| **Page** | **Section** | **Line** | **Type** | **Comment/ Rationale** | **Source of Comment (Name/Agency)** | **Suggested Disposition** | **Disposition**  **(Completed by Principal Editor)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 1.2 | para4, line 2 | ed | subject verb agreement | David S. Berry / NASA | From: "hardware type are"  To: "hardware types are" | OK |
| 11-18 | Sections 1 and 2 |  |  | Consider defining NHM acronym once at start of document & use NHM thereafter. Search on (NHM). | RIchon/NASA GSFC |  | OK |
| 13 | 1.6.1 | last |  | SANA definition, do not redefine acronym CCSDS – this was done in the Foreword. | RIchon/NASA GSFC |  | OK |
| 1-3 | 1.6.1 |  | ed/te | The term "Mnemonic Keyword" is not listed, but it is a central concept. The term is also used a few times before being described in detail. | David S. Berry / NASA | Add the term "Mnemonic Keyword" after the term "Keyword = Value Notation" | OK |
| 19-42 | Sections 3,4,5 |  |  | Be consistent in capitalization. For example 3.2.3 has ‘creation date line’ and 4.2.3 has ‘Creation Date line’. Line is sometimes capitalized & sometimes not. | RIchon/NASA GSFC |  | When “creation date” is used as a defined term it is capitalized. When it is used as a value it is not. For Example: Value in the Creation Date line shall be the Message creation date and time |
| 19-42 | Sections 3,4,5 text |  |  | Be Consistent in use of ‘header’ & ‘Header’. Uncapitalized should be only used in xml. | RIchon/NASA GSFC |  | OK |
| 21 | 3.4.1 |  |  | Why is Navigation Hardware Data capitalized? | RIchon/NASA GSFC |  | Made lower case in this instance |
| 2-10 | Sections ‘Authority’ through ‘Contents’ |  |  | Footers show incorrect section page numbers prior to Section 1. | RIchon/NASA GSFC |  | Tried to fix --- perhaps it worked this time. |
| 23 | 4.1.2 |  |  | Use either single or double quotation marks but not both in “There shall be no equals sign (**‘=”)”** | RIchon/NASA GSFC |  | OK |
| 23-34 | Section 4 |  |  | Change ‘annex’ to ‘Annex’ when referring to specific annex in text & tables. | RIchon/NASA GSFC |  | OK |
| 29-66 | Sections 4-6 |  |  | Global change: Capitalize ‘timetag’ except in XML | RIchon/NASA GSFC |  | OK |
| 3-1 | 3.1.4 | 1 | ed | Section number referenced at end of the line is wrong | David S. Berry / NASA | From: 3.1.5  To: 3.1.3 | OK |
| 3-1 | 3.2.2 | 1 | ed | Missing word | David S. Berry / NASA | From: "one each the following"  To: "one each of the following" | Moot: Changed wording already |
| 3-2 | 3.2.3 | 1 | te | States that "a single comment line" may be used, but it's actually "a single set of comment lines" | David S. Berry / NASA | From: "a single comment line"  To: "a single set of comment lines" or  "as many comment lines as are desired by the originator" or something like that. | Changed wording already but added plural to satisfy your intension |
| 3-2 | 3.3.1 | n/a | ed/te | It would be good to poin the reader to section 4 for the format info. | David S. Berry / NASA | Consider. | Added as well as similar pointers for the Metadata and Data Sections |
| 3-2 | 3.3.2(c) | 2 | ed/te | You refer here to the "Spacecraft Name Line", but in Section 4.3 you refer to it as "Object Name Line" | David S. Berry / NASA | Be consistent. Probably "Object Name Line" is best in both places because that is the associated keyword. | OK --- but is it better to change to “object” in “specifying the Name of the single Spacecraft”.  I think not so I’ve left it. |
| 3-2 | 3.3.2(d) | 2 | ed/te | You refer here to the "Spacecraft Identifier Line", but in Section 4.3 you refer to it as "Object Identity Line" | David S. Berry / NASA | Be consistent. Probably "Object Identifier Line" is best in both places because that is the associated keyword. | Ditto (to above line) |
| 3-2 | 3.3.2(f) | 1 | ed/te | Vague description | David S. Berry / NASA | From: "information in the Data Section"  To: "keywords in the Data Section" | It’s actually the form of the data that is found on lines containing the keyword. See my new wording. |
| 3-2 | 3.3.3(a) | 1,2 | ed/te | I continue to dislike the way the mandatory and optional keywords are separated in 3.3.2 and 3.3.3, but if you leave it this way, then the phrasing in 3.3.3 should improve. | David S. Berry / NASA | From: "between the required Metadata Start Line"  To: "immediately following the required Metadata Start Line", and remove the phrase "...and the required Time System Line (3.3.2 b)" | I’ve combined old sections 3.3.2 and 3.3.3 into a new 3.3.2. I think this rewriting satisfies your concerns. |
