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PROFESSIONAL EXPERIENCE

Designation: Technical Lead (September 2018 - Present)
Aerospace
HCL Technologies, Bangalore, India.

Designation: Senior Engineer Analysis (January 2015 – September 2018)
Aerospace
Axis Cades, Bangalore, India.

Designation: Executive (April 2013- January 2015)
Aero Group, Transportation Vertical,
L&T Technology Services, Bangalore, India.

Designation: Engineer - CAE (August 2011- April 2013)
Stress Group, Airframe Directorate,
Aeronautical Development Agency, Bangalore, India.

Designation: Engineer (September 2010- August 2011)
Design and Analysis Team
Basaveshwara Engineering Works, Naregal, India.

JOB PROFILE:

- Overall 9 years of experience in Aerospace domain in multiple disciplines like Design for need, Deviation (Concession) and Repair.
- Experience in **Nacelle Structures** of **A350**, **Dassault** and **MRJ**.
- Experience in ***AIRBUS DRR (Daily Repair Request)*** activity for the ***Wing-Filton (UK)*** and ***Wing-Wichita (USA)***.
- Experience in ***AIRBUS CONCESSION*** activity for *Single Aisle and Long Range Aircrafts.* Static and Fatigue justification of Concessions for both *Design Service Goal (DSG)* and *Extended Service Goal (ESG)*.
- Experience on ***CRASHWORTHINESS*** *certification* ***(VULNERABLE Activity)*** for *A350-1000, A350-900* aircraft using *ABAQUS 6.13.* Crashworthiness activities include ***DYNAMIC EXPLICIT ANALYSIS*** for *Blade Impact, Bird Impact* and *Belly Landing*.
- Experience in ***FATIGUE*** and ***DAMAGE TOLERANCE*** Analysis for Certification of Orbital-Joints and Cross Beams of A350-900.
- Experience in FE analysis of Composite and Metallic structural components of *AIRBUS A350XWB, A330 Neo, A400M* and *LIGHT COMBAT AIRCRAFT (LCA)* at part and assembly level using FE packages.
- FE analysis includes ***LINEAR STATIC, CONTACT, NON LINEAR STATIC, LINEAR BUCKLING, NATURAL FREQUENCY*** and ***DYNAMIC EXPLICIT ANALYSIS***.
- Worked on ***AIRBUS ISAMI*** modules like *FILLED HOLE, 1D JOINT, 3D JOINT, DAMAGED HOLE REPAIR, 1D SPLICING, JDV, PLAIN STRENGTH, UNFOLDING, DAMAGE TOLERANCE TRANSVERSE* and *EDGE IMPACT.*
- Proficient in *AIRBUS* tools like ***ISAMI, SAFE, SAMSEF, PSN, AIRBUS PATRAN, ACD*** and ***FASTPPH***.
- Worked on *DRR (DAILY REPAIR REQUEST)* activity tools ***AIRBUS SUPPLY GATE, AIRBUS WORLD, AIRNAVX, AVD (AIRBUS VIRTUAL DESKTOP), ICARUS, TRM (TECHREQUEST), MATHCAD, ISAMI*** and ***HAND CALCULATIONS***.
- Worked on *AIRBUS CONCESSION* activity tools ***ZAMIZ, CCD, TAKSY, SAFE, GILDA, SAMSEF, ISAMI*** *and* ***Hand Calculations***.
- Hands on experience in ***CLASSICAL METHODS*** for *FASTENERS* and *LUG DESIGN* by hand calculation used in aircraft components.
- Preparation of ***STRESS DOSSIER*** for both ***JUSTIFICATION*** and ***CERTIFICATION***. Drawing clearance from stress point of view.

PROJECTS

- ***Design optimization of Nacelle structures like Fancowl components and Thrust Reverser components for Nacelle Enhancement Program.***

  Software used : *Hypermesh, Nastran, Patran,MS Word and MS Excel.*

  Description : Static and Fatigue structural analysis of Fancowl and Thrust Reverser Components.

  Responsibility:

  - Coordinating with customer for various design changes.
  - Static Analysis checks to perform.
  - Fatigue Analysis checks to perform
  - Sign of sheet preparation and Airworthiness report preparation for the validation.

  Client : COLLINS USA

  Work Location : HCL Technologies (COLLINS) offshore

- ***Static justification of In-service Repairs (After Market Services) for single Aisle (A318, A319, A320 and A321), Long Range (A330 and A340) and Double Decker (A380) Aircrafts.***

  Software used : MS-Excel, MS-Word, MATHCAD, *ISAMI, AIRBUS World, TechRequest (TRM), ICARUS and Excel Macro.*

  Description : Each repair on an aircraft structure has to be capable of sustaining the original justified design loads for static, fatigue and damage tolerance requirements. Only the static requirements will be considered in this chapter.

