AISC Workshop Notes

11/6/03-11/7/03
NIST Campus
Gaithersburg, MD.

Attending:

John Manuel – Bechtel
Mark Holland – Paxton-Vierling Steel
Ivan Jivkov – Hatch
Steven Partridge – FabTrol
Jim Barr – Bentley
Barry Butler – Design Data
Chris Moor – Tekla
Robert Lipman – NIST
Kent Reed – NIST
Andrew J Crowley, Steel Construction Institute
Mike Pokorski – AceCad
Jason Golla – AceCad

Chuck Eastman – GA Tech
Frank Wang – GA Tech
Seok-Joon You – GA Tech
JaeMin Lee – GA Tech
Joe Dietrich – AISC
Rich Schaefer – Areus Consulting
Gabe Coleman- AISC
Bill Issler - Structural Software Consulting
Adrian Matlack - Structural Software
Consulting
Byung-Hai Lee – Consultant
Elizibeth Shulok - RAM International

The slides presented at the workshop arte available on the GA Tech CIS/2 website, at:
http://www.coa.gatech.edu/~aisc/

Action items are marked with highlight.

DAY 1: 11/6/03

1. **Introduction**
by Gabe and Kent. Chuck gave background on the history and development of CIS/2.

**2. An early DMC Workflow, dealing with DMC and updating changes to
different models** (workflow scenario driven by Hatch)
The scenario dealt with the development of a Design Model that is transferred via
CIS/2 to a Manufacturing Model for detailing. As the project is detailed, change
orders come in, requiring the updates to be entered into the Design Model and
transferred to the Manufacturing Model without losing all the detailing work. Also,
the Design Model needs to be made consistent with the Manufacturing Model if small
changes are made there.

Jim: this is not intended to be restricted to Hatch, but to be general
Chuck: presented the scenario, which involved use of DMC-lite, both applications
carried both the Design Model and corresponding Manufacturing Model, with
structural_frame_item_relationship to crosslink the two models. Both applications
synchronized updates after every import to capture model translation (between a
Design Model and a Manufacturing Model), and comparisons of the two models were

made by each to identify significant changes. Multiple 2-way updates were walked through. The main cross-links were with design_part and located_assembly.

Jim presented a scenario where each of the previous models were retained and the new and old files were compared, identifying the change. Each propagation was reviewed and accepted or dropped by the user. He made the following points:
- o Must be able to view/approve changes made BEFORE importing the changes
- o Must be able to view changes made AFTER importing the changes
- o Must be able to view additional changes BEFORE re-exporting the changes

Mark raised a question about how changing the size of clip angles can change the stiffness of a connection, leading possibly to resizing a member. How is a changed marked? It was agreed that the impacts of a change require human judgment to apply.

Jim and Barry will be implementing the capabilities presented.

Rules to Identify Changes Between Different Types of Models
In detailing, every member will be modified, by adding holes and other features. Chuck presented some of the rules that would identify changes in a Manufacturing Model that are true changes to a Design Model, as versus normal detailing. These included: Moving the location of a member, changing its length, rotation a member, changing its loads or release assumptions. Jim's explicit review example was an alternative to a rule-based system. It was left unclear if such a rule-based system would be implemented at this time.

Steel in Virtual Reality
Bob Lipman gave everyone a tour of the NIST Virtual Reality lab and "cave" demos of their steel modeling. Barry Butler fell 3 stories off of a virtual girder – whoops!

The group adjourned for dinner.

DAY 2 (11/7/03)

Exchange of MIS Data Regarding Status Back to Manufacturing Applications.
Steven reviewed the kinds of status information that could be provided by FabTrol. This included status of an assembly and status of drawings. This included:
- o Drawing status, drawing events, material status, part instance ABM details, work area events, work area status, part detailing, assembly part lists, parts in assembly.

Other status information identified were: pay category, coating status, the difference between forecasted dates and actual, status of certifications, QC status.

Mark pointed out the problem of tracking bolts that are purchased separately from steel, and must be merged into lots as assemblies are shipped.

Frank then presented different scenarios for passing this information back to Manufacturing Applications. Four alternatives were described:
1. Using project_plan_item and reporting status of tasks within process
2. Using item_property directly
3. Using item_property and also item_source_reference_proprietary
4. Using structural_frame_item_relationship to link with structural_frame_process.

After review, it was broadly agreed that Alternative 3, using item_property with an individually defined (at the company or project level) library of status items – a sort of flavor file -- was the most flexible and easy-to-implement way to go.