| 3-2 | 3.3.3(b) | 1,2 | ed/te | Same as immediately above | David S. Berry / NASA | From: "between the required Start Time Line"  To: "immediately following the required Start Time Line", and remove the phrase "...and the first Define Block (3.3.2 f)". | Same as immediately above |
| 3-2 | 3.3.4 | 7 | te | RE: “The data in each group are logically related (pertain to the same hardware)…”  Is the only logical relationship that of pertaining to the same hardware? No other logical relationships can cover the grouping (e.g. data points at the same time)? | Cheryl J Gramling/NASA | If the only logical grouping is that the grouped data belong to the same hardware, then simply state that. | See rephrasing |
| 3-2 | Indeterminate | last 2 lines on page | ed/te | The sentence that begins "The string defined as the Value of the Define Line..." is not numbered, but should be. | David S. Berry / NASA | Number this 3.3.5 | It could be 3.3.3 a but I considered it part of the Note. See indentation. I’ve changed the paragraph spacing to make this clearer. |
| 3-2 | Indeterminate | last 2 lines on page | ed/te | The sentence that begins "The string defined as the Value of the Define Line..." is a requirement, but is not worded as such. | David S. Berry / NASA | From: "will serve as the Keyword"  To: "shall be one of the Keywords" | The requirement is in 4.5.1 |
| 3-3 | 3.4.3 | 1,2 | ed/te | Clarity and economy of expression. | David S. Berry / NASA | From: "between the required Data Start Line"  To: "immediately following the required Data Start Line", and remove the phrase "...and the first Hardware Data Record (3.4.2 b)" | I’ve combined old sections 3.4.2 and 3.4.3 into a new 3.4.2. I think this rewriting satisfies your concerns. |
| 41 | Table 5-1 | 3 |  | Is ‘DEFINEd’ correct? in <Keyword>/Definition column | RIchon/NASA GSFC |  | rewritten |
| 4-1 | 4.1.3 | 6 | ed/te | Statement of fact should be an option. | David S. Berry / NASA | From: "The final character 'Z' is present..."  To: "The final character 'Z' may be appended..." | ok |
| 4-1 | 4.1.3 & 4.2.4, Table 4-1, Table 4-3 | last | te | Section 4.1.3 describes the use of [Z] to indicate UTC is used, and implies there are other time system options (e.g. TAI, per Annex B). Section 4.2.4 and Table 4-1 state the creation date/time is in UTC, with no option for other time systems. Table 4-3 provides examples with other time systems. These do not seem to be consistent. | Cheryl J Gramling/NASA | If UTC is indeed *an option* for time reference system (in other words other time reference systems could be used), then the text in section 4.2.4 and Table 4-1 should be updated from “date/time in UTC” to state ‘date/time in referenced time system”, or something similar. | My understanding is that if Z is not appended then the data may be in any time system as in Annex B. However, this is common to all the standards and I may not understand it completely. See for example sections 4.3.9 and Annex A of the TDM |
| 4-1 | 4.2.1 | 1 | ed/te | Refers to the "Format Version line", but that name is not used in section 3.2.2 (a). | David S. Berry / NASA | Since your precedent is to name each line in the standard, then 3.2.2(a) should refer to "the Format Version Line"; also, for consistency, the word "line" should be capitalized in 4.2.1 and 4.2.2. | Rewritten --- but I did Capitalize “Line” |
| 4-1 | 4.2.2 | Note | ed/te | I don't think the word "Note" is appropriate here. | David S. Berry / NASA | Remove "Note:" and make the statement contiguous with the other statement in 4.2.2 | OK |
| 4-1 | 4.2.3 | 1 | ed/te | Refers to the "Creation Date line", but that name is not used in section 3.2.2 (b). | David S. Berry / NASA | Since your precedent is to name each line in the standard, then 3.2.2(b) should refer to "the Creation Date Line"; also, for consistency, the word "line" should be capitalized in 4.2.3 and 4.2.4. | Rewritten --- but I did Capitalize “Line” |
| 4-10 | 4.4.5.2 | 1-2 | te | Technical clarity could be improved | David S. Berry / NASA | From: "... shall be in agreement with ..."  To: "...shall be equal to..." | Actually a number can’t be equal to a field. However, I see you point and I’ve tried to clarify. |
| 4-10 | 4.4.5.4 | 2 | ed | Wording could be improved | David S. Berry / NASA | From: "... the Character String specified by the Measurement shall include all blank space characters..."  To: "... the Measurement specified as a Character String shall include any blank space characters..." | OK |
