



**Solution Engineering Group**  
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## **James L. McDonald**

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Metallurgical and Welding Engineering Consultant, Solution Engineering Group

### **PROFILE:**

#### Metallurgical-Welding Engineer:

Researched and designed a CT X-ray tube window using explosion-bonded material which permitted next generation to utilize higher power Championed new technologies: Explosion Bonding, Pulsed MIG, Friction Stir Welding and Acoustic Micro-imaging.

Technical paper describing Pulsed MIG expertise used in FGD project awarded “Best of Program” and a large cash award by the Lincoln Foundation.

Managed, “Critical Piping-Remaining Life” multi-million-dollar project resulting in an on time, on budget project due to unique scheduling that resulted in reduction of expected overtime

### **PROFESSIONAL EXPERIENCE**

#### **Current Employer - Chicago, IL - September 2011- Present**

Sr. Welding Engineer: Provide assistance to production and maintenance to maintain a process containing 45 MIG robots and spot welding robots making tier one auto structural components. Provide corporate engineering with assistance in designing and implementing new systems. Set up and provide training for a weld sectioning and etching QC program of all MIG welds. Identify factors involved in improving the production system to the point it could be run without an end of line welder.

#### **Acuren Inspection – Griffith, IN – October 2009 – September 2011**

NDE & Visual inspections at Refinery, Steel mill, Nuclear Fossil Power plants. Loan servant to PCI as QA/QC on spent fuel dry-cast-loading-project at LaSalle & Farley Nuclear Stations. Called in as a part of the emergency crew during the Byron & Braidwood- Exelon Nuclear Station refueling outage (2010/11) for inspection of reactor head weld overlay, measuring pit depths and producing replicas of the worst areas of corrosion on the reactor head flange face seal ring. Part of the 24 hour support for the repair of the #6 Feedwater heater at the Joliet #9 coal station.

#### **Bureau Veritas NA – Downers Grove, IL – November 2008 – October 2009**

Resident Metallurgical / Welding Engineer for the Technical Center – Oil & Gas Division, Houston, TX

Provide welding expertise for AWS, ASME, & PED-CE mark application. Provide auditing services (IBR, 2nd & 3rd party) at valve manufactures in the Midwest and provided consulting for manufactures wanting to establish a CE Mark compliant system. Provided Foundry expertise for a 3 week China/Japan audit of valve Mfg. for US customer.

**Bodycote Materials** – Skokie, IL – Sept 2006 to July 2008

Welding Engineer – Provide expertise for all welding related failure analysis projects, guidance for all testing and test interpretation of weld samples, and assist customers in resolving welding problems and creating new welding procedures.

**Cummins Engine** – Stoughton, WI, 2004-2006

Welding Engineer - Provide welding/metallurgy problem solving resource for 6 manufacturing facilities in WI and Mexico. Responsible for major advancements in the general welding program, the inclusion of welding in the corporate Quality Assurance Program, update/reissue and implementation of a welder training manual, expansion of the metallurgical capabilities in the chemistry laboratory.

Identified the root cause of high manufacturing cost for AC housing bracket, implemented a new joint geometry providing significant decrease in fabrication cost while continuing to meet original design requirements.

For an Italian customer's special product we implemented a number of low/no cost manufacturing changes that enhanced the structural integrity of the product, making warranty claims more difficult to recover.

The implementation of low heat input Pulsed MIG equipment permitted the addition of new product line requiring excessive as-fabricated flatness requirements.

**Packer Engineering** - Naperville, IL, 2002-2003

Senior Consultant - Welding expert for multi-disciplinary engineering consulting and technical services company. Marketing industrial lab services including: Destructive & Non-Destructive Testing, Fracture & Failure Analysis, and Welding and Joining Evaluation & Development.

Provide welding expertise to both internal and external clients. Such as FSW guidance on NASA project.

Co-author for a Provisional Patent titled, "Improved CT X-ray Tube Housing".

**DUNLEE**, Aurora, IL, 2000-2002

Senior Materials Engineer - Materials expert for product development group for manufacturer of x-ray tubes for high power CT scanners. Identified and developed explosion bonded material for x-ray tube window.

Identified and initiated a project to Laser weld beryllium to copper to replace weaker braze joints.

Managed testing and special projects to improve the insulating and heat conduction properties of all Diala Oil.

