



ENGINEERING DESIGN & SIMULATION

Concept to Compliance through Simulation...



ENGINEERING DESIGN & SIMULATION (EDS)

EDS is one of the major R&D divisions of ARAI having core competence in New Product Development & Simulation. With state-of-the-art computational infrastructure and expertise available as a Simulation Lab, EDS is offering customized solutions from Concept to Compliance through Simulation. Areas of domain expertise include Benchmarking & Inspection, Crashworthiness & Impact, Durability, NVH, CFD, MBD and Manufacturing Process. Beside Transportation & E-mobility, EDS has a strong footprint in simulation driven design programs towards Defence, Nuclear, Medical, Space, Highway Safety & Security Applications.

2 WHEELER



Concept Design



Stability Analysis



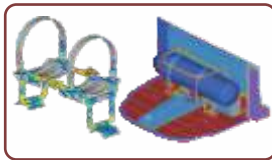
Ride & Handling Assessment



Two Poster Simulation



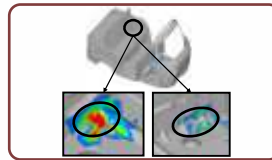
3 WHEELER



Cylinder Mount Evaluation



Durability Analysis



Failure Prediction



Structural Improvement

PASSENGER VEHICLE



Structural Life Assessment



External Aerodynamics



Vehicle Crashworthiness



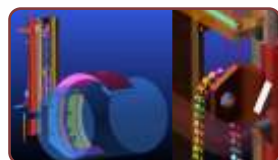
Sub-System Evaluation



Pedestrian Protection



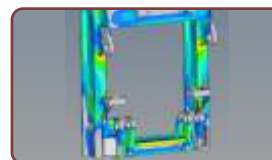
CONSTRUCTION EQUIPMENT & OFF ROAD VEHICLE