| 4-10 | Comment Line | 1 | ed | Potential multiplicity of comment lines is not indicated | David S. Berry / NASA | From: "...optional Comment Line is..."  To: "...optional Comment Line(s) is..." | OK |
| 4-2 | 4.2.5 | 1 | ed/te | Refers to the "Message Originator line", but that name is not used in section 3.2.2 (c). | David S. Berry / NASA | Since your precedent is to name each line in the standard, then 3.2.2(c) should refer to "the Message Originator Line"; also, for consistency, the word "line" should be capitalized in 4.2.5 and 4.2.6. | Rewritten --- but I did Capitalize “Line” |
| 4-3 | 4.3.6 & Ref 8 | 3 | gn | Newcomer question: Why is http://www.unoosa.org/oosa/en/osoindex.html the preferred reference for space objects? A quick perusal of the website on MMS found incorrect information. How frequently is the site maintained and by whom? How quickly after launch is it updated?  In addition, what designator is to be used prior to launch for testing message flows, interfaces, etc? | Cheryl J Gramling/NASA | If the NHM is to be useful for a new mission, then the site from which the international designator is retrieved should be up to date. | Slightly changed reference. I can’t answer your question but this is the standard source we are required to use. |
| 4-4 | 4.3.11 | 1 | ed | The "(if it exists)" should be moved for greater clarity; | David S. Berry / NASA | From: "The line (if it exists) specifying the Message Stop Time shall..."  To: "The Stop Time Line (if it exists) shall..." | reworded |
| 4-4 | 4.3.12 | 1 | ed | Re-phrase for greater clarity. | David S. Berry / NASA | From: "The Value in the line specifying the Message Stop Time shall..."  To: "The Value in the Stop Time Line shall..." | Reworded |
| 45 | A1.1 | 18 |  | “can often be predicted from incompatible ICSes” | NASA/Oltrogge | Suggest modifying to “are a common outcome of incompatible ICS RLs” | I think this change is good but I hesitate to alter a boilerplate section that is a quotation from other documents. |
| 45 | A1.1 | 7-20 |  | Unclear what this enumerated list represents; are these the mandatory conformance requirements? | NASA/Oltrogge | If so, please state as such. | Ditto above |
| 45 | Annex A |  |  | A1.1 Indent the list of users of the ICS | RIchon/NASA GSFC |  | OK |
| 4-5 | 4.3.16.1 | 2 | ed | Refers to Annex C but it should be Annex D. | David S. Berry / NASA | From: "(see Annex C)"  To: "(see Annex D)" | OK |
| 4-5 | 4.3.16.1; 4.3.16.2 | 2; 4 | te | Does the SANA registry currently have a listing of these Spacecraft System and Hardware Types Values? | Cheryl J Gramling/NASA | If the answer is No, then suggest the Nav WG develop and submit such lists. | That is the plan --- we’ve asked for a SANA registry containing this |
| 4-5 | 4.3.16.2 | Note | ed/te | The "Note" should be removed and made the last sentence in 4.3.16.2 because it uses the normative word "should". | David S. Berry / NASA | From: "Note: Every effort should be made..."  To: "Every effort should be made..." | OK. “Note” had been removed from every place where “should” is in the note. |
| 4-5 | 4.3.16.3 | Note | ed/te | The "Note" should be removed and made the last sentence in 4.3.16.3 because it uses the normative word "should". | David S. Berry / NASA | From: "Note: The set of Data Group fields should..."  To: "The set of Data Group fields should..." | OK. “Note” had been removed from every place where “should” is in the note |
| 45, 46 | Annex A |  |  | A1.1, A2, Change ‘proforma’ to ‘pro forma’ in 2 places. | RIchon/NASA GSFC |  | OK |
| 46 | A1.1 | 1 |  | “NOTE – The features itemized in the RL are elements of a NHM. Therefore support for a mandatory feature indicates that generated messages will include that feature, and support for an optional feature indicates that generated messages can include that feature. “ | NASA/Oltrogge | I wonder if this wouldn’t flow better if you moved this statement into the Mandatory/Optional section | This is directly copied from the standard “boilerplate” text. I have not altered it. I don’t know if I have freedom to change it because it is standard across other documents. |
| 46 | Annex A |  |  | A1.3 reference Xi – is the X supposed to be included? | RIchon/NASA GSFC |  | X is a variable and this may not be really clear but: This is directly copied from the standard “boilerplate” text. I have not altered it. I don’t know if I have freedom to change it because it is standard across other documents. |
