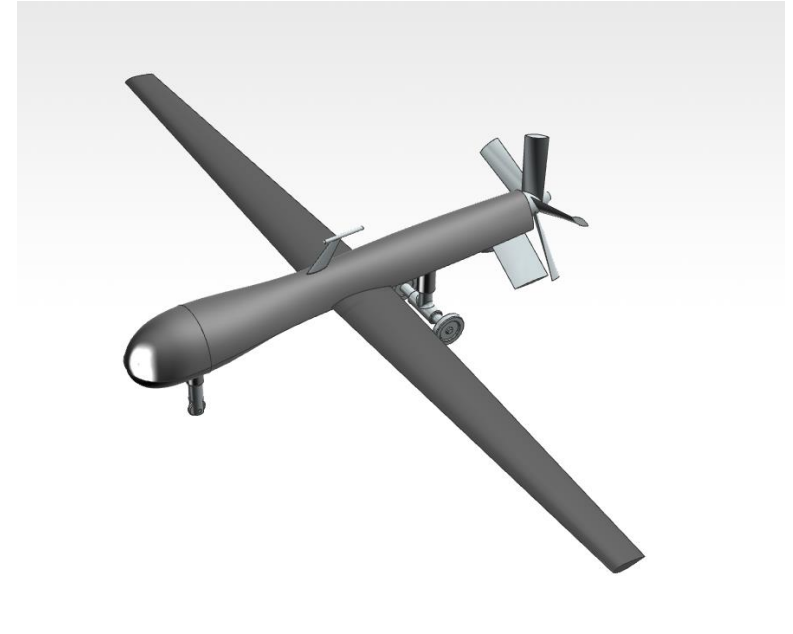


KZ250-Concept

FIXED WING UAV CONCEPT DESIGN



Introduction

KZ-250 is a concept design of a Fixed Wing UAV. It is inspired by Medium-Altitude Long-Endurance (MALE) drones which are used for military and industrial purposes. Few Examples of the MALE drones area as follows:

- Elbit Systems Hermes 900
- General Atomics Predator B
- Drishti 10 Starliner.



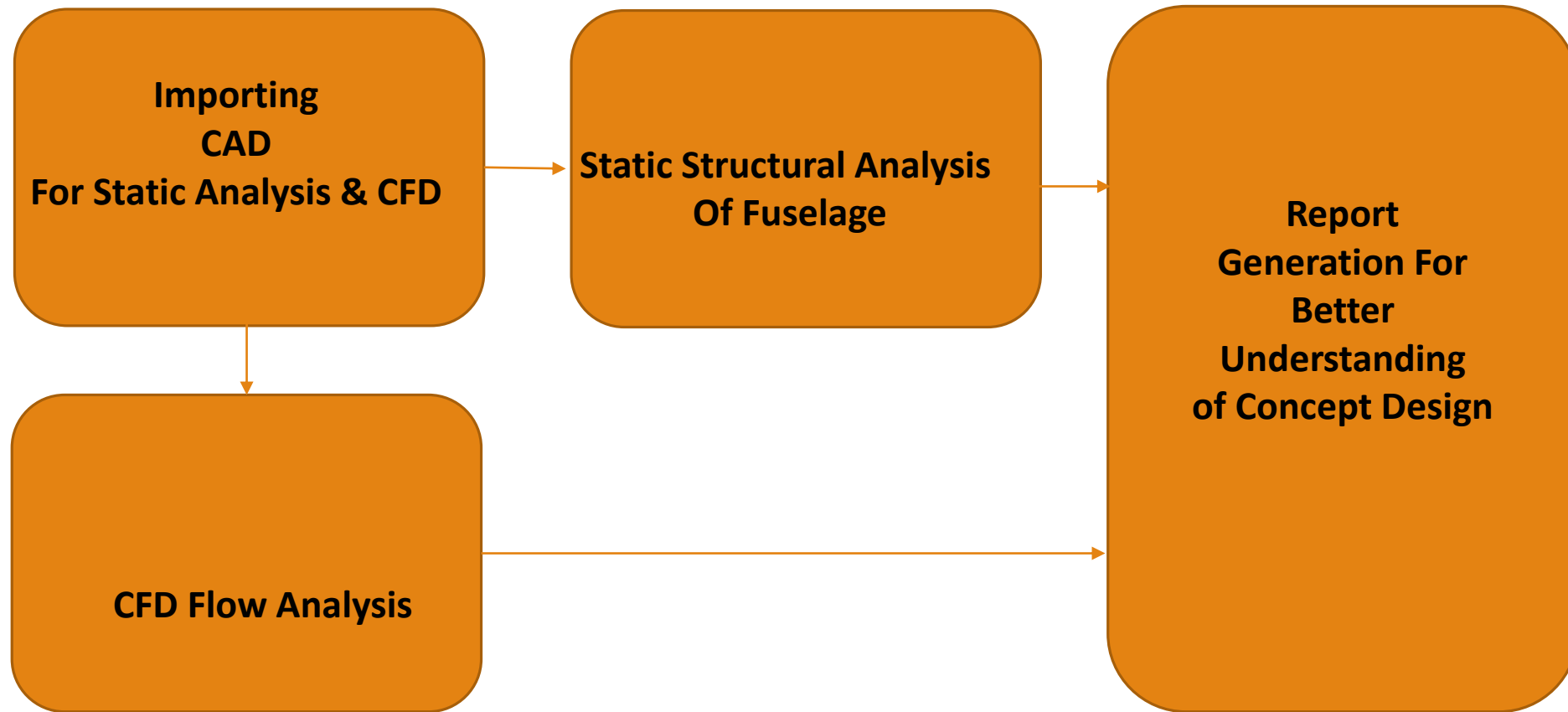
Product Development Process-Phase-1



Product Development Process-Phase-2



Product Development Process-Phase-3



Product Development Process-Phase-1- Part-A

Product Research



Concept & Specifications

Generation of Concept design & specifications Inspired by Medium-Altitude Long-Endurance (MALE) drones which are used for military and industrial purposes.

