ALI HAIDER

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SUMMARY

Mechanical Engineer with 4+ years of experience in equipment reliability, maintenance, and research. Skilled in managing large engineering projects, performing advanced material testing, and developing innovative manufacturing solutions. Currently pursuing an MSc in Manufacturing (Additive Manufacturing Major) at Aalto University.

WORK EXPERIENCE

Research Assistant – Hydrogen Embrittlement Project

Aalto University | Espoo, Finland **2025–Present**

- Working under **Prof. Pedro Vilaca** (Head of Department, Mechanical Engineering).
- Investigating hydrogen embrittlement effects on the Heat-Affected Zone (HAZ) of welded pipes.
- Performing CERT (Constant Extension Rate Testing), CLT tensile testing, Thermal Desorption Spectroscopy (TDS), and hardness tests on hydrogen-exposed materials.
- Predicting material degradation and failure mechanisms for welded structures.

Student Project Product Development

2024–2025

Vaisala Oy | Helsinki , Finland

- Led rapid prototyping and user testing to redesign HVAC transmitter casings for improved manufacturability and installation.
- Developed service blueprints and workflows for enhanced maintenance experience.
- Applied Design for Manufacturing (DFM) principles and explored novel closure mechanisms.

Maintenance & Reliability Engineer

2019-2024

Fauji Fertilizers Company Ltd. | Pakistan

- Conduct regular **inspections & maintenance of mechanical rotary and static equipment** to identify and address potential issues.
- Diagnose and resolve mechanical issues promptly, minimizing production interruptions.
- Design of Static piping system for petro-chemical process industry
- Document equipment inspections, maintenance activities, and repairs in detailed records.
- Ensure compliance with safety regulations and guidelines in all maintenance activities.
- Participate in interdisciplinary teams for troubleshooting complex mechanical issues.
- Led **5,000+** maintenance jobs in a 22-day turnaround, ensuring zero safety incidents.
- Participated in the development of a reliability framework, achieving a **$500k** reduction in maintenance costs.
- Managed spare parts inventory, optimizing availability in **SAP S4** & reduced procurement in lead times for **750+ spares by 30%, saving $2M** via streamlined purchasing processes

EDUCATION

MSc in Manufacturing (Additive Manufacturing Major)

Sep 2024 - current

Aalto University | Espoo, Finland

- GPA: 4.71/5 | EIT Manufacturing Scholarship
- Relevant Coursework: Advanced Manufacturing, Design for Additive Manufacturing (DfAM),Welding design and process, Manufacturing Operations, Non-Destructive Testing (NDT), Fracture Mechanics, Modeling in Applied Mechanics, Casting and Forming Technology, Mechanical Testing of Materials, Machining Processes,

BSc in Mechanical Engineering
National University of Sciences and Technology(NUST) | Pakistan 2015 - 2019

- GPA: 3.68/4
- Bachelor Thesis: Design and fabrication of thread testing bench for suspension rods

TECHNICAL SKILLS

- **Maintenance & Reliability:** Preventive/Corrective Maintenance, RCA, RCM
- **Welding & Inspection:** GTAW, SMAW,SAW,GMAW,FSW NDT (UT, RT, PT)
- **Design & Simulation Tools:** SolidWorks, AutoCAD, Altair (Topology Optimization), Simufact (Metal Process Simulation)
- **Project & Maintenance Tools:** SAP S4 (CMMS), Primavera P6
- **Engineering Analysis:** MATLAB, Granta EduPack, Compress, Ceaser II

CERTIFICATIONS

- **CSWIP 3.1 Certified Welding Inspector (TWI)**
- **Six Sigma Yellow Belt**

KEY PROJECTS

- **Topology Optimization of Aircraft Landing Gear Link Using Altair:** Redesign an aircraft landing gear link and follow up with finite element analysis to assess failure risk under operational loads.
- **Thermo-Mechanical Simulation of Engine Mounting Bracket in Simufact:** Evaluate how build orientation affects thermal deformation and residual stress in a metal engine mounting bracket during and after processing.
- **Machine design of Mechanical Sorting Mechanism:**CAD modeling and material selection using Granta EduPack, 3D printing of structural components, iterative strength optimization
- **Casting Design & Manufacturing plan for a sand mixer blade:**Material selection, process selection design optimization , tender call
- **Rehabilitation of Water Tube Boiler:** Upgraded superheater tubes from P-11 to P-22, replaced combustion nozzles, and ensured ASME compliance.
- **Urea Reactor Rehabilitation:** Conducted SCC detection through Replica Metallography, supervised GTAW welding repairs, and led ammonia leak tests for reactor integrity.
- **8MW Steam Turbine Overhaul:** Managed rotor, bearing, and nozzle replacements, installed electronic speed control, and enhanced turbine performance.
- **High-Pressure Ammonia Piping System:** Designed and fabricated ammonia piping, developed customized welding procedures, and ensured ASME B31.3 & Section VIII compliance.
- **Urea Feed Pump Overhaul:** Led shaft, seal, impeller, and bearing replacements to restore pump efficiency and reliability.
- **Ammonia Feed Pump Repair:** Developed repair procedures for cast iron casing and nozzle cracks, restoring pump integrity.
- **Manual Valves Maintenance:** Supervised welding repairs and valve seat replacements, ensuring compliance with API-598 standards.
- **Gas Pipeline Installation:** Led 45 km natural gas pipeline installation, completing an $8M project on time, ensuring safety and regulatory compliance.