

Project: Verification & Validation of systems of models

INTRODUCTION

Project Description	Application of a Verification and Validation framework to a computational simulation of a gear train as a proof of concept for the applicability of such a framework in complex systems.
System of Interest	Gear train
Question being Answered	Can we trust our computational simulations of the gear train life in service?

EXPECTED BENEFITS OF THE PROJECT

Target System:	Computational simulation of a gear train to predict the life of the components in service
V4i:	<p>Proof of concept for the applied V&V framework for complex systems</p> <p>Demonstration of the V&V framework applicability for different topics (see second V4i project with application of same framework to a compression system case).</p> <p>Evaluation of the V&V framework as a potential use case and industry neutral pattern for generic V&V activities.</p>

PROJECT APPROACH SUMMARY

- Specification of Application of Interest
- Planning and Prioritization of activities
- Code Verification and Software Quality Assurance
- Design and Execution of validation experiments
- Computation of system response quantities and solution verification
- Computation of validation metric results
- Calibration of computational model
- Prediction and uncertainty estimation for the application of interest
- Assessment of model adequacy
- Documentation of activities

FUTURE WORK

Demonstrate V4i value through cross industry Use Cases

- Compressor (see V&V of Models Project)
- Other systems and components

PROJECT TEAM

- Rolls-Royce Corp.
- Sentient Science
- Romax (via Rolls-Royce)
- Vanderbilt University (via Rolls-Royce)