| 4-6 | Table 4-2 | n/a | ed | On "DATA GROUP" | David S. Berry / NASA | From: "This string should be specified in an ICD"  To: "This string and necessary descriptive info should be specified in an ICD" | OK |
| 47 | A2.1.1 | 3 |  | ICS serial number | NASA/Oltrogge | Just my general ignorance, but where does such a serial number come from? | I don’t know! |
| 48 | A2.1.5 | 30 |  | If DATA\_STOP is optional, can DATA\_START also be? Same question for START\_TIME (M) vs STOP\_TIME (O). Conversely, META\_START and META\_STOP are both (M). | NASA/Oltrogge | (just asking; please forgive my unfamiliarity) | Made DATA\_STOP mandatory based on meeting discussion |
| 4-8 | Table 4-3 | n/a | ed/te | On "START\_TIME", the pointer to formatting information is incorrect. | David S. Berry / NASA | From: "...see 4.3.3 and 4.3.4"  To: "... see 4.1.3" | OK |
| 4-8 | Table 4-3 | n/a | ed/te | On "START\_TIME", the "Mandatory" column says "No", but according to 3.3.2(e) it should say "Yes". | David S. Berry / NASA | From: "No"  To: "Yes" | OK |
| 4-8 | Table 4-3 | n/a | ed/te | On "STOP\_TIME", the pointer to formatting information is incorrect. | David S. Berry / NASA | From: "...see 4.3.3 and 4.3.4"  To: "... see 4.1.3" | OK |
| 49 | B-3 | (table) |  | Recommend adding SYSTIME, defined as: “System time, measured in elapsed seconds from UTC midnight (00:00 Z)” | NASA/Oltrogge |  | OK |
| 5-1 | 5.1.1 | 1 | ed | Word choice | David S. Berry / NASA | From: "XML version"  To: "XML representation" | OK |
| 5-2 | 5.4.3.3 | 1 | te | Case sensitivity in URL | David S. Berry / NASA | From: "http://SANAregistry"  To: "http://sanaregistry" | OK |
| 5-4 | 5.4.6.4 | Note | te | Cannot have a normative requirements word in a note. | David S. Berry / NASA | From: "...placeholder and an actual Mnemonic Keyword must appear in its place."  To: "... placeholder to be replaced by an actual Mnemonic Keyword." | OK |
| 5-4 | 5.4.6.4 | Note | ed | Verb subject agreement | David S. Berry / NASA | From: "The syntax of Mnemonic Keywords are specified..."  To: "The syntax of Mnemonic Keywords is specified..." | OK |
| 5-5 | 5.4.7.3 | 5 | ed | Refers to "Figure 5-2", but that figure does not appear. | David S. Berry / NASA | From: "Figure 5-2"  To: "Figure 5-1" | OK |
| 5-5 (and others) | Fig 5-1 | Many | ed/te | "<Keyword>" is used throughout the figure (and in many places in the document), but that is not a tag in the NHM schema and would violate convention if it were. | David S. Berry / NASA | "Change All" recommended... if you include the XML brackets in the find/replace, it shouldn't be changed in the non-XML places in the document where "Keyword" is in fact desired.  From: "<Keyword>...</Keyword"  To: "<keyword>...</keyword>" | OK |
| 56 | Annex D | Table D-1 |  | Add Table D-1 Table name | RIchon/NASA GSFC |  | OK |
| 5-6 | 5.4.8 | Table 5-1 | ed/te | This Table defines special tags for the XML that are shown in Figure 5-1 without explanation. | David S. Berry / NASA | Suggest moving Table 5-1 before Figure 5-1 since the figure uses the tags defined in the Table. | OK. Moved the table but the descriptions remain in place |
| 57 | Annex D | Table D-1 |  | Last line, Change etc, to etc. (period instead of comma) | RIchon/NASA GSFC |  | OK |
| 5-7 | 5.5.1, 5.5.2 | All | ed/te | These sections supplement the information in 5.4.3.3 with respect to the xsi:noNamespaceSchemaLocation attribute. | David S. Berry / NASA | Move immediately after 5.4.3.3 | I tried to do this and renumber but I’m not entirely certain that this is exactly what you intended --- please check. |
| 60 | Annex E |  |  | Change Explantion of ACS.OBC1.QUAT.V5.F4B to Expla**nat**ion of ACS.OBC1… | RIchon/NASA GSFC |  | OK |
| 61 | Annex F |  |  | Correct hour from T4:00 to T**0**4:00 in START\_TIME (day of month and hour)—2009-06-**29**T**04**:00:00Z | RIchon/NASA GSFC |  | OK |
| 61 | Annex F |  |  | Multiple places. Change date from ‘2009-06-49’ to ‘2009-06-**29’** | RIchon/NASA GSFC |  | OK |
| 61 | Annex F |  |  | Add  DEFINE = ACS.STA1.STAR1.V4.I3B and  DEFINE = ACS.STA1.STAR2.V4.I3B  to match the comments and the data in the message—there are data for both STA1 & STA2, two stars for each star tracker. | RIchon/NASA GSFC |  | OK |
| 6-1 | 6.3.2 | 2 | ed | double opening bracket | David S. Berry / NASA | From: [[2]  To: [2] | OK |
| 6-1 | 6.3.3 | 3 | ed | double opening bracket | David S. Berry / NASA | From: [[2]  To: [2] | OK |
| 6-2 | 6.3.4 | 2 | ed | double opening bracket | David S. Berry / NASA | From: [[2]  To: [2] | OK |
| 6-2 | 6.3.4 | 2 | ed | Typo (or=>of) | David S. Berry / NASA | From: "...allowable range or Values"  To: "...allowable range of Values" | OK |