1. Steven will develop a list of status information the FabTrol can provide, and a way for identifying how it could be tailored for a job or company.
2. GA Tech will try to support this in exporting the data back.
3. GA Tech will provide a tutorial for implementers showing how the data will be modeling in CIS/2.

NASCC '04 Planning
Rich presented the plan for NASCC 2004, in Long Beach, California. It will be held March 24-27. They presented 6 different capabilities to be presented. The following one was added:
   o   Reporting status back from MIS application (Partridge, Eastman, Butler)

SDNF 3.0
Mark initiated a discussion of Intergraph's decision to developed SDNF 3.0. He identified it as a direct attack on the development of a single standard for the US industry. He recommended that the AISC act on this competition to CIS/2 at NASCC and point out the harm it can do to the industry. He cited correspondence from Intergraph agreeing that CIS/2 would be the sole exchange standard.   Joe Dietrich of AISC stated that it would be inappropriate for AISC to reprimand an individual software firm for their lack of compliance.

GT Demonstration
GA Tech gave a short demonstration of a web-based relational database of CIS/2. Joon and JaeMin presented it. The work was partially funded by FabTrol. They accessed the server site at GA Tech, showed multiple projects on the CIS/2 server, retrieved a file, and sent down a file with associated drawing files. They checked the consistency of the P-21 file with the associated drawing files. It showed that one drawing file was missing.

There was a discussion of how the DB combined with the DMC control and access restrictions began to open up a variety of uses:
   o   Putting project models on the web for downloading and bidding
   o   Using such a repository for large projects

o Supporting a flow of project work, such as the Hatch scenario.

CIS/2 Best Practices

Chuck reviewed a set of issues where different CIS/2 translator implementations are using different ways to encode the same information. These are each addressed separately.

- Use of GUID
  - o GUID is not part ID, nor piece mark: it is a system identifier for matching different versions of a data object. The Object-ID is what a company or user assigns (possibly through a program) to track an individual physical item. GUID goes in managed_data_item.instance_id. Object_id goes into structural_frame_item.item_description. A piecemark goes into located_part_marked.piece_mark.

  All translators should follow these methods.
- Use of Bars in detailing
  - o Flat plate is defined in AISC standard as FB and should be referenced in the AISC Shape Database it is often managed ad hoc way now
  - o Detailers should be able to define which are cut from plates and which from flat bars.
- Part finish
  - o To be carried in surface_treatment.surface_finish_specification
  - o Structural_frame_item_relationship: info for 'receiving' part

  SW developers should send GA Tech example files with part finishes.
- Cost codes / prelim marks
  - o Frank noted cost code is assigned to particular structural_frame_item
    Andrew noted LPM/6 added an item_cost_code

  SW developers should send GA Tech example files with preliminary marks.
- Lots and sequences
  - o Frank asked that we need examples of lots and sequence.
    (SDS)Zone_of_structure_seq – none (XSteel)

  SW developers should send GA Tech example files with lots and zones.
- Countersunk holes
  - o Alternative ways of defining them:
    - Use of Feature_volume_curve
    - Counter_sinking ? use of chamfers (feature_edge_chamfer)
      challenge: (Frank noted that for Fabtrol, it's hard to handle)

  A direct method of representing countersunk holes should be considered for LPM/7.
- Consistent material specifications
  - o There are many different ways applications are identifying material. For software to read it, we need a single way. A standard list of materials for steel is needed.

  Gabe will check if there is a reference standard we could use.
- Project specification

  Every P-21 file should have a project specification:

      o Structural_frame_item.project, structural_Frame_item.item_name

Collaboration of CIS/2 and New Developments

- CIS/2 and IAI:

Kent discussed CIS/2 collaboration with IFC. He reviewed the history of IFC.
Mark proposed that an agreement of joint interfaces or functional merging be developed
and signed by NASCC'04. The rationale for this included:
  - That we have strong deployment and can help IAI
  - That IAI has strong visibility and we can benefit from more visibility
  - This integration could head off parallel efforts in Europe

The AISC staff will pursue this joint relationship.

- FIATECH by NIST

   Kent described the development of FIATECH. Their efforts included RFI for tracking
   parts, etc. It was agreed that they should look at CIS/2 as an enabling technology.
   It was pointed out that the leadership of FIATECH is in bed with Intergraph. They
   should be made aware of the problems with Intergraph.

Kent and others will make FIATECH aware of Intergraph problem. All with contact with
FIATECH will push involvement with CIS/2.