



ADVANCED ENGINEERING SOLUTION INC.

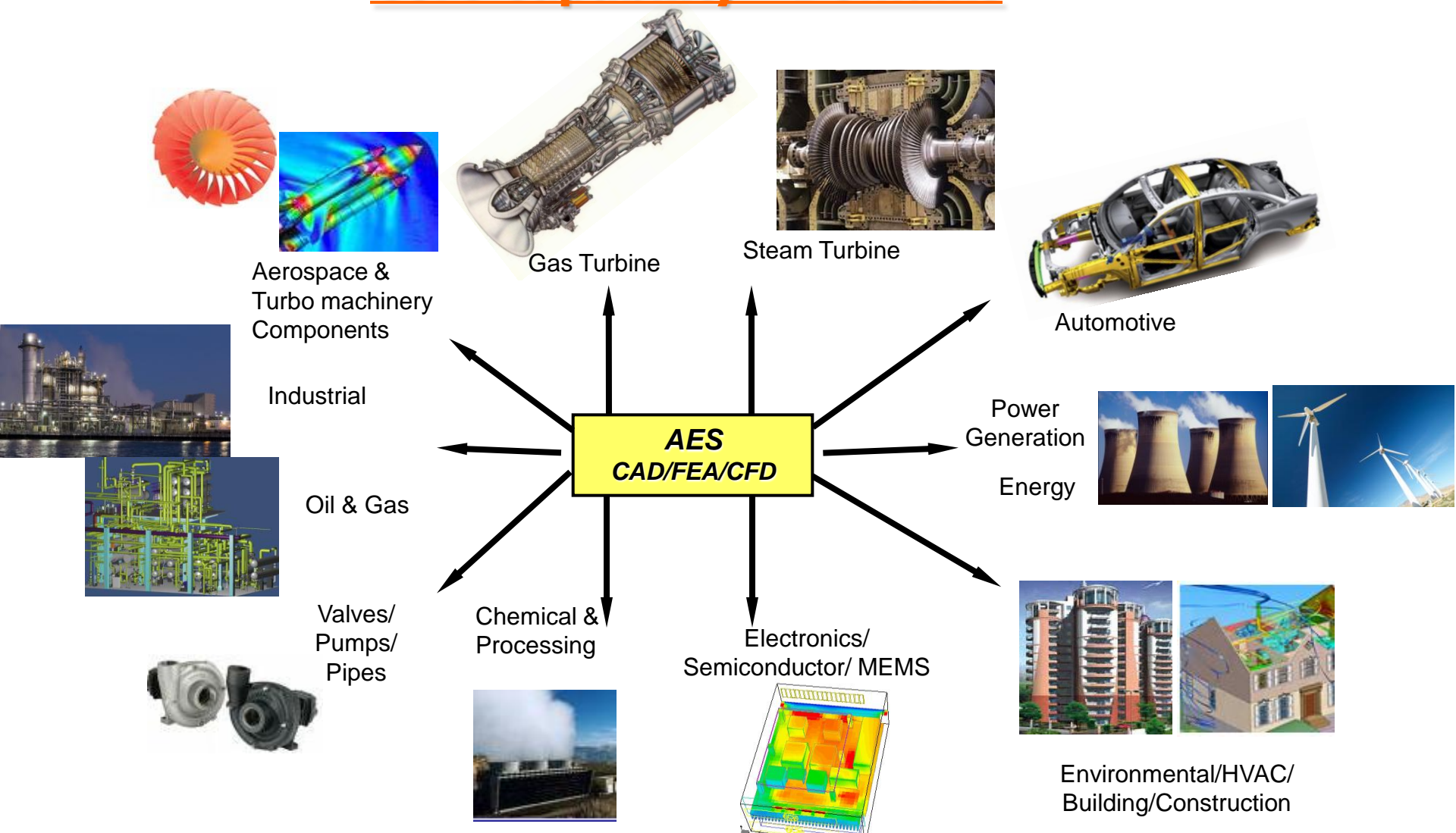
Innovative Steps to Excellence.....

Effective Automotive Engineering Solutions
Fixture Design & Robotic Simulation for BIW Manufacturing





Core Capability - Domains





About Us

AES Automotive group is well trained with good understanding of Automotive BIW Welding Fixture and Robotic simulation concepts, and can work for different customer standards and requirements.

AES uses its proven methodology of onsite and offshore resources to deliver value to its customers.

AES manages and executes various ongoing design and analysis projects with onsite project coordinators and offshore engineering staff located in India to provide better, faster and more cost-effective solutions to its global customers.