| 6-2 | 6.3.5 | n/a | te | This section as currently written doesn't allow for text values in lower case that come from telemetry, some of which might be meaningful as lower case text. | David S. Berry / NASA | Add exception for text "measurements" that come in telemetry. | Please check to see if what I’ve done removes the problem. |
| 64 | Annex G |  |  | Change **V4** to **V5** (q1,q2,q3,q4, qual flag): <DEFINE>ACS.OBC1.QUAT.**V4**.F4B</DEFINE>  and here: <Keyword>ACS.OBC1.QUAT.**V4**.F4B</Keyword> | RIchon/NASA GSFC |  | OK |
| 71 | Annex I | Table I-2 |  | NHM-D01, Trace column: Change 3.1.**9** to 3.1.**6**. Section 3.1.9 does not exist | RIchon/NASA GSFC |  | OK |
| 73 | Annex J | Fig J-1 |  | Diagram-first line of Mnemonic Keyword needs text sized smaller or border/box made bigger. | RIchon/NASA GSFC |  | It’s OK in the WORD Version |
| 73 | Annex J | Fig J-1 |  | Diagram: Spell Man**dat**ory correctly | RIchon/NASA GSFC |  | OK |
| 73 | Annex J | Fig J-1 |  | Center the title for Fig J-1 | RIchon/NASA GSFC |  | WORD thinks it’s centered |
| 8 | Document Control | W11 |  | Version W11/description, there is a repeated word. Change ‘of of’ to ‘of’. | RIchon/NASA GSFC |  | OK |
| A-2 (labelled H-2) | A1.2 | 1 | ed | article disagreement | David S. Berry / NASA | From: "... a NHM..."  To: "... an NHM..." | Fixed in several places |
| A-2 (labelled H-2) | A1.2 | 8-9 | ed | Reference Column: 2 little errors | David S. Berry / NASA | From: "...or table in Navigation Hardware Message(CCSDS..."  To: "...or table in the Navigation Hardware Message (CCSDS..." | Changed to NHM and added space |
| A-4 (labelled H-4) | A2.1.4 | last table row | ed | The last table row is blank, and can thus be deleted without impact. | David S. Berry / NASA | Delete last blank row. | OK |
| A-5 (labelled H-5) | A2.1.5 | 1.2.1 | ed/te | I don't know that the Time Format needs to be in this list... almost every line in the NHM has some type of format requirement. | David S. Berry / NASA | Remove line | OK |
| A-5 (labelled H-5) | A2.1.5 | 1.4 | ed/te | Hmmm... Not sure that the Header order needs to be in this list, but it is an interesting thought. | David S. Berry / NASA | Discuss (?) |  |
| A-5 (labelled H-5) | A2.1.5 | 1.5 | ed/te | "Comment" is not in the correct place in the Requirements List | David S. Berry / NASA | From: 1.5 Comment  To: 1.2 Comment (and move after 1.1 NHM Version) | OK … and renumbered items |
| A-5 (labelled H-5) | A2.1.5 | 2.7 | ed/te | "Comment" is not in the correct place in the Requirements List | David S. Berry / NASA | From: 2.7 Comment  To: 2.2 Comment (and move after 2.1 Start, also make it "Metadata Start", analogous to "Data Start" later in the table) | OK … and renumbered items |
| A-5 (labelled H-5) | A2.1.5 | 2.9 | ed/te | Hmmm... Not sure that the Metadata order needs to be in this list, but it is an interesting thought. | David S. Berry / NASA | Discuss (?) |  |
| A-5 (labelled H-5) | A2.1.5 | 3.3 | ed/te | "Comment" is not in the correct place in the Requirements List | David S. Berry / NASA | From: 3.3 Comment  To: 3.2 Comment (and move after 3.1 Data Start) | OK … and renumbered items |
| A-5 (labelled H-5) | A2.1.5 | All | ed/te | The document reference column is blank | David S. Berry / NASA | Fill in document references (alternatively, wait until the final version to avoid having to do it over and over ... | WAIT |
| All | Every section |  |  | Footer – correct the version number to ‘**W14**’ in each section (some show ‘W914’, some show ‘W94’) | RIchon/NASA GSFC |  | OK |
| All | Every section |  |  | Footer – correct the date to Nov 20**15** in each section | RIchon/NASA GSFC |  | OK |
| B-1 (labelled H-1) | Table B-1 | SCLK | te | The Note on SCLK does not mention the ICD | David S. Berry / NASA | Because the spacecraft clocks can be very exotic, the definition should be provided in the ICD. Add this to the "Note". | OK |
| C-2 (labelled H-2) | C1.12 |  | ed | The "XML Schema" section number should be C2.1 | David S. Berry / NASA | Hopefully this will automatically change when C2 is numbered. | OK |
| C-2 (labelled H-2) | C1.12 |  | te | The link to the schema is not included | David S. Berry / NASA | Add the link to the NHM schema: http://sanaregistry.org/r/ndmxml/ndmxml-1.0-nhm-1.0.xsd | I put in the link but I couldn’t follow it in a browser. |
