

Engineering, R&D solutions to **Nuclear Energy Sector**

Seismic Analysis | Detailed Engineering | R&D
CAE/FEA / CFD - Multi-physics Simulation
FFS /RLA /RLE | Digitalisation | Project Advisory



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TELEPHONE: +91 80 6816 0000

OUR OFFERINGS

We provide inter-disciplinary engineering and collaborative services

- **Seismic analysis and qualification**
 - a. Mechanical (Passive and Active Equipment),
civil structures, electrical, I&C, piping
 - b. Safety Class-1 and Safety class-2 equipment & piping
 - c. ASME Section -III, RCC, PNAE, IEEE, IS, ASCE, AERB etc.
 - d. Engineering support and coordination for shake
table testing
 - e. Floor Response Spectra (FRS) generation
 - f. Seismic Re-evaluation & Seismic Margin Assessment
- **3D modeling and detailed engineering**
 - a. Plant 3D modeling
 - b. Piping engineering (routing, layout preparation,
supports, Dynamic stress analysis, BoQ
extraction, as-built drawings)
 - c. Mechanical equipment (stationary & rotary equipment)
 - d. Civil engineering (Concrete and Steel Structures)
 - e. Electrical, instrumentation & Control
- **Code Based Design and qualification as per
ASME/ and similar codes**

OUR OFFERINGS

- **Digitalisation**

- a. Digital TWIN: AI / ML models, hybrid models, Physics Informed Neural Networks (PINNs), reduced order models (ROMs)
- b. Building Information Modeling (BIM)

- **Physics Based models for design verification and optimisation**

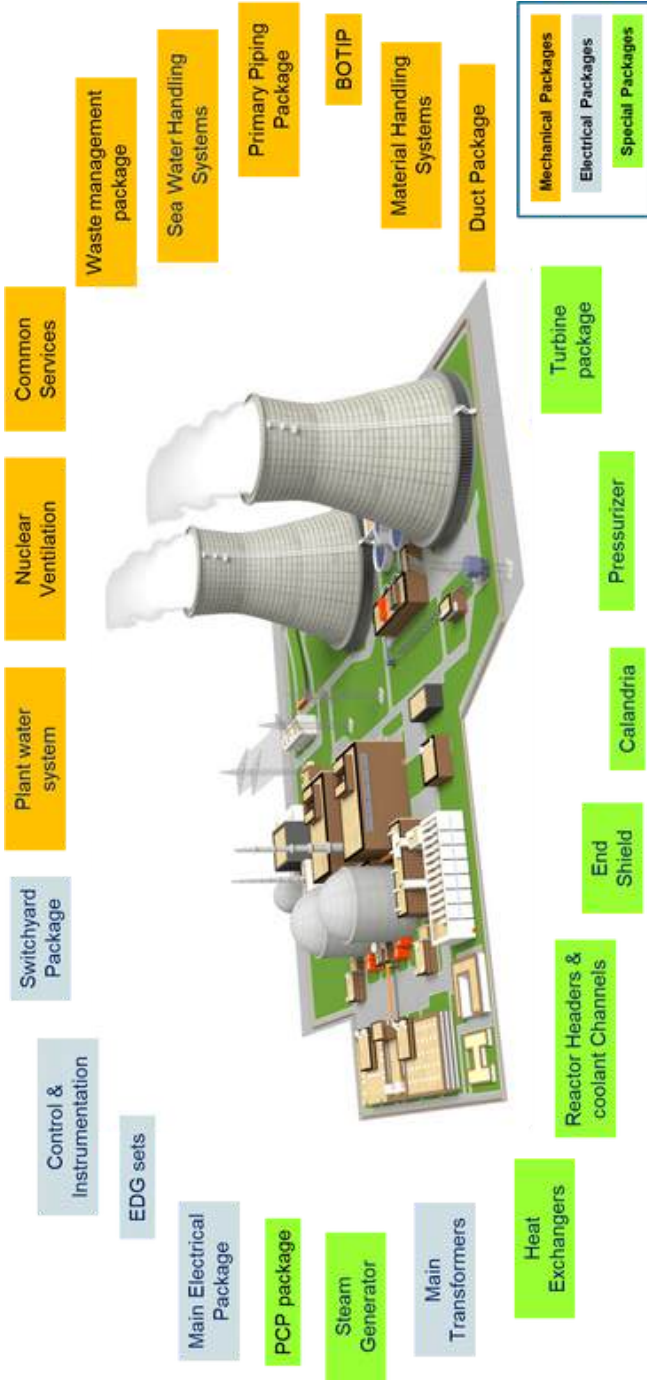
- a. Finite element analysis- FEA,
- b. Computational Fluid Dynamics - CFD,
- c. Materials and damage modeling (fatigue, fracture, creep)
- d. Multi-physics models

