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# MEETING

**Meeting Date** 26/02/2016 **Ref** TEC-MSS/2016/588/ln/MST

**Meeting Place** ESTEC **Chairman** M. Such (TEC-MSS)



Miguel Such  
2016.03.03  
10:58:13 +01'00'

**Minute's Date** 03/03/2016 **Participants** TEC-MSS  
G. Campoli,  
A. Kusumo Adi,  
Space Structures  
Nikolay Asmolovskiy,  
Florian Ruess

**Subject** SpaceBolt technical Feedback (part 1) **Copy** J. Santiago-Prowald (TEC-MSS)

Meeting Minutes	Actions
<p><b>1 INTRODUCTION</b></p> <p>The aim of this teleconference is to provide Space Structures with TEC-MSS first feedback to Space Bolt including some specific questions. As the trial license expires only the 31.03.2016, a second call will be planned at the end of March with the complete feedback.</p> <p>The evaluation was performed from the point of view of a reviewer. In the future, it may refer as well from a design point of view.</p>	
<p><b>2 TEC-MSS FEEDBACK AND DISCUSSION</b></p>	
<p>Refer to Annex 1 (TEC-MSS feedback to Space Bolt – part 1).</p>	
<p>The evaluation was performed from the point of view of a reviewer. In the future, it may refer as well from a design point of view.</p>	
<p>SB user manual attempts to combine knowledge from VDI and ECSS so that the results are compliant to VDI and ECSS. The main different is the female thread failure mode verification which differs</p>	



from VDI and ECSS. The model implemented follows the VDI methodology as the results are generally more conservative and not so far from the ECSS.	
Through the functionality verification, no discrepancies on the results or bugs in the tool were found.	
As a reviewer, it is often difficult to find all input parameters (information from the project) to determine if the MoS are OK. Space Structures clarifies that, due to this problem, the “simplified flange verification” option was implemented in the software. This allows a review even with little input data available.	AI-1 (Space Structures)
It is recommended to add the following functionality: <ul style="list-style-type: none"> <li>- Duplicate flanges within a Bolt group</li> <li>- Include the possibility to create an in-house DB of washers and flanges</li> </ul>	
Helicoil modelling is not included in the tool. The main reason is that this is also not covered in the ECSS standard. Nevertheless, the locking torque effect can be introduced as a prevailing torque.	
It is recommended to introduce examples of Nastran input and result files in the user manual.	
Space Structures will deliver the examples for ESA evaluation	AI-2 (SpaceStructures)
TEC-MSS (GC) will provide two datasets cases of bolt verification to be solved by Space Structures in order to cross check the outcomes.	AI-3 (TEC-MSS)
<b>3 CONCLUSIONS</b>	
A follow up meeting is planned tentatively for the 31/03/2016. ESA will propose a final date according to ESA and Space Structures availability.  ESA thanks Space Structures for their support in this meeting. Space structures thanks ESA for the very valuable feedback provided.	

Description	Action	Due Date
Space Structures to send “simplified flange verification” examples with the inputs provided in AI-3.	AI-1	11/03/16
Space Structures to deliver example inputs	AI-2	29/02/16 (Closed)
TEC-MSS to provide dataset for verification check	AI-3	04/03/16



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# MEETING

<b>Meeting Date</b>	30/03/2016	<b>Ref</b>	ESA-TEC-MSS-MIN-001710
<b>Meeting Place</b>	ESTEC	<b>Chairman</b>	M. Such (TEC-MSS)
<b>Minute's Date</b>	30/03/2016	<b>Participants</b>	G. Campolli (TEC-MSS) F. Ruess (Space Structures) N. Asmolovskiy (Space Structures)
<b>Subject</b>	SpaceBolt technical Feedback (part 2)	<b>Copy</b>	J. Santiago-Prowald (TEC-MSS)

Meeting Minutes	Actions
<b>1 INTRODUCTION</b>	
The aim of this teleconference is to provide Space Structures with TEC-MSS final technical feedback to Space Bolt.	
<b>2 TEC-MSS FEEDBACK AND DISCUSSION</b>	
The two additional examples performed since the first meeting has been performed and the results are as expected.	
ESA appreciates the feedback to the test cases as it showed not only the robustness of the tool but also ways to verify bolt calculations even if the input data is not fully coherent.	
Nevertheless, it is considered that the tool is more focused to the bolt dimensioning and verification rather than on the review process.	
The NASTRAN files delivered have been reviewed and are considered useful for the use of the tool.	
Loads per bolt can be easily imported from a Nastran punch file. However, it is recommended to allow for the selection of a subset of elements or load cases.	
It is recommended to add in the user manual how to select a specific subset of elements.	
The current output report is only the minimum MoS calculation specifying the bolt and load case affected. It is recommended to make possible the reporting of all MoS for each bolt and load cases.	



<p><b>3 CONCLUSIONS</b></p>	
<p>The conclusion from the evaluation period is positive in that all benchmark cases considered have led to the expected results and the user friendliness of the tool allowed quick bolt calculations without apparent errors and in line to the ECSS-E-HB-32-23A.</p> <p>Therefore, it will be technically recommended to ESA TEC-MSS to procure the tool. This recommendation, however, is not binding. Therefore, further financial or programmatic aspects need to be discussed with ESA TEC-MSS and Space Structures management.</p>	

Description	Action	Due Date