CURRICULUM VITAE

THE KILPATRICK GROUP, PA

GARY E. KILPATRICK, P.E., DFE
Certified Diplomate Forensics Engineer (NAFE)
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(Updated 09/15/2020)

DIVISION I SERVICES: INDUSTRIAL ACCIDENTS RECONSTRUCTION
PRODUCT DEFECT AND FAILURE ANALYSES
(OSHA CERTIFIED 29CFR1910; 29CFR1926; 29CFR1928)

Have approximately 20 years of industrial work experience in industial wood working machinery such as rip saws, boring machines, routers and shapers, sanding machines; Have been responsible for sheet metal spot welding operations; Automotive industry in metal cutting multi-axis machining centers, transfer lines, roller bearing machining and manufacturing, drilling, tapping and boring operations, OD and ID grinding operations, gear manufacturing, sheet metal roll forming, kinetic energy punch and forming presses and hydraulic punch and forming presses presses, overhead gantry cranes, manufacturing and process, machine design, machine guarding, gantry crane design, conveyor design and quality assurance, assembly line and bench operations, warehouses and tractor trailer loading docks; Have extensive knowledge of standards of care and maintenance requirements of industrial process equipment along with the standards of care and proper practice of plant operations; Automotive engineer: Worked in the automotive industry for approximately 10 years which included OSHA safety regulations; Have OSHA certifications, OSHA safety regulations expert in 29CFR1910, 1926 and 1928, ISO 9001 requirements and applicable ANSI, UL and ISO Standards; Extensive investigation and reconstruction experience of many types of industrial accidents; Worked for the inventer of the forklift the Clark Equipment Company who was a manufacturer of forklifts, heavy off-road earth moving machinery; Machined spur and hypoid ring and pinion gears, spur gears, spindles, planet carriers, wheel knuckles, transmission housings, axle housings and differential gear train carriers for rough terrain telescoping forklifts and rough terrain telescoping cranes; Assembled rough terrain telescoping forklift and rough terrain telescoping crane brake systems and drive train components including large transmissions, driver steer axles and differential units; Have 1000+ hours of experience in the day-to-day operation of forklifts over a five year period which included material handling operations. Have operational experience with sitdown forklifts and standup narrow aisle forkilfts; Have a current forklift certification and license to operate forklifts; regulation; Have design engineering experience in overhead gantry cranes and belt conveyors as Have thousands of hours of experience operating gantry cranes during process machining and assembly operations; Very knowledgeable of telescoping and latice boom cranes both axle wheeled driven and crawler tracked cranes; Very knowledgeable of crane counterweights, load charts and lift plans; Very knowledgeable crane operations, maintenance and government regulations as well as other types of industrial process equipment; The process equipment used to machine component parts were both the older type NC tape operated controllers as well as the more modern CNC controllers using G,M,T,S,D,P,N codes; Worked as a mechanical design engineer for various companies which involved process machine design, continuous improvement projects and quality assurance; Have experience in process equipment installation such as surface grinders, automated robotic automotive wheel bearings process equipment, rollformers, spraying equipment and kinetic energy punch presses; Farming machines; Have experience working with warehouse storage racks; Setup a warehouse for the storage of sheet metal rolls and forklift FIFO; Have investigated industrial accidents while working as a staff engineer in industry and have investigated many industrial accidents as a litigation expert since 2003. Investigates the causes of tracked and wheeled mobile crane failures, tractor accidents, earth moving machine and forklift accidents.

DIVISION II SERVICES: FORKLIFT ACCIDENT RECONSTRUCTION AND PRODUCT DEFECT AND FAILURE ANALYSES (OSHA CERTIFIED 29CFR1910; 29CFR1926; 29CFR1928)

Worked for the inventer of the forklift the Clark Equipment Company who was a manufacturer of forklifts, heavy off-road earth moving machinery; Very knowledgeable of OSHA regulations 29CFR1910.178 "Powered Industrial Trucks" and have OSHA certifications; Machined spur and hypoid ring and pinion gears, spur gears, spindles, planet carriers, wheel knuckles, transmission housings, axle housings and differential gear train carriers for rough terrain telescoping forklifts and mobile wheeled rough terrain telescoping cranes; Assembled rough terrain telescoping forklift and mobile wheeled rough terrain telescoping crane drive train components including large transmissions, driver steer axles and differential units; Have 1000+ hours of experience in the day-to-day operation of forklifts over a five year period which included material handling operations. Have operational experience with sitdown forklifts and standup narrow aisle forkilfts; Have a current forklift certification and license to operate forklifts; Very knowledgeable of standard mast and telescoping mast forklifts both; Have investigated many forklift accidents and have gaven professional opinions in many forklift accidents.

DIVISION III SERVICES: MOBILE CRANE ACCIDENTS RECONSTRUCTION AND PRODUCT DEFECT AND FAILURE ANALYSES (OSHA CERTIFIED 29CFR1910; 29CFR1926; 29CFR1928)

Worked for The Clark Equipment Company who was a manufacturer of forklifts, heavy off-road earth moving machinery and cranes; Very knowledgeable of OSHA regulations 29CFR1926.1400 and have OSHA certifications; Machined spur and hypoid ring and pinion gears, spur gears, spindles, planet carriers, wheel knuckles, transmission housings, axle housings and differential gear train carriers for rough terrain mobile wheeled rough terrain telescoping cranes; Assembled rough terrain telescoping mobile wheeled rough terrain telescoping crane drive train components including large transmissions, driver steer axles and differential units; Have thousands of hours of experience operating gantry cranes during process machining and assembly operations; Have design engineering experience with overhead gantry cranes; Very knowledgeable of telescoping and latice boom cranes both axle wheel driven and crawler tracked cranes; Very knowledgeable of crane counterweight systems, crane load charts and data loggers; Very knowledgeable crane operations, crane Newtonian Physics, rigging, maintenance, training and government regulations; Have investigated and gave professional engineering opinions in crane accidents.

DIVISION IV SERVICES: AMUSEMENT PARK RIDE ACCIDENTS RECONSTRUCTION AND PRODUCT DEFECT AND FAILURE ANALYSES

Mr. Kilpatrick also provide forensic engineering service to investigate the cause of Amusement Park Ride Accidents; He has been retained in cases involving patron go-karts rides, patron ride retraint system design, patron ride machines incorporating gondolas, ride machine support structural failure by applying his engineering education and training, knowledge and experience in machanical machine design as well as the interpretation of the Amusement Park Ride ASTM F24 Committee standards. Mr. Kilpatrick will determine whether or not the amusement rides device is designed properly for its intended purpose or is defective by design and what components failed in service and why it failed to cause an accident. Mr. Kilpatrick will also opine on Amusement Park Ride Standards of Maintenance and Standards of Care.