- **Structural Integrity Assessment**

- a. Fitness for service (FFS)
- b. Remaining life assessment and extension (RLA /RLE)

- **Engineering Advisory**

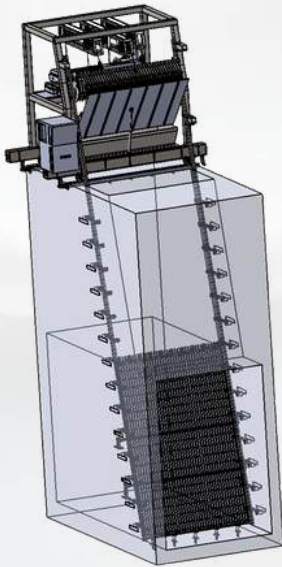
- a. Owners engineering consultancy
- b. Forensic engineering / support in legal arbitrations
- c. Engineering Process Automation
- d. HAZOP Studies, etc.



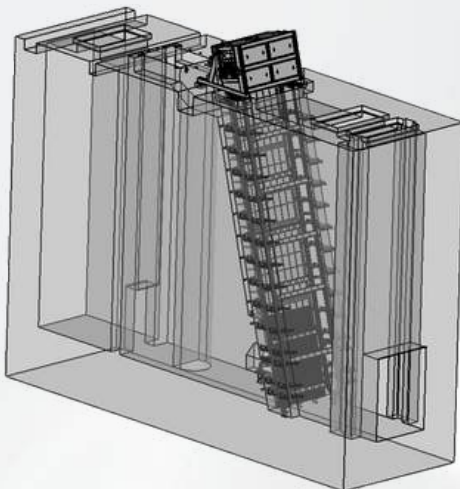
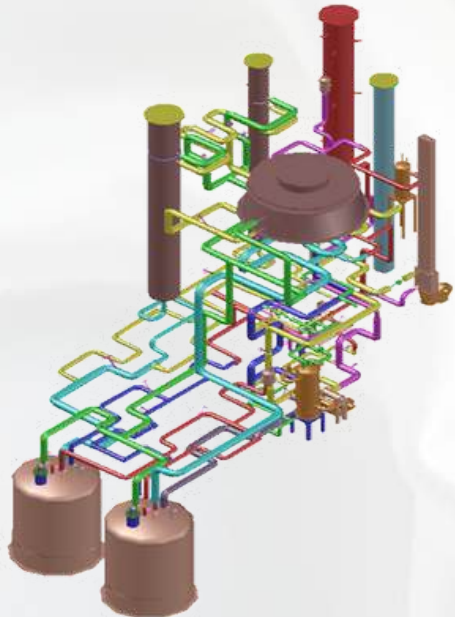
ProSIM's Experience In Nuclear Power Plant Packages

