

60. EXAMPLE OF THE IMPORTANCE OF STANDARDIZATION OF RECURRING TASKS: MAINTENANCE AND REPAIR OF AIRCRAFT - COMPONENTS AT NAVAIR

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SUMMARY

The ability of simulation (CAE) to significantly impact engineering work is well-recognized at the user level. As that recognition rises up the management chain in major organizations, the advantages are paralleled by the need to understand and manage/leverage the strategic use of simulation as an emerging strategic asset. As with other organization-wide issues (e.g. finance, PLM, HR, regulatory compliance) this need takes the form of an activity called Simulation Governance (SimGov). This presentation summarizes a very important practical aspect of SimGov related to the standardization of recurring analysis tasks for the application of existing design rules. Software tools designed to fit existing analysis processes provide for the preservation and accumulation of corporate knowledge with increased reliability, providing consistent results by tested and approved analysis procedures. Furthermore it expands the use of simulation to a broader class of engineers (not full-time experts in CAE) and how they, and more importantly their management, can be sure that the results of their simulations are accurate enough for the intended use at any point in the design/development process, which in this example is the analysis of fastened connections of metallic and composite aircraft parts to minimize the risk of premature damage/failure.

The successful onward march of CAE will require that it be put in the useful hands of many more engineers ("democratization") who, although capable as product development engineers, are not, and cannot realistically all be expected to become, CAE experts. The software that they use (and that their organizations manage) must take on the role of automating verifiable accuracy for the intended purposes, which in itself creates the need for standardization. The CAE software/solution vendors must take on the responsibility of insuring that their software meets these requirements. The specialized topics of verification, validation, and uncertainty quantification (VVUQ) are now seen as key aspects of the software/solver part of SimGov. This presentation focuses on a specific need within NAVAIR and how an SBIR funding grant to ESRD led to the development of a set of analysis tools for NAVAIR engineers, in the form of standardized vertical FEA-based applications supported by solution verification.