DIVISION V SERVICES: MOTOR VEHICLE CRASH RECONSTRUCTION AND PRODUCT DEFECT AND FAILURE ANALYSES

Since 2003, have more than 16 years of experience providing forensic engineering services in Motor Vehicle Crash Reconstruction to law firms, public defenders and insurance companies; Automotive engineer; worked in the automotive industry for approximately nine years; Board certified Forensic Engineer through the National Academy of Forensic Engineers (NAFE); Diplomat Forensic Engineer (DFE); Have a Class A Commercial Driver's License (CDL) with Tanker, Haz-Mat, Triples, Passenger Bus and School Bus endoresments; Have approximately 100 hours of drive time experience in commercial tractor trailer trucks; Very knowledgeable of the Federal Motor Carrier Saferty Regulations namely 49 CFR 40, 303, 325, 350 -

399 for commerical tractor trailer trucks as well as other commercial vehicles; Hazardous Materials training and certification DOT Hazardous Materials namely 49CFR 100-185; Have extensive knowledge of commercial vehicles with air brake systems, semi-trailer landing gear, commercial tractor-trailer trucks, commercial cement trucks, commercial dump trucks, commercial flatbed and box trucks, school buses, fire trucks, ambulances; Have extensive knowledge of standards of care and maintenance requirements of commerical vehicles; Part-Time school bus driver and school bus safety expert; Have extensive knowledge of the air brake systems, pre-trip, during-trip, post-trip inspections and both paper and electronic driver logs. Member of the North Carolina Truckers Association; Very knowledgeable of motor vehicle airbags and seat belts; Avid motorcycle rider and motorcycle expert in the function, handling of motorcycles, product defect and failure analyses and motorcycle crash reconstruction; General knowledge of highway guard rail systems; Extensive knowlegde and investigation experience in All-Terrain Vehicles (ATVs) and Recreational Off-Highway Vehicles (ROVs) crash and rollovers reconstruction and ramps used in loading and unloading these machines; Have extensive training and knowledge of ATVs and ROVs. Have owned and ridden a 2007 Honda TRX 420 Rancher ATV; Pedestrian collisions; Have extensive engineering education, knowledge, training and experience in analyizing complex vehicle and pedestrian crashes, incorporate state-of-the-art computer video simulation software technology to demonstrate and animate how a car, light truck, commercial tractor trailer truck, motorcycle, ATV or pedestrian crash takes place; Have extensive training, knowledge, experience and equipment in lamp filament analyses, imaging and analyizing the crash data reports (CDR) stored in a car or light truck's event data recorder (EDR); Extensive training, knowledge, experience and equipment in imaging and analyizing commercial tractor trailer truck's Electronic Control Module (ECM) run data concerning truck speed, engine rpm, brake application, clutch application, engine load, throttle application, cruise control, DTC codes, transmission gearing, hard stop braking and last stop data and other data; Involved in product defect and failure analysis of cars, light trucks, heavy commercial vehicles, air brake systems, motorcycles, ATV's, ROV's and their components; Create CAD drawings for trial exhibits. Can build models for trial exhibits; Have written and submitted expert reports for state and federal courts for trial; Have given expert deposition and courtroom trial testimony multiple times; Attend and participate in various seminars regarding research in imaging and analyizing a vehicle's crash data reports and heavy commercial trucks ECM data; Attend and participate in staged motor vehicle collisions and associated analyses for research involving cars, light trucks, commercial heavy trucks, motorcycles and pedestrians.

DIVISION VI SERVICES: MOTORCYCLE AND ALL-TERRAIN VEHICLE (ATV) CRASH RECONSTRUCTION AND PRODUCT DEFECT AND FAILURE ANALYSES

Have more than 30 years of experience riding motorcycles; Am an Avid motorcycle rider; Owner and rider of a 2012 Harley-Davidson CVO Road Glide Custom; Have owned and operated a 2007 Honda TRX 420 Rancher ATV for several years; Provide forensic engineering services to law firms, public defenders and insurance companies:

Motorcycle Product Defect and Failure Analyses:
Human Factors, Investigation and Evidence At-Scene Mapping. Slow and High Velocity Collisions, Crush and Damage Analyses, Drag Factor, Skid Analyses, PDOF, ΔV, Closing Velocity, Conservation Linear and Angular Momentum, Conservation of Mechanical Energy, Crush Damage Analyses, Crush Energy, Critical Velocity and Circular Motion, Dynamic Weight, Crashes involving cars and pickup trucks, Pedestrian Crash Reconstruction, Shift, Falls, Flips ,Vaults, Rollovers, Lamp Filament Analyses, Honda Airbag Operation and Failure Analyses, Motorcycle Inspections, Motorcycle Standards of Care,Motorcycle Crash Testing, Motorcycle Braking and Skid Testing, Motorcycle Suspension and Handling Testing.
Motorcycle Product Defect and Failure Analyses; Handling Issues, Frame design, Handlebar Design and Mounting, Frontend Design Rake and Trail, Wobbling, Brakes, Engines and Drivetrains, Tires and Rims, Seating, Foot Peg/Running Board Placement, Rider/Passenger Ergonomics.

All-Terrain Vehicle (ATV) Product Defect and Failure Analyses.
ATV crash reconstruction.
Investigation and Evidence At-Scene Mapping.
Human Factors.
Product Defect and Failure Analyses.

State by state ATV Laws and Requirements.
Specialty Vehilce Institute of America SVIA/ANSI Standards.
Recreational Off-Highway Vehicle Association (ROHVA) Standards.
Consumer Product Safety Commission (CPSC) Annual Reports of ATV-Related Deaths and Injuries.
CPSC Consent Decree Involving the Manufactures of ATVs.
Major Steps for ATV Certification and Compliance.
16 CFR Part 1420 Regulations for ATVs.

EDUCATION

North Carolina State University 1990:
Bachelor of Science Degree in Mechanical Design Engineering with a minor in Speech Communications.
Mitchell Community College 1985:
Associate in Science Degree - College Transfer Curriculum.

HONORS

North Carolina State University MAE Hall of Fame: Inducted 2013.

PROFESSIONAL TRAINING AND DEVELOPMENT

Seak, Incorporated: Received training on direct and cross-examination to testfy during despoition and trial. Have also read other books on the subject: (1) Law School For Experts; (2) Cross Examination Science and Techniques Published by LexisNexis Authored by Roger J. Dodd and Larry S. Pozner.

Public Speaking and Communications:

Dale Carnegie Course: Public Speaking and Public Relations. Certificate (1980).
Mitchell Community College and North Carolina State University Public Speaking Courses. Degrees (1985-1990).
Midlands Technical Community College: Train The Trainer. Certificate (1996).

General Industry and OSHA Safety:

Modern Machine Shop Technology (1979).
Chesapeake Consulting: Constraint Management Applications. Certificate (1998).
Mesa Consulting Group Incorporated: Six Sigma. Certificate (2000).
North Carolina State University: ISO 9001: 2000 Internal Quality Auditing. Certificate (2005).
Forsyth Technical Community College: Pro-Engineer 2001 CAD Software Training. Certificate (2003).
Guilford Technical Community College: General Contractor's Licensing Preporation Course including
OSHA 29 CFR 1910 General Industry Regulations and OSHA 29 CFR1926. Certificate (2006).
Measuring and Improving Boiler Efficiency – Advanced. Certificate (2007).
OSHA 29 CFR 1926 Construction Industry Regulations and Major Hazard and Prevention Strategies. Certificate (2010).
OSHA Industrial Accident Investigation. Certificate (2010).
Forlkift Operation Safety, Certification and Licensing Course. Certificate (2014).
Combined Heat and Power – Utilities Power Generation. Certificate (2017).
Chiller Plant Optimization. Certificate (2017).
Forlkift Operation Safety, Certification and Licensing Course. Certificate (2018).
DOT Hazardous Material Transportation Requlations 49CFR 100-185 Training and Certification

Cranes Operatoions and Safety:

»National Commission For The Certification of Crane Operators (NCCCO).
»Crane Institute of America.
»Specialized Carriers & Rigging Association.
»Association of Equipment Manufactures: Safety Manual For The Operation and Maintenance of Cranes.
»Naval Ships Technical Manual Chapter 589 Cranes.
»Mobile Power Crane and Excavator and Hydraulic Crane Standards No. 4.
»ASME B30.11 Monorail and Underhung Cranes.

