

# Randall C. Crawford

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## Objective

I am currently seeking an employment opportunity in metrology, quality, and/or reliability engineering in the manufacturing sector. My primary interest is process qualification, optimization, and standardization, utilizing proven data analysis methods, strategic problem solving, and industry standards. A lifelong dedication and fascination with manufacturing concepts, the successful completion of numerous PPAP qualification projects in different industries, and the ability to comprehend, interpret, and utilize technical information, have prepared me for such an opportunity. I am confident that the right fit will foster an industrious and innovative relationship that will lead to an extended, mutually beneficial partnership.

## Education

<b>Data Analytics Bootcamp</b>	<b>Butler University (online)</b>	<b>12/20 ~ 05/21 In Progress</b>
<u>Applications Covered:</u> Microsoft Excel & VBA Programming Pandas Data Munging & Data Parsing Web Data (API Requests) Advanced SQL Queries & Modeling Web Frameworks & Dashboards (Bootstrap) Flask Data Rendering JavaScript Programming D3.js Fundamentals & Concepts Data Wrangling with R Machine, Neural, & Deep Learning		Python Programming Matplotlib Graphing JSON Traversal & Data Parsing Web Design (HTML / CSS) MongoDB ETL Project Work JavaScript APIs & Web Charting Geomapping with Leaflet.js Tableau Dashboarding & Concepts Big Data & Cloud ETL
<b>Reliability Engineering Certification</b>	<b>American Society for Quality Control</b>	<b>In Progress</b>
<b>BA Completed</b>	<b>Indiana University Southeast, New Albany IN</b>	<b>12/14</b>
- <b>Bachelor degree in General Studies with concentration in Mathematics and Science</b>		
<u>Studies:</u> Six Sigma, TQM, SPC, & DOE TOC, MRP, MRP II, ERP, & JIT Team Development & Problem Solving Project Management & Lean Concepts Industrial Engineering Solutions Differential Equations & Applications		SQL Programming & VBA Modeling (Excel) Propositional, Quantificational, & Symbolic Logic Matrices, Graphs, Trees, & Machines Regression & Variance Analysis (Excel & Minitab) Discrete & Continuous Probability Distributions Linear Programming & Modeling (Excel)

## Relevant Work History

<b>Quality Assurance Manager</b>	<b>Alliant Technologies LLC, Louisville KY</b>	<b>10/16 ~ 02/20</b>
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Alliant Technologies LLC is a provider of controls solutions, conveyor/sorting system designs, and custom manufactured PLCs to the freight and parcel, warehouse and distribution, manufacturing, airline, and government markets.

### Achievements

- Conducted a comprehensive investigation into failures associated with an international airport project. Discovered a number of issues that were addressed formally. Best practices and company policies were created to prevent their reoccurrence.
- Assumed responsibility for the creation of check sheets from system drawings to be used by contracted electricians and company control engineers on UPS worksites for various levels of system commissioning. Inspected the system drawings for errors, and provided the design department with the necessary feedback to resolve them.

- Assisted in the development of policy for worksite communication and conduct.
- Suggested using data pads with construction monitoring software to create worksite daily reports efficiently, and improve timely reporting of issues to company and worksite managers.
  - o Raken Jobsite Management Software
- Assisted the Panel Shop manager with the development of quality documentation and processes, then trained Panel Shop supervisors and wireman concerning them.
- Collected and stored quality data concerning panel manufacturing, then posted and reported results weekly to the Panel Shop manager and supervisors.
- Outlined a way to use QC data pads with data collection software to automatically generate, print, and store company and customer quality documentation to greatly reduce the labor, materials, and equipment depreciation involved in creating, copying, and scanning them.
- Followed up on customer corrective action documentation to make sure quality issues were being resolved in a timely manner.
- Conceived of a reverse FMEA strategy focusing on manufactured PLC defects.
- Logged in crimpers, electrical torque screwdrivers, calipers, and torque wrenches in a database for verification and calibration. Performed intermittent verification on those tools to determine their need for calibration.
  - o GAGEPack Calibration Management Software
- Put together a formal comparison of QMS and ISO standards.
- Systematically created a company safety manual that met third party audit standards with a score of 97%, qualifying the company for continued work with Amazon, GE, and others.
- Worked with HR and department managers to get required safety training and documentation in place.
- Suggested the use of video recording and screen recording for training and reference purposes, given most of the experienced employees were constantly on a worksite, and business expansion demanded the need for more employees.
- Suggested the need for regularly updated platform for project management that could be accessed by department managers and support groups to greatly improve scheduling and prioritization of labor and activities.
- Audited project management documentation over various project types with a PMAT format. Provided project managers with feedback. Determined that specific documentation standards should be created for each project type.