- Elbit Systems Hermes 900
- General Atomics Predator B
- Drishti 10 Starliner.



Concept Fixed UAV Design Specifications:

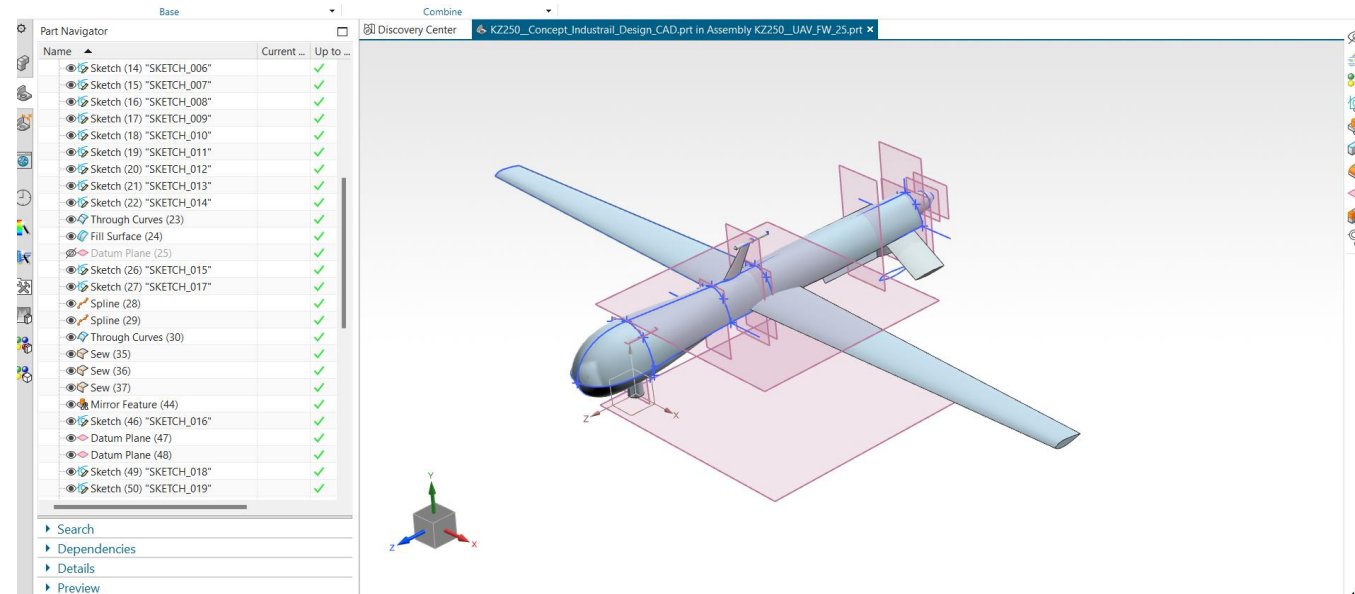
- Top speed: 220 km/h--61 m/sec
- Wing Span:14900 mm /14.9 meters
- Length: 7070 mm /7.07 meters
- Payload of 300 Kg
- Maximum Altitude:9500 meters