Seismic Analysis

**Movable Trash
Rack Machine**

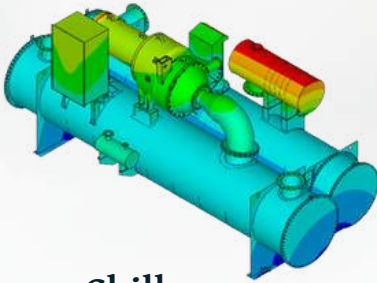


**High temperature
piping system**

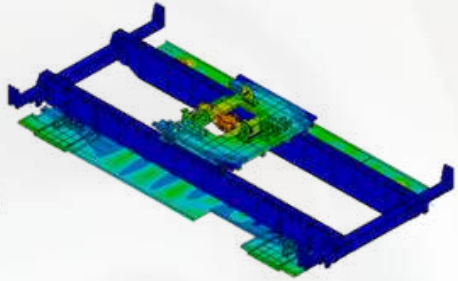


**Revolving
trash Rack
Cleaning
Machine**

Seismic Analysis - Equipment



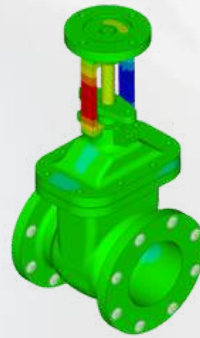
Chillers



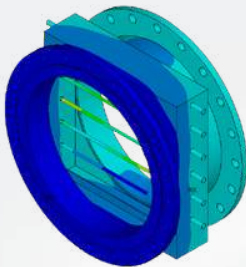
Cranes



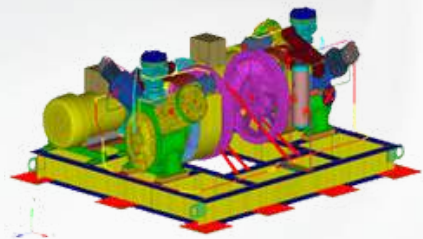
EDG Sets



Valves

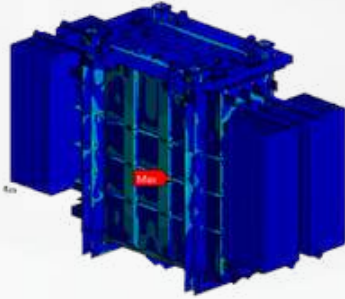


Dampers

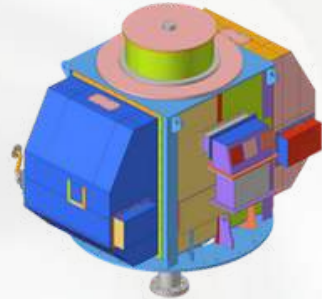


Compressors

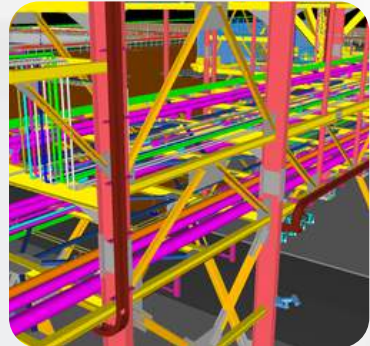
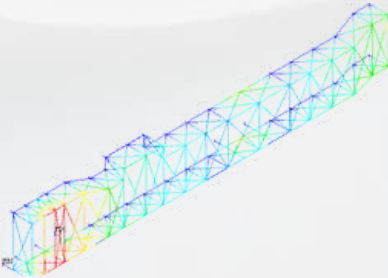
Seismic Analysis