Departments

AES
AUTOMOTIVE DIVISION

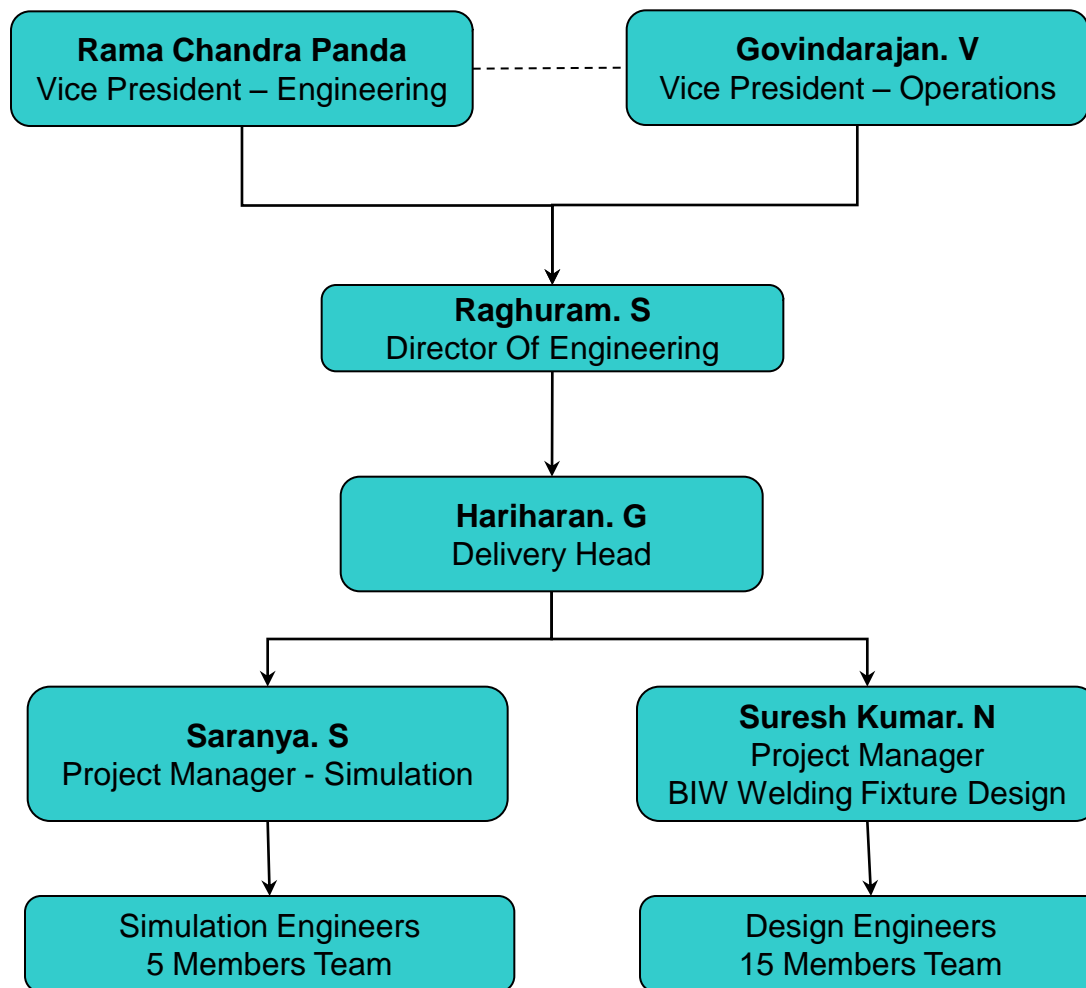
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graph TD; A[AES AUTOMOTIVE DIVISION] --> B[BIW FIXTURE DESIGN]; A --> C[ROBOTIC SIMULATION];
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**BIW FIXTURE
DESIGN**