Materials

- Aluminium-Aerospace Grade
- Carbon Fiber Composites
- Titanium

Product Development Process-Phase-1- Part-B

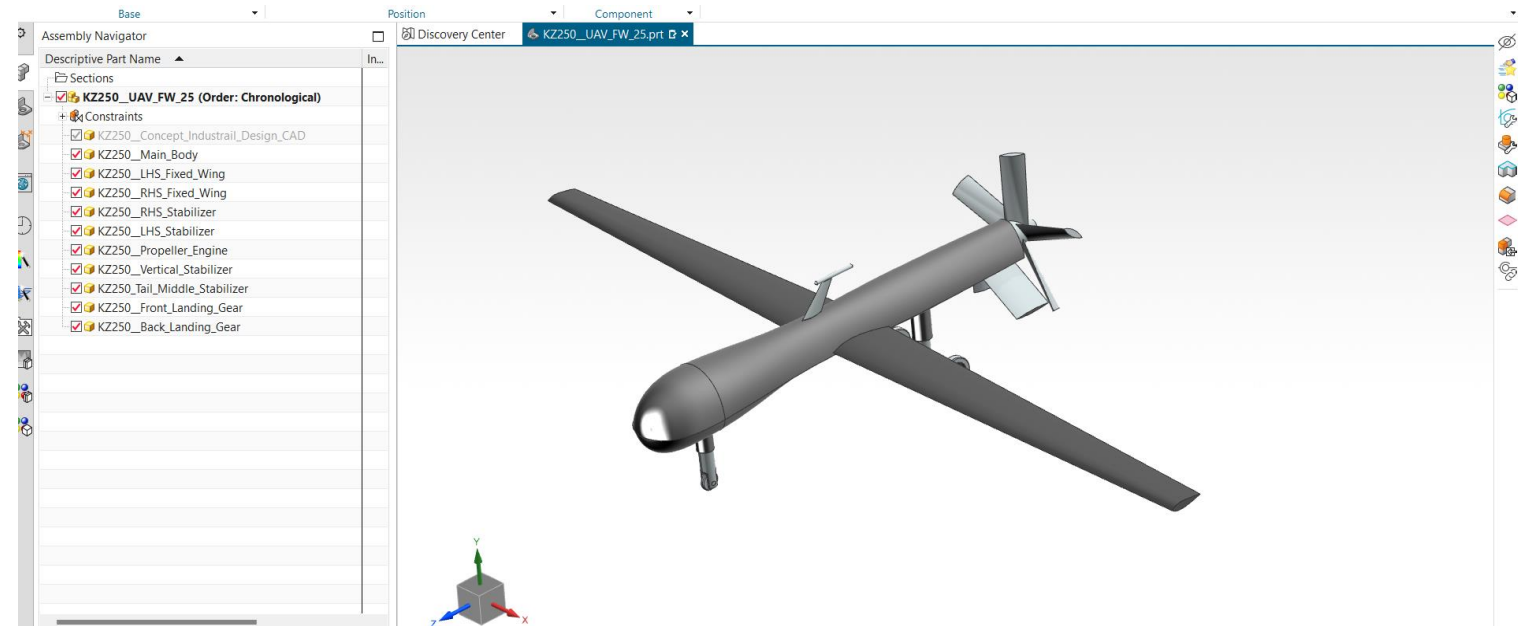
Master Model Curves & Surface Design in Siemens NX



Generation of Master Model using Curves, Surface Modelling and Solid Modelling Techniques. Creating Product interface of Geometry and curves to be shared with subsequent parts and assemblies.

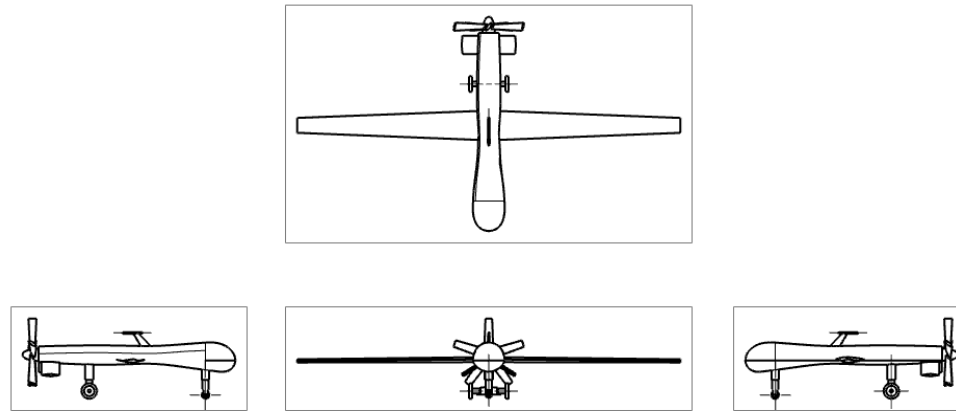
Product Development Process-Phase-2-Part A

Creating Individual Parts & Assembly



Using Top Down Design /Assembly Approach and Master Modelling Technique to Create Individual Parts & Assembly in NX using WAVE Link Geometry, Product Interface & Wave Link Interface.