»ASME B30.5 Mobile and Locomotive Cranes.
»ASME B30.20 Below The Hook Lifting Devices.
»ASME Bth-1 Design of Below The Hook Lifting Devices.
»CSA Group National Standard of Canada CAN/CSA Z150.16 Safety Code on Mobile Cranes.
»CSA Group National Standard of Canada Z150.3
»Crane Safety.
»Crane Types.
»Crane Instruments and Components, Loading, Rigging, Inspection, Testing.
»Crane Safe Work Practices.
»Crane Movements.
»Crane Two-Blocking.
»Hazards Common To Most Cranes.
»Crane Telescoping Boom and Lattice Boom.
»Crane Hand Signals.
»Crane Below The Hook Lifting Devices.
»Crane Lattice Boom Disaasembly Error and Colapse.
»Crane Counterweight Holding Mechanism Failure.
»OSHA Regulations 29CFR1926.1400.
»OSHA 29CFR1926.550; 1400 (Cranes and Derricks in Construction).
»OSHA 29CFR1910.180 (Crawler, Locomotive and Truck Cranes).
»Canadian/Ontario OSHA Crane Regulations 851; 1060.

Forklift Operations and Safety:
»OSHA 29CFR1910.178 (Powered Industrial Trucks).
»ANSI/ITSDF B56 Standards Industrial Truck Standards Development Foundation.
»Have over 1000+ hours of experience in the day-to-day operation of forklifts over a five year period which included material handling operations. Have operational experience with sitdown forklifts and standup narrow aisle forkilfts; Have a current forklift certification and license to operate forklifts.

Amusement Park Ride Safety:
Member of International Association of Amusement Parks and Attractions (IAAPA).
Attended the Operators Forum for the American With Disabilities Act.
ASTM F24 Committee Standards For Amusement Park Rides.

Tractor Trailer Driver's School Training:
Future Truckers of America; Asheboro, North Carolina (2018).
Full-Time Student; Four Week Class.
Road Tractor Training Vehicle: Volvo with sleeper Berth; 53 foot van and 53 foot flatbed trailers.
Tranmission: Eaton 8 speed with high/low range switch.
Graduation Datte: April 19, 2018.
Endorsements: Tanker, Hazardous Materials and Triples.
Truck Pro: Commercial Tractor Trailer Truck Air Brake Seminar (2017).
The Smith Driving Systom (2018).
Member of the North Carolina Truckers Association:

North Carolina Passenger and Public School Bus Training:
North Carolina School Bus and Passenger Bus Classes (2018).
School Bus Driver's Training (2018).
Emergency Drug Administration Training.
School Bus: Type C 2001 Thomas Built Bus Full-Size Bus 57 Student Capacity.
Brake System: Air Brakes.
Automatic Transmission.
Engine: 3126 Caterpillar Medium-size In-Line Six Cyliner Diesel Engine.
OSHA Regulations For School Bus Drivers.
Endorsements: Passenger and School Bus.
Substitute/Part-Time School Bus Driver for the North Carolina Department of School Transportation.

Traffic Accident Reconstruction and Product Defect and Failure Analyses:

North Carolina Commercial Drivers Licence (Class-A CDL) for Driving and Operating Commercial Tractor-Trailer Trucks License Number 3744851. Endorsements: Tanker, HazMat and Triples.

DOT Hazardous Material Transportation 49CFR 100-185 Training and Certification (2018).

North Carolina School Bus Training; have Passenger and School Bus Endorsements (2018).

North Carolina State University: Machine Design, Dynamics and Mechanics of Machines and Vehilces, Motor Vehicle Traffic Accident Reconstruction Sciences. BSME (1990).

University of North Carolina: Introduction To Forensic Engineering. Certificate (2002).

Northwestern University Research in Traffic Accident Reconstruction (2003).

Institute For Police Techology and Management Research in Traffic Accident Reconstruction (2010).

National Academy of Forensic Engineers: Forensic Engineering Seminars (2005, 2006, 2012, 2014).

Collision Safety Institute: Automotive Crash Research Testing & Training. Certification (2006).

Collision Safety Institute: Bosch Diagnostics Crash Data Retrieval System Download and Analyses Training and Certification (2006).

iWitness Close Range Photogrammetry. Certificate (2008).

Insurance Institute for Highway Safety and Highway Loss Data Institute: Vehicle Crashing Test Comparisons and Ratings. Seminar (2011).

Chief Automotive Technologies: Vehicle Construction Technology and Trends. Seminar (2011).

SAE Tractor-Trailer Event data Recorder Symposium (2011).

ARC-CSI Vehicle Crash Conference Crash Data Retrieval Systems Summit Houston Texas. Certificate. Vehicle were crash tested at these summits. (2011, 2013).

Aras 360 HD/Reality 4 day Crash Simulation training Course. Certificate (2014).

Engineering Dynamics Corporation: Advanced Vehicle Dynamics and Crash Simulation 5 Day Course. Certification (2015).

ARC-CSI Boot Camp and Crash Conference; Crash Testing of Motor Vehilces. Certificate (2015).

ACTAR Examination Preparation Course (2015).

Northwestern University – Traffic Crash Investigation/At-Scene Investigation/Evidence Mapping (2015)

Northwestern University – Commerical Truck Crash Reconstructiion and Air Brake Systems (2016).

Northwestern University – Pedestrian Vehicle Crash Reconstruction (2016).

Truck Pro: Commercial Tractor Trailer Truck Air Brake Seminar (2017).

Northwestern University – Commerical Truck ECM Data Imaging and Analyses (2017).

DOT Hazardous Material Commercial Transportation Requlations 49CFR 100-185 Training and Certification. (2018).

Technology & Maintance Counsel Technicians Meeting on Air Brake Systems Presented By MERITOR and WABCO (2018).

National Association of Professional Accident Reconstruction Specialist (NAPARS):

Crash Reconstruction Training Through the National Association of Professional Accident Reconstruction Specialist (NAPARS) (2020):

- »Motorcycle Crash Reconstruction
- »Motor Vehicle Rollover Anaiysis and Reconstruction
- »Motor Vehicle Crash Testing
- »Perception/Response Time Studies in Various Types of Motor Vehicle Crashe
- »Chip-Level Crash Data Recovery
- »Motor Vehicle Tires Inspection and Tire Analyses
- »Using New Freightliner Electronic Control Module Engine Run Data

Motorcycle Riding and Training:

Avid motorcyclist for over 30 years riding both trail, motocross and street motorcycles.

Dirt Bike Motocross Racing/Trail Riding: 1969 – 1974.

Motorcycle Safety Foundation: Advanced Rider's Training. Certification (2002).

Harley Owners Group: Chapter 3446 Group Riding Class. Certificate (2004).

Big Bear Choppers: How To Build a Custom Motorcycle (2009).

Bike Safe North Carolina – Instructed by the Cary Poilce Department in cooperation with the North Carolina Highway Patrol. Certificate (2013).

Currently own and ride one street motorcycle: 2012 Harley-Davidson CVO Road Glide.

All-Terrain Vehicle (ATV) Riders Training:

ATV Safety Institute - ATV Rider Course: ATV Rider Certification (2007).
Recreational Off-Highway Vehicle Association (ROHVA) Riders Certification (2018).
Owned and rode a 2007Honda FourTrax TRX 420 TE/FE Rancher.