| C-2 (labelled H-2) | N/A | after header | ed/te | The paragraph under "SANA Considerations" should be supplemented. | David S. Berry / NASA | From: Existing.  To: "The following NHM-related items will be registered with the SANA operator. Requests to add information to any of the registries should be sent to "info@sanaregistry.org. The registration rule for new entries in the registry is that new requests will be considered by the CCSDS Area or Working Group responsible for the maintenance of the NHM at the time of the request." | OK |
| C-2 (labelled H-2) | N/A | sec header | ed | The "SANA Considerations" section should be numbered "C2" | David S. Berry / NASA | Add section number. | OK |
| C-3 (labelled H-3) | C1.13 |  | ed | The "Hardware Types and Units" section number should be C2.2 | David S. Berry / NASA | Hopefully this will automatically change when C2 is numbered. | OK |
| C-3 (labelled H-3) | N/A | sec header | ed | The "Patent Considerations" section should be numbered "C3" | David S. Berry / NASA | Add section number. | OK |
| D-1 (labelled H-1) | N/A | para 4 | ed | The column number is incorrect. | David S. Berry / NASA | From: "The first column ('Value') contains..."  To: "The second column ('Value') contains..." OR  "The 'Value' column contains..." (this one is probably better) | OK |
| D-1 (labelled H-1) | N/A | para 5 | ed | The column number is incorrect. | David S. Berry / NASA | From: "The second column (' Mnemonic Keyword Field ') identifies..."  To: "The first column ('Mnemonic Keyword Field') identifies..." OR  "The ' Mnemonic Keyword Field ' column identifies..." (this one is probably better) | OK |
| D-1 (labelled H-1) | N/A | para 5 | ed | Awkward. Requires reader to go back into the document. | David S. Berry / NASA | From: "... the type or field for the Value as described in Table 4-2."  To: "...values for the System and Hardware Type fields in the Mnemonic Keyword." | OK |
| D-1 (labelled H-1) | N/A | para 7,8,9 | ed | These paragraphs start with "third", "fourth", and "fifth" respectively. | David S. Berry / NASA | Consider just using the heading of the column instead of the number. | OK |
| D-1 (labelled H-1) | N/A | para 9 | ed/te | Justification for the ICD would be useful. | David S. Berry / NASA | From: "An ICD should be used..."  To: "Because spacecraft instrument units are often instrument specific, even for hardware that perform similar functions, an ICD should be used..." | OK |
| D-2 (labelled H-2) | H/W Type, Value column |  | ed | The values should be sorted alphabetically, but this is difficult to do with merged table cells. | David S. Berry / NASA | From: existing sort  To: alphabetical sort | OK. It was tough but it gave me the opportunity to notice a couple of other desirable changes. |
| D-2 (labelled H-2) | H/W Type, Value="ACC", Units |  | ed/te | Shows "m/s^2", which most readers should know means "m/s2", but we shouldn't assume, and we have nothing in the "Definitions and Conventions" section to indicate what this means. | David S. Berry / NASA | From: "m/s^2"  To: "m/s2" | OK |
| E-1 (labelled H-1) | N/A | N/A | ed | On the headings for "Explanation of ...", the first heading is underlined partly, and the other two have no underlining. | David S. Berry / NASA | Be consistent. Probably best to underline all these headings. | OK |
| E-1 (labelled H-1) | N/A | N/A | te | EYECURRENT: The statement about the binary Quality flag is insufficient to determine its meaning. | David S. Berry / NASA | Should add "0 = valid data, 1 = invalid data", or the opposite. Since this is just an example, either will do. | OK |
| E-2 (labelled H-2) | N/A | N/A | ed | THM.AST1.TEMP: The table states that the location of the sensor is not required, but the explanation says it is useful. | David S. Berry / NASA | Consider adding a phrase at the end "..., but is not required for processing." | OK. Made even more clear. |
| E-2 (labelled H-2) | N/A | N/A | te | ACS.OBC1.QUAT: The statement about the binary Quality flag is insufficient to determine its meaning. | David S. Berry / NASA | Should add "0 = valid data, 1 = invalid data", or the opposite. Since this is just an example, either will do. However, again since this is an example, it should be the OPPOSITE of whatever is chosen for EYECURRENT. | OK |
| F-1 (labelled H-1) | N/A | N/A | te | START\_TIME: The date part of the time is invalid | David S. Berry / NASA | From: 2009-06-49  To: 2009-06-29 (or "09" or "19" or some other valid value) | OK |