2D-Representation



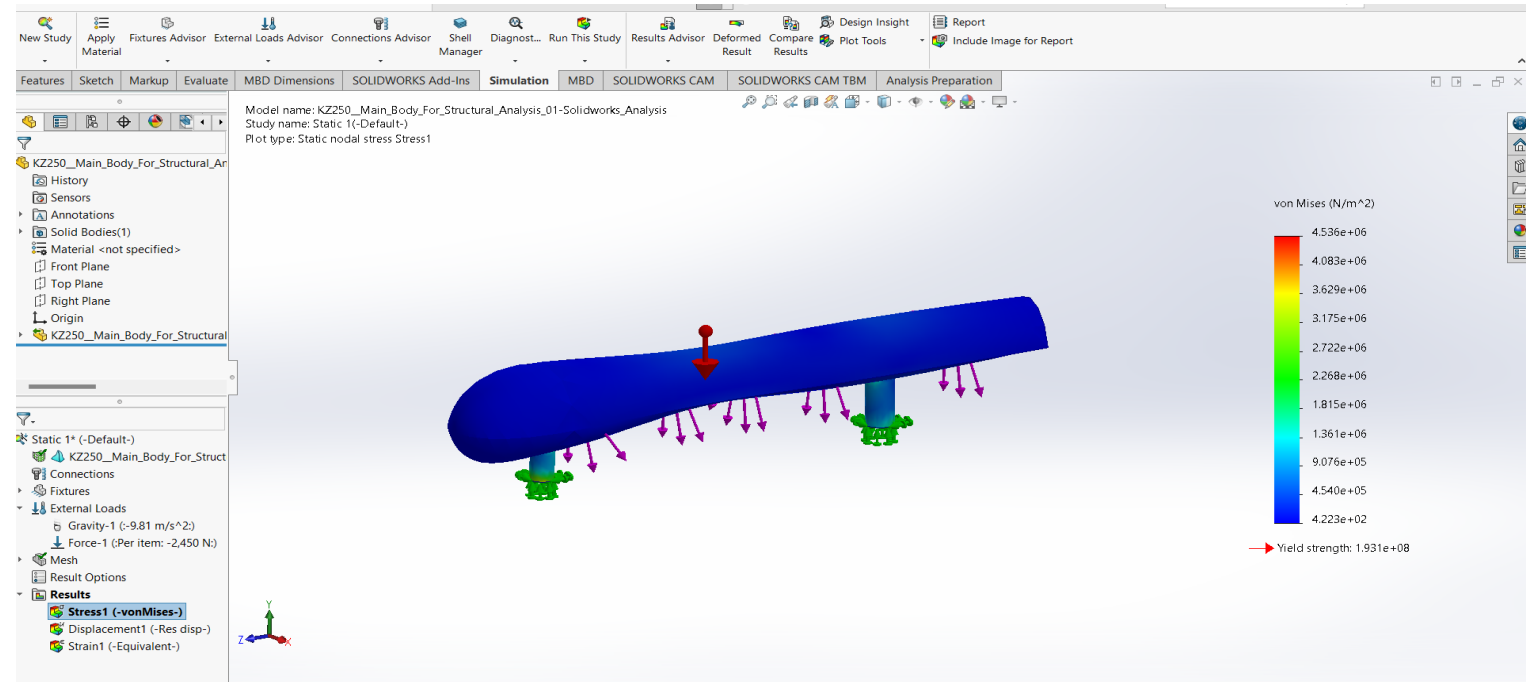
KZ250-Fixed Wing UAV
Ortho Graphic Views

Creating Basic 2D Representation of the UAV using drafting workbench

Product Development Process-Phase-3-Part A

Static Structural Analysis Of Fuselage

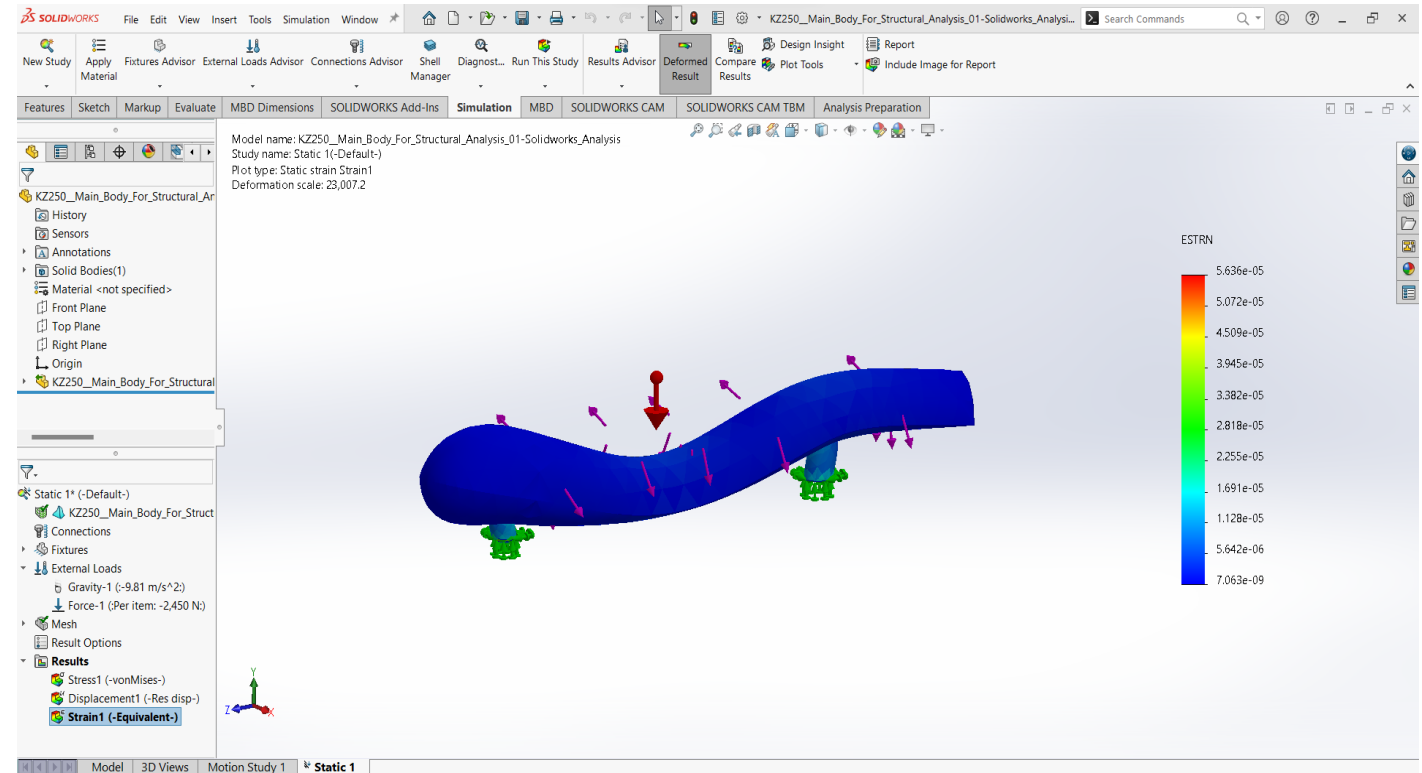
Generating Static Structural
Analysis Using Solidworks
Simulation workbench



