FAT | Forschungsvereinigung Automobiltechnik

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Working Group Meeting - χMCF Standardization

>>> Minutes <<<

on Dec 10. 2020, 9:30am – 3:00pm
- Webex Meeting -

Participation

- Nikolaos Economidis (Beta CAE Systems SA)
- Dr. Carsten Franke (PROSTEP AG)
- Dr. Lothar Kaps (VW)
- Dr. Karin Tröndle (VW)
- Dr. Halvar Schmidt (BMW)
- Michael Sauer (Dassault)
- Luc Feuvrier (Dassault)
- Wolfgang Hübsch (Magna ECS)
- Catalin Runcianu (Siemens)
- Timothy Guirguis (Altair)
- Dr. Ulrich Fox (Ford)
- Dr. Robert Schilling (Ford)
- Lorand Kalotai (Ford)
- Dr. Matthias Weinert (Ford)
- Jan Dotter (FAT)
- Stephan Haas (Magna ECS)
- Lars Eilers (Volkswagen-Osnabrück)
- Dr. Jürgen Bruns (Volkswagen)
- Kosmas Gourgounis (Beta CAE Systems SA)

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TOP 0 – Introduction

- new members of the WG introduced
  - Jan Dotter (FAT)
  - Stephan Haas (Magna ECS)
- Observation shared that finding χMCF V3.1 documention with simple key words seems to be more difficult than desired
- Jan Dotter will discuss options to improve this with FAT internal IT

TOP 1 – ISO Workstream

- χMCF was presented to the German ISO representatives (June 16) who support the initiative and later to the Change Mgmt Forum of the ISO TC184/SC4
- Overall positive feedback, the need to align closely with STEP AP 242 expressed by ISO members
- Next step would be the creation of a New Work Item Proposal (NWIP); more detailed advises expected from German ISO rep's
- Next milestone is the ISO meeting in May 2021

TOP 2 – LOTAR

- Dr. Carsten Franke presented χMCF to the LOTAR working group on Dec 1
- LOTAR stands for Long Term Archival and Retrieval
- The LOTAR WG has links to STEP and is in general open to support & use χMCF

TOP 3 - Software Implementation Status of χMCF Standard

- ***ANSA/MetaPost***
  - V21 will support import, export, and editing of χMCF data
  - List of supported key words / joining elements for V21.1 presented
  - For some elements only read is possible so far; for those cases, output will be converted into rivet types
  - Next steps are enabling editing from scripts & extended usage of femdata
- Discussion on <appdata/>:
  - Karin Troendle requests support for <appdata/>
  - ANSA can and will support only if details on the <appdata/> are available and can be understood and processed by ANSA; otherwise there is a high risk data incompatibilities
  - During the discussion, it turns out that <custom_attributes/> of <femdata/> can be used for the related use case
- Discussion on <femdata/>
  - It becomes obvious that there seem to be 2 types of use cases so far for <femdata/>

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- Use case 1: the Pre-Proc writes the <femdata/> block – in this case, design changes drive updates in the <femdata/> written by the Pre-Proc
- Use case 2: a downstream activity (e.g. fatigue) writes <femdata/> - in this case, the Pre-Proc ignores the <femdata/> as compatibility cannot be guaranteed for design changes
- If a downstream activity needs the Pre Proc to output certain <femdata/> it must be described in the related software manual / documentation >> then the Pre-Proc SW vendor can (decide to) create <femdata/> per use case 1
- *A small team (Nick E, Tim G, Stephan H, and Carsten F) will align in more detail and prepare a proposal for the next WG meeting*

- **Altair**
  - Version 21.1 will support χMCF for all connections
  - The version is currently in the quality assurance process
  - Altair wants to use / define solver specific names for the FE realization of joint types; due to the variety of possible realizations which are customer and solver dependent and also highly "dynamic" this is seen as a typical use case for the <appdata/> block
    >> no change to the standard intended / needed

- **Magna / FEMFAT**
  - Import / export of xMCF data realized by the FEMFAT visualizer
  - 1d connections are now implemented
  - FEMFAT uses the <appdata/> to carry special data for efficiency purposes
  - Next step is the implementation of the *pname* attribute in order to support ABAQUS models (ANSA V21 supports *pname*)
  - Halvar Schmidt asks if it is planned to enable the FEMFAT core solver to import and export xMCF >> FEMFAT strategy will rather be to enable the visualizer to work in batch mode but there is no specific plan yet when this will happen

- **HBK / DesignLife**
  - Situation unchanged compared to May 27; project still on hold but seen as important

- **Siemens / LMS**
  - Catalin Runcianu presents latest development(s) which will be released in Version 2021.1
  - A list of those xMCF elements that are being supported with that version 2021.1 will be provided after the meeting. Shared with the minutes.