  Responsibility :

  - A static or stress analysis is performed to make sure that the structure can withstand the applied ultimate loads without failure and without permanent deformation at limit load.
  - There are two main approaches in demonstrating the static strength capability of the repair design.
    - **Details of the applied loading are known:** a detailed stress analysis of the part to be repaired results in an optimized repair design. This is generally the approach taken by the manufacturer.
    - **No details of the applied loading are known:** In this case the REVERSE ENGINEERING METHOD may be employed to evaluate the repair static strength capability.
  - The following checks in a static analysis for repair are performed:
    - Tension check
    - Shear check
    - Compression check
    - Check to ensure that the fasteners are able to transfer the applied loading.
  - Following calculations were performed to justify the repairs:
    - Calculation under Tensile Load:
      - Maximum Tensile Load
      - Reserve Factor
      - Determination of Fastener Number
    - Calculation under Shear Load:
      - Maximum Shear Load
      - Reserve Factor
      - Determination of Fastener Number
    - Determination of Shear or Bearing Critical for Sections in Double Shear:
      - Calculation of Double Shear Fastener Allowable
      - Determination of Max Fastener Allowable Load Based on Bearing Stress Allowable
      - Determination of Bearing Stress Based on Fastener in Double Shear
      - Determination of Fastener Number
    - Calculation under Crippling Load
      - Calculated Element Breadth
      - Calculating Element Crippling Stress
      - Calculating Element Crippling Load
      - Calculating Profile Crippling Load
  - Static justification for ***In-service Repairs*** like corrosion, nicks, dents and lightning strike cases for the wing ATA chapters 57−20−00.

  Client : AIRBUS UK

  Work Location : AXISCADES (AFDCI) offshore

- ***Static justification of Concessions for single Aisle aircraft A319, A320 and A321 for Design Service Goal (DSG).***

  Software used : *ISAMI, ZAMIZ, TAKSY, AIRBUS World and Excel Macro.*

  Description : The project deals with addressing concessions of any individual aircraft (Each MSN), which shall be operated up to DSG (48 000 FC) and corresponding RF.

  Responsibility:
  - Worked on non-conformities like Rework for scratches, Dents, Nicks and Fastener Oversize.
  - Static RF computation from AIRBUS supplied static reports.
  - RF Improvement using Knock down Factors for static justification.
  - Calculations performed for concessions like stringer deviations and doubler modifications.

  Client : AIRBUS Hamburg

  Work Location : AXISCADES (AFDCI) offshore

- ***Fatigue justification of Concessions for single Aisle aircraft A319, A320 and A321 for Extended Service Goal (ESG).***

  Software used : *SAFE7.6-2, ISAMI, ZAMIZ, TAKSY, AIRBUS World and Excel Macro.*

  Description : The project deals with addressing concessions R/C/P/T of any individual aircraft (Each MSN), which shall be operated up to ESG1 (60 000 FC).

  Responsibility:
  - Project in charge at the offshore for Resource management and delivery estimation.
  - KPI calculation and project estimation.
  - Forecast planning.
  - Customer interaction and continuous process improvement.
  - Fatigue justification based on AIRBUS Fatigue Quality Index (AFI/IQF) and Life Cycle (FC/FH) estimation.
  - Spectrum Launch, Equivalent stress extraction from GFEM using Dynfest.
  - Fatigue justification of concessions for extended service goal using AIRBUS M2841, Concession user guideline and practical guideline.
  - Kt calculations for skin rework repairs, fastener changes, dents, chemical milling using SAFE and ISAMI airbus modules.

  Client : AIRBUS Hamburg

  Work Location : AXISCADES (AFDCI) offshore

- ***Static validation of the shear webs and angles of aft lower shell for A350-900 MSN5 certification.***

  Software used : *NASTRAN, PATRAN, ISAMI and Excel Macro.*

  Description : The aft lower shell consists of Crossbeams, Cross beam fitting, Frames, Lower panel, Struts and Frames which is a junction between Shear web Angles and vertical angle. The Shear webs are located between Frame 62 to Frame 71 and stringers 37-38 LHS & 37-38 RHS.

  Responsibility:
  - FEM validation for the given DFEM using AM2036 Standard.
  - Static Stress Analysis of shear web fittings.
  - Buckling Analysis.
  - Fastener calculations.
  - Filled hole calculation.
  - Damage tolerance analysis.
  - Plain strength analysis.
  - Edge impact analysis.
  - Metallic stability analysis.
  - Material strength analysis.

