Brian Swinburne |  | 19-Oct-22: BDS: Agree |
| B | General |  |  | Check if more SANA entries need to be added to Annex B | Brian Swinburne |  | 20-Oct-22: BDS: Agree, check what has been done in the ODM. |
|  | 6 |  |  | Update CDM with new wording for numerical representations worked at the NAV Fall Meetings 2022. | Brian Swinburne |  | 20-Oct-22: BDS: Agree |
| 3-2 | 3.2 |  |  | Move CLASSIFICATON in header uo to top under COMMENT field. | Brian Swinburne |  | 09-Nov-22: NAV: Agree |
|  | General |  |  | Change “Conjunction Data Message CATALOG\_NAME references in document to Space Object CATALOG\_NAME | Brian Swinburne |  | 14-Nov\_22: NAV: Agree |
| F-2 |  |  |  | Add clarification to RTN Coordinate Frame definition with reference to RSW\_INERTIAL keyword in SANA. | Dan Oltrogge |  | 20-Feb-23: Agree |