
Ravi Koyyana

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About:

10 yrs of design & analysis experience in Gas Turbine Combustion systems. Interested in addressing problems by following basic fundamentals using data (experimental/analytical) for validation. Looking for an opportunity to work for an organisation dealing with variety of technical challenges to resolve customer issues by providing effective solutions.

Competencies & Skills:

- Strong Fundamentals in mechanical design and durability of Gas Turbine Combustion System.
- Expertise to provide engineering solution for entire Product Life Cycle of the combustion component like design, development, testing, vendor qualification, manufacturing, fleet issue and repair.
- Expertise in Finite Element Static & transient thermal, static & transient structural, Nonlinear Elastic-plastic, creep, contact, modal, harmonic and Lifting analysis using ANSYS, UG & Hypermesh.
- Knowledge of Fracture mechanics for crack growth & damage tolerance assessment.
- Expertise in durability assessment of the gas turbine combustor parts like thermal, structural, Low cycle fatigue, high cycle fatigue, fracture, oxidation and creep.
- Good at hand calculation for mechanical design and heat transfer.
- Worked on supplier qualification, data review and recommendations.
- Understanding of manufacturing drawing, tolerance stack up, GD&T and Bill of material.
- Knowledge of sig sigma design tools and concept for robust design.
- Always looks for opportunities of implementing quality, Continuous improvement & simplification.
- Leadership and team management. Planning, leading and executing deliverables.
- Strategy, Planning and Execution of direct material productivity/Cost Out.
- Strong analytical skill. Innovative mindset to address technical challenges.
- Excellent communication skills with the ability to relate to people at any level of business.
- Strong Documentation Skills. Own technical reviews from conceptual to validated design.
- Mentoring and coaching of Young engineers.

Professional experience:

Current Organization: General Electric (GE), JFWTC, Bangalore, India

Senior Engineer (April 2015 – Till Date)

Lead Engineer (April 2012 – March 2015)

Engineer (Aug 2008 – March 2012)

Educational Qualifications:

Course	Discipline	College/University	Year of Passing	Aggregate/Division
M.Tech	Mechanical (Solid Mechanics & Design)	IIT Kanpur, India	2008	8.25/10
B.E	Mechanical	NIT Raipur, India	2006	78/100

Computer Knowledge and FEA Skills:

FEA Package	- ANSYS, HYPERMESH, UG
Mesh Generation	- ANSYS, HYPERMESH, UG
Modeling Package	- UG
Post Processor	- ANSYS, PropLife (In-house GE code for crack propagation)
Miscellaneous	- MATLAB, ANSYS APDL

Rewards & Recognition:

- ERD (Highest level award for project) for 6B DLN1+ DF design & development
- Several Management awards & Global DMP of the month award for cost out.
- Several Project of the month/quarter award for project executions.
- Several team level awards for behavioural differentiator during project execution.
- 1 Patent
- TISCAT publication (GE Internal technical paper)
- GATE All India Rank 32
- Batch Topper in B.E.

Summary of Overall Professional:**Global ownership for Gas turbine Combustion component design and analysis:**

- Engineering execution on Design, Manufacturing and Field issues pertaining to Gas Turbines Combustion Components.
- It involves providing engineering solutions during all the stages of product life cycle of Gas Turbine Combustion Components through analytical assessments. The responsibility includes: Design & Development of new products, Supplier Deviation's, Manufacturing Non-conformance, and Fleet Issues (reliability issues of hardware). Working very closely on above-said areas with design team, Material Engineer, Supplier Quality Engineer, Advance Manufacturing Engineer, Fleet Support and Product Service Engineer.

Next generation combustion system design and durability assessment:

- New product development program to cater to higher power & efficiency. Increased firing temperatures pose a significant durability & heat transfer challenges.
- Leading the entire effort of durability assessment for LCF and HCF in the context of completely new design and immature manufacturing process.
- FEA assessment, like thermal structural, modal and harmonic to estimate the LCF/HCF capability and subsequently design improvement.
- Develop a full scale analytical model to capture overall system response to mitigate the uncertainty of different loads & suggested design improvement ideas.
- Work with the cross functional team like manufacturing and MPE for estimating risk associated with inherent flaw and surface roughness based on fracture mechanics approach.
- Test & learn to prove initial design concepts and improve the existing capabilities.

Premix oil technology for low emissions & enhanced durability:

- The existing legacy diffusion technology is limited by emission regulation using water over a limited operations range in regions deprived of water availability. This program required the elimination of water usage and coming up with a novel product.
- Led the durability efforts for design and development right from conceptual stage. This involved coming up with a design that caters to inherent failures due to liquid oil operation. Few such failure modes are internal coking, external coking, high temperature metal fatigue.
- In the absence of completely understood flow/CFD models, developed empirical models using test data to map out the operational space which helped in reducing the test points by 3 times.

Mission based lifing for F-class combustion system:

- In order to avoid forced/un-planned outage's, the idea of remaining useful life based on the way the machine is operated was conceptualised. Enormous real time data was sought for developing physics based hybrid models.
- Employed innovative design process of applying the methods of data analytics, tribal knowledge, field data, and physics based modelling into a package that drives more revenue for GE combustors. Worked closely with services teams to come up with design methodology and implemented it for field validation on the fielded units.

E class 32K new product induction to GE Gas Turbine product portfolio

- Worked on design and development of E class 32K product development for GE Gas Turbine to eliminate completely the existing 24Khr combustion inspection interval and directly aligned with hot gas path
- Durability assessment of new design for wear, creep, oxidation, TBC spallation and bolt relaxation by FEA approach using ANSYS.
- Validation through lab test. Drive instrumentation requirements for lab test and data analysis for design validation.

Cost out, quality, simplification

- Challenge the existing design practice limitations and improved the modelling practices on several instances.
- Implemented several Kaizen ideas leading to 2-fold productivity enhancement.
- Explored and created opportunities for material productivity savings.

Certification and Training (Manufacturing/Shop Floor/ Power Plant/Other Trainings):

- Green Belt Certification for Design for Six Sigma (DFSS)/DMAIC.
- Leadership development training, Crotonville
- Trainings - Fundamentals for Technologists, Building Essential Leadership Skills, Foundation of Leadership
- Shop floor, Supplier visits, power plant (DHABOL) visits to enhance manufacturing, assembly process for a gas turbine.
- BGGTS (BHEL and GE Gas Turbine Service/Refurbishment Shop) for enhancing repair knowledge for GT components.