**KEITH MCWILLIAMS**

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**PROFESSIONAL SKILLS:**

* **Problem solving using creative/critical thinking to reach data-driven decisions**
* **Quality and Process improvement tools**
  + Six Sigma, DMAIC, DMADV, PFMEA/FMEA, PPAP, Root-Cause Analysis, DOE, Histograms, Poka-Yoke, ISO 9001:2008 Lead Auditor, 5S
* **Data Analysis and Interpretation**
  + Analysis of Variance, Gauge R&R, Regression Analysis, Statistical Distribution Analysis
    - EXCEL, SAS, Minitab, Matlab, Visual Basic
* **CAD and Finite Element Analysis**
  + Inventor, Solidworks, CATIA, Unigraphics, ANSYS, ABAQUS, AutoCAD, GD&T (ASME Y14.5), DFM
* **Project Management**
  + Microsoft Office, OneNote, Outlook, Project, SharePoint, Intuit Quickbase

**EXPERIENCE:**

**Quality Engineer II, Smith & Nephew, Memphis, TN January 2016 – Current**

**Product Design Engineer, Comp Performance Group, Memphis, TN January 2014 – January 2016**

* Using DFM & ASME Y14.5 principles bring new products to market to support Comp Performance Group’s (CPG) ever expanding product portfolio.
* Work with management and engineering team to define scope and deliverables of new projects using DMADV Six Sigma principles
* Manage multiple projects in varying stages of the design cycle and ensure that engineering has a clear understanding of FMEA and PPAP for each new product
  + Design cycle includes determining product/project deliverables, developing business case, designing and prototyping initial concept, working with multiple departments to source, market, and sale finished goods.
* Designed tool for improved rocker arm assembly/disassembly process. Design substantially reduces time required to upgrade engine valve train while maintaining compatibility with common workshop equipment.
* Designed or assisted in the design for the following types of components:
  + Rocker arms, lifters, retainers, clutches, transmissions, flywheels/flexplates, retainers, tools, enclosures, throttle bodies, torque converters, intake manifolds, electronic connectors, gears, fixtures, in-house structures, shifters, etc.
* As an ISO 9001:2008 lead auditor, work across departments to implement continually improving processes
* Use Root Cause Analysis practices to determine how and why parts and processes fail to meet standards established during the design requirements and business case portion of the product cycle
* Determined quality/performance issue for a new Ford Mustang clutch package using PFMEA/FMEA principles. Discovered that a manufacturing error on one of the clutches components was preventing it from properly releasing during operation. Issue was resolved and parts were released from engineering hold.
* Lead implementation and manage CPG’s rapid prototyping (RP) cell. The rapid prototyping process is critical to bringing products online in a timely manner.
  + Developed process for orienting parts within RP machine to ensure parts produced are useable.
  + Lead inter-departmental training for RP machine
  + Building business case to bring additional capabilities to our RP cell
* Actively direct engineering resources (1 full time, 1 part time) employee for one of CPG’s brands to ensure that projects are consistently updated, completed, and deliverables are understood.
  + Verify and approve engineering documentation, drive new products through the design cycle, provide manufacturing support for manufactured products.

**Engineering Design Consultant, C&H Baseball, Memphis, TN November 2014 – August 2015**

* Coordinated with owner and in the field surveyors to convert 2D sketches into 3D models
* Develop engineering drawings in Solidworks using ASME Y14.5 GD&T standards

**Graduate Research Assistant, Mississippi State University, MS State, MS Spring 2012 – December 2013**

* Implemented ICME principles and outlined an efficient procedure for coupling microscale and macroscale analyses for entire aircraft structures using MAC/GMC and ABAQUS FEA
  + Used MATLAB and Python programming languages to implement statistical distributions of fibers within multiscale analyses in order to replicate real world variability in fiber stiffness and strength exhibited in composite material structures.
  + Assisted in the development of behavior characterization of composite materials using FEA, Matlab, Excel, and MAC/GMC
* Coordinated development, between Aerospace Engineering, Chemical Engineering, and Chemistry departments, and implementation of an on campus VARTM manufacturing process of composite materials.
* Developed critical knowledge in the design and manufacturability of composite materials
* Worked with SAS, Minitab, and Excel to analyze test results and investigate Design of Experiments set ups for future projects
* Wrote and reviewed technical papers and reports that were entered into peer reviewed journals and technical conferences

**Engineering Intern, True Temper Sports, Amory, MS Summer 2012**

* Participated in Six Sigma Greenbelt training and assisted with Engineers green belt projects
  + Used DMAIC principles to evaluate processes and identify potential improvements
  + Evaluated testing and measuring procedures using Gage R&R and ANOVA
  + Worked to implement Poka-Yoke into processes whenever possible
* Studied manufacturing to ensure that during design, parts were able to be manufactured and checked for part approval.
* Projects were documented in technical reports that were presented to upper management
* Using statistical data analysis, worked to identify labor inefficiencies and a process change resulting in approximately $75,000 in annual savings
* Led project evaluating shaft straightening procedures and identified a 27% improvement in the shaft throughput in the straightening department and verified results using reliability studies in SAS and Excel

**Engineering Intern, Zeon Chemicals, Hattiesburg, MS Summer 2010/2011**

* Initial exposure to continuous improvement and lean manufacturing principles (5S)
* Worked with safety and environmental engineer to update and revise plant layout prints using AutoCAD

**EDUCATION:**

**Bachelor of Science: Aerospace Engineering, Minor in Mathematics**

May 2012, Magna cum Laude (3.69/4.00), Mississippi State University

**Master of Science: Aerospace Engineering, Minor in Statistics**

May 2014, GPA (3.87/4.00), Mississippi State University

**HONORS/PROFESSIONAL ORGANIZATIONS**

Smith & Nephew Young Professionals Society, Tau Beta Pi Honor Society**,** Sigma Gamma Tau,

AIAA, SEMA-YEN**,** ASC,MSU-DBF Design Team

MS Space Grant Consortium Fellowship Recipient (July 2013-May 2014)

**PUBLICATIONS/ACADEMIC ACTIVITY**

# McWilliams K; *Efficient Coupling of Micro/Macroscale Analyses with Stochastic Variations of Constituent Properties.* Thesis. Mississippi State University, 2014.

# McWilliams K, Lacy Jr. T, Roy S; Development of an ICME-Based Airframe Digital Twin Model of an All-Composite Air Vehicle; 28th Technical Conference, American Society of Composites; September 2013; State College, PA