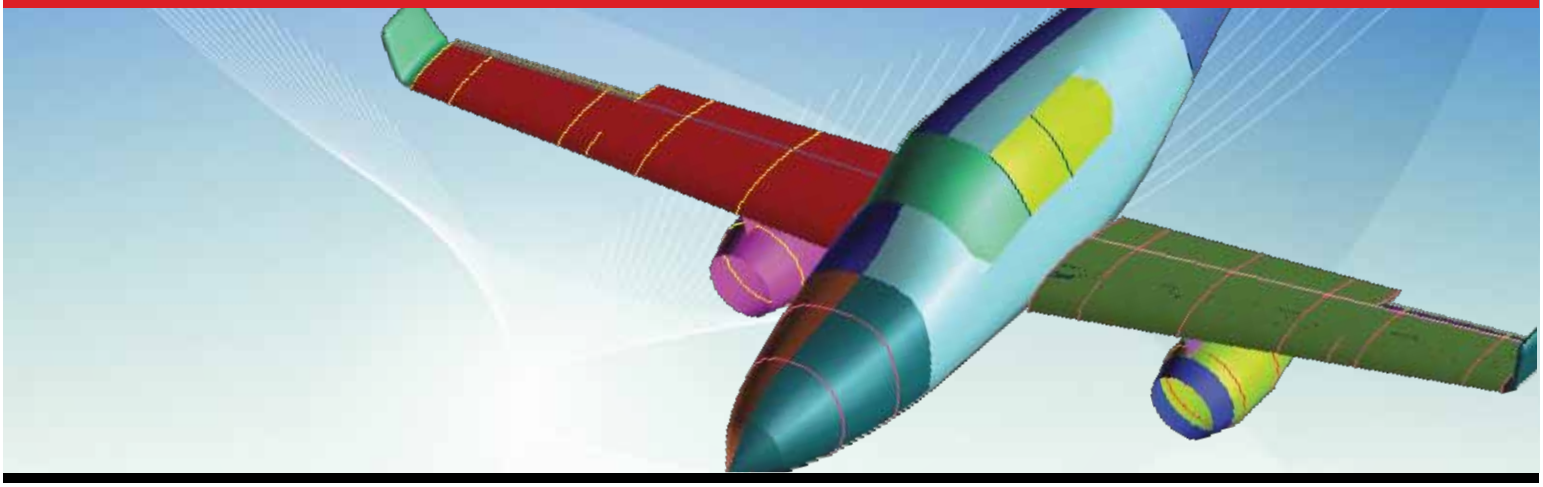
MSC Software

CASE STUDY

MSC Software: Case Study - In Summa Innovation & Fokker Aerostructures

New Methods for Simulation Automation

Breakthrough Results for Fokker Aerostructures



In May 2011, MSC Software, In Summa Innovation, and Fokker Aerostructures entered into a close partnership. In the so-called "Fokker Virtual Lab" the three companies started to do serious research with MSC Software products SimXpert and MSC Nastran. MSC Software and In Summa Innovation provided training and technical support to the partnership while Fokker invested in manpower to execute the specific research activities. The main goal was the investigation of new simulation technologies for (possible) future use. Together the companies developed a detailed plan for the execution of the research which was guided by a steering committee in which Fokker's engineering management participated as well as a representative from In Summa Innovation. All together some 900 man hours have been invested.

The goal of this first project was twofold, 1) familiarization and testing of MSC Nastran, and 2) familiarization with SimXpert to create a prototype for a process to automate the creation of a QA-sheet, the quality assurance of FEM models.

During the project many positive aspects of both tested programs have been found which lead to a positive recommendation to adopt both programs for production work at Fokker.

In Fokker's Virtual Lab, nine benchmarks have been done with MSC Nastran SOL400 which is the fully nonlinear solution integrated in MSC Nastran. Eight of these benchmarks are the standard Fokker certification benchmarks and benchmark number nine was defined to test element offsets. Fokker immediately noticed that only 2 small changes were needed to make an existing MSC Nastran input file (bdf)

Key Highlights:

Industry

Aerospace

Challenge

Investigate new simulation technologies for future use.

MSC Software Solutions

SimXpert & MSC Nastran

Benefits

- Created a prototype for a process to automate the creation of a QA-Sheet.
- Researched new technologies in a joint effort between suppliers and users.
- Developed the process of how to use SimXpert & MSC Nastran in the complete design process outside the production environment.