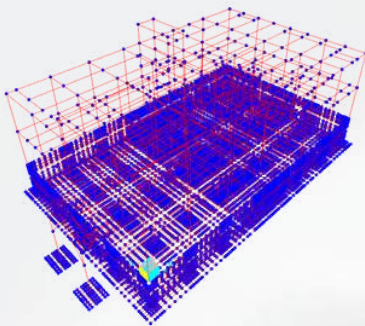
Transformers



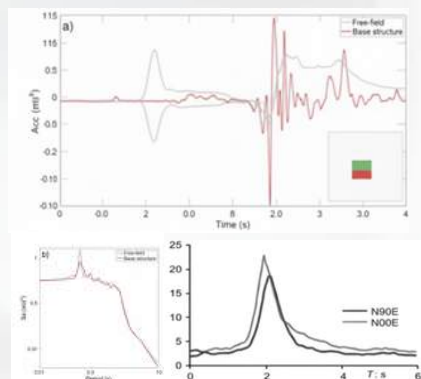
Motors



Cable Tray & Support Structures

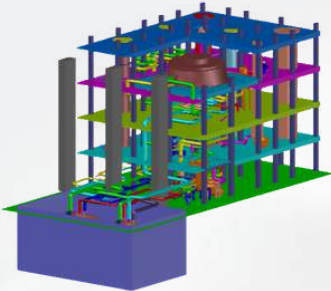
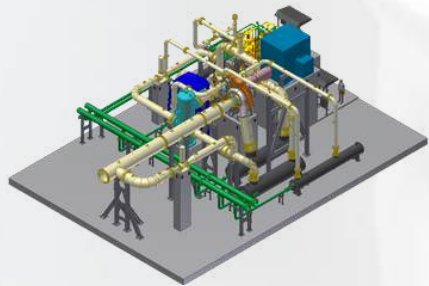
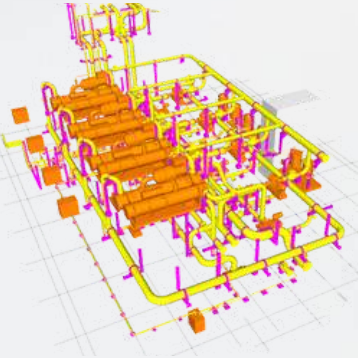
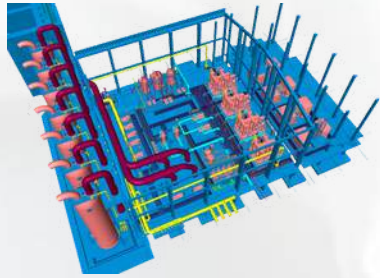
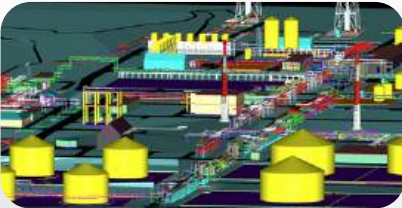
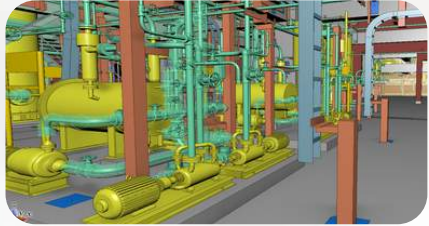
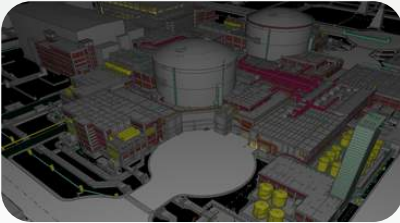


