| **Pg** | **Sec** | **Para** | **Line** | **Type** | **Comment/ Rationale** | **Reviewer (Name/Agency)** | **Suggested Disposition** | **Final Disposition**  **(Do Not Fill In)** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1-1 | 1.1 | 2 | 3 | ge | If I am not mistaken, we agree to not specify the exchanges as taking place only between space agencies based on comments I got for the Green Book. | Juan Carlos Raymond/NASA GSFC. | Should the exchanges take place between participants, which are space agencies and commercial companies? |  |
| 1-1 | 1.1 | 2 | 1 | ed | The word standard should be used only once. | Juan Carlos Raymond/NASA GSFC. | The first sentence should read “This Navigation Hardware Message (NHM) Proposed Standard specifies a message format..” |  |
| 1-1 | 1.1 | 2 | 3-5 | ed | “hardware data” was multiple times in the same sentence. | Juan Carlos Raymond/NASA GSFC. | Revise the second sentence within this paragraph. For example, you could say that such exchanges are used for distributing hardware data included in the spacecraft telemetry received by one ground functional group to a group responsible for the analysis and determination of the orbit and attitude, and for the control and reconstruction of spacecraft maneuvers. |  |
| 1-1 | 1.1 | 2 | 7 | ge | I am unsure if the performance of the hardware and of the onboard use of the hardware data sounds right in here. | Juan Carlos Raymond/NASA GSFC. | Wouldn’t it be better to say that the data is then used to perform ground attitude determination and in some cases orbit determination and reconstruction of maneuvers, and monitor and analyze the performance of the hardware used for navigation? |  |
| 1-1 | 1.1 | 2 | 8 | ge | Software development is done not only by space agencies. | Juan Carlos Raymond/NASA GSFC. | Space agencies should be removed out of this sentence. |  |
| 1-1 | 1.1 | 3 | 1-2 | ge | What is the purpose of this sentence? It is already mentioned in the first paragraph, and it is unnecessary to indicate what specific ground element function receives and distributes telemetry. | Juan Carlos Raymond/NASA GSFC. | Remove. |  |
| 1-1 | 1.2 | 1 | 1-2 | ge | I think that it makes more sense to say that the message is designed for navigation applications that **required** input of spacecraft hardware data. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-1 | 1.2 | 1 | 2-4 | ge | I think that the most important applications are attitude and orbit determination, and and sensor and software parameter calibrations. Other software applications include the performance analysis and monitoring of the spacecraft navigation hardware and processes. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-1 | 1.2 | 1 | 6 | ge | I do not understand what you meant by hardware data includes data that results from onboard processing of its data produced by the hardware. | Juan Carlos Raymond/NASA GSFC. | I think that “produced by the hardware” should be removed in this sentence. |  |
| 1-1 | 1.2 | 1 | 9 | ed | Missing comma (,) | Juan Carlos Raymond/NASA GSFC. | A comma (,) is missing before “the standard. |  |
| 1-2 | 1.2 | 3 | 1 | te | What do you mean by accuracy? | Juan Carlos Raymond/NASA GSFC. | Do you mean the accuracy of the data? Or, how accurate (or applicable) a NHM can be? |  |
| 1-2 | 1.3 | 1 | 3-5 | ge | The standard does not address transmission between ground to ground stations, either. The proposed standard is applicable only to the format and content of the navigation data inside the message. | Juan Carlos Raymond/NASA GSFC, | I think that you could say that the document does not address the transmission of the message. The proposed standard is applicable only to the format and content of the navigation data inside the message. You already mentioned that the telemetry data is transmitted from the spacecraft to the ground stations according to establish standards and this document is only applicable for messages transmitted ground to ground. |  |
| 1-2 | 1.4 | 1 | 1-2 | ge | I think you should say that the spacecraft hardware data are used for many required ground-processing functions. Navigation Hardware data is essential to perform the underlying functions of navigation. But, … | Juan Carlos Raymond/NASA GSFC. | See comment.. |  |
| 1-2 | 1.4 | 2 | 1 | ed | Missing comma (,) | Juan Carlos Raymond/NASA GSFC. | Missing comma (,) after the “In order for a standard to be useful” |  |
| 1-2 | 1.4 | 2 | 1 | ed | “apply” should be “applies” | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-2 | 1.5 | First bullet | 1 | te | Section 1 not only contains a description of the structure of the document and the conventions and material used in it. It also talks about the purpose and scope of the proposed standard. | Juan Carlos Raymond/NASA GSFC | See comment… |  |
| 1-2 | 1.5 | 2nd-6th bullet | all | te | Wouldn’t it be better to have the section about the syntax used in the NHM in KVN format after the structure and content of the NHM in the KVN format? The same for the XML format. In my opinion, it is better if both are presented following each other as opposed to presenting the CML structure and content and then the KVN format again. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-3 | 1.5 | 6th bullet in this section | 1 | ed | Although Annex A does not have content at the moment, it should listed in a separate bullet. It is now in the bullet for the content of Section 6. | Juan Carlos Raymond/NASA GSFC. | Annex A content or description should be in a separate bullet. |  |