Static Structural Analysis of the Body-Fuselage

Product Development Process-Phase-3-Part A

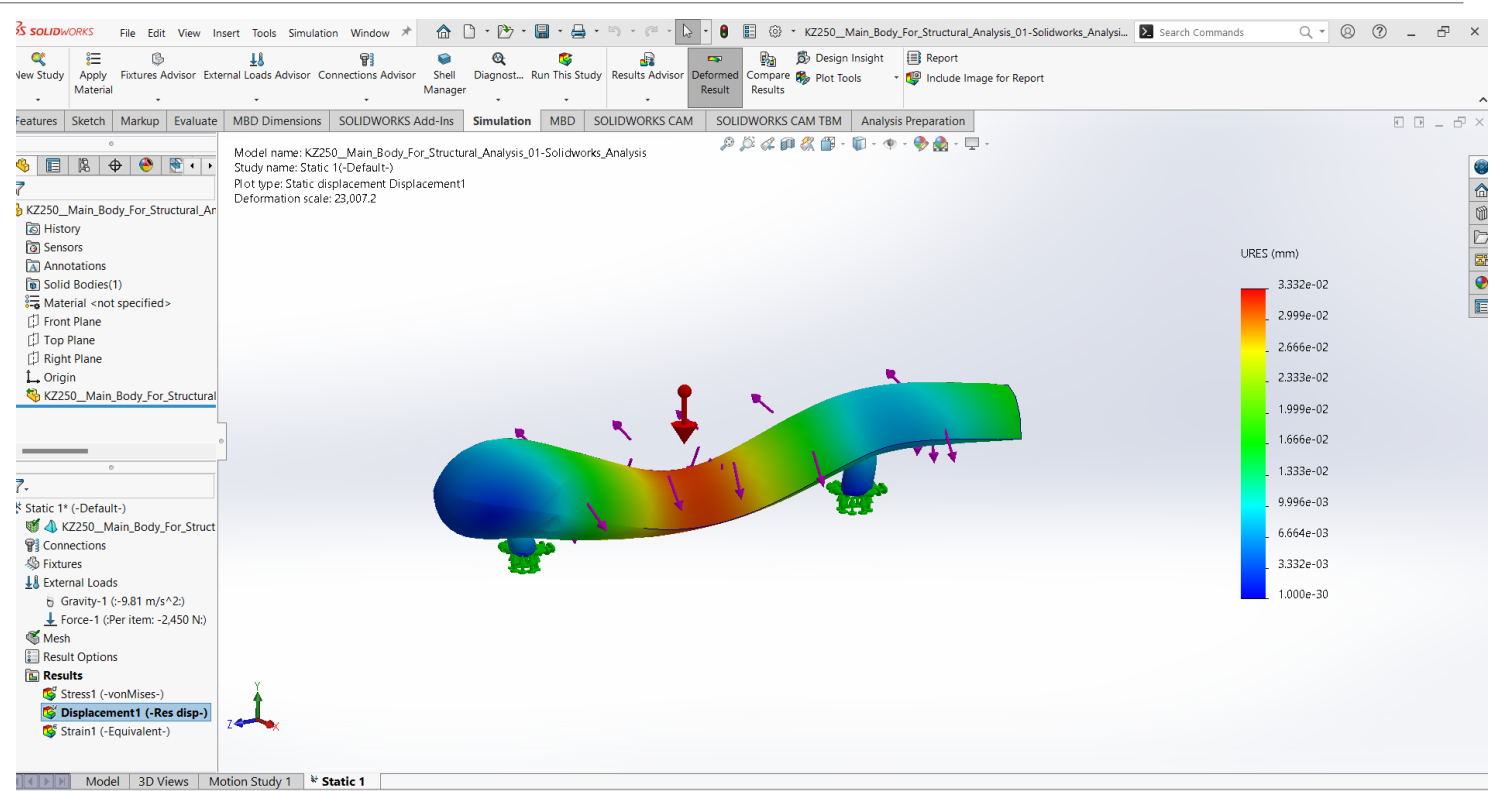
Static Structural Analysis Of Fuselage



Strain Distribution

Product Development Process-Phase-3-Part A