**ROBOTIC
SIMULATION**



Project Organisation

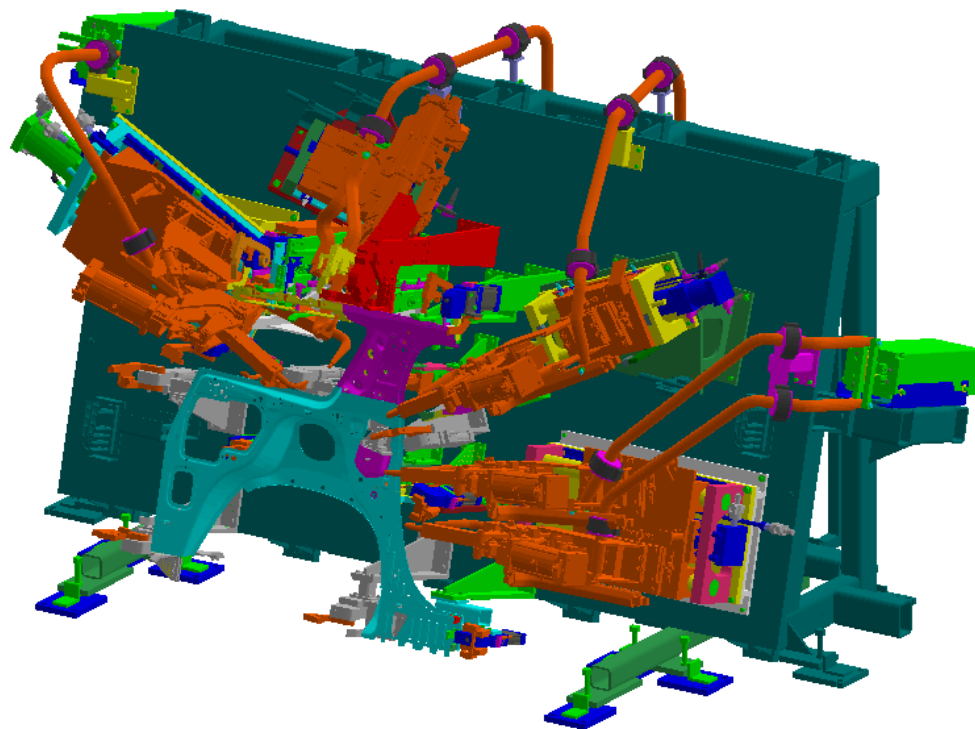




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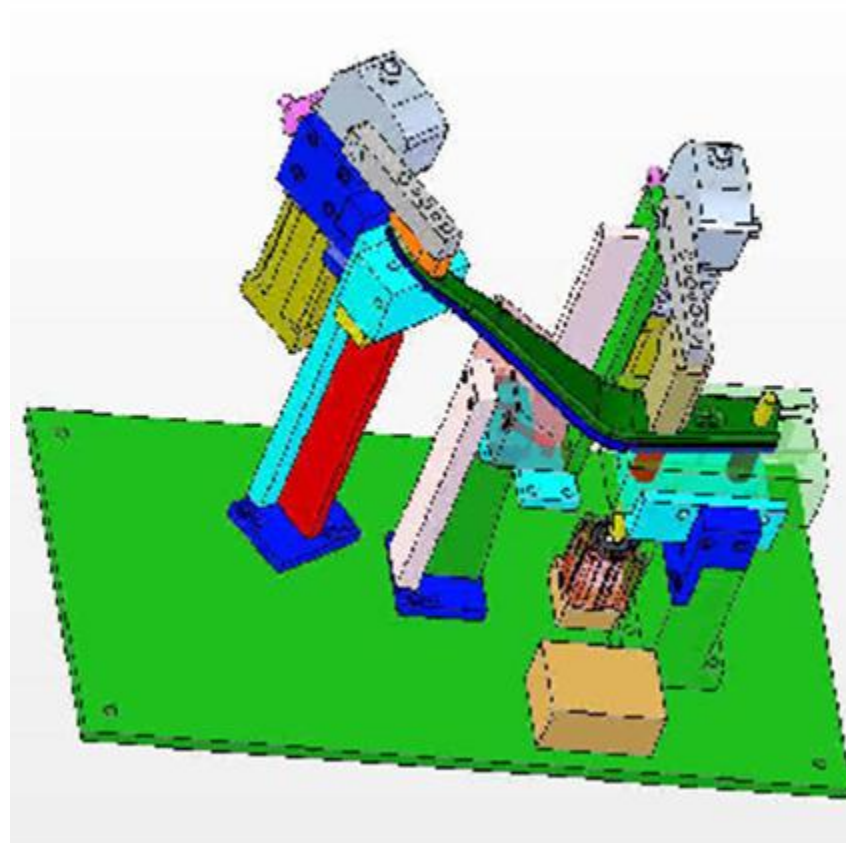
TOOL & FIXTURE DESIGN FOR BIW MANUFACTURING





Work Areas

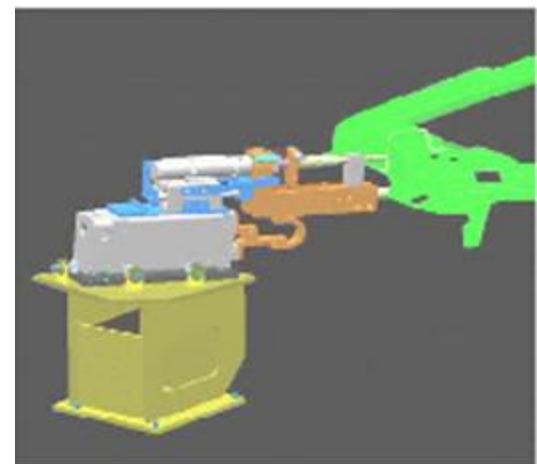
- BIW Welding Line
- Welding Fixture Design & Detailing
 1. Geo Station Design & Detailing
 2. Respot Station Design & Detailing
- End Effector Design & Detailing
- Pallet Tooling
- Hold Buck Units





Welding Fixture Units

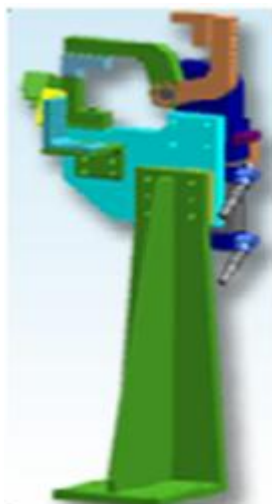
- Weld gun Units
- Clamp Units
- Base Units
- Locating Pin Units



