Conclusions from the

CAD Data Exchange Roundtable discussions

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1. CAD & PLM tools used?

- Pro/E (PTC)  
  Windchill (PTC)

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  CoCreate (PTC)  
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- 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)  
  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.