



November 02, 2000

The Madison Area SolidWorks® Users' Group (MASWUG) was held on November 2, 2000 at Promega in Madison, WI. We had 39 attendees from 23 companies present.

Introductions

Kent Ziemer of American Superconductor opened with an introduction. The theme of this meeting was finite element analysis.

Case Study

A case study of converting a casting based assembly to plastic

David Strait of GE Lunar took a casting based assembly and converted it to plastic for a \$300 cost reduction and 3 lb (40%) weigh savings. Several materials were evaluated to provide high stiffness, high tensile strength, reasonable impact, stable shrink, water stability, UL approved, and reasonable cost.

The part was originally designed without draft and the plastic molder, PlasTech Engineering, added the draft and sent the model back for interference checking using SolidWorks. SLS prototypes were ordered off the models to locate additional assembly interference problems. The SolidWorks models were also sent to Structural Research and Analysis for stress analysis. The different plastics were evaluated to determine where the stress exceeded the limits of the material. Several modifications were made by GE Lunar to overcome this and the stress analysis was repeated until an acceptable material and stress level was reached.

Main Presentation

FEA stress analysis

Mike Azimi of Structural Research and Analysis presented an overview of Cosmos, an FEA Gold partner of SolidWorks.

The basic steps are:

- Define part geometry and the material



- Define the constraints and the loads
- Mesh the part
- Calculate the stress
- Review the data and process color graphical representations; review AVI files of the strain.

The friendless, cost and speed at which one can do FEA today is greatly improved compared to a few years ago. The auto mesh capability is adequate for many parts. The program has the capability to mesh the important areas tighter for greater accuracy. The designer can also remove small features that are unimportant to the stress analysis to speed up the process. A configuration in SolidWorks can be used to save the FEA model information. For sheet metal and other thin parts, the 2D mesh capability can be used to speed the analysis. Gaps in the part design such as weldments are not permitted. A configuration of the part must be made to close the gap so that the loads can be transferred properly from one piece to the next. Gaps between bearing and shafts must also be taken into account.

Periodic loading at various frequencies can be used to find resonant points. Static, impulsive, and long duration loads can also be used. Buckling analysis can be performed and may occur before the stress level is exceeded.

Cosmos can also be used to solve Non-Linear analysis outside of SolidWorks. For example, a dynamic contact analysis can be done on parts that collide with each other. Heat transfer, conduction, convection, and radiation can also be performed as well as Electro-magnetic analysis.

Purchase or Outsource FEA

George Skupniewicz of Nicolet indicated they decided to purchase the basic package so that the analysis could be done in a timely fashion while the project was in the design phase. At least one person in the company should be trained to be able to help others use the package. He indicated that it is a challenge to keep up to date on the program when one uses the program only a couple of times per year. If one uses FEA 3 or fewer times per year, then outsourcing the work to consultants is more economical than purchasing the package that can range from \$6000 to \$20,000 depending on options. Applied Engineering, Inform Product Development, Paradigm Design, and Structural Research and Analysis are a few companies that can perform FEA analysis.



Types of FEA packages that integrate to SolidWorks

Jeff Osman from SolidWorks indicated that all of the partners are listed on the SolidWorks web page at www.solidworks.com. Below is the current list.

Analysis/FEM/FEA

ADINA System CAEFEM CFDesign for Windows Coolit Certified Gold Product:
COSMOS/Works DesignSpace Certified Gold Product: FloWorks InCADPlus
INERTIA NISA ProCAST Certified Gold Product: visualNastran FEA for SolidWorks

He also briefed us on the 3D instant web site that is available to share information with others without sending them a file that they need to store on their hard drive. It is called 3D PartStream.NET. Once it is fully operational, you will be able to automatically create a web page with your part on it using the SolidWorks server where others can view it using a PASSWORD. If you have a web site, it can be posted there as well. More information can be obtained from the SolidWorks web site under press releases.

He also solicited for enhancements for future revisions. One suggestion was to have the ability to open a drawing from the model. Currently, we can open the model from the drawing.

Web Site Improvements

Time did not permit us to show the complete new Maswug web page www.geocities.com/maswug .

So we are asking for input here. The site is intended to archive meeting notes and post new agendas for meeting. Please review the site and forward any improvements to the new email for Maswug, maswug@hotmail.com . We are also considering setting up an EZboard if people wish to post questions that all of the Maswug' members can read and respond to. An example might be a model that you are having difficulty with and are looking for some guidance. If you think you might use this media, then send email to maswug@hotmail.com . If we have enough interest, we will set one up. A temporary board has been set up for you to view at: <http://pub22.ezboard.com/bmaswug.html>.



Call for Volunteers

Kent Ziemer of American Superconductor solicited for future MASWUG discussion topics. Please send email to maswug@hotmail.com with your topics that you would like covered. Also indicate if you would be willing to give a short presentation on a subject.

1. Advanced surfacing
2. New features in SolidWorks 2001
3. Basics of converting a part model into a drawing, and saving the files in appropriate directories.
4. PDM choices and feature comparisons
5. Libraries and part model usage
6. Would you like breakout sessions on Visual Basic and other topics
7. Enhancement request forum
8. Other

Please forward these minutes to others who work at your company or are interested in joining MASWUG. Please send any secretarial business (i.e. potential new member e-mail addresses for the database, comments about the meeting, the meeting minutes, etc) to: maswug@hotmail.com.

Submitted by MASWUG secretary: Jeff Wong