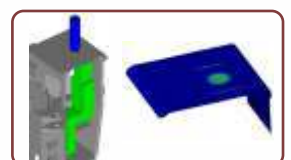
Mechanism Simulation



Kinematics Design



Durability Simulation

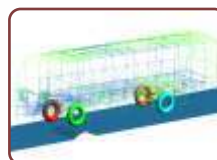


ROPS / FOPS

BUS



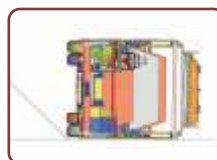
Lightweighting



Virtual Proving Ground



HVAC Thermal Comfort Prediction



Regulatory Compliance - Virtual Validation



TRUCK



Windscreen Wiping Simulation



Four Poster Durability



Underhood Thermal Evaluation

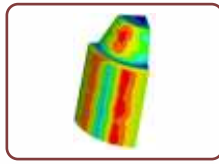


Regulatory Compliance – Virtual Validation

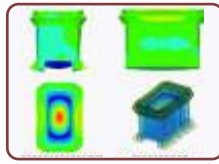
NUCLEAR



Transportation Package Drop



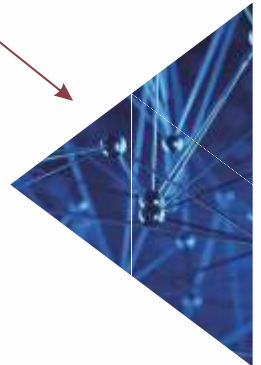
Thermal Simulation



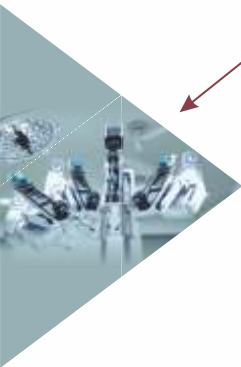
Frequency Prediction



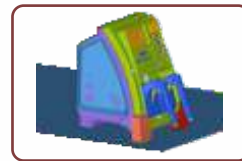
Simulating Accident Condition



MEDICAL EQUIPMENT



Pace-Maker Component Evaluation



Defibrillator Performance Evaluation



Human Body Implant Development

DEFENCE



Gun Chassis Strength Prediction



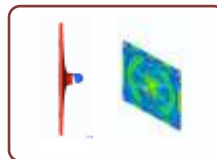
Blast Simulation



Armored Capsule Design



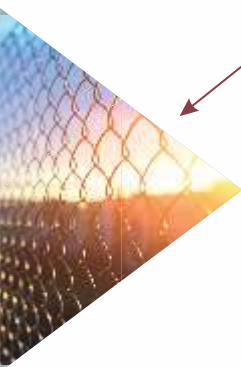
Failure Prediction



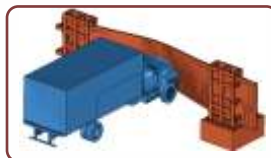
Ballistic Performance Evaluation



SECURITY & HIGHWAY SAFETY



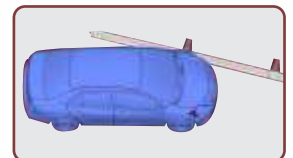
Crash Bollard



HVM Gate



Street Furniture



Highway Safety Barrier

BENCHMARKING & INSPECTION



Powertrain



Vehicle BIW



Full Vehicle

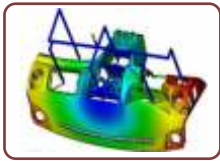


Marine Turbocharger



Packaging & Integration

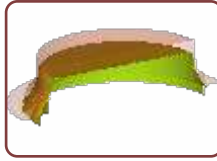
MANUFACTURING PROCESS



Interior Panel Flow Simulation



Door Trim Flow Simulation



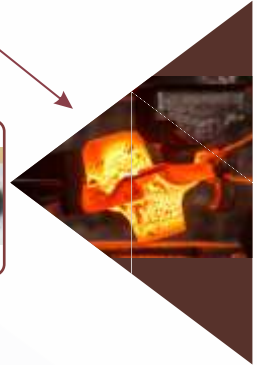
Wheel Rim Stamping



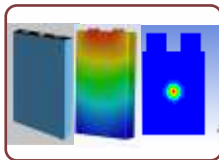
Defect Removal & Yield Improvement in Casting



Flashless Forging of Crankshaft



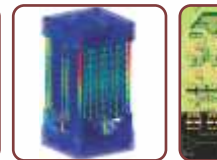
E - MOBILITY



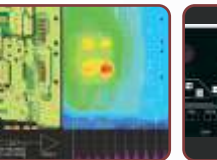
Battery Thermal Management



Motor Performance Evaluation



Battery strength Assessment



PCB Thermal Simulation



ADAS Actuation – Using Drive by Wire

STATE-OF-THE-ART INFRASTRUCTURE

HARDWARE

- Portable Blue Light 3D Scanner – 12 MP
- HPC Server – 192 Core, 1500 GB RAM
- High End Workstations for CAD & Simulation

SOFTWARE

- Pre / Post Processor – Hyperworks, Primer, En-Sight
- Solver – LS-Dyna, Radioss, Madymo, Nastran, Adams, Motion Solve, LMS, Abaqus, Ansys Fluent, Design Life, FE-Safe, Tosca, Forge, Moldflow, Truck/Car/Suspension Sim, Pyrosim and Optistruct
- CAD – Unigraphics, Creo, Catia, Geomagic

SALIENT FEATURES

- ISO 27001 Certified
- Flexible Work Model – Offshore Development Centre (ODC), Rate-Contract
- Pioneer in CAE based Certification – NABL (ISO 17025) Accreditation
- Product Lifecycle Management – DFSS, DFMEA
- Robust Simulation Methodology with In-House Validation Facility
- Design & Validation Support to EV Startups



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ARAI
Progress through Research



The Automotive Research Association of India
(Affiliated to Ministry of Heavy Industries, Govt. of India)

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