Static Structural Analysis Of Fuselage

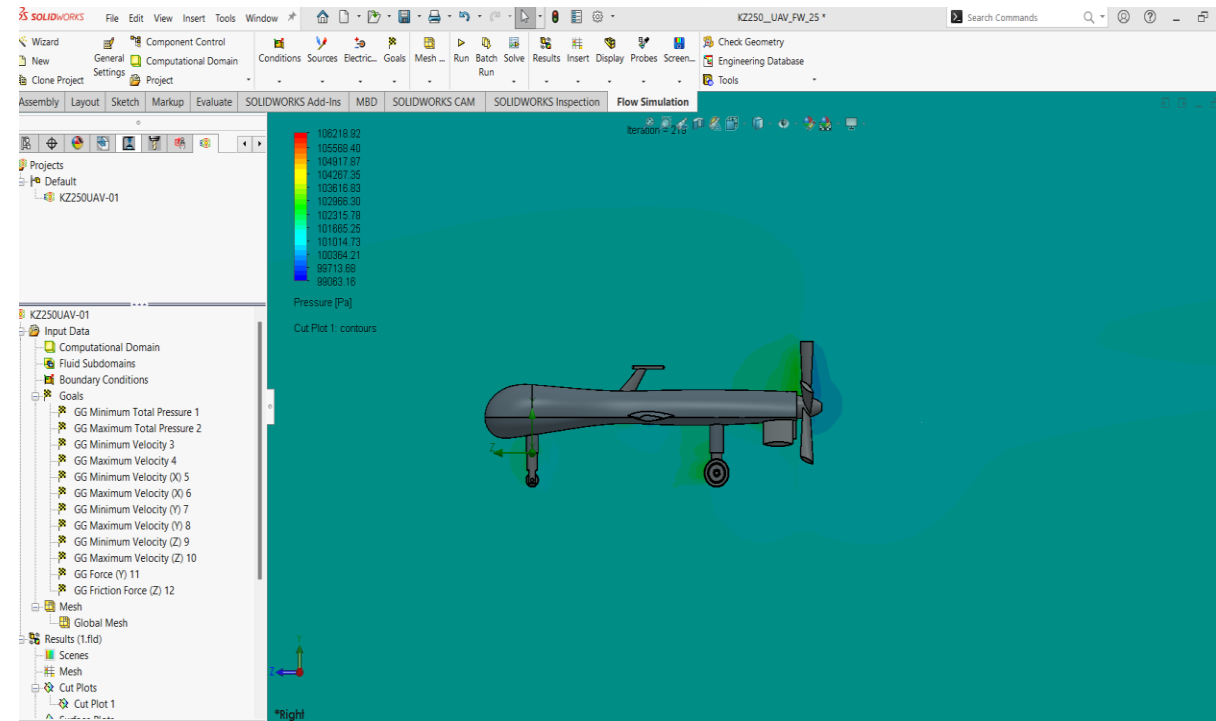


Displacement Analysis

Product Development Process-Phase-3-Part B

CFD Flow Analysis

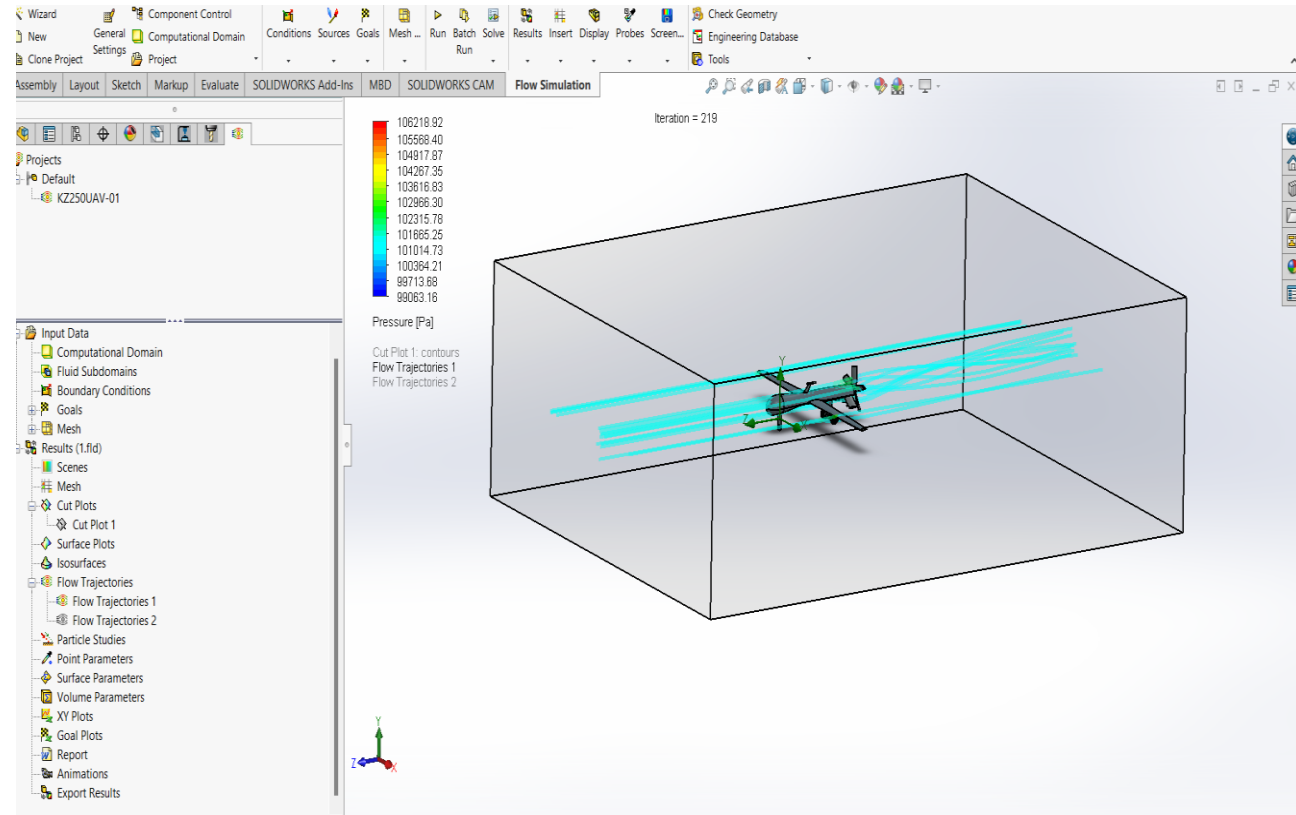
Generating Pressure Plot
Using
Solidworks Flow Analysis Workbench



