



Autodesk University Round Table Summary

Please read and delete this section before posting. Use this template to capture the main points and take-aways from your Round Table. After completing, upload it to the Speaker Resource Center (SRC) using the *Upload Additional Class Materials* task no later than **December 15, 2013**. The document will serve as a re-cap for session attendees and a learning resource for the greater AU community.

SESSION TITLE	Electrical in a 3D World: A Roundtable Discussion
SESSION ID	MA2103-R
SPEAKER	Randy Brunette, Janna Spicer, Lee Hollingworth
COMPANY	Autodesk

MAIN DISCUSSION POINTS

- Are you integrating electrical and mechanical design today?
- What is required for a smooth transition?
- What functionality is required?
- What makes 2D to 3D workflows valuable?
- What types of simulation are needed?
- How important is collaboration?



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KEY TAKE-AWAYS

- **Are you integrating electrical and mechanical design today? (And why is it important?)**
 - Need exact cable and wire lengths for
 - BOM, materials ordering/management,
 - cost savings,
 - machine cutting lengths/labeling – automate and reduce MFG cost/time
 - Want to determine electrical loads
 - Collaboration
 - Want a live connection between electrical and mechanical designs (not a transfer file)
 - Want better integration between tools (E-Plan and Inventor desired)
 - Full BOM with all parts (EE and ME)
 - Want 3D design to detect clashes digitally before build
 - Electrical → Inventor → Revit workflow
 - Want time saving design capabilities in Inventor to get 3D benefit (currently working around using Inventor DWG in ACE as a reference, and really doing 2D design)



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- **What is required for a smooth transition?**

- Making workarounds
 - E.g. creating unique part numbers (file names) for components in Inventor, even though it's the same part number used multiple times in design.
 - Currently avoiding pushing BOM from AIP or ACE to SAP. Building from scratch in SAP.
 - Reference Designators in Inventor – creating unique IDs
 - Process changes - Managing disconnected updates (delete a relay from both ACE and AIP designs independently) now done by 1 person, rather than a person from each department
 - Auto-route isn't working on terminal blocks with set direction (internal/external) – routing manually
- Catalog and tag number in Inventor (should work like the panel layout in ACE). Tried to solve by creating electrical components in Inventor. Copy of Content Center 😊
- 3D representation of electrical components (often available from MFG'ers)
- Need method for data sharing and revision control
- Indicate RefDes in a Balloon on drawing
- Want wire lengths available in ACE (it's present in the AIP→ACE XML, just not being used by ACE). Could be translated in as XDATA to ACE, as an attribute on a line (wire)



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- **What functionality is required?**

- Terminal block direction indication (internal/external)
- Parts – need to be able to reuse the same part multiple times in same design with unique RefDes and same part number
- Disconnect in wire numbering. ACE→AIP okay, but going back doesn't work. (Same electrical/logical value in AIP, even though a t-connection is really 2 wires minimum.) Can use a T in ACE to force 2 wire numbers. But still doesn't work in AIP
- Wire lengths in ACE
- One BOM (preference toward getting final BOM from ACE, due to good reporting capabilities)
 - Different MFG groups utilize different pieces of the BOM. EE vs. ME BOM items. Need to be able to separate/differentiate. Some parts are really both Electrical and Mechanical in nature.
- Some benefit to generating a single combined assembly with all electrical and mechanical parts
- Matching up wire types from ACE→ AIP. If EE creates new wire type, have to find a match or create new wire type in AIP library.
- Want Inventor to help minimize wire lengths based on available wireways. Establish segments based on wireways and wire exit direction from every pin on components.
- Different pin numbers on component for ribbon
- Limitation of cable harness/segment linkage between parts and assemblies. Sub-harness desired. Want to be able to reuse and combine with other harnesses.
- Copy Design for electrical and mechanical design. Reuse past project data very heavily on new projects, make changes to what's new. Want this to happen in 1 step, if both tools work well together.



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- **What types of simulation are needed?**
 - Battery studies – how to size battery based on load and desired battery life.
 - Heat generation, thermal analysis, condensation removal from inside a cabinet.
 - Thermal heat map (red=hot, blue=cold). Effect of adding heat sink
 - Showcase visualization of CFD results
 - Can I determine whether a circuit does what it is supposed to? Logical function. Provide signal input, see what comes out.
 - Current drop over length of circuit
 - Push the button – how can I tell if this is working?
 - Power signals: LED indicator
 - See switches/etc open/close as triggered by previous inputs on the schematic.
 - Visual indicators on schematic showing state
 - Calculate weight and sagging of folding panels for strength, when folded and unfolded in various positions
 - Pressure, time
 - Failure analysis, fault study, simulate a brown-out
 - Currently we “over engineer stuff” so we don’t have to worry about it. Reliability is most important for public utilities.
 - ACE Simulation Software for analysis
 - Lower on priority list – other things need to be fixed first
 - Visualize results of simulation in Showcase



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- **How important is collaboration?**
 - Using Vault Pro for data management and sharing
 - Want the Copy Design tool in Vault to support ACE/AIP projects
 - If using Vault for data management, include a task for the receiving engineer that there is a change, and they need to review/adopt/reject it.
 - Include notifications in Vault
 - User is required to write a note about what changes they made when checking in... but users get lazy. (some users in SAP already have revision notification)
 - Team notification vs. individual notification
 - Revision tracking & approval tracking
 - Use ACE “Mark Design” as part of change/revision notification?
 - Notification of changes should be automatic. When drawings are released (not on every single save).