

Conclusions from the

CAD Data Exchange Roundtable discussions

Benoit Riffaud
Per-Olof Friman
David Widegren



1. CAD & PLM tools used?



Pro/E (PTC)
Windchill (PTC)



Pro/E (PTC)
CoCreate (PTC)
Windchill (PTC)



NX 5? (Siemens)
Teamcenter (Siemens)



NX7.5 (Siemens)
Solid Edge (Siemens)
CoCreate 2D (PTC)



CATIA V5 (Dassault)
Smarteam (Dassault)
EDMS/CDD (CERN)



NX 8.5 (Siemens)
Pro/E (PTC)
Inventor (Autodesk)



Creo, Pro/E (PTC)



Solid Works (Dassault)

1. CAD & PLM tools used?

- HL-LHC is a Multi-CAD collaborative project
 - No real surprise, but the list of tools is long...
 - The list of CAD tools will probably evolve over time due to the long project lifecycle.
- Currently, the contractual reference for manufacturing is 2D but 3D is frequently asked for by manufacturer.
 - Formal approval is today done on 2D data only.
- STEP is the de facto 3D CAD exchange format used within the collaboration.
 - Works well for unidirectional read-only exchange.
 - Not suitable for bi-directional exchange requiring modifications (several examples of remodelling mentioned).
 - Official format for 2D data exchange needs to be defined. (PDF, HPGL, etc)

2. Current main processes & workflows for data exchange

- Different identified types of collaborations:
 - Final delivery of completed package. (One-shot)
 - Collaborative design work. (Ping Pong)
- Frequency of data exchange is varying in different work packages. From several times a week to a few months.
- Currently applied methods for data exchange varies between different institutes and work packages. Examples of tools used;
 - EDMS, Plone, Emails, etc
- Communication about modifications is mainly based on informal processes;
 - Emails, video conferences, etc.

2. Current main processes & workflows for data exchange

- Needs expressed concerning common data exchange repository for the collaboration (CAD + other documentation)
 - Possibility to trace data exchanges
 - Notification about changes
 - Avoiding duplication of data
 - Anyhow, all final design documentation must be centralized at CERN (Why wait until last moment?)
- Questions raised concerning exchange frequency in common repository
 - Need to impose minimum update pace / project heartbeat? (Allowed to exchange data more frequently...)
 - Avoid to others to work with obsolete data for too long
 - Allow sharing of data as soon as possible in the project
 -

3. Experience & Lessons learned

- Efficient and easy viewing of CAD data for non-CAD users is needed
 - An absolute must if going towards 3D approval / verification.
- The most efficient CAD data exchange examples were experienced when using the same CAD software on both sides (same version & same release).
- It is required to provide detailed instructions of what CAD data is expected by the project and for the integration.
 - Use of skeletons / simplified models
 - Verifications of geometry of converted models

Important with common language and naming conventions.

Needs expressed for easy access to updated CERN integration environment models.

4. Handovers & Data Ownership

- Strong requirements for means to manage and guarantee access rights on shared data throughout the whole lifecycle.
- Remarks concerning Intellectual Property:
 - Often not an issue for data produced by institutes as long as remaining within the collaboration.
 - For sub-contracted designs more care has to be taken. (Depending on contractual conditions.) Situation to be clarified further.
 - Important that CERN has access to the complete final data set.
- Final delivery of CAD data must contain both STEP and native files.