PROFESSIONAL ENGINEERING LICENSURE

- North Carolina Board of Examiners for Engineers and Surveyors
  Professional Engineer License Number (027030).
  Professional Corporation License Number (C-2279).
  Original Issue Date: 06/25/2001
- Florida Board of Professional Engineers
  Professional Engineer License Number (66186).
  Original Issue Date: 05/21/2007
- South Carolina Board of Registration for Professional Engineers and Land Surveyors
  Professional Engineer License Number (25937).
  Original Issue Date: 08/29/2007
- Georgia State Board of Registration for Engineers and Surveyors
  Professional Engineer License Number (PE032652).
  Original Issue Date: 12/14/2007
- Louisiana Professional Engineering and Land Surveying Board
  Professional Engineer License Number (33528).
  Original Issue Date: 11/27/2007
- Tennessee Architect and Engineering Board
  Professional Engineer License Number (00111899).
  Original Issue Date: 12/26/2007
- Virginia Board For Architechs, Professional Engineers and Land Surveyors
  Professional Engineer License Number (0402046851).
  Original Issue Date: 09/28/2009
- New Jersey Board of Examiners for Engineers and Surveyors
  Professional Engineer License Number (24GE04845900).
  Original Issue Date: 02/02/2010
- Washington, DC Board of Professional Engineers
  Professional Engineer License Number (PE905690).
  Original Issue Date: 05/27/2010
- West Virginia State Board of Professional Engineers
  Professional Engineer License Number (18874).
  Original Issue Date: 10/25/2010
- Mississippi Board of Licensure for Professional Engineers and Surveyors
  Professional Engineer License Number (20194LTD).
  Original Issue Date: 04/30/2011
- Maryland State Board of Professional Engineers.
  Professional Engineer License Number (43433)
  Original Issue Date: 03/27/2013

PROFESSIONAL ASSOCIATIONS MEMBERSHIPS

- National Society of Professional Engineers (1999).
- American Society of Mechanical Engineers (2002).
- National Academy of Forensic Engineers (2002).
- National Association of Professional Accident Reconstruction Specialists (2003).
- Society of Automotive Engineers (2008).
- American Motorcyclist Association (2006).
- Harley Owners Group (HOG) (2001).
- American All-Terrain Vehicle Association (2006).
- International Association of Amusement Parks and Attractions (2016).
- North Carolina Truckers Association (2018).

OFFICES HELD

- PENC Chapter President – North Piedmont Chapter (2002-2003).
- PENC Chapter Treasurer and Secretary (2003-2004).
- PENC Chapter Vice President, President Elect and Chapter Governor (2007-2008).
- PENC Chapter President, Chapter Govenor, Programs Chairman (2008-2009).
- PENC National Engineer's Week Chairman (2009-2011).
- PENC Programs Chairman (2009-2010).
- PENC Chapter Governer (2011-2012).
- PENC Director (2012 – 2015).
- PENC Current Member (2000 – Present)

PUBLIC SPEAKING EXPERIENCE

- Dale Carnegie Course Public Speaking.
- College Public Speaking Classes.
- Industrial Classroom Teaching.
- Deposition and Court Trial Testimony.
- National Engineer's Week – Various Local Middle Schools.
- National Society of Professional Engineers Presentations.
- Society of Manufacturing Engineers Presentations.
- National Academy of Forensic Engineers Presentations.

PRESENTATIONS/TEACHING

- Mathematics Teacher For Koyo Corporation (1996-1997)

Taught basic math to potential hourly employees for the purposes of screening for future employment as machinist. Created math text and testing materials for classroom use.

- Society of Manufacturing Engineers – Subject Forensic Engineering (2004).
- Professional Engineers of North Carolina – Subject Forensic Engineering (2007, 2008, 2014, 2017).
- Raleigh-Wake County Paralegal Association – Subject Forensic Engineering (2007).
- Guilford County Paralegal Association – Subject Forensic Engineering (2007).
- Casualty Insurance Adjusters Various Chapters – Subject Forensic Engineering (2007).
- North Carolina Paralegal Association – Subject Forensic Engineering (2008).
- Local Middle Schools – National Engineer's Week – Subject Engineering Profession (2005-2009).
- North Carolina State University ASME Student Section. Subject Forensic Engineering (2009).
- Piedmont Community College – Subject Forensic Engineering (2009).
- National Engineer's Week – Subject Careers in Engineering and What Engineers Do (2004-2009).
- Professional Engineers of North Carolina – Subject NASA's Saturn V Moon Rocket (2010).
- IADA Conference – Vehicle Crash Data Retrieval and Traffic Accident Reconstruction (2011).
- National Academy of Forensic Engineers – ATV Accidents (2012, 2014).
- Professional Engineers of North Carolina – Motor Vehicle Crash Reconstruction (2017).

WRITING EXPERIENCE

- Industrial operation, training and maintenance manuals for various companies.
- ISO 9001: 1994; ISO 9001: 2000 documentation for various companies.
- Presentations.
- Forensic Engineering Expert Reports.

TECHNICAL PAPERS AND PUBLICATIONS

- The Physics of a Collision (2006).
- Product Design, Product Manufacturing and Product Quality Control (2012)
- Forensic Engineering Analysis of Hazards Associated with Operating an ATV by a

Paraplegic (NAFE 2012).

- Forensic Engineering Analysis of an ATV Accident Involving Two Riders on a Type 1 ATV Designed for One Driver and No Passengers (NAFE 2013).

FORENSIC ENGINEERING CASE WORK LITIGATION EXPERIENCE TO DATE

Industrial Accident Investigation/Reconstruction:

- Industrial Accidents/OSHA Safety/Machine Gurading/Hazard Investigations/ Product Defect and Failure Analysis Investigations:
  - »All OSHA 29CFR1910, 1926 and 1928 Industry Safety Regulations and
  - »Applicable ANSI, ISO, ASME, UL, ASTM Standards.
  - »Workmans Comp Claims.
  - »Complexor Take-Up Machine Accidents.
  - »Home Appliance Failures.
  - »Earth Moving Machines.
  - »Underground Mining Equipment.
  - »Farming Equipment and Tractor Accidents.
  - »Crop Harvester (Combine) Accidents.
  - »Lawn Mower Accidents.
  - »Soil Aerator Accidents.
  - »Forklift Accidents – both sitdown, narrow isle standup and truck mounted/piggyback forklifts.
  - »Pallet Jack Accidents.
  - »Crane Accidents.
  - »Crane Speaderbar Lifting Test Waterbag Accidents.
  - »Man Boom Lifts Articulated.
  - »Man Lifts Scissor Lifts.
  - »Mobile Crane Accidents and Component failures.
  - »Belt Conveyor Accidents.
  - »Overland Belt Conveyor Accidents.
  - »Power Cord Accidents.
  - »Hand Operated Tools.
  - »Staple Gun Accidents.
  - »Subtractive Machining Operator Safety and Practice.
  - »CNC Machine Program Coding for Component Production.
  - »CNC Multi-Axis Machining Centers.
  - »Machine Guarding.
  - »Shipping/Receiving/Loading Docks.
  - »Lockout/Tagout Requirements.
  - »Process Equipment Maintenance and Standards of Care.
  - »Product Defect and Failure Analyses.
  - »Product Safety Signs, Symbols, Warnings and Labeling.
  - »Many other types of industrial process equipment and standards of care.
  - »Powerline Cable Lifting Accidents.
  - »Machine Guarding Accidents.
  - »Poultry Process Equipment Accidents.
  - »Fabric Rollup Machines Accidents.
  - »Scaffold Failures.
  - »Ladder Failures.
  - »Orchard Ladder Inspection Failure Accidents.
  - »Folding Bench Accidents.
  - »Belt Sanders Accidents
  - »Power Saw Accidents.
  - »Automatic Storage and Retrieval Systems (AS/RS)(AGV) Forklift Accidents.
  - »Ladder Accidents.
  - »Loading Dock Accidents - Dock Lift, Dock Leveler and Dock Plate Accidents.
  - »Power Plant Accident Investigations.
  - »Power Tool Accidents: Belt Sanders, Radial Miter Saws.
  - »Exercise Strength Training Equipment Accidents.