Co-author for a Provisional Patent titled, "Enhanced Electron Backscatter to Reduce X-ray Tube Heating".

**CASE CORPORATION** - TAD, Burr Ridge, IL, 1998-1999

Senior Welding Engineer - Managed product development project for manufacturer of farm and construction equipment. Performed Weldability Test on 12 hard-facing materials and subsequent abrasion testing for development of

advanced plow shears. Recommended Pulsed MIG and two hard-faced materials for final application that resulted in significant schedule savings. Recommended combination of Pulsed MIG and Robotics which produced significantly lower heat input, lower dilution factors, and higher than anticipated abrasion resistance. Saved \$50,000 customer by providing welding and NDE guidance for parts supplier.

**UNION TANK CAR CO.**, East Chicago, IN, 1997-1998

Manager - Welding Engineering Department

Managed expansion of welder testing and training facility for manufacturer of railroad tank cars. Facilitated 20% increase in production. Enhanced supervisory support for new welders, which decreased turnover rate. Initiated change from pure CO to a mix gas, and flux core to metal core. Introduced development of Pulsed MIG on thinner materials.

**NALCO CHEMICAL COMPANY**, Naperville, IL, 1995-1997

Senior Metallurgist - Performed failure analysis of boiler and water treatment components. Developed microscopic method of measuring pit depth on corrosion coupons to provide additional meaning to weight loss calculations.

**SARGENT & LUNDY**, Chicago, IL, 1991-1995

Metallurgist and Welding Engineer - Provided consulting services on FGD, DEA Systems, life-critical piping systems and fans, API 653, alloy wallpapering, non-metallic coatings, and tank and pressure vessel repair. Set-up corrosion monitoring system on MEA CO recovery system. Managed on site project engineers and contractor systems. Wrote technical specifications for power plant projects involving FGD, DEA, and API 653.

**HAYNES INTERNATIONAL**, Kokomo, IN, 1989-1990

NDE Engineer - Developed new NDE quality control ideas and equipment for nickel and coal alloy mill. Implemented real time method of measuring difference between crown and edge thickness of nickel alloy sheet, which generated 2% savings for all materials processed. Created new testing method for manufacture of woven traveling belt that minimized risk from over-stressing fabrication methods.

Prior to this time I worked construction projects with CB&I, Fluor/Daniel, Bechtel, & GK Newberg, on fossil and nuclear power plants and petrochemical plants. (LaSalle, Byron, Calloway, Limerick, Marble Hill, SASSOL-II)

## **EDUCATION & CERTIFICATION**

**EDUCATION:** B.S., Metallurgical Engineering, University of Missouri, Rolla, Missouri

**CERTIFICATION:** E.I.T., Engineer in Training, #21444-E C.W.I., Certified Welding Inspector, # 07041121 / 04-01-13, American Welding Society; NDE, Non Destructive Examination Level II Qualifications in RT/PT/MT; Nuclear QA Records Review; NDE Level I Qualifications in UT.

Welder Certification, ASME/AWS - SMAW/GMAW (Pulse)/FCAW/GTAW/CS, SS, Ni, AL.

### **TECHNICAL PUBLICATIONS**

"What to Watch Out for in Welding Components for Flue Gas Desulfurization Plants," Presented at AWS annual meeting, 1991. Published in Welding Journal, December 1992, Co-author E. Dille.

"The Role of Pulsed MIG Stainless Steel Welding in High Quality FGD Linings," Presented at AWS annual meeting, 1989. Published in Welding Innovation Quarterly, Volume V No. 1 1988, and "Best of Program Award". "Chromium Depletion on the Surface of Nickel Based Alloys," Presented Corrosion 1988, Co-author E. Dille. "Corrosion Resistance and Erection of Nickel Alloy Liners in FGD Systems," Presented at Corrosion 1987. Published in Material Development, November 1987, Co-author V. Coppolechia.

### **HONORS**

Requested by NACE to represent the utility industry on panel discussion, Corrosion 1987.

The 1988 Lincoln Foundation Best of Program Award and a \$10,000 prize.

Participated with Nickel Development Institute and LG&E in discussing SDRS material selection and construction/erection methods with representatives of National Utilities Commission from Italy.

Co-author on two Patents: "Enhanced Electron Backscattering in X-Ray Tubes" (7260181) and "Improved Ct X-Ray Tube Housing" .