#### Training

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|---|----------------|-------|
| - 2018 CED Automation Exposition Seminars | Louisville, KY | 1 day |
| - 2019 CED Automation Exposition Seminars | Louisville, KY | 1 day |

#### Travel

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|---|----------------|--------|
| - Amazon System Commissioning   | Buffalo, NY    | 5 days |
| - UPS Centennial Quality Response   | Louisville, KY | 5 days |
| o Created a procedure for the verification, then managed a team to evaluate PLCs for a potential disconnect handle fault, and fix it. |                |        |
| - UPS System Commissioning  | Phoenix, AZ    | 2 days |

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#### **Qualification Technologist      Andersen Corporation, Bayport MN      07/13 ~ 08/16**

Andersen Corporation is a manufacturer of doors and windows for the residential and commercial real estate development industries.

<i>Contractor: ENTEGEE Engineering Technical Group</i>	<b>02/10 ~ 06/13</b>
<i>Initial 9-Month Contract Completed</i>	<b>10/08 ~ 06/09</b>

#### Achievements

- The programming and operation of coordinate measuring equipment to generate dimensional measurement data for PPAP qualification activities (FAI layouts, GR&R studies, and capability analysis), product development projects, statistical process control, corrective action measures, and design drawing revisions (reverse engineering)

- OGP Flash 200, ZIP 250, and FOV SmartScopes
  - Measure X, Measuremind NT, and MeasureFit Software Applications
    - Evaluated measuring fixtures, vinyl/fibrex extruded and milled wood profiles, profile gages, miter and bevel end cut angle fabrications, calibrator blocks, glue dies, aluminum profiles, capping and adhesive thicknesses, and purchased foam products
- Romer AbsoluteArm 230
  - PC-DMIS For Portable 2014 Software Application
    - Evaluated curved wood and glass components, end cut fabrications, forming templates and molds, and measuring fixtures
- Brown And Sharpe XCEL 7.10.7 Bridge CMM
  - PC-DMIS CAD++ 2013 Software Application
    - Evaluated extrusion dies, calibrator blocks, saw attachment designs, process standards, profile taper gauges, and measuring fixtures
- The design, verification, testing, and implementation of profile measuring fixtures for SmartScopes
- The development of SmartScope quality procedures concerning machine restart and re-alignment, profile sample preparation, fixture utilization, sample measurement, and sample retention
- The design, development, and revision of SmartScope dimensional profile roadmaps
  - Autocad Inventor
- The monthly SmartScope configuration data backup, calibration verification, and preventative maintenance check for five measuring machines
- The utilization and programming of data management software applications for automatic real time analysis, report generation, and server distribution of dimensional, testing, and process capability results from three SmartScope quality laboratories
  - QC-CALC Real Time and QC-CALC SPC Software Applications
    - Installed on each OGP SmartScope PC
  - SPC Office Buddy Software Application and Windows Batch File Programming
    - Installed on a designated data processing PC
- The weekly update of a SmartScope profile measurement data performance metric, and participation in a corrective action forum
- The completion of a \$50k capital expenditure project to upgrade PCs, operating systems, measurement and data software applications on four OGP SmartScopes and a Brown and Sharpe CMM
- The use of various measuring equipment (Optical Comparator, Heidenhain XYZ Tables, Heidenhain Horizontal and Vertical Linear Scales, Caliper, Micrometer, Gage Pins and Blocks, Height Gage, Taper Gage, Level, Angle, etc...)
- The development and utilization of recognized company standard study formats for process capability and gage repeat and reproducibility (GR&R) using Microsoft Excel
- The utilization of a Minitab statistical analysis software for engineering problem resolution
- The performance of a Linearity study to determine the reliability of the DT500 Distance Sensor Laser
- The design and implementation of a QC workstation for the dimensional evaluation of curved wood blank components
  - Motorola LI4278 Barcode Scanner, Mitutoyu U-Wave System, and DT500 Distance Sensor
    - QC-GAGE and QC-CALC Real Time Software Applications
- The development and utilization of a mathematical shrinkage model to predict dimensional movement in curved wood blank components over time
- The use of multiple linear regression and correlation analysis to develop a predictive model to estimate the effects of a profile shaping process on curved wood blank components
- The development of an automatic time clock notification process for required control plan checks
  - Hourglass Time Clock Application and Windows Batch File Programming
- The training of employees concerning PPAP qualification standards, MSA, measurement software programming, GD&T, fixture design concepts, and general measurement strategies and techniques