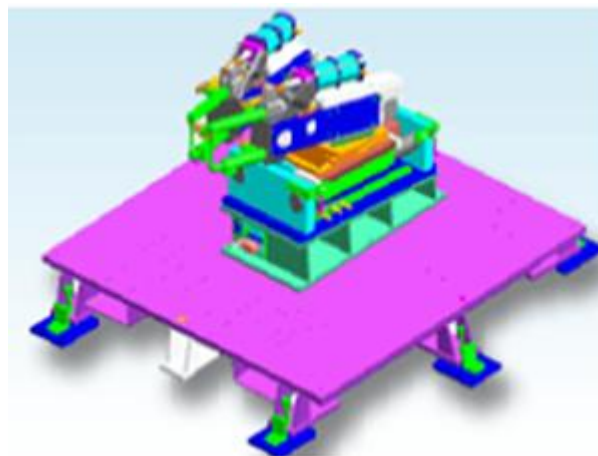
WELD GUN UNIT



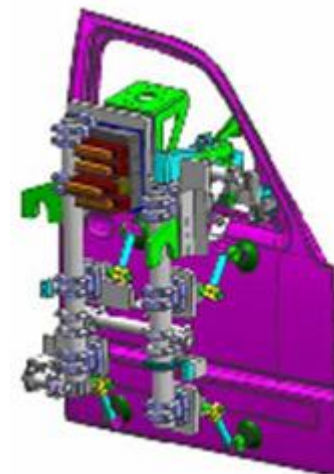
SHOT PIN PACKAGE



CLAMP UNIT



WELD GUN SLIDE

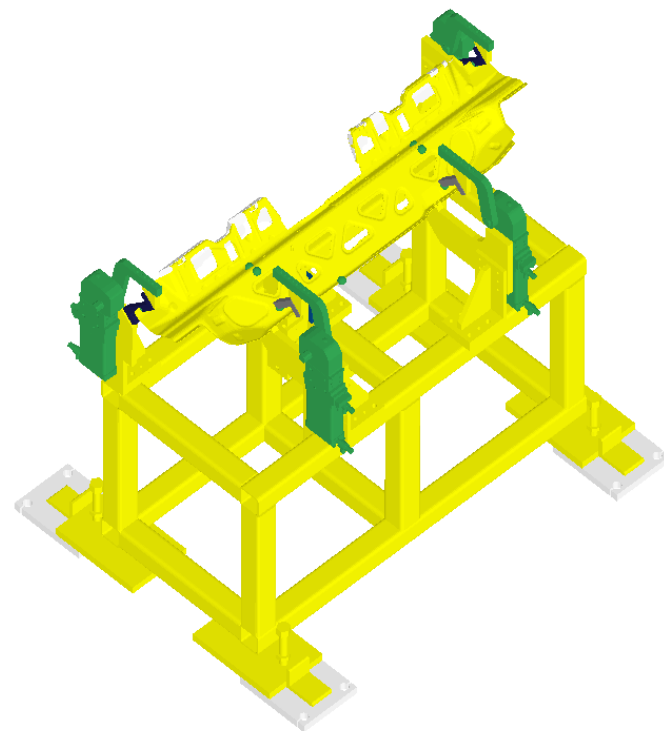


END EFFECTOR



Welding Fixture Design Process

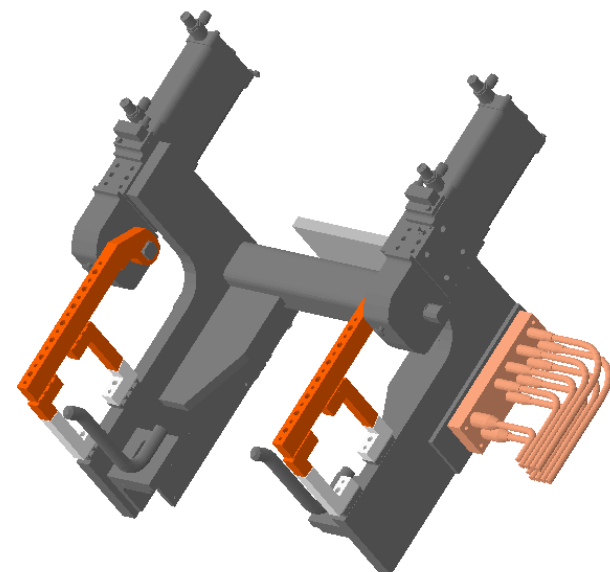
- Study of Clamping Plan
- Understand the Sequence of operations
- Application of NAMMS Standards
- Selection of Various Commercial items
- Apply Mechanical Design Standards
- Verify the Feasibility with interacting tools
- Verify the Design for Manufacturability
- EOAT Design for Welding & Material Handli
- Design Modifications of Welding Fixtures





Welding Fixture Detailing

- Detailing of Welding Fixtures and EOAT's
- Detailing as per various Standards like Gm/DC
- Expertise on GM toolkit (KB tool)
- Detailing to meet Customer Specifications and Manufacturing Setup
- NC Components Detailing
- Part Detailing
- Welded Construction Detailing (Construction Hole etc.)
- Unit level Layout and BOM creation (Clamps, Locating Pins & Bases)
- Key sheet and BOM Creation for Weld Stations





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ROBOTIC SIMULATION



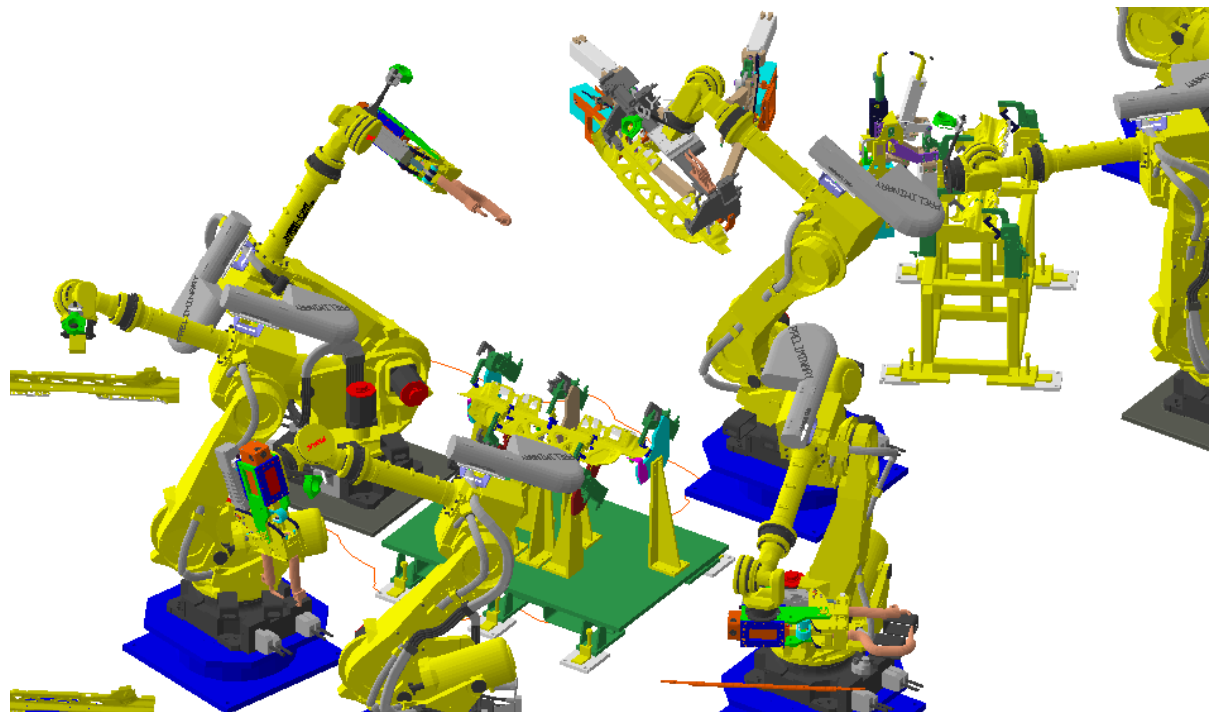


Services

Providing various application services for Robotic Simulation of Automotive Components.

