

TRACK 4: ADVANCED ENGINEERING TOPICS
“OVERVIEW ON AEROSPACE GEARS: FROM ROBUST DESIGN TO FAILURE ANALYSIS”

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ABSTRACT

In today's world, the continuous development of new power transmission systems has resulted in increasing performance and efficiency as well as reduced weight and cost. Concerning gears, the studies and modelling conducted are highly motivated by the objective to find geometries in which the system is able to maintain optimal behavior despite geometrical uncertainties and load variations. This indicates a need for strong collaboration among teams in the areas of design, manufacturing and control with experts having good experience and knowledge of gear tooth damages in service. The success of such collaborative approach is highly dependent on actions taken in the early stages of the design and analysis phase, widely identified as the primary area in which process improvements can be made. The objective of this presentation is to show that the combination of appropriate modelling and simulation methods can provide solutions or designs with optimum gear behavior and great reduction in risks of failure. This approach integrates powerful and extensive software solutions, such as KISSsoft or ROMAX, with robust and multi-objective gear tooth optimization techniques and tools using a genetic algorithm.

BIOGRAPHY OF SPEAKER

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Mr Robert SHANDRO is a Principal Consultant with MATCOR Technology and Services Pte Ltd in the field of mechanical, power transmissions and materials engineering. He specializes in failure investigation, forensic engineering and condition assessment with more than 30 years of consulting experience in Aerospace, Transportation, Energy, Shipbuilding and Public Works.

He has been involved in numerous failure analysis, forensic engineering and condition assessment cases locally (FRANCE) and internationally. He has also performed many power transmissions failure analysis, calculations, modelling and simulations for companies such as SAFRAN, AIRBUS, TOTAL, AVIO, EDF, NEXTER, MITSUBISHI, CGG VERITAS, ALSTOM.

Mr Robert SHANDRO is currently member of French Delegation for ISO TC60 (Technical Committee for Gears) and member of UNM - Office of the French Standardization System in the field of mechanical engineering.

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