FRS Generation



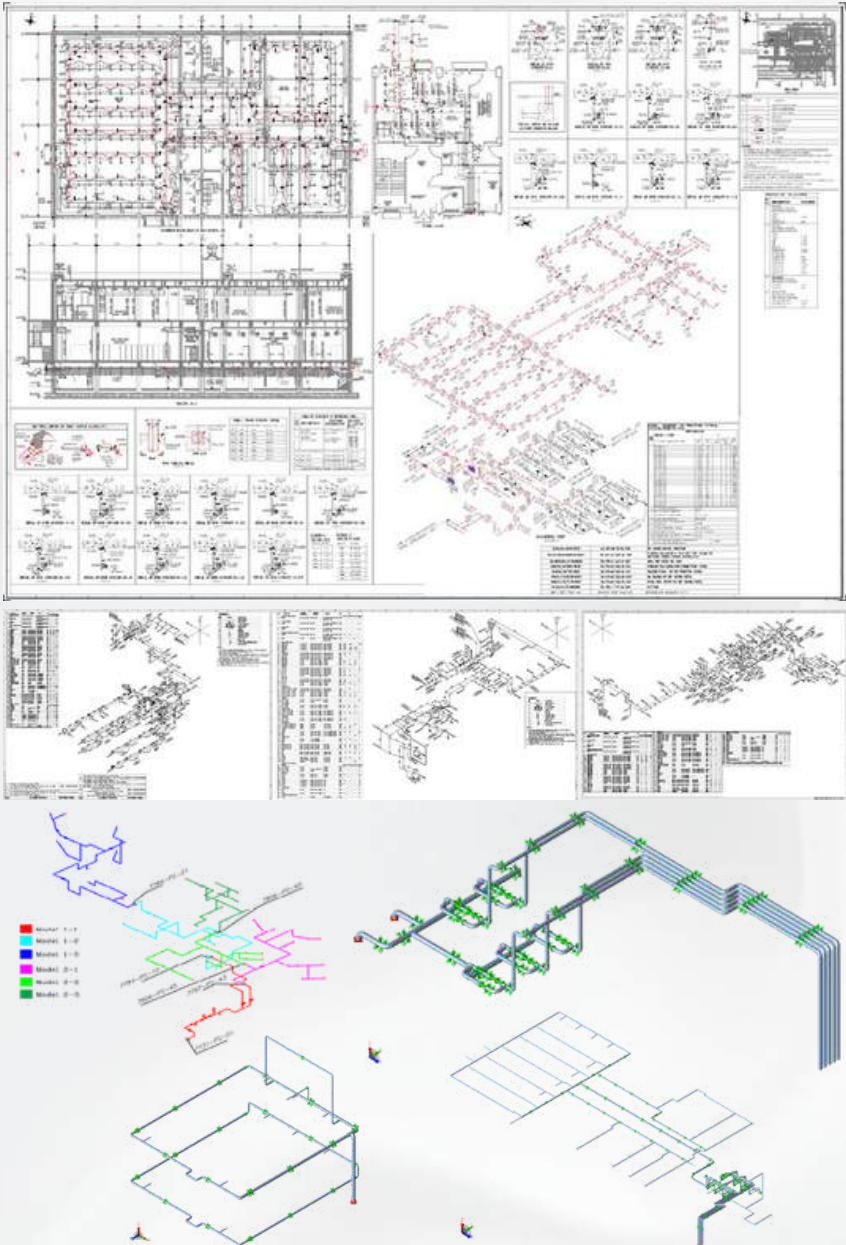
Detailed Engineering

3D Plant Modelling



Piping Engineering

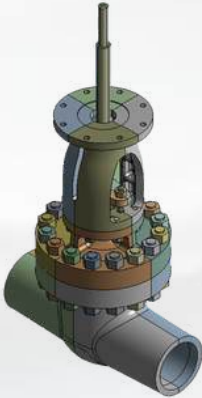
Isometric Drawings | General Arrangement Drawings



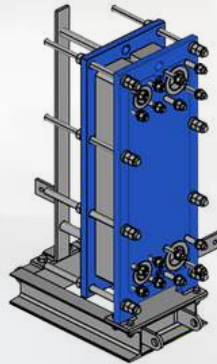
Code Based Design & Codal Qualification

- **Code Based Design:**

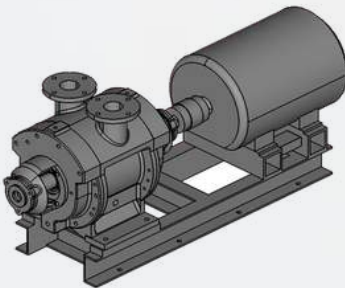
(ASME - Sec VIII Div1 & Div2, Section III, API, EJMA, etc.)



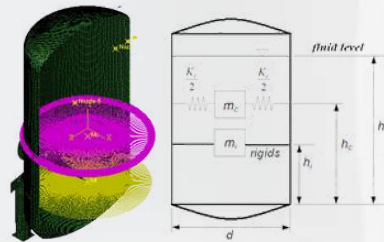
Valves



Heat Exchangers



Pumps



Pressure Vessel

- Review design for full codal compliance
- Design Modification & Optimization to meet all codal and safety compliance requirements

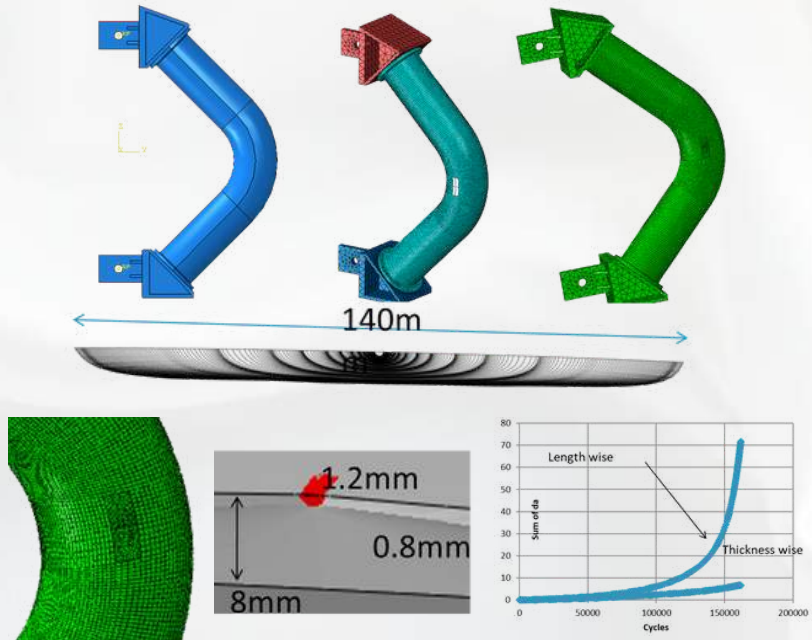
Digitalisation



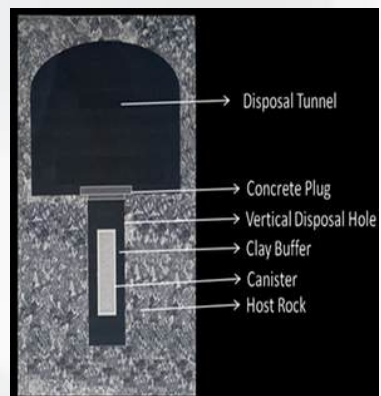
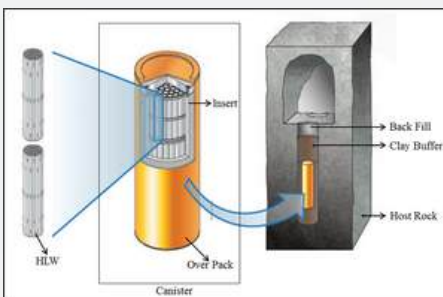
- Digital Twins
- Reduced Order Model (ROM) development
- AI/ML model development and implementation (including IIOT)
- Hybrid model development (combination of Physics based models and data based models)
- Building Information Models (BIM)