- **Dassault / CATIA/3DS**
  - Luc Feuvrier presented the current status
  - Dassault has completed an assessment of xMC and concludes that there is no conflict or compatibility issues between the core concept used in the 3DExperience platform and xMCF
  - there have been some observations showing opportunities for further development of xMCF, e.g. consider
    - domain of usage (link tags/attributes to functions that use them, like CAD, CAE, Manufacturing, Cost Estimate, …)
    - PMI information
    - …
  - Implementation of xMCF into Dassault products will be linked to specific projects (to address specific use cases) with customers

- Features being implemented into the software will be made available to other customers subsequently
- xMCF should be linked closely to the STEP standard (AP242)

TOP 4 – Updates on Industry Use Cases

- Juergen Bruns presented one use case for Volkswagen
- The presented use case deploys xMCF to improve efficiency of the BiW model build process
- It allows more streamlined quality checks and debugging iterations when required (data flow downstream and upstream)
- Bolted connections (e.g. for full vehicle model builds) are being done manually yet

TOP 5 – Further Enhancements of xMCF

- **Step Welds (ref.: slide 9 of the ppt working doc)**
  - Agreed to re-use attributes/tags from sequenced connections (section 8.5 in the document of xMCF V3.1; pg 156), i.e. ***margin***, ***spacing,*** augmented by ***length*** (describes the length of a step weld element)
  - It needs to be clarified how the potential disconnect between the over all length of a step weld connection (defined by the <loc_list/>) and the accumulated length from margin/(n-1)*spacing/n*length can be resolved
  - A kind of priority ranking of the parameters and an adjustment strategy needs to be defined
  - *Assignments:* The OEMs shall clarify how they define step welds; based on this feedback, the step weld strategy will be defined. The attached powerpoint (working document during the meeting) shows two potential options
  - It was also discussed what should be done if step weld line will be interrupted by a hole or similar features; one option which is already available would be to define separate weld lines

- **Weld Extensions (ref.: slide 10 of the ppt working doc)**
  - Weld extensions are used to reduce stress concentrations at weld ends
  - Different shapes of weld extensions are used (straight, straight with angle, curved with a radius, …)
  - Free forms are not commonly used yet but should be considered in a definition
  - they could be defined generically outside of the actual connection groups and referenced within the connection group (either intrinsic in the xMCF file or in an external part catalogue)
  - Generic assumption is that weld extensions shall be joint to the actual weld line without gap
  - Similar logic as in step welds could be used to consider the three 3 portions (1 main weld line + 2 weld extensions)
  - Weld extensions would be connected to the base part only

- **Variants (ref.: slide 11 of the ppt working document)**
  - Nick Economidis suggested to look into a working example of variant management with xMCF from BMW, which could be presented in the next meeting (if approved by BMW)
  - Was agreed

- **Weld nut vs Clinch Nut**
  - It was concluded that the current description of weld nut vs clinch nut (as well as for weld bolts vs clinch bolts) in the document should be improved in order to clarify and avoid misunderstandings
  - Also, the need for graphics or pictures in the document was agreed
  - Will be continued in the next meeting
- **Other elements from the backlog**
  - Due to meeting time limit, the other items could not be discussed and will be picked up in the next meeting
  - Part Catalogue
  - Tolerances

It was agreed that a small group shall tackle the tasks outside of the full WG meeting and prepare a proposal for the next meeting. Nick Economidis, Carsten Franke will be the core of this group. Anyone who wants to participate shall contact Nick, Carsten or me.

When an ad hoc working group is required to pursue the ISO NWIP workstream, Nick Economidis and Carsten Franke would support it.

Assignment Summary:

- OEM shall collect the information and share with the team who step welds are being defined in their CAD standards – Matthias Weinert, Halvar Schmidt, Jürgen Bruns
- Small group around Nick Economidis and Carsten Franke shall prepare proposals for the open items for
  - Step welds
  - Weld extensions
  - Description for clear distinction between weld nut and clinch nut
- Nick Economidis to clarify with BMW if their variant management approach can be presented in the next meeting.
- Matthias will include Nick and Carsten when an ISO ad hoc working group will be set up

Next Meeting:

- 20.5. 2021 (webex)