Product Development Process-Phase-3-Part B

CFD Flow Analysis

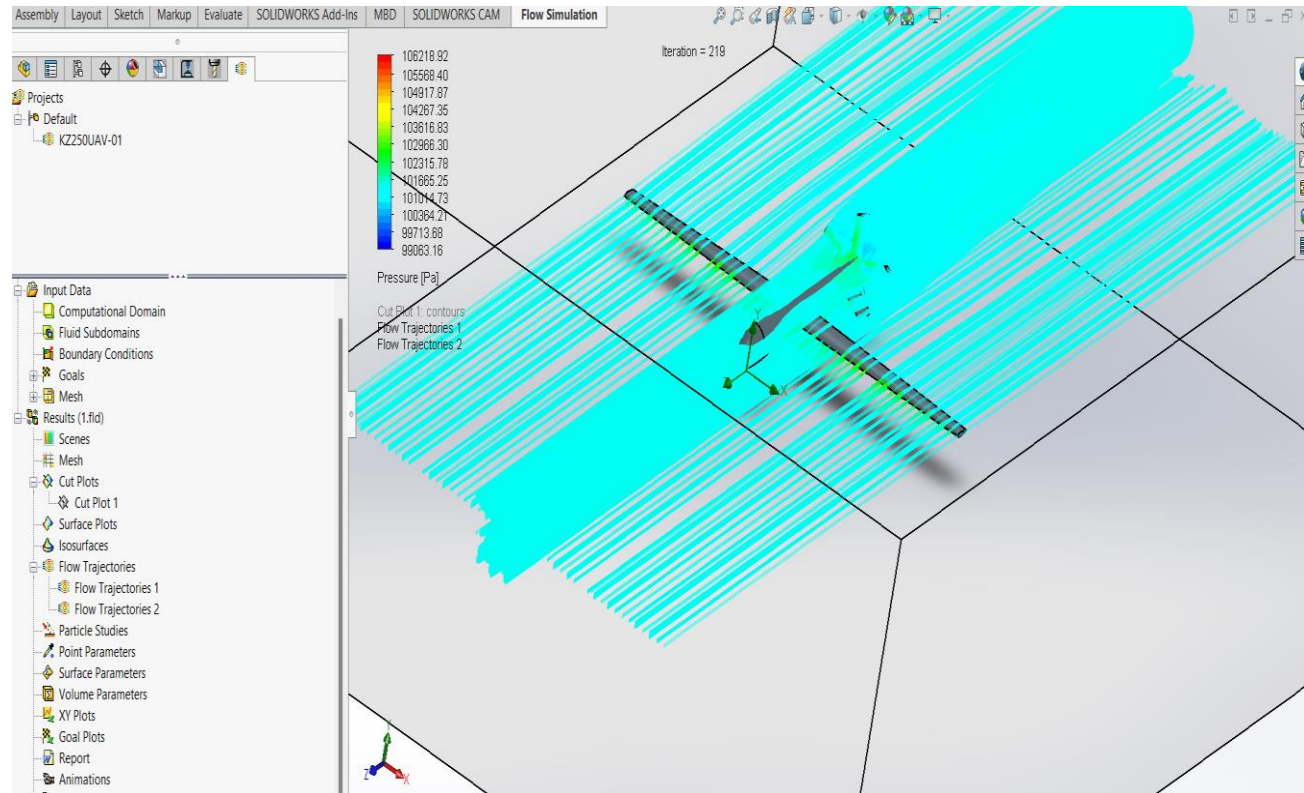
Generating Fluid Flow Plot
Using
Solidworks Flow Analysis Workbench



Product Development Process-Phase-3-Part B

CFD Flow Analysis

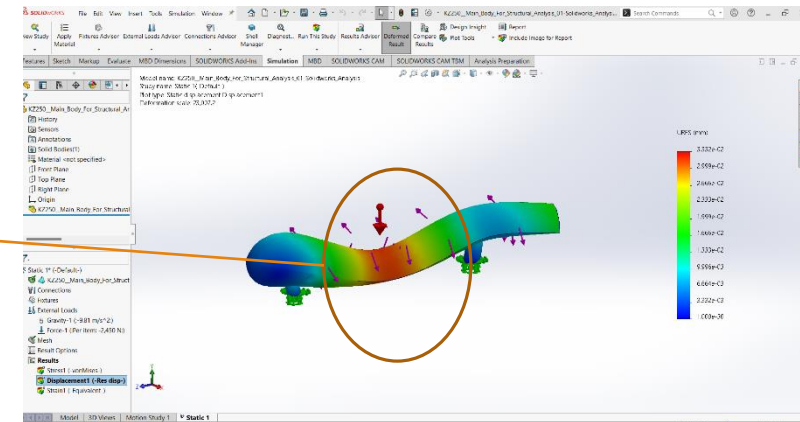
Generating Fluid Flow Plot
Using
Solidworks Flow Analysis Workbench