»Lawn Mower Accidents.
»Lawn Aerator Accidents.
»Escalators Accidents.
»High Voltage Power Line Tower Structures Faliure Accidents.
»Product Safety Signs, Symbols, Warnings and Labeling.
»ANSI Z535 Labeling Standards.
»Product Safety Information in Product Manuals, Instructions and Other Collateral Materials.
»Wood Working Machine Accidents.
»Abrasive Shotblaster Accidents.
»Motor Vehicle Coil Spring Compressors Accidents.
»Industrial Piping Systems.
»Electric Utility Cable Reel Machines.
»Solenoid Control Valve.
»Home Water Pipe Rupture.
»Pressure Washer Accidents.
»Coulking Gun Failure.
»Abrasive Shot Blasting Equipment Accidents.
»Warehouse Dock Leveler Accidents.
»Escalator Inspections.
»Commercial Rug Hanger Failure.
»Industrial Trip and Fall Case – Drainage Pit
»Bushhog Accidents.
»Farming Chemical Warehouse Inspection.
»Exercise Equipment Failures.
»Poultry Processing Equipment Accidents.
»Power Generation Steam Pipe Valve Accident.

Amusement Ride Accidents

ASTM F24 Standards; Standards of Maintenance; Standards of Care and Operation; Product Defect and Failure Analysis.

»Go-Kart crashes with kart inspection.
»Samba Balloon Ride Gondola support failure with the inspection of the entire machine structure. The main superstructure was cracked in multiple locations. Engineer advised the client to take the ride ou of operation and either repair the superstructure or distroy it.
»X-Factory Ride; Inspection of the machine's patron restraint system design.
»Musical Ferris Wheel in an Arcad whi8ch was a coin operated kiddie ride.

Motor Vehicle Crash Reconstruction

Traffic Crash Reconstruction involving cars, light trucks, school buses, bicycles, heavy commercial trucks, motorcycles, bicycles and pedestrians.

»At-Scene Investigation and Evidence Mapping.
»Slow and High Velocity Collisions, Drag Factor, Skid Analyses, PDOF, ΔV, Closing Velocity, Conservation Linear and Angular Momentum, Conservation of Mechanical Energy, Crush Damage Analyses, Crush Energy, Critical Velocity and Circular Motion, Dynamic Weight.
»Vehicle Inspections.
»Cars and Pickup Truck Crash Reconstruction.
»Car/Light Truck Event Data Recorder (EDR) Report Imaging, Analysis and Interpretation.
»Commercial Tractor Trailer Truck Crash Reconstruction.
»Commercial Tractor-Trailer Truck Electronic Control Module (ECM) Operational Data Imaging , Analysis and Interpretation.
»49 CFR 40, 303, 325, 350-399 Federal Motor Carrier Safety Regulations.
»49CFR 100-185 DOT Hazardous Materials Regulations.
»Public School Bus Crash Reconstruction.
»Pedestrian Crash Reconstruction.
»School Bus Accidents.

»School Bus Child Rollover Accidents.
»Shift, Falls, Flips ,Vaults, Rollovers.
»Lamp Filament Analyses.
»Airbag Operation and Failure Analyses.
»Seat Belt Operation and Failure Analyses.
»All Terrain Vehicles (ATVs) and Recreational Off-Highway Vehicle (ROV) Crash Reconstruction.
»Recreational Off-Highway Vehicles (ROVs) Crash Reconstruction.
»Motor Vehicle Product Defect and Failure Analyses.
»Motor Vehicle Inspections.
»Vehicle Standards of Care.
»Product Defect and Failure Analyses.
»Engine Failure.
»Vehicle Crash Testing.
»Vehilce Braking and Skid Testing.
»Suspension System Failures.
»Vehicle Suspension and Handling Testing.
»Cars and Pickup Truck Crash Reconstruction.
»Car/Light Truck Event Data Recorder (EDR) Report Imaging, Analysis and Interpretation.
»Motorcycle and Bicycle Crash Reconstruction.
»Commercial Tractor Trailer Truck Crash Reconstruction.
»Commercial Tractor-Trailer Truck Electronic Control Module (ECM) Operational Data Imaging , Analysis and Interpretation.
»Commerical Vehicle Maintenance and Standards of Care.
»Commercial Heavy Truck Air Brake Systems.
»Commercial Trailer Inspection.
»49 CFR 40, 303, 325, 350-399 Federal Motor Carrier Safety Regulations.
»49CFR 100-185 DOT Hazardous Materials Regulations.
»Public School Bus Crash Reconstruction.
» (ATV) All Terrain Vehicles Crashes and Rollover Reconstruction.
» (ROV) Recreational Off-Highway Vehicles Crash and Rollover Reconstruction.
»Motor Vehicle Product Defect and Failure Analyses.
»Motor Vehicle Inspections.
»Vehicle Standards of Care.
»Product Defect and Failure Analyses.
»Vehicle Crash Testing.
»Vehilce Braking and Skid Testing.
»Vehicle Suspension and Handling Testing.
»Video School Bus Anaylsis.
»Suspension System Failure Accidents.
»Coil Spring Compressor Accidents.
»Cement Truck Crash Accidents.
»Van Vehicle Seat Failures.
»Recreational Vehicle (RV) Inspections.

Motorcycle and ATV/ROV Crash Reconstruction and Product Defect and Failure Analyses

»At-Scene Investigation and Evidence Mapping.
»Slow and High Velocity Collisions, Drag Factor, Skid Analyses, PDOF, ΔV, Closing Velocity, Conservation Linear and Angular Momentum, Conservation of Mechanical Energy, Crush Damage Analyses, Crush Energy, Critical Velocity and Circular Motion, Dynamic Weight.
»Product Defect and Failure Analyses.
»Pedestrian Crash Reconstruction.
»Vehicle-Bicycle Crash Investigation.
»Shift, Falls, Flips ,Vaults, Rollovers.
»Dirt Bike Accidents.
»Tire Deflation Failures.

»Lamp Filament Analyses.
»Brakes Failures.
»Engine Failures.
»Engine Cylinder Head Failures.
»Engine Throttle Failures.
»Handlebar and Frontend Failures.
»Electrical Charging System Failure.
»All Terrain Vehicles (ATVs) and Recreational Off-Highway Vehicle (ROV) Crash Reconstruction.
»ATV and Utility Guy Wire Collsion Accidents.
»ATV Wheel Knuckle Failures.
»ATV Ball Joint Failures.
»Motorcycle Front Fork Failures.
»Motorcycle and ATV Inspections.
»Motorcycle and ATV Standards of Care.
»Motorcycle Crash Testing.
»Motorcycle Braking and Skid Testing.
»Motorcycle and ATV Suspension and Handling.
»Bicycle Component Failures.
»Motorcycle Tailbag Inspection.
»ATV Recoil Starter/Compression Release Inspection.
»ATV Loading Ramp Accident and Analysis.
»(ATV) All Terrain Vehicles Crashes and Rollover Reconstruction.
»(ROV) Recreational Off-Highway Vehicles Crash and Rollover Reconstruction.