| 1-3 | 1.5 | 7th bullet in this section | 1 | ed | Typo. | Juan Carlos Raymond/NASA GSFC. | Suggest removing A in Annex BA. It should be only Annex B. |  |
| 1-3 | 1.5 | 7th bullet in this section | 1 | ed | The only accepted normative values are provided in the table. The content of the annex B in section 1.5 should specifically mention that only the normative values for the time\_system keyword are normative. | Juan Carlos Raymond/NASA GSFC. | Suggesting changing the content of Annex B in section 1.5 to say that the only normative values are for the TIME\_SYSTEM keyword. |  |
| 1-3 | 1.5 | all | all | te | I think Annex C should go before Annexes A and B. It is better to look at the normative and informative defined keywords in continuous Annexes. | Juan Carlos Raymond/NASA GSFC. | Suggest moving Annex C before Annexes A and B. |  |
| 1-3 | 1.5 | 14th bullet in this section | 1 | ed | Needs space between Annex J and contains. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-3 | 1.6 | 1 | 2 | ed | Error in the cross-references. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-3 | 1.6.1 | 2 | 1 | te | It is hard to understand what the physical parts of the spacecraft relate to the hardware onboard spacecraft as the source of the data. | Juan Carlos Raymond/NASA GSFC. | I think the definition of the Navigation hardware should be more specific. I think that physical parts should be replaced with actuators and sensors that provide the measurements for orbit and attitude determination and control, or something of this nature. |  |
| 1-3 | 1.6.1 | 3 | 1&2 | ed | I think it sounds better if you say that the navigation hardware data includes all the measurements and post-processed data values and results obtained from Navigation Hardware. | Juan Carlos Raymond/NASA GSFC. | See comment.,. |  |
| 1-4 | 1.6.1 | 1 | 1 | ed | I think you could say that the Measurement represents a value or descriptive state of that property. | Juan Carlos Raymond/NASA GSFC. | I think that the measurement could be a value or a descriptive state of the property. It is unnecessary to say that the measurement represents a measurement. |  |
| 1-4 | 1.6.1 | 2 | 1 | te | Does the XML denote a language or a format? | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-4 | 1.6.1 | 3 | 2 | ge | Why did you say that the definition of ICD is not limited to document with that title? | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 1-4 | 1.7 | 1 | 1 | ge | It sounds better if you say that the following documents contain or constitute, through reference in this text, provisions of this proposed standard. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| all | all |  |  | ge | There are extra blank pages between major sections of the document. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 2-1 | 2.2.2 | 1 | 3 | ed | Why is the content of the NHM separated into 3 basic types of computer data structures? There is also a typo. | Juan Carlos Raymond/NASA GSFC. | I think the computer data structures are different to the message content structure you are referring to in this paragraph. If you are using types. Shouldn’t structures be used instead of structure? |  |
| 2-1 | 2.2.2 | 1 | 4-7 | ed | I think the verb “define” is used too many times in the last sentence. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 2-1 | 2.2.3 | 1 | 2 | ed | Spell out the XLM acronym. Or, KVN should not be spelled out. You can spell them out here as a first use in this section, but you already included them in the terms used in this document. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| 2-1 | 2.2.3 | 1 | 4 | ed | Should the ICD specify or identify? | Juan Carlos Raymond/NASA GSFC. | I think the verb specify is more appropriate. |  |
| B-4 | Table |  |  | ge | Typo. | Juan Carlos Raymond/NASA GSFC. | Is “unites” the right word in the note for MET? |  |
| E-4 | Table |  |  | te | I could not find in the SANA registry the Coarse Sun Sensor (CSS) value for the hardware type. Does the I4 mean that the measurement type is repeated 4 times? It would be nice to have an explanation or description of the example under the table or have all the values in the table D-1. It will clearly show the meaning of the mnemonic without having to search and guess the meaning of it. For example, is it 4 eyes or 4 CCSs? | Juan Carlos Raymond/NASA GSFC. | See comment. |  |
| F-1 | Annex F | METADATA | 3 | te | The OBJECT\_ID should be in a separate line | Juan Carlos Raymond/NASA GSFC. | Move the OBJECT\_ID below OBJECT\_NAME. |  |
| F-1 | Annex F | METADATA | 4 | te | I think that the DEFINE keyword next to START\_TIME should be in a different line. | Juan Carlos Raymond/NASA GSFC. | Remove the DEFINE keyword next to the START\_TIME keyword value to a different line or removed it. |  |
| F-1 | Annex F | METADA | 4 | te | Shouldn’t a STOP\_TIME keyword be placed below the START\_TIME and make it obligatory for the NHM? | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| F-1 | Annex F | METADATA | 8 | te | The TIME\_SYSTEM keyword is obligatory and was not included in the example. | Juan Carlos Raymond/NASA GSFC. | See comment… |  |
| F-1 | Annex F | METADAATA | all | te | Without the comments, which are not obligatory (informative), it is challenging to decipher what the values (3 integers, 1 binary, etc) mean. How could someone understand the meaning of the values without the comments? I could not figure out the meaning of V4 in all the mnemonics, either. I initially thought it was 4 values, but saw some with more mnemonics with more than 4, | Juan Carlos Raymond/NASA GSFC. | See comment… |  |