Verification & Validation of LSDYNA Simulations

Prerequisite: This training class is intended for all LS-DYNA analysts and any other FE simulation engineers. The presentation even though is geared toward LS-DYNA, the methods and discussions is applicable to any other FE software.

Objective of the course: To teach methods and procedures of validating and verifying that the simulation results are valid and acceptable. It is crucial for engineers to verify the accuracy of the FEA solver and also validate the results against experimental tests and other outputs, in order to ensure an error-free finalized design.

Who should attend: All simulation engineers, irrespective of FE simulation experience.

COURSE OUTLINE

- Introduction
- Definitions of Verification versus Validation (V&V)
- Differences Between V&V
- Variability in Simulation Results:
  - Things you have control over
  - Things you do not have control over
- Introduction to MPP
  - MPP vs SMP results
- Experimental Data and lack of it, and V&V
  - Test Repeatability
- Simulation Results on Different Machines
  - Single Precision vs Double Precision
- Experimental outputs for V&V
- Verification & Validation
  - Methods
  - Steps
  - Procedures
- Quantitative vs Qualitative Validation
- Validation Metrics
  - Magnitude-Phase (MPC) metrics
  - Single-value metrics
  - Analysis of variance (ANOVA) metrics
- Mesh Convergence Criterion and Verification
- Useful Outputs D3hsp & Message File
- Validation in the Frequency Domain