WORK EXPERIENCE

06/02 to Present

THE KILPATRICK GROUP, PA, JAMESTOWN, NC
Forensic Engineering Services:
DIVISION I: Industrial Accident Reconstruction and Product Defect and Failure Analyses.
DIVISION II: Forklift Accident Reconstruction and Product Defect and Failure Analyses.
DIVISION III: Crane Accident Reconstruction and Product Defect and Failure Analyses.
DIVISION IV: Amusement Ride Accidents/ASTM F24 Standards/Standards of Maintenance/Standards of Care and Operation/Product Defect and Failure Analysis.
DIVISION V: Motor Vehicle Accident Product Defect and Failure Analyses.
DIVISION VI: Motorcycle Accidents Reconstruction/Standards of Maintenance/Standards of Care and Operation/Product Defect and Failure Analysis.

2/05 to 7/06

K&S TOOL AND MANUFACTURING COMPANY HIGH POINT, NC
Quality Control, Process Engineering, Maintenance and Safety Manager
ISO 9001:2000 registered contract manufacturer of machined, formed, punched, fabricated, welded and assembled parts and subassemblies. CNC machined, formed and fabricated, welded and assembled component parts and subassemblies for client companies.
Managed the quality control department and had supervisory responsibilities. Responsible for the ISO quality system, quality manual and other similar documentation and files. Involved in APQP and PPAP for special customers. Made changes and updates to the quality system as needed. Acted as ISO management representative for the company. Organized and scheduled training sessions for company employees on matters of ISO 9001:2000 standards, OSHA safety, human factors and newly hired employees. Managed and performed monthly internal quality audits on quality system elements. Lead and motivated employees to quality check their product. Performed first article inspections with report documentation for both

customers and employees utilizing company measuring equipment. Created, followed up, closed and filed quality action plans, corrective action reports, preventive action reports, continuous improvement reports and other similar documentation. Also managed the maintenance program.
Assisted in the design of a bearing press machine for functionality, safety and human factors.
Managed and documented all maintenance activities and schedules. Hands-on from time to time.
Managed the installation of all purchased and incoming machinery.
Managed all facility related matters concerning building maintenance, HVAC and electric utilities.
Acted as resident company engineer in all engineering matters including plant engineering, machine and tool design and OSHA 29CFR1910 safety audits and OSHA regulations.
Was company Safety Manager. Created and distributed plant facility evacuation charts.
Performed safety audits on all plant facilities and equipment including kinetic energy punch presses, hydraulic presses, automatic laser cutting machines, vibratory media deburring and cleaning equipment; press brakes, automatic robotic welding machines, CNC machining centers (lathes) and hazardous chemicals including water based metal cutting coolants and petroleum based oils. Managed the distribution of MSDS and audited all MSDS books. When a safety issue was discovered, the safety issue was corrected.
Worked with the shipping/receiving department regarding the inspection and management of damaged containers and product that were received from domestic and over seas companies.
(Worked for K&S Tool temporarily to earn capital funds for The Kilpatrick Group, PA.)

7/01 to 6/02

SPHERION GREENSBORO, NORTH CAROLINA
Process Verification-Validation Engineer (Contract Engineering)

Provided engineering services to Bristol Myers Squibb, a manufacturer of ostomy, wound care products and pharmaceuticals.
Assisted in the modification and retrofit of production machinery for ostomy pouch manufacturing. Created and implemented process validation protocals IQP, PQP, OQP and DOE and statistical methods with reports per FDA GHTF and cGMP guide lines for approval to launch MK4 ostomy pouch process into production.
Provided engineering support to a new prototype Digital Label Printing Line. Benchmarked the process, gathered downtime data, trouble-shooting of equipment designs, and made recommendations to engineering manager on how to improve uptime. Decreased downtime by 40%. Created written PM schedules and trouble-shooting guides.
Designed and installed a protective cover for a 15 watt class 4 marking laser to meet OSHA, ANSI and ISO safety requirements of a class 1 laser. (Contract assignment was completed)

10/99 to 04/01

ERICO INCORPORATED ABERDEEN, NORTH CAROLINA
Mechanical Design/Manufacturing/Process Engineer

ISO-9002 and UL Listed manufacturer of grounding, electrical and structural support systems for the residential and commercial construction industry. Utilized Microsoft computer software and AutoCad 14 extensively.
Expedited and managed capital and expense projects, cost reduction, continuous improvements integration of OSHA 29CFR1910 safety requirements for ergonomic and lean manufacturing which included spot welding, wire drawing, copper plating, rod straightening, kinetic energy punch presses and cut-to-length operations. Used Six Sigma, SPC, problem solving, root cause analysis techniques, lean manufacturing, PFMEA, DFMEA, APQP, QIP, CIW and Kaizen extensively.
Established and led cross-functional teams for Centers of Excellence throughout the corporation. Established and led Six Sigma, QIP, CIW and Kaisen teams to reduce downtime, increase productivity, train personnel in lean manufacturing techniques, equipment operation theory and preventive maintenance. Developed and implemented a Six Sigma based statistical process and quality control system (SPC) for all departmental processes. Documented and tracked all project time lines, cost, cost savings, downtime reduction and process improvements. Monitored production schedules, inventories, production issues, product scheduling, and scrap levels. Communicated with production scheduler and production manager concerning production runs and production concerns. Created and controlled line

documentation such as process flow mapping, work instructions, quality standards instructions, tooling specifications, tooling layouts and control plans.
Coordinated and relocated a complete automated roll forming line from Ohio to the North Carolina facility.
Redesigned blanking press die tooling for 75 ton Minster OBI strut pre-notch punch presses. Implemented SMED. Installed safey blocks required by OSHA 29CFR1910. Installed a coolant spray system to add lubricity to a formally dry punching operation. Human factors studies were performed during the design process. These changes increased tool life three times and reduced replacement tooling cost achieving a total yearly cost savings of $100,000. As a result of these continuous improvement projects, reversed a negative $110,000 per month variance to a positive $40,000 per month variance and reduced setup time by 75%.
Designed and installed an enclosed in-process automated spraying system to apply a rust preventative to strut products to eliminate oxidation problems creating a superior product compared to the competition and met all OSHA 29CFR1910 safety requirements.
Redesigned Flexibar assembly tooling to eliminate scrap and customer claims and achieved a yearly cost savings of $20,000.
Designed and supervised the installation of a hazardous chemical containment area for the storage of acids, bases and oxidizers per OSHA 29CFR1910 hazardous material regulations.
Designed a 30 foot belt conveyor for strut operations with an ergonomic and easy-to-use automatic ejection mechanism to replace an existing manual conveyor and saved $8000 by designing and building it in-house. The conveyor was guarded to meet OSHA 29CFR1910 regulations. Human factors studies were performed during the design process.
Performed a complete design load and stress analysis on an existing in-house fabricated below-the-hook lifting device per ASME B30.20 standard. This lifting device was used for transferring 6500 pound sheet metal rolls from pallet to process equipment. It was determined that the lifting device design had not been tested by a second party testing lab and did not have the ASME B30.20 required data plate. The lifting device was permanently removed from service and replaced with a commercially available below-the-hook lifting device.
Trained operators on how to setup and use a spot welder to increase quality and production.
Managed projects and key hourly personnel to expedite and facilitate project work phases to closure. Involved in hands-on maintenance of process and material handling equipment.
Managed spare parts and tooling inventories for two separate facilities.
Member of the Safety Committee. Performed safety audits to enforce OSHA 29CFR1910 regulations of the facility, process, warehouse and material handling machinery and to assure ergonomic working conditions and the use of personal protective equipment. Reported findings to committee members with recommendations. Worked with the safety committee, created and implemented an OSHA 29CFR1910.147 compliant Lock-Out/Tag-Out system for the facility.
Redesigned floor layout for Flexibar process relocation. Redesigned floor layout of maintenance and tool room areas. Redesigned warehouse layout for relocation and steel coil storage and FIFO.
Investigated an accident involving a 75 ton Minster punch press and rollformer.
(Due to a 90 mile commute to work one way and rising fuel prices, resigned position to accept a contract engineering position with Spherion)