| F-1 (labelled H-1) | N/A | N/A | te | START\_TIME: The time part of the time is invalid | David S. Berry / NASA | From: 4.:00:00Z  To: 07:15:00.6Z | I want to include a case where the start time is earlier than the time of the first data point. This is allowed because data will not be processed if it is before the start time but can be processed if it is equal to or after the start time. |
| F-1 (labelled H-1) | N/A | N/A | ed | Second "DEFINE" block comment is inconsistent with the Mnemonic keyword | David S. Berry / NASA | From: ACS.STA2  To: ACS.STA1  Or  Change comment to refer to "Star tracker 2"  Probably changing the comment is better since most of the keywords in the Data Section use STA2 | Added STA1 instead of changing STA2 to STA1 |
| F-1 (labelled H-1) | N/A | N/A | ed | Third "DEFINE" block comment is inconsistent with the Mnemonic keyword | David S. Berry / NASA | From: ACS.STA2  To: ACS.STA1  Or  Change comment to refer to "Star tracker 2"  Probably changing the comment is better since most of the keywords in the Data Section use STA2 | Duplicate of above |
| F-1 (labelled H-1) | N/A | N/A | ed/te | Define block for "THM.IRU1..." defines a keyword that is not used in the Data Section. | David S. Berry / NASA | This is probably not a problem, and in fact one can imagine that a mission might have a standard set of Define Blocks for the spacecraft that may not always be present in the Data Section. Don't know if you did this on purpose, but we don't have anything in the text that indicates that this situation is OK (i.e., Mnemonic Keyword defined, but not used in the data). | In order to clarify I added a comment in the DEFINE Block for this data |
| F-1 (labelled H-1) | N/A | N/A | ed/te | Define block for "THM.IRU1..." contains an inconsistency between the Measurement Count and Measurement Type fields. | David S. Berry / NASA | From: "V4.F6B"  To: "V4.F3B" or "V7.F6B" | OK |
| F-1 (labelled H-1) | N/A | N/A | ed/te | The second and third lines in the Data Section use a Mnemonic Keyword that is not defined in the Metadata Section. | David S. Berry / NASA | From: "STA1" to "STA2" to correspond to the DEFINE keywords.  I don't know if this was done on purpose, however, we don't have anything in the document saying what happens if someone has data that is not defined... should processing stop? or should the data just be ignored (undefined keyword)? | Added STA1 data instead of changing STA1 to STA2 |
| F-1 (labelled H-1) | N/A | N/A | ed/te | The date part of every Hardware Data Record is invalid ("day" field is "49"). | David S. Berry / NASA | From: existing 49  To: Value chosen for START\_TIME field. | OK |
| G-1 (labelled H-1) | N/A | N/A | ed/te | Sample was designed to match that of Annex F, but it contains "STOP\_TIME" which was removed from Annex F. | David S. Berry / NASA | Remove "<STOP\_TIME>" line. | OK |
| G-2 (labelled H-2) | N/A | N/A | ed/te | Define block for "THM.IRU1..." contains an inconsistency between the Measurement Count and Measurement Type fields. | David S. Berry / NASA | From: "V4.F6B"  To: "V4.F3B" or "V7.F6B" | OK |
| G-2 (labelled H-2) | N/A | N/A | ed/te | Define block for "ACS.OBC1..." contains an inconsistency between the Measurement Count and Measurement Type fields. | David S. Berry / NASA | From: "V4.F4B"  To: "V5.F4B" | OK |
| G-2, G3 (labelled H-2,H-3) | N/A | N/A | ed/te | All keyword tags in the Data Section are erroneous. | David S. Berry / NASA | From: "<Keyword>...</Keyword>  To: "<keyword>...</keyword> | OK |
| G-3 (labelled H-3) | N/A | N/A | ed/te | Hardware data record for "ACS.OBC1..." contains an inconsistency between the Measurement Count and Measurement Type fields. | David S. Berry / NASA | From: "V4.F4B"  To: "V5.F4B" | OK |
| General |  |  | Gn | For many of these data types an orientation wrt body frame (and/or inertial) may be needed. Are those to be defined in an ICD for a particular mission or is there a complementary message needed for the NHM that defines sensor location? | Cheryl J Gramling/NASA | Offer a way to determine the sensor location in the NHM document, perhaps defined in ICD or another CCSDS Nav message. | **This should be in the ICD.** The location is in THM.AST1.TEMP.V3 in Annex E. Location is often needed for hardware such as thrusters but is generally not needed for attitude sensors. For sensors such as GPS coordinate systems are essential but I don’t have a good example of this type of hardware. |
| General | V14; 1.1 | 2 | te | Why is this limited to ground system exchange? Has any thought been given to using this to exchange data on a crosslink between SC or is the ASCII a preclusion? | Cheryl J Gramling/NASA |  | There is already a standard for exchange of data between space and ground and between space and space. |