Operations

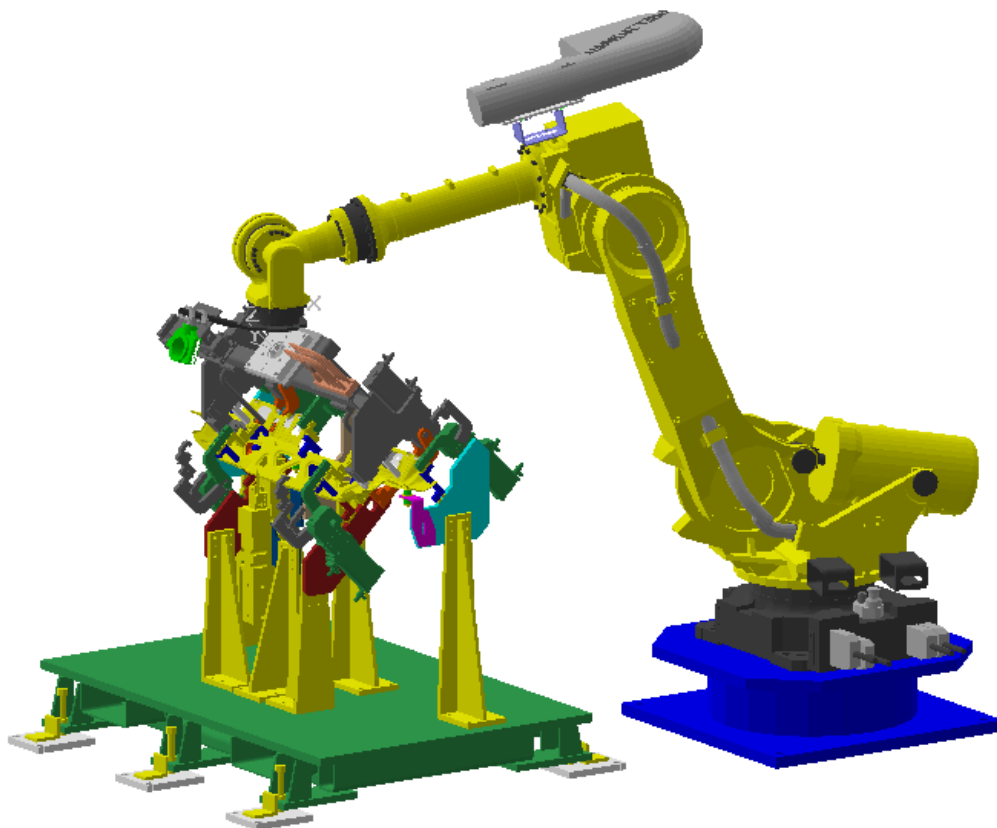
- Material Handling
- Spot Welding
- Arc Welding
- Sealant Application
- Stud Welding
- Pedestal Applications