**Training (On-Site)** (Productivity Quality, Inc.)

- MeasureFit Programming	Plymouth, MN	1 day	04/28/14
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**Training** (Hexagon Metrology University)

- PC-DMIS For CMM 100-103	Plymouth, MN	5 days	02/14/14
- PC-DMIS For CMM 200-203	Plymouth, MN	5 days	03/27/15

**CMM Programmer      Metrology Support Services, Fortville IN      07/08 ~ 09/08**  
Metrology Support Services is a provider of coordinate measuring equipment, retrofitting and calibration services, as well as inspection services for a wide variety of industries and applications.

**Achievements**

- The programming and operation of coordinate measuring equipment to generate dimension data and presentations for various clients
    - o 2 Bridge CMMs: IMS Impact and MSS SX
      - VDMIS Version 6.2 Beta Software Application
  - The development of a VBScript project for Microsoft Word to customize quote generation documentation derived from .html output from the company website
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**Senior Level CMM Programmer      Entegris Incorporated, Chaska MN      11/07 ~ 05/08**  
Entegris is a global supplier of technology, product, and service solutions that purify, protect, and transport critical materials used in the semiconductor and other high technology industries.  
*Contractor: ENTEGEE Engineering Technical Group      5-Month Contract Completed*

**Achievements**

- The programming and operation of coordinate measuring equipment to generate data for the verification or modification of assemblies, components, and gaging fixtures
    - o 4 Bridge CMMs: Browne and Sharpe Global Classic and FX, Zeiss Eclipse and Numerex
      - PC DMIS CAD++ Version 4.2 MR1, 3.7 MR3, & 3.5 MR2 Software Applications
  - The systematic training of 5 technicians, 6 inspectors, and 2 auditors, in the effective use of coordinate measuring equipment and the PC DMIS dimensional measurement software application
  - The design of single and multi-shot CMM holding fixtures to improve measuring repeatability
  - The design and implementation of effective datum structures to improve measuring repeatability, product transferability between CMMs, and standardization of setup methodology
  - The design of a gold standard fixture, based on the Zeiss geometrical verification concept
  - The development of interim ball bar and ring gauge CMM calibration programs and procedures, to verify the calibrated accuracy of CMMs
  - The participation in the development of preventative maintenance procedures for each CMM
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**CMM Inspector      Dresser-Rand Corporation, Painted Post NY      09/07 ~ 10/07**  
Dresser-Rand is a global supplier of reciprocating compressors for the oil, natural gas, chemical, and naval industries.  
*Contractor: AAA Airporter Services, Inc. (MADI)      45-Day Contract Completed*

**Achievements**

- The programming and operation of coordinate measuring equipment to generate data for the verification of machining processes and the modification of components
    - o DEA Delta SP 12' Manual Bridge CMM
      - Browne and Sharpe Tudor For Windows Software Application
    - o Sheffield Manual Portage 76-B Rotary Table CMM
      - ATT Inc. CAPPS DMIS Version 6.1 Software Application
  - The restoration of the Sheffield CMM, consequently increasing lab measurement throughput 80%
  - The development of qualification and preventative maintenance procedures for the Sheffield CMM
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**Contract QE Assistant      Medventure, Louisville KY      11/06 ~ 01/07**  
Medventure is a supplier of outpatient surgical devices for the healthcare industry. *Contract Completed*

**Achievements**

- The development of completed supplier qualification reports for all of the company's vendors.

Montaplast is a global supplier of welded lost core and injection molded plastic parts for the automotive industry.

