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[Home](#) > Integrated modeling for Aerospace Powerplant system assessments

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## Integrated modeling for Aerospace Powerplant system assessments



Presented at the STAR Global Conference 2012.

The purpose of this presentation is to illustrate the methodology used at Airbus Military to develop simplified models of aircraft systems in order to characterise a particular component that is not following the general behaviour, implementing complex CFD simulation results at the same time.

In this methodology there is a clear interaction between 1D and zero-dimensional models with CFD simulation results. The use of the isolated CFD itself is not feasible due to time constraints, in particular:

? Oil system heat transfer and pipe flow is modelled using a 1D suite. In order to cool the oil at certain conditions, an air-oil heat exchanger is used. The characterisation of the airflow is then performed by means of a CFD simulation, and incorporated into the 1D analysis, providing rapid overall results.

? Nacelle assessments of airflow discharge are performed, simulated using a 1D model that characterises the different pressure losses through the intakes and components by means of a CFD simulation, so that quick trade-offs assessments can be performed.

In summary, the aim is to illustrate the use of CFD tools to provide reliable results for further assessments that will be carried out in future 1D trade-offs.

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