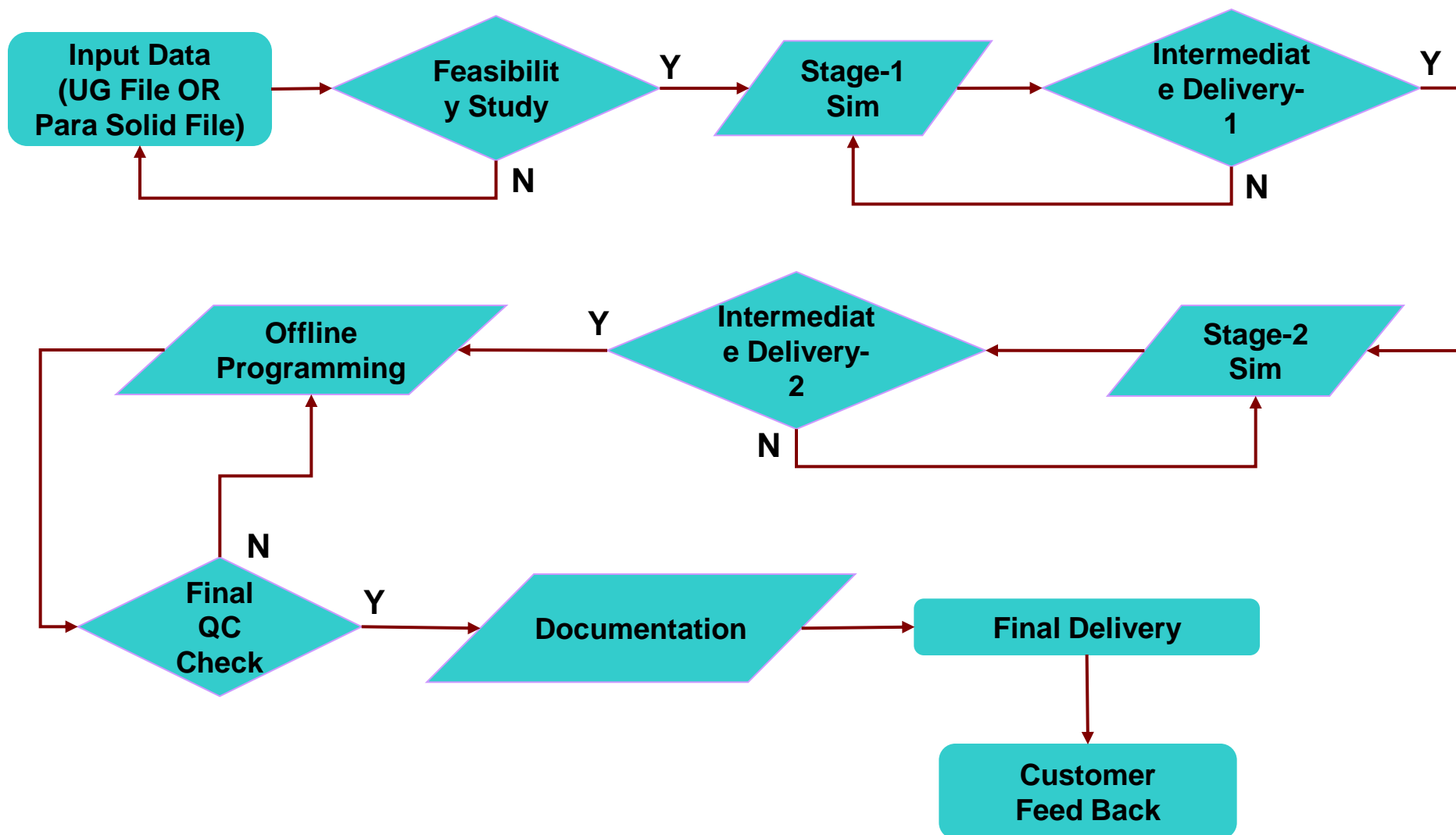
Project Services

- Feasibility Study
- Process Simulation
- Design Simulation
- Design Validation
- Process Optimization
- Sequencing
- Weld Spots Distribution
- Offline Programming





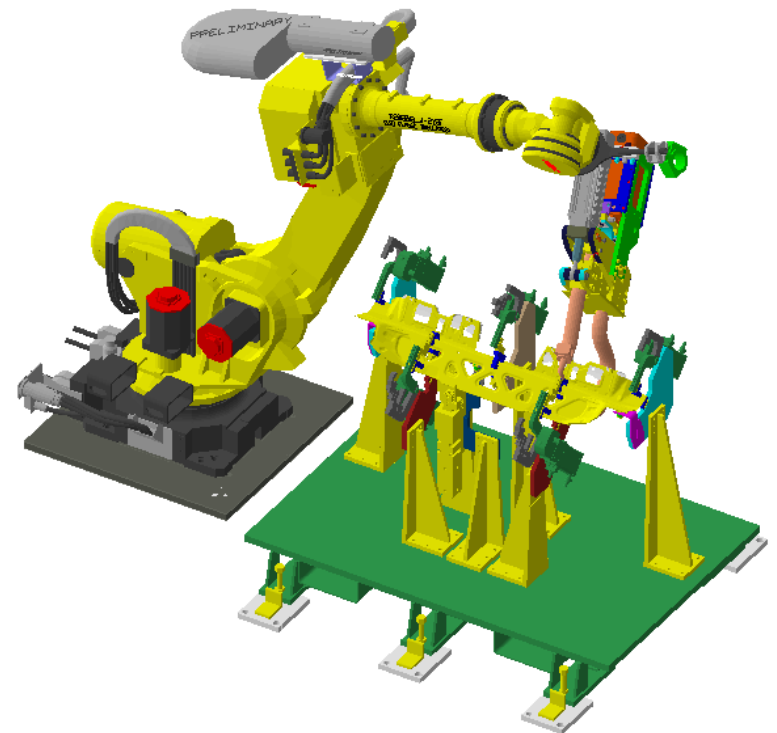
Process Flow





Feasibility Study

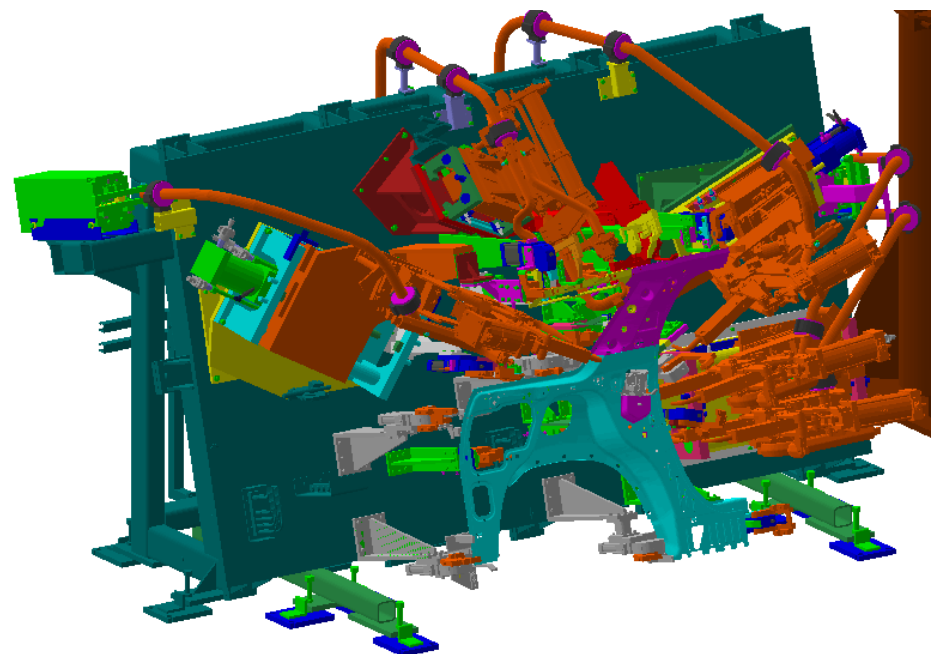
- Reacheability study with the input tools
- Placement of the tools and the robots
- Feasibility study of spots