**Achievements**

- The programming and operation of coordinate measuring equipment to generate measurement data for the buy-off (PPAP), certification, development, liability, and/or modification of assemblies, components, gaging fixtures, primary and secondary standards, and molds
  - o Browne and Sharpe XCEL Single Column CMM
    - QUINDOS 6.0, CAM2 AUTO, and PC DMIS 3.5 Software Applications
- The familiarity with reading German and Japanese blueprints
- The use of various measuring equipment (QL-20 Contour Projector Optical Comparator, Mahr Perthometer, Caliper, Micrometer, Gage Pins and Blocks, Height Gage, Taper Gage, etc...)
- The troubleshooting of VBScript in data analysis spreadsheets

**Training (On-Site)**

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|--|---------|---------------------|
| - QUINDOS 6.0 Programming                | 10 days | QUALIS (Instructor) |
| - Descriptive Statistics & DOE           | 5 days  |                     |
| - Geometrical Dimensioning & Tolerancing | 5 days  |                     |

Oxford Automotive Products Company was a global supplier of stamped and/or welded metal chassis parts for General Motors, Ford, and Daimler-Chrysler.

**Achievements**

- The maintenance, operation, and programming of coordinate measuring equipment to generate presentations for the buy-off(PPAP), certification, development, liability, and/or modification of parts, gaging fixtures, primary and secondary standards, tools, and dies
  - o Trimek LK LY90S Twin Column CMM
    - LK DMIS 5.3 and LK CAMIO 5.3 Software Applications
  - o Mora Manual Single Column CMM
    - GEOMET, upgraded to Metronics QC5000 Software Application
- The detailed outline of operating and programming instructions for the automated CMM
- The development of data collection procedures and forms, statistical analysis spreadsheets, and graphs for Attribute R & R, Bias, Capability, Gage R & R, Linearity, SPC, and Stability studies
- The formation of calibration procedures, the maintenance of a calibration database, and the generation of calibration work orders for all utilized measuring tools
  - o GageTrack Calibration Software
- The practical familiarity with GD&T for Ford and GM parts, PPAP demands, and QS-9000 standards
- The conception of a comprehensive historical reference for quality dilemma (pertinent details, visual renditions, corrective action recommendations) and an inter-departmental system for its maintenance

**Training**

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|--|------------------|--------|----------|
| - Measurement Systems Analysis Certificate | Indianapolis, IN | 1 day  | 07/09/99 |
| - LK DMIS Programming Certificate          | Brighton, MI     | 5 days | 05/26/00 |
| - LK CAMIO CAD Interface Certificate       | Brighton, MI     | 5 days | 06/09/00 |

**Travel**

- Oxford PPAP of GM parts      Ramos Arizpe, Mexico      24 days      11/01/99 ~ 11/24/99
  - o CMM operation for part layout requirements, graph generation for capability study requirements (StatGraphics), and spreadsheet development for Trim Analysis requirements

- Gaging Fixture Buy-offs      Yokohama, Japan      13 days      06/12/00 ~ 06/23/00
  - >> Sugai Auto Works
    - o Evaluated gaging fixture quality and design, created and demonstrated a Gage Repeat and Reproducibility Study for Japanese use, and developed a checklist for gaging fixture buy-offs
- Oxford PPAP of Ford parts      Oscoda, MI      4 days      07/05/00 ~ 07/08/00
  - o Demonstrated layout methods for gaging fixtures and parts without the use of a CMM
- Assembler/Tool Buy-offs      Grand Rapids, MI      2 days      07/11/00 ~ 07/12/00
  - >> Advanced Tooling Systems      >> Engineered Tooling Systems
    - o Evaluated weld assembly equipment      o Evaluated tooling equipment through part quality
- Piercing Unit Buy-off      Troy, MI      2 days      07/13/00 ~ 07/14/00
  - >> Oxford Owned Piercing Unit Designer (Hillman Machinists)
    - o Evaluated piercing equipment
- Part Quality Buy-offs      Yokohama, Japan      41 days      07/23/00 ~ 09/01/00
  - >> Kanto Auto Works, Topre, Nikkei, Seki-tech, Katayama, Suzuki, and Sugai Auto Works
    - o Evaluated part and gaging fixture quality, created a Capability Study format for Japanese use, and electronically documented part and fixture quality reports

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**Product Flow Analyst      Golden Brands/Golden Foods, Louisville KY      05/97 ~ 04/98**  
*Three Promotions: Lab Technician > Warehouse Quality Inspector > Inventory Control Specialist*

Golden Brands/Golden Foods Inc. was a supplier of shortening for Pillsbury and several regional restaurant franchises.