  Client : AKKA Technologies

  Work Location : L & T Offshore

- ***Fatigue and Damage tolerance validation of the crossbeams 61 to 71 of the A350-900 XWB Aft Lower shell.***
  Software used : *PSN, ISAMI and EXCEL MACRO.*
  Description : The aim of the fatigue and damage tolerance analysis is to determine the life of the part and to ensure that it will hold the Design Service Goal. The Aft Lower Shell (ALS) consists of Crossbeams, Frames and Lower panel. Other parts are used in order to link different elements such as the Struts which provide radial junctions between Crossbeams and Frames.
  Responsibility:
  - GFEM load extraction.
  - Spectrum generation.
  - Finding Equivalent fatigue stresses from Spectrum output for different missions.
  - AFI calculation.
  - Fatigue life calculation for different missions.
  - Finding Equivalent propagation stress from spectrum output.
  - Equivalent Crack Propagation Stress Calculation.
  - Stress Intensity Factor Computation.
  - Determination of Critical Crack Length.

  Client : AKKA Technologies
  Work Location : L & T Offshore

- ***Fatigue and Damage Tolerance analysis of Orbital joint at FR 13 STR 30 and FR 13 STR 23-27.5 for A350-900 certification.***
  Software used : *PSN, ISAMI, PATRAN, NASTRAN, FASTPPH, SAFE, SAMCEF and EXCEL MACRO*
  Responsibility :
  - Geometry check-up and Drawing details.
  - Load Extraction from the PSN Tools for the Super Stiffener and the Rod.
  - Spectrum generation using ISAMI.
  - Discretisation of GFEM.
  - Joint 3D Calculation of the fastener using SAFE and SAMCEF using FASTPPH method.
  - Post Processing for Fastener Hole Study and RF improvement.
  - Preparation of the Certification Report using Dossier Tool and ACD6 Sheet.

  Client : SAFRAN Labinal
  Work Location : SAFRAN India

- ***A350XWB-900 CWB and Outer Wing Box Root Joint Non-Linear Finite Element Analysis.***
  Software used : *HYPERMESH and ABAQUS*
  Responsibility :
  - FE Modelling of Lower Cover Panels of Centre Wing Box and Outer Wing Box, Fuselage Panel Stringers and Repair Parts for Internal Foot Frames (IFFr) of Left Wing Root Joint.
  - Shell mesh followed by tetra mesh creation for all repair parts and foot frames.
  - Mesh conversion from shell S4 to SC8R for the cover panels.
  - Mesh refinement over the contact jones near Vertical Tee.
  - Creating contact surfaces for Repair Parts, Centre Wing Box Crown Fittings and Top Cover.
  - Updating Section Properties for the fittings and Panels.
  - Material non-linearity and geometrical non-linearity considered for the analysis.
  - Post processing the analysis results at various section points.

  Client : AIRBUS France
  Work Location : AIRBUS India

- ***A380 LH and RH Wing Rib Feet Modifications FE-Modelling and validation.***

  Software used : *HYPERMESH, NASTRAN and MD PATRAN*

  Responsibility :

  - FE Modelling of A380 Wing Ribs and Wing Rib Feets in MD PATRAN.
  - Updating Materials and Material Properties for the Ribs and Rib Feets.
  - Validation as per M2036 (Finite Element Analysis Manual)

  Client : AIRBUS UK

  Work Location : AIRBUS India

- ***NLG Forward Door of LCA NP1 STD Aircraft.***

  Software used : *HYPERMESH, NASTRAN and ABAQUS*

  Description : NLG door is the structural part of aircraft which is operated by jack for the extension and retraction of landing gear. NLG door assembly is made of Honeycomb core sandwiched structure, composite skin and metallic fittings.

  Responsibility:

  - Geometry clean-up was carried out in HYPERMESH using CATIA V5 solid models.
  - Shell mesh, brick mesh and tetra mesh generation for skin, fittings and honeycomb structures using HYPERMESH.
  - Various boundary conditions and load cases for the door in closed, open and jammed condition were studied to check for critical condition.
  - Carried out linear and non-linear static, buckling and natural frequency analysis in ABAQUS and NASTRAN.
  - Co-ordinated with loads and detail design group for structural modifications.
  - Hand calculations were made for fastener and lug designs.
  - Stress report is released and door is in flying condition.

  Client : ADA Bangalore

  Work Location : ADA Bangalore

- ***F1A Side Panel in Fuselage Test Box of LCA LSP Series.***

  Software Used : *HYPERMESH and ABAQUS*

  Description : Fuel tank is the structural part of the aircraft which provides the space for the storage of fuel. It is located in the front fuselage from which fuel is supplied to the engine. Fuselage Test Box is made of composite c-channel, test panel and aluminium test rig. The scope of the project is to check for pressure test.

  Responsibility:

  - Geometry edited using HYPERMESH.
  - Shell mesh generated for entire assembly using HYPERMESH.
  - Coupling and connector elements were idealised for rivet and bolt connections.
  - The non-linear static, buckling and natural frequency analysis were carried out for pressure load case.
  - Co-ordinated with detail design and testing group for structural modifications and testing conditions.
  - Submitted technical report for test setup and the setup is ready for testing.