Stage1 Simulation

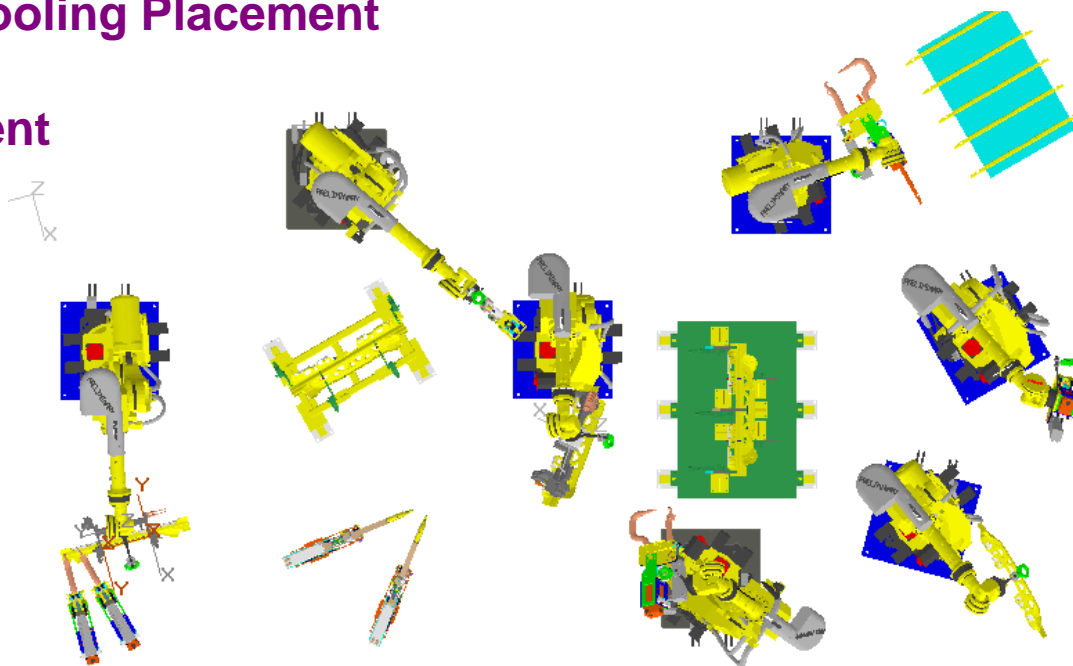
- Approval of Tooling and Facility Designs
- Initial Path Creation
- Swapping of the Spots if Needed
- Initial Programming
- Process under cycle.





Stage2 Simulation

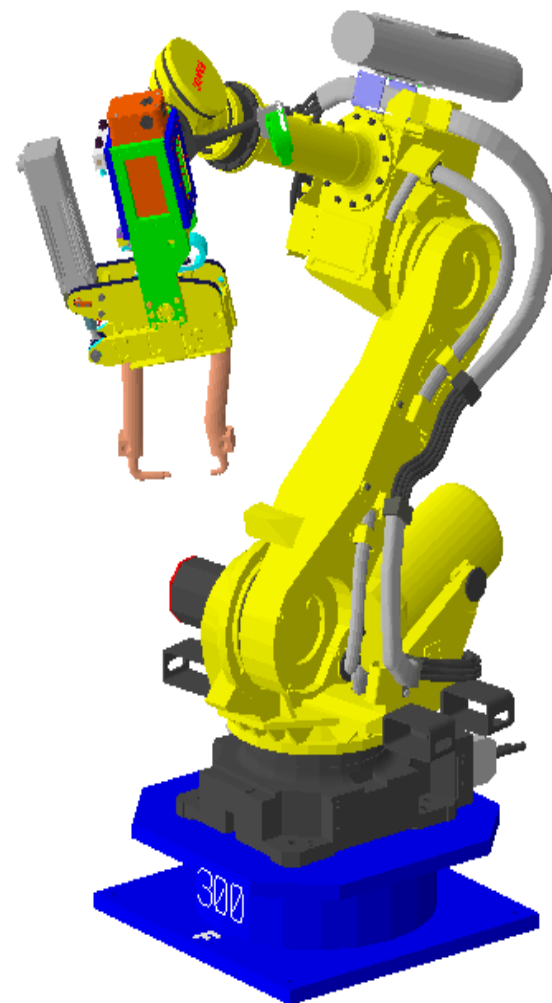
- Robot Path Finalization
- Collision free Workcell
- Finalization of Robot and Tooling Placement
- DXF out of the tool placement
- Swept volume Creation
- Payload Entry





Offline Programming

- Final Programming
- Attributes entry according to customer standards
- Fixture Programming
- Sequence Creation
- I/O Connection
- Cycle time under Control





Documentation

- Weld Matrix Creation
- Robot Data Sheet Creation
- SIM Status Report Creation
- Open Issues Report Creation
- Cycle time Report Creation



Case Study -1

Client : North American Client

Product Line :

Phase1, Phase2 & Phase3 Simulation of Rear Floor Body line

Objective :

- ☐ Design Validation of Welding fixture, Holding Systems, Pallet Tooling, Weld gun and EOAT has done and reported in the issue list with suggestion for the Designers.
- ☐ Weld gun Selection for all Welding station
- ☐ Collision free path creation for the whole line
- ☐ Offline programming for all the Robots
- ☐ RDS and Weld Matrix Creation.