"Fokker sees SimXpert as the next generation pre- and post- processor and wants to introduce MSC Nastran's Advanced Nonlinear capability as the prime nonlinear solver"

Johan Morsink, In Summa Innovation

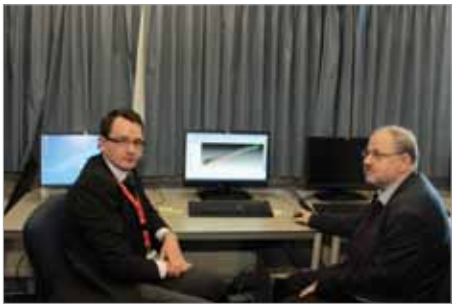
running with SOL400, and this is a great advantage because converting input decks is usually labor intensive and error prone. The results were very good and because SOL400 supports element offsets, accurate results at correct locations were produced. Also larger models were analyzed with good results. Besides SOL400 fully supporting nonlinear analysis with element offsets, it offers support for large rotations (also for rigid elements), full 3D contact, different material properties for tension and compression, VCCT (Virtual Cracks), Acoustic Analysis, Advanced Thermal Analysis, Analysis Coupling (chaining) like Thermo/Mechanical, all within the well accepted MSC Nastran solver solution.

The Multidisciplinary Simulation Solution, SimXpert (supporting Pre and Post Processing for MSC Nastran SOL400), has especially been researched in the domain of process automation using the Template Builder Workspace. A SimXpert Template has been created to automate the creation of Quality-Assurance Sheets. The template comprises of existing built-in library actions which were Marco recorded and Fokker specific script actions. Each User Interface (UI) window that will prompt the user for input was easily generated from within the Template Builder Workspace. Here both the inputs and outputs are defined and necessary data connections are made between actions. Input of the one action is sent downstream to the next. This SimXpert Template gathers information and data from different sources, whether it be direct user input, existing files or from other applications. The user simply defines a project directory and the template then searches and reports back a list of analysis solutions and associated loadcases found. It is then up to the user to define the model from a selectable list for which a QA sheet will be generated. User selectable quality checks, such as: Groundcheck and Element Quality Check, have also been built into this Template, allowing the user to do a complete model verification. The user is free to decide if the quality check results already exist or if an analysis still needs to be performed. The gathered data, including images, is processed and then inserted into a (MS-Word) document with the pre-defined QA sheet layout and formatting. It is entirely up to the user to execute the SimXpert Template completely with pre-defined input or interactively step-wise. This process automation allows Fokker to improve quality and make data integrity easier and faster to achieve. The template can be customized.

Based on our experience, the time needed to develop a QA report (from 25 to more than 100 pages) can be reduced with 50% or more. This delivers an interesting ROI for Fokker. And it provides an improvement in quality through the reduction of errors.

The overall conclusion of this project is that it is worthwhile to research new technologies in a joint effort between suppliers and users. For all parties involved the conclusion is that Fokker sees SimXpert as the next generation pre- and post-processor and wants to introduce MSC Nastran's Advanced Nonlinear SOL400 capability as the prime nonlinear solver.

Based on the results of this project we can expect that new projects can be developed for joint execution in the "Fokker Virtual Lab," an environment intended for the Tools & Methods department of Fokker Aerostructures to not only test software but also develop the process of how to use the software in the complete design process outside the production environment. Fokker and software vendors work closely together on real use cases, positioning of the software, acceptance in the engineering community and the final business case.

