

The use of Tech Illustrator™ at Airbus



Already the wide-body A380 “flies over” many of the well-known frontiers of aviation technology. As the world’s largest passenger aeroplane it will carry up to 555 people in its two full-length decks, connected one above the other. And in the future the cargo version will carry 150 tons of cargo. It is still a secret as to whether one day prestigious companies such as Singapore Airlines intend to provide their First- and Business-Class customers, who stay 18 hours on board, with fitness or sleeping rooms in the lower deck of



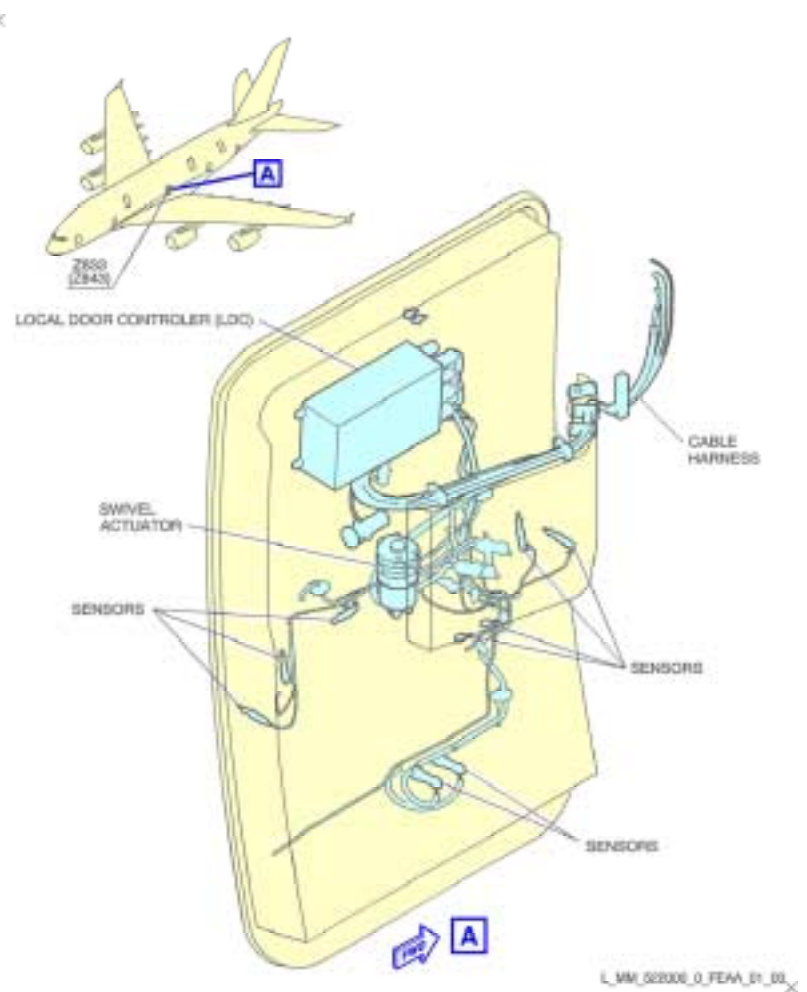
their already ordered aeroplanes. The decision to build the A380 was made in December 2000. As has been stated in the planning phase, about 300.000 illustrations will be necessary for its documentation. One month later, in January, a unique Airbus-Company was founded. “Both events gave the impulse as well as the chance to optimise the provision of the technical illustrations as well as to harmonise the accompanying business processes” remembers Jean-Paul Gerhardt, responsible for the technical illustrations of the

whole group. Thus the ground was prepared to use new possibilities such as the interactivity and online-access in the field of technical documentation. The A380 is thus the first aeroplane at Airbus where these technologies are being used. In 1991, the four individual European companies at the time (Aérospatiale France, British Aerospace Systems, CASA in Madrid and German DASA) had already decided to use one and the same software to provide technical illustrations. But as the programs had been used according to the local needs of each location, different “software releases” had been applied. Moreover, in England the management media used for illustrations were different from those used in France, and those used in Germany were different from those used in Spain. “Thus, as time went on, different applications arose as a reason for lack of standardisation”, Airbus Project Manager Noël Andrieu from Toulouse remembers. An exchange of illustrations in original format is thus only possible with great effort.

Each location and its supplying illustration offices, the so-called contractors, will convert the existing technical illustrations into the TIFF format (CCITT G4) and finally save them in the central archives in Toulouse. Such a quality is sufficient for prints or for the use of documents in paper form. When an illustration is also needed in another location it will be delivered using this raster format.

Definition of a standard catalogue

Since the merger of the individual companies, the aim of Airbus has been to obtain a better “look and feel” for the whole technical documentation and provide them with additional features which allow any customer and location to identify them as an Airbus illustration. For instance, all illustrations have to be prepared in WebCGM format (using the WebCGM Plug-In from Auto-trol Technology) for an interactive usage. This vector format, suitable for Internet, allows the usage of so-called “hot spots” with which it is possible to link illustrations in order to show details. With this format the user can have access to enlargements of details and, if necessary, the possibility to process them without any loss of quality. When using a raster format one would quickly be limited by its given resolution. Project Manager Noël Andrieu soon added the usage of colour to the standard catalogue as it helps the perception of the observer. Thus, the human eye may seize the technical facts about 30% faster. The integration of images in form of photos and graphics was another wish.