| General; H-2 | Annex D |  | gn | How would one handle a nav measurement derived from a COM system, under NAV or under COM? Where would items like oscillators fall, if not directly associated with CDH, COM, or NAV, but the overall spacecraft? | Cheryl J Gramling/NASA | A few additional examples may be helpful. | The System field (see Annex D) would be COM. We don’t have a System Field of “NAV”. |
| H-1 | [H1] | [H1] | ed | Typo | David S. Berry / NASA | From: "CCSDS (has unnecessary leading quote)  To: CCSDS | OK |
| H-1 | [H2] | [H2] | ed | Error in publication date | David S. Berry / NASA | From: November 2010  To: May 2010 | OK |
| H-2 | Table D-1 | Hardware Type | te | Under GNS, under Description, carrier phase and Doppler are missing. | Cheryl J Gramling/NASA | Suggest including all data types. | This table is intended to contain examples rather than be exhaustive. |
| H-2 | Table D-1 | Hardware Type | Te | Missing data item descriptors from the COM system such as pseudo-range, Doppler, or carrier phase. | Cheryl J Gramling/NASA | Suggest including data items from COM systems. | See above |
| H-2 | Table D-1 | Hardware Type | Te | Missing Hardware item oscillator with associated descriptor (could be frequency offset or bias, base frequency, …) | Cheryl J Gramling/NASA | Suggest including oscillators as part of the nav hardware complement. | See above |
| H-2 | Table D-1 | Hardware Type | Te | The System field offers THM and PWR, but there are no Hardware Types associated with the thermal or power subsystems. | Cheryl J Gramling/NASA | Suggest adding in thermal and power subsystem Hardware types, such as unit temperature (°C, °K), voltage (V), power [consumed/used/required] (J, W), etc. | See above |
| I-1 (labelled J-1) | Table I-1 | NHM-P01 | ed | Trace error | David S. Berry / NASA | From: 3.1.7  To: 3.1.5 | OK |
| I-1 (labelled J-1) | Table I-1 | NHM-P02 | ed | Trace error | David S. Berry / NASA | Remove Annex B trace | OK |
| I-1 (labelled J-1) | Table I-1 | NHM-P04 | ed | Trace error | David S. Berry / NASA | Add Annex B trace | OK |
| I-1 (labelled J-1) | Table I-1 | NHM-P05 | ed | Trace error | David S. Berry / NASA | From: 5-1  To: 6.2.2 | OK |
| I-1 to I-3 | Annex I |  | Ed | Pages in Annex I are labeled J-1 through J-3 | Dale Force/NASA | Convert J to I | OK |
| I-2 (labelled J-2) | Table I-1 | NHM-P09 | ed | Trace error | David S. Berry / NASA | From: 5.3.16  To: 4.3.16 | OK |
| J-1 | Figure J-1 | N/A | ed | Typo in "Key" | David S. Berry / NASA | From: "Manditory"  To: "Mandatory" | OK |
| J-1 | Figure J-1 | N/A | ed | Positioning of "HEADER" is a little misleading | David S. Berry / NASA | Consider moving "HEADER" down slightly (similar to what was done with "METADATA") so that the logical place to start is the "NHM" block at the very, very top. Right now the "HEADER" is the perceived start. | OK |
| J-1 | Figure J-1 | N/A | ed | Typo | David S. Berry / NASA | From: "Mnemonic Keywords"  To: "Mnemonic Keyword" (there's only one of them in each line) | OK |
| J-1 | Figure J-1 | N/A | ed | Wrong word in "MNEMONIC KEYWORD" blow-up | David S. Berry / NASA | From: "Value Count"  To: "Measurement Count" (per Table 4-2) | OK |
| J-1 | Figure J-1 | N/A | ed | Wrong word in "MNEMONIC KEYWORD" blow-up | David S. Berry / NASA | From: "Data Type"  To: "Measurement Type" (per Table 4-2) | OK |
| Many | 5,6 |  | Ed | Pages in sections 5 and 6 are numbered at the bottom as H-5-1, etc. and should be 5-1, etc. | Dale Force/NASA | Remove H- from page number | OK |
| Many | Annex A-G |  | Ed | Pages in Annexs A-G are numbered H-n instead of a-1, B-1, etc. | Dale Force/NASA | Convert H to correct Annex letter | OK |
| n/a | n/a |  | te | General: In the effort to be creative with the NHM and re-write sections that exist in other Nav WG documents, there is now no section analogous to section 4.3 in the TDM, which describes formatting for all values in the KVN representation of an NHM. There was formerly such a section in the NHM, but it appears to have fallen by the wayside. | David S. Berry / NASA | Consider restoring a section(s) that provide formatting information for integers, exponential notation, case of text values, etc. as is found in section 4.3 of the TDM. There is a section in the XML syntax (6.3) that provides such information for XML instantiations. | I’ve added the relevant information that was in the TDM to 4.1 (NHM KVN Syntax : General). I’ve rewritten some of it to fit better. |