#### Achievements

- The routine interface with MIS, production planning, quality control, sales, and shipping, to develop more effective queries for the inventory database and acquire weekly production and shipping schedules to aid the task of scheduling daily product flow activities
- The scheduling of daily allocation, storage, and retrieval activities for finished product and materials  
*Averages:* 13 trailers/day 23 pallets/trailer 32 boxes/pallet 8 customers/day 2 loaders 2 line drivers  
*Factors:* Products-10 types Boxes-4 types Loaded Pallets-4 types Cooling-3 rooms & 5 periods  
 Racking (single entry)-3 types & 4 depths (24,15,9,3 pallets) FIFO-maintained for each destination
- The creation of an algorithmic schematic for the pre-determination of scheduling activities
- The development and dispersement of a daily finished product and materials allocation, storage, and retrieval form to provide direction for line drivers and dock loaders
- The daily reconciliation of product flow activities through the comparison of completed forms, database activity, and physical inventory
- The quarterly inventory of approx. 7,000,000 lbs. of shortening at an accuracy of 99.97%
- The development of Quality procedures and data collection forms for the Shipping department
- The summation of individual, dock loader, line driver, shift, and collective performance measurement indicators (Man-hours vs. Product Moved vs. Product Reworked vs. Product Scraped)
- The successful comparison of quantitative data from Receiving, Processing, Production, Inventory, and Shipping to isolate the primary cause of waste in the total operation, and the successful development of procedures for the Production department to rectify it
- The utilization of projected sales, inventory fluctuations, and traffic study to estimate the extent, type, and location of additional racking
- The submission of conventional drawings for the floor layout of the racking expansion, and the supervision of the installation

#### Training

- Intermediate Microsoft Excel Course      Louisville, KY      1 day      03/98 approx.

### Travel

- Shipment Inspection Joplin, MO 2 days 01/98 approx.
    - >> Carmar Freezers Inc.
    - Product temperature sample and trailer inspection
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### **Quality Technician**

**Futura Plastics, Louisville KY**

**02/97 ~ 04/97**

*Agency Employee: Kelly Services, Inc. Louisville, KY*

*Temporary Assignment*

Futura Plastics, Inc. was a supplier of plastic parts for General Electric.

### Achievements

- The acquaintance with the plastic injection molding process and quality issues common to it
  - The pulling of an over-exposed supervisor from a nylon gas leak
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### **Scale House Attendant Consolidated Grain and Barge, Jeffersonville IN**

**10/96 ~ 01/97**

*Agency Employee: Personnel Management, Inc. Jeffersonville, IN*

*Seasonal Employment*

Consolidated Grain and Barge, Inc. is a distributor of grains, fertilizers, and road salt.

### Achievements

- The tare and weighing of tractor-trailers and dump trucks for the generation of a billing statement for fertilizers (potash, ammonium nitrate, etc.) and road salt
  - The sampling and testing (moisture, foreign material, etc.) of grain (corn, soybeans, wheat, etc.), and the weighing and tare of tractor-trailers and dump trucks for the generation of a credit voucher
  - The proper generation and distribution of billing statements and credit vouchers
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### **Manufacturing Associate**

**A. O. Smith Automotive, Corydon IN**

**05/90 ~ 03/94**

*A. O. Smith was purchased by Tower Automotive*

A. O. Smith Automotive Products Company was a supplier of stamped and/or welded metal chassis parts for Ford Motor Company.

### Achievements

- The performance of every functional position, barring support and management roles, at the facility
- The election to the position of Team Leader by fellow team members
- The experience of meeting facilitation, agenda setting, and group problem solving
- The conception of a Peer Review system for Associate empowerment in the areas of performance evaluation, continuous improvement, reward and recognition, corrective action, hiring, and termination
- The periodic summarization of assembly defects and their respective catalysts
- The re-allocation of labor and introduction of inspection responsibilities in a bottleneck work station such that the number of operators was reduced from 5 to 4 (providing an additional Associate for continuous improvement activities), the cycle time was reduced by approximately 4 seconds (moving the bottleneck to the next workstation, a series of robotic welding operations), the number of defects found after the re-organized work station was reduced by 75% (relieving the new bottleneck of poor quality input), and all of the Associates involved expressed their appreciation

### Training (On Site)

- Dale Carnegie Interpersonal Training
- Myers-Briggs Type Indicator (E/I NTJ) And Problem Solving
- 8-D Problem Solving Seminar
- TQM Orientation
- Cost Justification
- Peer Review Process

### **Personal Interests** \_\_\_\_\_

- Strategic Games (Chess), Music (Classical and Contemporary), and Philosophy (Axiology and Logic)

### **References** \_\_\_\_\_

*Available Upon Request*