As the original supplier has not further developed the illustration software used so far, Airbus started to look for a new system on the market in January 2002. “This new system should support corresponding import and export filters as well as respect all standards of the aviation industry as for instance ATA iSpec 2200”, says Jean-Paul Gerhardt as he describes the most important requirements. “A further criterion of choice was the performance of the programming interface in order to adapt the illustration tool to internal business processes and meet a corporation-wide binding illustration policy.”

After an intensive exchange of views among all European divisions the new project-division prepared a feasibility study under the direction of Mr Noël Andrieu: “It was important for us that all those who would later use the new software be implicated from the very beginning on. ”

The future illustration guidelines were thus defined together in the form of Style Guides which exactly define, for example, how an edge situated in the foreground should look like and on which level a certain line has to be. No problems due to differences of mentality arose in those internationally-composed

teams. "Questions were asked and it was tried to get to the bottom of apparent obviousness. Thus misunderstanding is avoided and harmonisation is achieved much faster", reports Mr Andrieu. "After all, each Style Guide has been defined by the actual end-users from the relevant departments. "

In August 2002, the company made a Benchmark test opposing two systems which existed on the market. After these very intensive tests, Airbus decided to choose Tech Illustrator™ from Auto-trol Technology in Düsseldorf. One important criterion of choice was the convincing quality of the programming interface. "This is the philosophy applied for all our products", explains Mr Wolfgang Scholz, Manager of Auto-trol in Germany. "It offers our customers maximal flexibility which allows adapting each application exactly to the needs of the company. " Thus you will find these developed software solutions as standard solutions not only in the aeroplane industry but also in the automobile industry.

The company in-house illustration guidelines to obtain a common "look and feel" were established in Hamburg and Toulouse using the "Tech Illustrator Plus™ (SDK)" development tool and further programs like External Access and Objex/AGL. The customisation is logically separated from the actual Tech Illustrator-System using API interface (Application Programming



Interface). This offers the advantage that the regular further development of the software may be adopted later without great effort because an adaptation of the company's specific modules is not necessary.

The now binding and standardised software has been released by the Project Manager Noël Andrieu and passed on to each department and to the contractors. The basic agreement for the first stage of extension covers a total of 62 licences for all Airbus-locations in addition to a number of the so-called "category 1" contractors and their subcontracted illustration offices. All users of Tech Illustrator have been trained for one week, out of which 3 days were needed for the general part and 2 days for the Airbus specific adaptations and extensions.

Reorganisation of the process chain

In parallel, the process of all technical documentation concerning the A380-activity has been optimised and new "business rules" have been defined. Tech Illustrator is now integrated in this Workflow.

All orders for a technical documentation start from a subdivision of each unit. These are mainly the Maintenance Domain, Material Domain and the Repair Domain. The latter, for instance, has to function immediately in case of any damage at an airport.

The documentation authors request the relevant illustrations which then will be linked with their text written in SGML.

When drawing the illustrations, one often goes back to 3D-models. However different CAD-systems are used at Airbus because of the former individual companies. The 3D-models provided by the construction and development units will be converted in ProductView by PTC and thus made available additionally in the original formats as the so-called Digital Mock-ups in the PDM-System of Airbus.

When an illustration must be created from the basis of a 3D-model, a transformation of this PTC-format into a CGM-format occurs after the removal of hidden edges. In case of problems of accuracy, one may use the original CAD-format. The created CGM file will now be read by Tech Illustrator® from Auto-trol Technology.

The generally applied Style Guides fix the possible positions of the angles. After such a preparation the actual work with Tech Illustrator starts.

Rolls Royce Germany as the supplier of the turbines also uses this software and will now work for Airbus using their Style Guides. All illustrations provided by them can thus be used directly. Concerning other main suppliers, such as Recaro, the manufacturer of the seats, one will exchange data more effectively in the future so that Airbus may use existing original CAD-models and illustrations directly.

A further link in the process chain is the automated quality check of all completed illustrations. In case of deviation from the Style Guides for example, the contractor will have returned his deliverables for correction. In case of a positive evaluation they will be passed to the authors. The finished documentation will finally be saved as SMGL as "master-manual" and as HTML for the online-documentation. For the A380 and its technical documentation there will thus no longer be any printed versions.

The illustrations will be additionally saved as individual documents in a central data base: once in their original format, as a Tech Illustrator file, and secondly as a standardised and thus neutral CGM file, according to the ATA iSpec 2200 definition. "Illustrations will normally be delivered to customers in this format ", says Project Manager Noël Andrieu.

Since August 2003, the program system has been used in the whole group and since then there has been an increasing demand from the individual domains. The wish to use the advantages of an online-documentation for the rest of the Airbus-product line is expressed more and more often. Therefore Auto-trol Technology is currently developing a converter that will also make the illustrations from the old system available for Tech Illustrator.

"We are thus having a steep takeoff", rejoices Manager Jean-Paul Gerhardt.