2/98 to 7/99

GKN AUTOMOTIVE ROXBORO, NORTH CAROLINA

Automotive Engineer Mechanical Design/Manufacturing/Process

Manufacturer of automotive constant velocity half shaft assemblies. Responsibilities included expediting and managing capital projects, cost reduction, continuous improvement, ergonomic integration of OSHA 29CFR1910 safety requirements for the assembly of automotive constant velocity half shafts in a Tier 1, ISO9001 and QS9000 facility.
Utilized Japanese philosophies of Kaizen, Poka Yokes, Zero Defects, Brainstorming, Waste Elimination, 5-S, FMEA, lean manufacturing and Kan Ban material control systems. Used Six Sigma, problem solving and root cause analysis techniques extensively.
Extensively utilized a Six Sigma based statistical process and quality control system (SPC) for all assembly cells. Documented and tracked all project time lines, cost, cost savings, downtime reduction and process improvements.

Created and controlled line documentation such as process flow mapping, work instructions, quality standards instructions, tooling specifications, tooling layouts, control plans and SPC documents.
Designed and built special ergonomic assembly tooling and fixturing that met OSHA 29CFR1910 regulations for continuous improvement and new program launches. Human factors studies were performed in the design process. Monitored production schedules, inventories, production issues, product scheduling, scrap levels and communicated with production coordinators concerning production runs and production concerns. Processed ECN's in department.
Was directly responsible for the hands-on repair and maintenance of assembly equipment, machine downtime tracking and improvement flashes across three shifts 24 hours per day. Coordinated maintenance activities with maintenance manager. Was directly responsible for ordering and inventories of all machine component maintenance items, new program, improvement design and replacement tooling. Facilitated and managed quality improvement processes and continuous improvement workshops with respect to each cell, it's operators and equipment.
Managed the installation of new assembly cells for new program launches. Inspected and assessed equipment to meet safety requirements of OSHA 29CFR1910 regulations. Performed machine capability studies, PSW, product master samples, tooling plans, control plans and documented changes for PPAP submission to customers. Created all line documentation for process production launches.
Heavily involved in hands-on maintenance of process and material handling equipment.

5/97 to 1/98

COPELAND CORPORATION HARTSELLE, ALABAMA

Mechanical Design/Manufacturing/Process Engineer

Manufacturer of residential HVAC refrigeration compressors. Manufacturing process machines included: CNC multi-axis machining centers, dial machines, milling machines, boring machines and assembly. Responsibilities included expediting and managing capital projects; cost reduction; continuous improvement; ergonomic integration of OSHA 29CFR1910 safety requirements for machining aluminum pistons and rods, cast iron cylinders blocks and heads.
Utilized Japanese philosophies of Kaizen, Poka Yokes, Zero Defects, Brainstorming, Waste Elimination, 5-S, FMEA, ergonomic lean manufacturing. Used Microsoft computer software extensively and AutoCAD for design purposes.
Redesigned a two machine 4-axis CNC work cell eliminating 3 operators saving $94,000 in direct labor cost. Human factors studies were performed in the design process. Assisted in the redesign of all compressor bodies for more efficient work holding. Redesigned CNC machining center work holding clamps to match the body redesign for scrap reduction. Processed ECN's in department for product design changes.
Heavily involved in hands-on maintenance of process equipment.
Created work instructions, machinery setup instructions and machinery operation parameters. Created bid packages for capital equipment quotation, cost justifications, appropriations requests. Coordinated maintenance activities with maintenance manager.
(Due to future marriage and relocation, resigned position to accept new position with GKN Automotive)

2/95 to 5/97

KOYO BEARINGS ORANGEBURG, SOUTH CAROLINA

Automotive Engineer Mechanical Design/Manufacturing/Process

Manufacturer of high performance automotive wheel bearings. Manufacturing process machines included: CNC multi-axis machining centers, ID and OD surface grinders, drilling and tapping machines, heat-treatment and assembly. Responsibilities included expediting and managing cost reduction, and continuous improvement projects, integration of OSHA 29CFR1910 safety requirements for CNC turning (lathes), grinding and automatic assembly of SAE1055 and SAE 52100 steel bearing inner and outer rings.
Utilized Japanese philosophies of Kaizen, Poka Yoke, Zero Defects, Brainstorming, Waste Elimination, 5-S, FMEA, ergonomic lean manufacturing and Kan Ban material control systems.
ISO9002 certification was awarded to Koyo during May of 1996. Was heavily involved with documentation development for certification.

Extensively utilized automated statistical process and quality control system (SPC) which was built into all manufacturing processes.
Traveled to Osaka, Japan to prove off $6,500,000 of capital equipment including completely automatic CNC Murata MW series and LE type Miyano two axis turning centers (lathes), Koyo and Toyo shoe type centerless grinders and plunge type forming grinders and automated assembly machines. Personally performed floor lay out and supervised equipment installation upon arrival. Assisted in the creation of work instructions, quality standards instructions, tooling specifications and tooling layouts for processes.
Performed continuous improvements of bearing manufacturing process through extensive carbide insert and grinding wheel testing. Saved Koyo $157,000 per year in tooling cost by changing metal cutting fluids and through carbide insert testing.
Heavily involved in hands-on maintenance of all automated process and material handling equipment.
Received classroom training on how to successfully write CNC coded programs utilizing the G,M,T,S,D,P,N codes to setup a multi-axis machining center for component part production.
Modified Machining CNC programs to reduce cycle time and increase tool life.
Redesigned the loading mechanism of an automatic ABS pulser ring assembly press for changing from an INA to FAG pulser ring meeting safety requirements of OSHA 29CFR1910 regulations.
Authored company math textbook and taught mathematics in classroom setting for testing and screening potential full-time hourly employees. (Resigned to accept new position)

8/94 to 1/95

DML INDUSTRIAL PRODUCTS HICKORY, NORTH CAROLINA
Mechanical Design/Manufacturing/Process Engineer

Manufacturer of high speed steel tooling for the wood and metal working industry.
Manufacturing process machines included: CNC multi-axis machining centers, drill flute grinders, centerless OD grinders, saw blade machining, carbide machining and adhesion and saw blade re-sharpening. Responsibilities included expediting and managing cost reduction, and continuous improvement projects, integration of OSHA 29CFR1910 safety requirements for CNC and NC turning and grinding operations. Responsibilities included expediting and managing capital projects, cost reduction, continuous improvements and ergonomic integration of OSHA 29CFR1910 safety requirements for manufacturing high speed steel tooling.
Designed, built and installed an ergonomic manufacturing process to support a Lindberg homo steam tempering furnace for applying a high temperature dark blue ferric oxide surface treatment for high speed steel drill bits. Designed, built and installed a 60 foot structural steel overhead monorail crane for lifting furnace payloads in excess of 2,000 pounds per ASME B30.11 standard. Crane and equipment met the requirements of OSHA 29CFR1910 crane regulations. Human factors studies were performed in the design process. Created written operation and setup manuals for this operation.
Assisted in the design of an ergonomic manufacturing cell to produce high speed steel S&D drill bits. Equipment included a Hertlein spiral flute grinder, two centerless grinders, a relief grinder, a Winslow drill pointer, tables and gravity conveyors. Human factors studies were performed during the design process. Created written operation and setup manuals for this cell. This cell eliminated three operators and saved DML $112,320 per year in direct labor cost. Also processed ECN's in department.
Performed grinding wheel tests on Hertlein spiral flute grinders to improve grinding wheel performance and life. Grinding wheels used and tested were made by Norton and Carborundum.
Installed a coolant recycling system to recycle used coolant. Created written operation and setup manuals for this system. This system saved DML $6,000 per year.
Created bid packages for capital equipment quotation, cost justifications, and appropriations requests.
Coordinated maintenance activities for process and material handling equipment with maintenance manager.
(Accepted new position with Koyo Corporation due to imminent layoff and plant closure)

