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BAE SYSTEMS USES THEOREM SOLUTIONS FOR CAD DATA MIGRATION

Nimrod MRA4 data migration brings significant benefits

BAE Systems, one of the world's leading high technology and manufacturing companies has utilised a combination of Theorem Solutions TPM data exchange automation and translation products to migrate Nimrod MRA4 data from CADD5 into CATIA. The project migrates tens of thousands of CADD5 models and drawings into CATIA bringing significant benefits to BAE through the reduction of ongoing costs of running multiple CAD systems. The successful migration process also ensures the retention of valuable intellectual property created over many years.

In the past Nimrod was designed in two CAD systems, the wings were designed in CADD5 and the rest of the airframe in CATIA. Over time Nimrod has evolved into one of the most advanced and versatile airborne systems ever made. A BAE systems project team at Warton in Lancashire England became aware that unification of the design data onto a single CAD system would bring significant benefits both financially and operationally and in 2006 began to investigate the feasibility of migrating the Nimrod CADD5 data into CATIA.

BAE systems were already very experienced in the day to day translation of specific CAD parts from CADD5 into CATIA for their own use and for use within their supply chain and their methods included standard based translators such as STEP and IGES and the use of Theorem's CADverter for 3D model translation. However their experience showed them that translation carried out in low volume and in an interactive manner would not be suitable for the migration of over a hundred thousand models and drawings. The demands on time and manpower alone would make this completely impractical.

In seeking a solution to the limitations of the current process BAE Systems evaluated the batch capabilities of applications at their disposal and reached the conclusion that none of the options provided a complete solution. Their next action was to contact Theorem and open a series of discussions aimed at addressing their problems.

CAD data translation specialists Theorem are not only developers and suppliers of CAD translation products but also provide solutions for a large scale migration projects. Because of this Theorem already has some generic applications that help companies wishing to migrate large volumes of CAD data in the most effective manner. As the parties worked together a solution to BAE's problems began to emerge.

The initial challenge was to demonstrate that the Theorem CADDs to CATIA translator would prove suitable for the translation of the 3D data and since BAE were already a user of this Theorem product it did not take long to confirm. Secondly came the requirement to translate 2D drawings from CADDs to CATIA either associated with 3D models or as standalone 2D drawings. This was a significant challenge but Theorem developed specific application software to solve it and the project reached a stage where the CAD translation problems were considered resolved to BAE's complete satisfaction.

However it had always been known that simply providing batch translation capabilities was not going to meet BAE's full project requirements. The nature of the project meant that the batch processes would need to be monitored and that comprehensive audit trails would be required enabling the cross checking of any translated data back to its original source and showing everything that had happened to it during the migration process. With over 100,000 CADDs files requiring translation into CATIA, if this monitoring and audit trail creation were to be carried out manually, manpower costs alone would have made the whole project unfeasible.

Theorem proposed that BAE consider Theorem Process Manager (TPM), an application specifically designed for the control and management of computer processes and an agreement was made to move forward to a 'Proof of Concept' phase which would entail the automatic combination of the translation processes with automated monitoring and audit trail creation under the overall control of TPM.

Even before this phase could begin it became clear that another significant requirement would need to be included within the TPM automated process.

All translations in the Nimrod project are subject to a checking process. This was planned to be a manual activity undertaken by experienced checkers and it had originally been designed to confirm the validity of relatively small numbers of translations. The migration process would create a high volume of translated data very quickly and the risk was that it would either swamp the existing checkers or require the temporary employment of a great many more checkers. Without automation, data checking would be a significant time bottleneck and add substantial cost to the project.

To solve this problem the decision was taken to utilise checking software and procedures that could be incorporated and automated in the TPM process. A set of appropriate CADDs files was identified and nominated for use as the test data set for the Proof of Concept phase. This enabled a three month pilot to demonstrate that Nimrod 2D and 3D data could be quickly and accurately translated into CATIA, that the translations met the required quality standards, that

checking could be automated, that the results could be easily audited and that the whole migration project could be run under TPM with the minimum of operator intervention.

During the course of the Proof of Concept a number of refinements were made to various aspects of the overall solution the most significant of which was to incorporate a series of automatic exception reports to indicate to checkers where there might be issues in a particular model or drawing. This meant that instead of a final manual checking process that examined a small number of translations at random, the checkers would be directed towards the files that exhibited problems and this resulted in even greater efficiency in the overall project.

The Proof of Concept phase was fully successful and BAE Systems at Warton has since implemented an on-site production system and is now reaping the benefits.

The migration process is under the full control of TPM and only requires the selection of input data and a 'drag and drop' action to initiate a set of translations and all the other activities that are necessary in this demanding project. Comprehensive validation and checking takes place without operator intervention and exception reports provide a small team of checkers with clear indication of which files should be manually examined.

Often in projects of this nature it is difficult to identify tangible benefits but they were very clear in this CADDs to CATIA migration. Effective migration has saved significant future expenditure that would have arisen from operating both CADDs and CATIA. Automatic comparison and validation between CADDs source and post translated CATIA has saved a significant cost through the avoidance of additional manpower and the automatic creation of audit trails saved further manpower whilst providing comprehensive audit reports.

The outcome is a highly successful solution to a complex CADDs to CATIA migration project that demanded not only meeting the technical objectives but also providing very significant savings in time and cost.