Challenges:

Weld gun Selection is the main challenge in this project. AES Engineers has done a great job in this area and given very good suggestions to our customer to make the system work.

Tool Used : USPOT





Case Study -2

Client : North American Client

Product Line :

Phase1,Phase2 & Phase3 Simulation of Front Floor Body line

Objective :

- ☐ Design Validation of Welding fixture, Holding Systems, Pallet Tooling, Weld gun and EOAT has done and reported in the issue list with suggestion for the Designers.
- ☐ Weld gun Selection for all Welding station
- ☐ Collision free path creation for the whole line
- ☐ Offline programming for all the Robots
- ☐ RDS and Weld Matrix Creation.

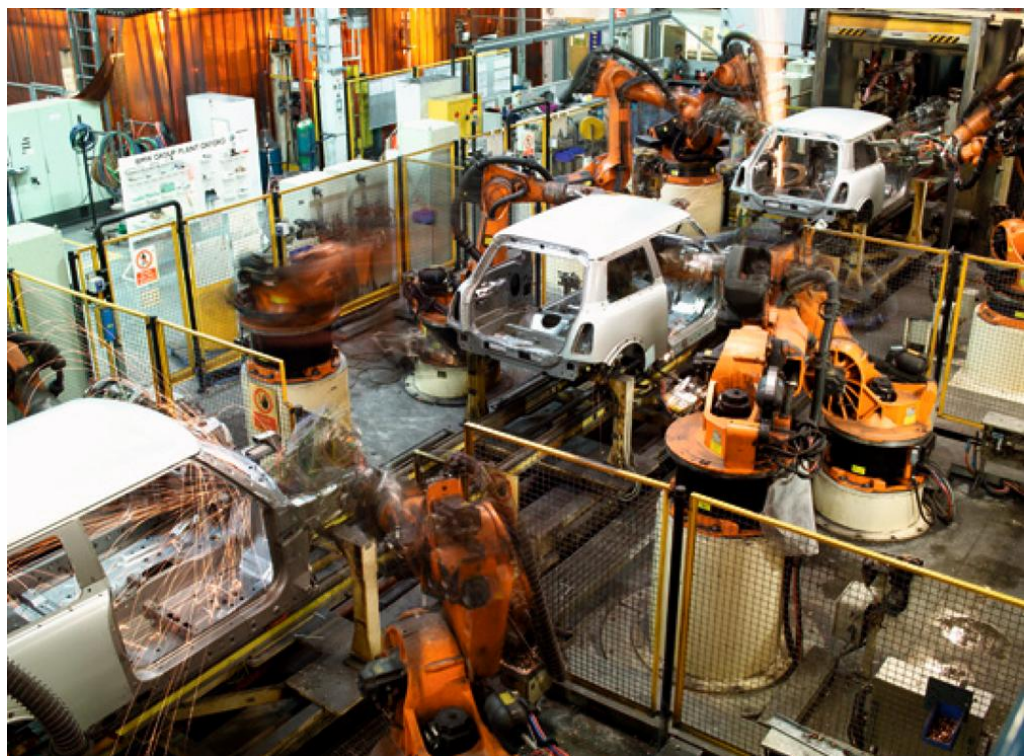




Challenges :

Cycle time is the major challenge in this project. AES Engineers has to work out in the paths to make the system under cycle.

Tool Used : USPOT





Case Study -3

Client : Indian Client

End User : European Major OEM

Product Line :

Phase1,Phase2 & Phase3 Simulation of Hood line

Objective :

- ☐ Design Validation of Welding fixture, Holding Systems, Pallet Tooling, Weld gun and EOAT has done and reported in the issue list with suggestion for the Designers.
- ☐ Weld gun Selection for all Welding station
- ☐ Collision free path creation for the whole line
- ☐ Offline programming for all the Robots
- ☐ RDS and Weld Matrix Creation.





Challenges :

Cycle time & gun selection are the major challenges in this project.

AES Engineers has to work out in the paths to make the system under cycle.

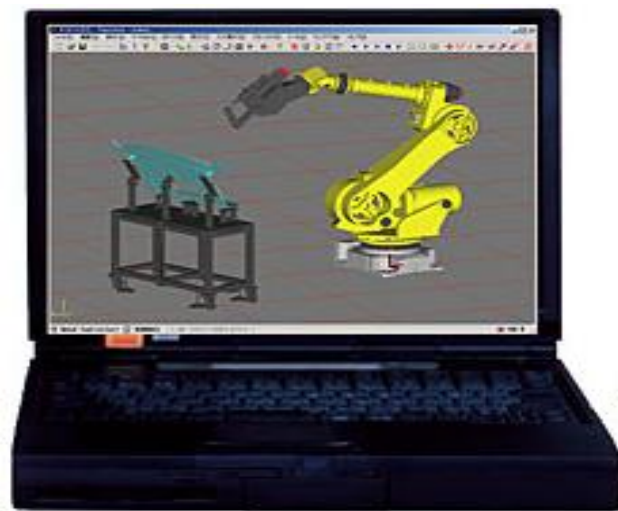
Tool Used : ROBCAD





Simulation Software

- UltraSpot
- Robcad
- Igrip



CAD Software

- Pro E
- Unigraphics
- Catia V5
- Solid Works
- Inventor
- Autocad



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Thank You