1/94 to 5/94

CONTROLS SOUTHEAST INCORPORATED CHARLOTTE, NC
Mechanical Design Engineer (Temporary Contract Position)

Was under temporary assignment to assist the design engineering department in the planning, design, manufacture and assembly of a testing apparatus to run experiments and gather transient heat transfer data in the form of Temperarture vs. Time in order to generate temperarture tables and graphs for the analysis of data to determine the overall heat transfer coefficients and time transients of various heat transfer cements during startup heat flow. Was responsible for all testing and data collection.
After testing and data collection was completed, created a detailed scientific report and subitted it to the company management for their future use. (Contract assignemnet completed)

10/93 to 12/93 **FISHBURNE INTERNATIONAL HENDERSONVILLE, NC**
Draftsman (Temporary Contract Position)
Modified engineering drawings for existing products.
(Contract assignment was completed)

12/92 to 4/93 **FOXCROFT TEMPORARIES STATESVILLE, NORTH CAROLINA**
Draftsman (Temporary Contract Position)
Created detailed instrument drawings for existing products for a client company.
(Contract assignment was completed)

4/92 to 10/92 **B&W NUCLEAR TECHNOLOGIES LYNCHBURG, VIRGINIA**
Tool Design Engineer
Manufacturer of nuclear fueled electric power generation facilities. Responsibilities included the design of manufacturing tooling for Uranium 235 commercial nuclear reactor fuel assemblies. Managed cost reduction and continuous improvement projects and integration of OSHA 29CFR1910 and NRC safety regulations for manufacturing Uranium 235 commercial nuclear reactor fuel assemblies.
Developed tig spot welding jig and a spring compression leaf jig for assembling rod cluster control assemblies (RCCA). Reduced assembly time 30 minutes per unit, a 99% reduction in assembly time. Human factors studies were performed during the design process.
Performed detailed design load analysis for all fuel assembly lifting fixtures. It was determined through the analysis that fixtures met OSHA 29CFR1910 and NRC regulations.
Performed safety audits. Tested personal protective equipment human body harness and lanyard equipment used on personnel lifts. Determined that the lanyard design was dangerous and had it removed from service perminately. All tooling design was performed using Personal Designer 3-D modeling CAD software. (Layoff. Further layoffs and downsizing continued)

4/91 to 6/91 **MORRIS AND ASSOCIATES GARNER, NORTH CAROLINA**
Assistant Engineer
Responsibilities included modifying engineering hand drawings for existing products.
(Resigned to seek other employment)

06/84 to 08/84 **VICKERS FLUID PUMPS**
Summer Factory Technician
Was employed by Vickers during a summer job while in college to machine component parts, assemble and test gear pumps. Operated OD grinders to precision grind the OD's of the gear shank and gear teeth. Operated an automated brush machine that polished the gear teeth sides. Worked in assembly to assemble gear pumps. Also operated a test stand to test the pumps for output pressure, function and break-in. Left Vickers to go back to attending college classes at the end of the summer. (Summer Position. Returned to university after summer break)

9/81 to 12/90 Enrolled in college classes for bachelor of science degree program in Mechanical Engineering curriculum. Worked part-time and full-time to pay for all college expenses.

11/78 to 4/83 **CLARK EQUIPMENT STATESVILLE NORTH CAROLINA**
Forklift and Crane Manufacturing/Machinist/Assembly Technician

(Per-College Automotive Work Experience)

Manufactured forklifts, earthmoving machines and rough terrain mobile cranes. Manufacturing process machines included: CNC multi-axis machining centers, spur gear shapers, hypoid ring and pinion gear machining centers, axis shaft sline rollers, milling machines, boring machines, drilling and tapping machines, transfer machining line machines and assembly. Clark Equipment invented the forklift and the Bobcat and was the main competitor to Caterpillar.

Assembled drive steer axles, differential gearing units and transmissions for rough terrain telescoping forklifts and rough terrain telescoping cranes. Also assembled and bench tested large transmissions and differential units. Ergonomically modified assembly bench cell layout and increased assembly production from 5 Gallion road grader axles per shift to 10 Gallion axles per shift. Was commended by plant manager for production increase. Human factors were taken into consideration during the assembly design process.

Setup and operated high production high precision automatic CNC operated and NC tape operated metal cutting multi-axis machining lathes including vertical and horizontal multiaxis turrent lathes, job shop lathes, broaches, multispindle drill presses and tapping machines, milling machines, transfer lines, shaft spline rollers, gear shapers and shavers, OD and ID surface grinders and boring machines.

Set up and operated OD, ID and surface grinders using resinoid and vitrified bonded grinding wheels. Grinding wheels were dressed using diamond dressers.

Assisted heat treatment department in heat treating rough terrain telescoping forklifts and rough terrain telescoping cranes spur and spiral bevel ring and pinon gears, shaft splines and spindles using methods of oil quenching and induction hardening.

Was a licensed forklift operator; Have operational experience with sitdown forklifts and standup narrow aisle standup forkilfts; Operated forklfts each day for the duration of employment. When required, performed plant wide material handling responsibilities by driving forklifts to load machine cells with pallets of component parts and also distributed materials throughout the facility. Have over 1000+ of hands-on day-to-day expereince operating forklifts both the electric standup type and propane powered sit-down forklifts.

Enrolled at Mitchell Community College evenings part-time for college transfer courses.

7/78 to 11/78 **BERNHARDT FURNITURE COMPANY STATESVILLE, NC**

Machine Operator (Pre-College Work Experience)

Manufacturer of home wood furniture.

Set up and operated various wood working machines and machined wood furniture components to print specifications. Machine types included turning and knife lathes, routers, shapers, sanders, boring machines and dove tail machines.

(Resign position to accept new position with Clark Equipment Company)

1/78 to 6/78 **BEAUTYMAID MILLS, STATESVILLE NORTH CAROLINA**

Machine Operator (Pre-College Work Experience)

Manufacturer of feminine textile products.

Setup and operated cloth handling machines to unfold and transfer cloth from one spool to another.

Unfolded rolls of cloth to be used for product manufacturing.

Operated electric knives to shear and cut several layers of cloth to the shapes of a paper patterns. (Resigned position to accept new position with Bernhardt Furniture Company)

6/75 to 1/78 **KEWAUNEE SCIENTIFIC FURNITURE CORPORATION STATESVILLE, NORTH CAROLINA**

Shipping Clerk (Pre-College Work Experience)

Manufacturer of scientific laboratory furniture.

Loaded and unloaded commercial tractor trailer trucks using hand trucks and pallet jacks.

Operated dock levelers to allow tractor trailer trucks access to shipping and receiving department. Also operated various wood working machines to machine wood furniture components to print specifications. (Resigned position to accept new position)