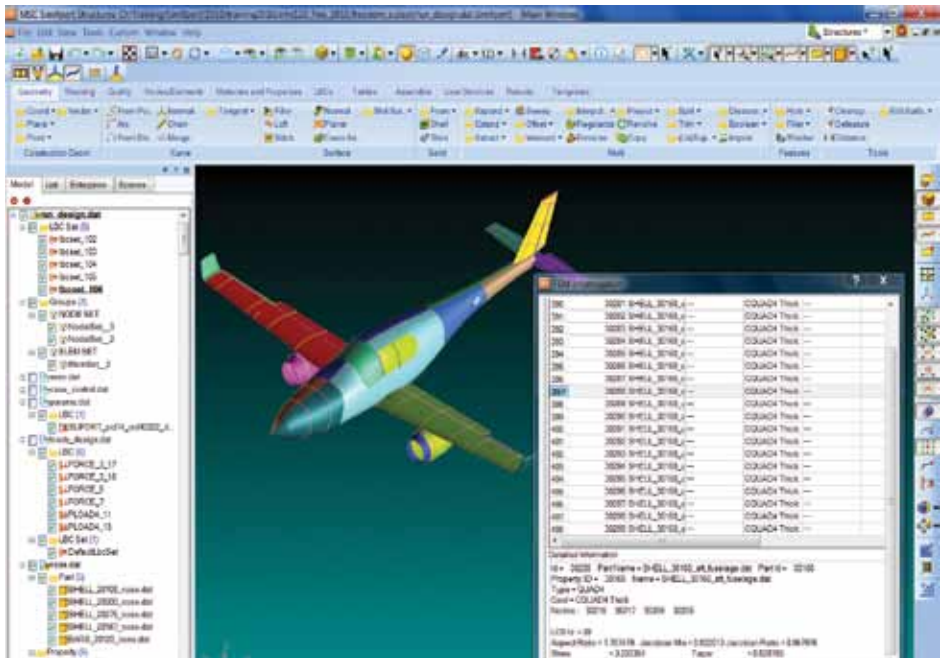


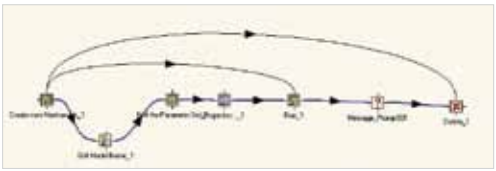
About In Summa Innovation

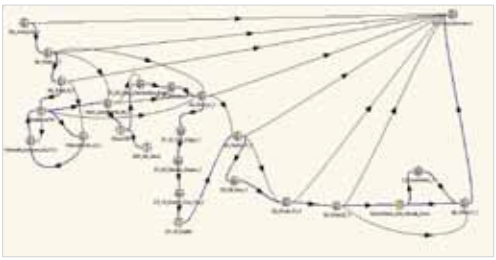
In Summa Innovation is the exclusive agent in Benelux for MSC Software. We deliver CAE applications like SimXpert, SimDesigner, MSC Nastran, Adams, Patran, Marc, Actran and XFlow. In addition to this software we provide our clients support, training, consultancy and engineering services. In Benelux we have more than 150 well respected clients. For more information, please visit: www.Insumma.nl/innovation

About Fokker Aerostructures

Fokker Aerostructures is a company of Fokker Technologies. Fokker Technologies is the group name for four specialized Fokker Business Units: Fokker Aerostructures, Fokker Elmo, Fokker Landing Gear and Fokker Services. Fokker Technologies develops and produces advanced structures and electrical systems for the aerospace and defense industry, and supplies integrated services and products to aircraft owners and operators. The group achieved a turnover of € 616 million in 2010 with 3,700 employees.







About MSC Software

MSC Software is one of the ten original software companies and the worldwide leader in multidiscipline simulation. As a trusted partner, MSC Software helps companies improve quality, save time and reduce costs associated with design and test of manufactured products. Academic institutions, researchers, and students employ MSC technology to expand individual knowledge as well as expand the horizon of simulation. MSC Software employs 1,000 professionals in 20 countries. For additional information about MSC Software's products and services, please visit www.mscsoftware.com.

Please visit www.mscsoftware.com for more case studies

About SimXpert

Multidiscipline Simulation

SimXpert is a next generation CAE application that empowers engineers to perform an expansive range of multidisciplinary simulations by delivering new tools that accelerate learning curves and shorten model preparation and setup times all within a fully integrated user environment.

"Doing more with less" is a common theme in most companies today, but designers, engineers and CAE analysts spend most of their time and effort on manual, labor intensive tasks. Translating and fixing CAD data, meshing, reworking models, creating the same plots and charts over and over – all of these mean that engineers are spending more time developing expertise in using tools rather than on evaluating and understanding their products. SimXpert changes that by providing native access to CAD data and easy to use tools to automate their simulation jobs and get results fast.

About MSC Nastran

Accurate, Efficient & Affordable Finite Element Analysis

MSC Nastran is the world's most widely used Finite Element Analysis (FEA) solver. When it comes to simulating stress, dynamics, or vibration of real-world, complex systems,
MSC Nastran is still the best and most trusted software in the world – period. Today, manufacturers of everything from parts to complex assemblies are choosing the FEA solver that is reliable and accurate enough to be certified by the FAA and other regulatory agencies.

Engineers and analysts tasked with virtual prototyping are challenged to produce results fast enough to impact design decisions, and accurate enough to give their companies and management the confidence to replace physical prototypes. In today's world, nobody has time or budget to spend evaluating the accuracy of their FEA software – you need to know it's right.

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