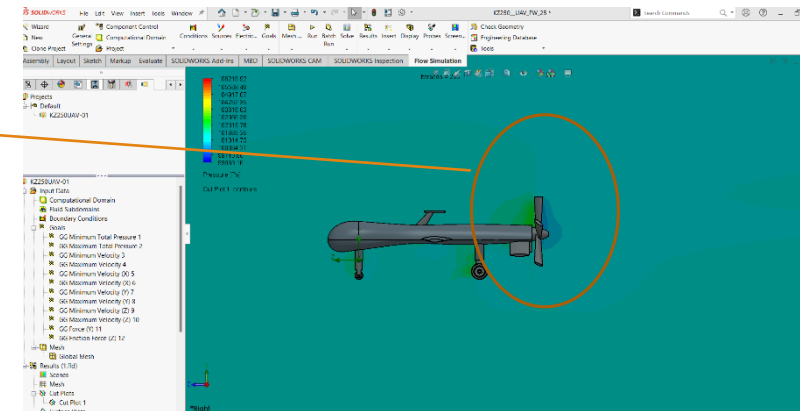
Product Development Process-Phase-3-Part C

Findings of Static Analysis & CFD Analysis

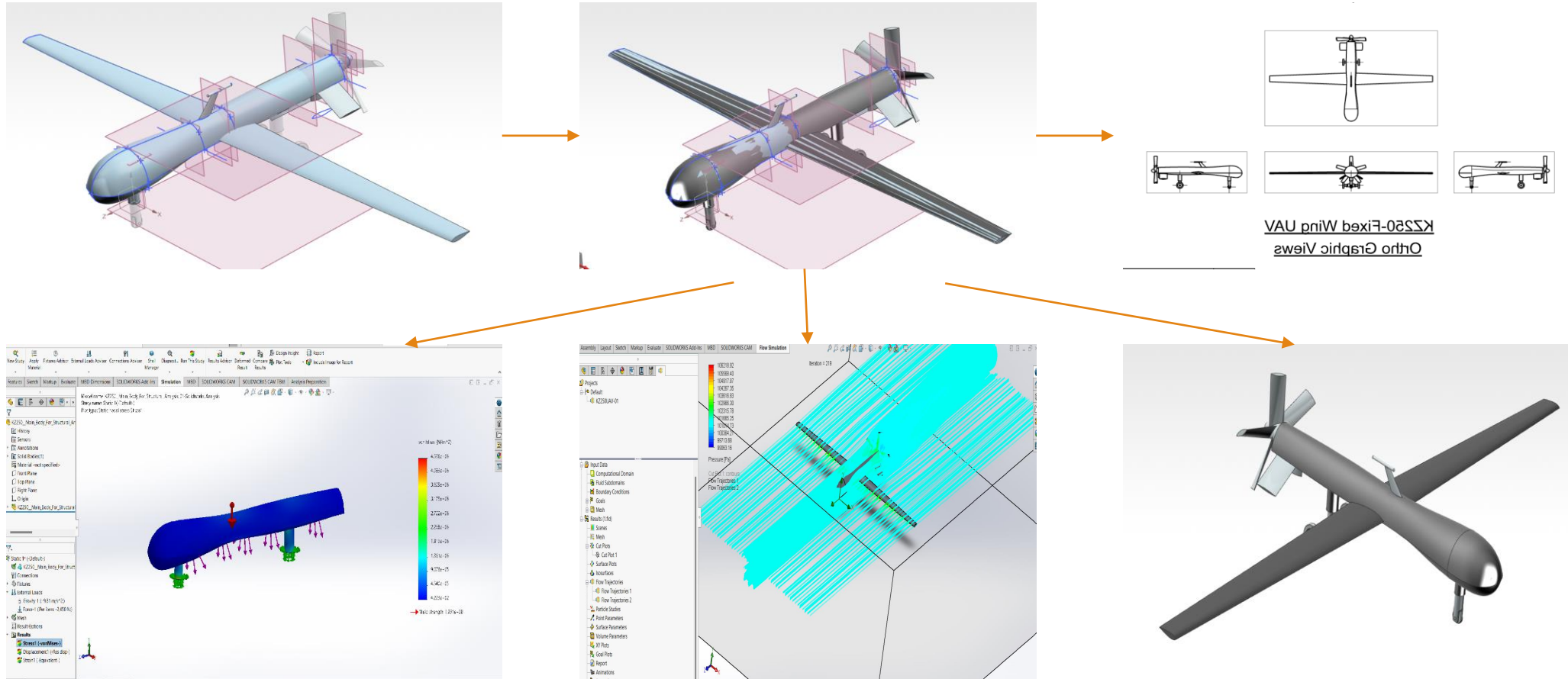
*Improvement needed in Fuselage Structure design



*Improvement needed in Tail end design of UAV



Overview of the Process



Learnings & Skills developed for real time industrial application

- Developed a good understanding of New Product Development Process
- Developed a good understanding Top Down & Master Modelling Technique using Siemens NX
- NX Siemens Solid Modelling & Surface Modelling skills
- NX Basic Drafting & Rendering skills
- Basic Static Structural Analysis Using Solidworks Simulation
- Basic Computational Fluid Analysis Using Solidworks CFD