Research & Development

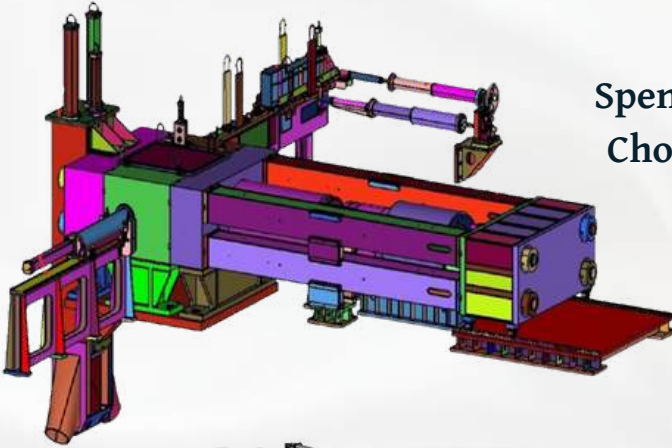
Leak Before Break (LBB) Studies of Coolant Channel



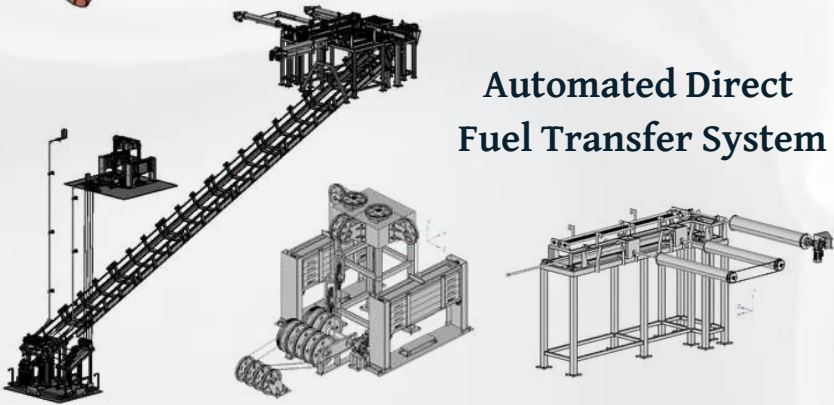
Deep Geological Disposal System



Design & Development



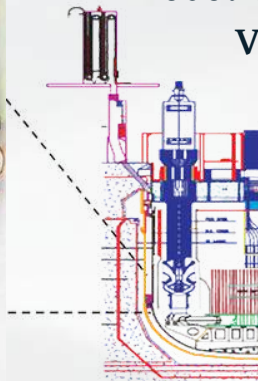
**Spent Fuel
Chopper**



**Automated Direct
Fuel Transfer System**



**Robotic Inspection
Vehicle**



Engineering Consultancy & Advisory

ProSIM provides variety of consultancy and advisory services to operators, EPCs, and technology companies

Owners Engineering

Technology selection, design basis reports, review of engineering design and documentation, balance engineering support, coordination with EPCs and vendors



Pre-Bid Engineering Support

Detailed technical inputs to prepare time and cost estimates, generate tech specs for vendors, interface with operator/ end user and EPCs

Engineering Expert Reports for Legal Arbitrations

Work as engineering experts and present detailed technical opinion in legal arbitrations. Conduct analysis of multiple scenarios and present to arbitrators



Failure Analysis / Root cause Analysis

Using physics based simulations to mimic variety of scenarios to mimic the failure and develop an understanding of failure

Such studies are used for optimizing the product/ process or in legal arbitrations; or to make the robust design free from failures



HAZOP Studies

Structured and systematic HAZOP studies to identify potential hazards and operability issues.

Hazards are identified, operability issues are detected, and safeguards are ensured for people, equipment, and the environment.



Clientele (Partial List)



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Seismic Analysis | Detailed Engineering | Digitalisation
Remaining life assessment / extension (RLA/RLE)
Research & Development | Project Advisory



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