  Client : ADA Bangalore

  Work Location : ADA Bangalore

- ***NLG U/C Bracket of LCA NP1 STD Aircraft for the Repair Scheme.***

  Software Used : *CATIA V5 and ABAQUS*

  Description : NLG U/C Bracket is the structural part of the aircraft which is directly attached to the Nose landing gear. It is located in the under carriage of front fuselage. The purpose of the Bracket is to take jack reaction load from Nose landing Gear to fuselage. The objective of the project is to modify the bracket for navy deck landing load cases.

  Responsibility:

  - For the first cut results, the entire assembly was taken into CATIA v5 and tetra mesh generated for all the parts.
  - The connections and contacts were defined for the model.
  - Carried out linear static analysis in CATIA v5.
  - Co-ordinated with detail design and fatigue group for skin modification and cyclic load cases.
  - Detailed analysis (linear static contact) was carried out in ABAQUS for seven critical load conditions.
  - Hand calculations for fasteners were made to check the strength of bolts and rivets.
  - Stress report is released.

  Client : ADA Bangalore

  Work Location : ADA Bangalore

- ***Dive brake of LCA MK2.***

  Software Used : *HYPERMESH, ABAQUS and PATRAN*

  Description : Dive brake is the structural part of the aircraft which is a substitute for MLG Follow-up door and Airbrake. It is located in the centre fuselage. Aim of the project is to study feasibility for replacing existing airbrake and follow-up door with single dive brake.

  Responsibility:

  - The surface geometry and fitting sections were taken into HYPERMESH for meshing.
  - Pre-processing was carried out both in PATRAN and ABAQUS for open, closed, just open and jammed conditions.
  - Carried out linear, non-linear, buckling and frequency analysis for six load conditions.
  - Compared results of NASTRAN and ABAQUS for all the load cases.
  - Co-ordinated with detail design group for metallic and composite configuration of skin and various lug designs.
  - Stress report is under making.

  Client : ADA Bangalore

  Work Location : ADA Bangalore

- ***Other major projects carried out.***

  - Stress analysis of Turkey Feather for SP series.
  - Stress analysis of 1200 litre Drop Tank for jettisoning.
  - Mechanism simulation of Arrestor Hook for Navy Trainer MK2.
  - Stress analysis of MLG Aft Door for Air force Fighter MK2.

QUALIFICATION

Bachelors in Mechanical Engineering ' 2010
Class/Grade: First
Visvesvaraya Technological University Belgaum, India

Thesis: ***Study of Vibrational Behaviour of Composite Laminated Plate using FEM***
Developing a thorough understanding of the behaviour of laminate with different stacking sequence is a fundamental step towards understanding the behaviour of complex structures. To support the project, lamina made up of Carbon fibre and Epoxy resin is used. The FE Model considered is a four layered composite plate in a simply supported manner subjected to uni-axial point load at centre. Analysis was carried out for special orthotropic laminate with different stacking sequence [0/90/0/90], [0/90/90/0] and [90/0/90/0] in ANSYS.

PROFESSIONAL TRAINING

- HYPERMESH: At Altair Engineering works Through ADA.
- NASTRAN/PATRAN: At CSM, a vendor of MSC Software for ADA.
- ABAQUS: Undergone advanced trainings on Mechanisms, Connectors, Contacts at ADA by Dassault Systems.
- CATIA V5: 3D Modelling and GSD Training at Cadmax Solutions.
- During my period of work at ADA, I attended fundamental trainings on RADIOSS, OPTISTRUCT, HYPERVIEW, CATIA V5 ANALYSIS (Contacts and Connections) and ELFINI.

COMPUTER PROFICIENCY

Programming	**:** *C & MATLAB (Basics).*
Pre Processing	**:** *ABAQUS, PATRAN, CATIA V5 (ELFINI), HYPERMESH.*
Solvers	**:** *ABAQUS, NASTRAN, RADIOSS, ELFINI.*
Post Processing	**:** *ABAQUS, PATRAN, HYPERVIEW.*
Operating Systems	**:** *MS Windows, Unix and Linux.*

AIRBUS TOOLS

MD PATRAN, NASTRAN, FASTPPH, PSN, ISAMI, SAFE, SAMCEF, ACD, STRESS DOSSIER, EXCEL MACRO

PERSONAL DETAILS

D.O.B	**:** 3rd Feb 1988.
Nationality	**:** Indian.
Passport No	**:** K3800374
Languages	**:** English, Hindi & Kannada.

DECLARATION

I hereby declare that, the above mentioned details are true to my knowledge.

Date :

Place : **Signature**