

GREG STARK CONSULTANCY LLC

Metallurgical & Welding Engineering Services

8808 Bradford St. • Denton, TX 76207 USA • (469) 231-1285 • gsc@gregstarkconsultancy.com



Personal Details:

Gregory D Stark

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Objective: Contract consulting position supporting Oil and Gas Corporations for Metallurgical and Welding Engineering activity.

Diversified background in Metallurgical and Welding Engineering, and Quality Engineering in:

Steel Manufacturing and Fabrication -
Structural Steel & Aluminum Construction –
Petrochemical Plants & Equipment -
Subsea Pipelines & Equipment -
Heat treating Alloy Systems –
Aerospace Flight & Transport Hardware –
Pipe Manufacturing and Mill Survey -
Vessels & Process Piping –
Forged Flanges, Fittings & Equipment –
Fitness for Service (FSS) –
NDE Systems–VT, MPT, DPT, UT, RT, ET–

Oil & Gas (Sour & Sweet) Prod., Transmsn -
Gas & Refinery Plants & Equipment (S&S) –
Marine Hardware –
Offshore Platforms Construction -
All Major Welding & Brazing Processes -
Metallurgical Processing and Coating –
HFI Pipe Sour Gas Qualification Service –
Failure Analysis & Investigations –
Specification Development -
Statistical Process Control (SPC) –
Technical Paper Presentation (NACE) -

International Specifications: ABS, AMS, API, ASME, ASTM, AWS, BSI, BV, CEN, DIN, DNV, FED, ISO, JIS, MIL, NACE, NASA.

EMPLOYMENT HISTORY:

Greg Stark Consultancy

Denton, Texas

Current & Past Projects:

Metallurgical & Welding Engineering Consultant

9/07 - Present

- ExxonMobil Development Company Consultant (May, 2012 – December, 2014) – Metallurgy and Corrosion Group, Houston, for welding engineering support to various project locations such as Barzan, Pt. Thomson, Hebron, Banyu Urip, Marine Well Containment System, ERHA North Phase 2, SubSea Standardization, Odoptu Stage 2, Damar, as well as on site project support such as Ulsan, South Korea and Scotland. Guided EPC/Vendor qualification of Super Duplex Stainless Steel piping, and API 2W grades and ASTM A514 Grade Q structures for offshore platforms.
- National Pipe Company Saudi Arabia (Mar., 2012) – Performed consultation and third party Quality and Production Audit of production facility for compliance with API 5L/ISO 3183 for Saudi Aramco Engineering requirements projects.
- Red Sea Refining Company (Aug, 2011,-Feb, 2012) – PMT Welding Representative for Yanbu Export Refinery Expansion Project joint venture previously between Saudi Aramco and Chevron. EPC2, EPC3 and EPC4 packages, as well as WASIT Gas Project, all in Seoul, S. Korea.
- Oil States Industries (2011) – Metallurgical engineering consultation for gas

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carburization of wire rope traction winch fabrication using ASTM A131, Gr. EH36 for McDermott vessels.

- National Pipe Company Saudi Arabia (Jan., 2011) – Performed consultation and third party Quality and Production Audit of production facility for compliance with API 5L/ISO 3183 and Saudi Aramco Engineering requirements projects.
- Lan Do Development Project by BP (2010 & 2011) – Reviewed subsea pipeline welding specifications and developed corrosion testing matrix for 13Cr and Inconel 625 clad X65 pipe joints. Recommendations accepted by BP prior to EPC bid selection.
- National Pipe Company Saudi Arabia (May, 2010) – Performed third party Technical Capability Audit of production facility for compliance with API 5L/ISO 3183 and Saudi Aramco Engineering requirements prior to five year tender agreement.
- Bergrohr GmbH Siegen (2010) – Conducted specifications review and gap analysis for product development of Berg-Lay CRS lined pipe in accordance with API 5LD
- Panhandle Energy (2010) – Phase VIII for Florida Gas Transmission; developing Welding Qualification Matrix and Plan, and welding procedure qualification review.
- Technip USA (2010) – Metallurgical & Welding engineering for Jubilee Project offshore Ghana API 1104, Appendix A, welding procedures for subsea piping and PLET construction. (API 5L X52 & X65, ASTM A694 F65, ABS EH36, EN10025 S275 and S355
- Oil States Industries (2009) – Metallurgical & Welding engineering consulting for marine winches, structures (ASTM A514 ABS EH36), and ship equipment and hull attachments (ASTM A514) for Hatlapa (North Sea vessels) and Atlantico Sul for Petrobras (ASTM A829 Gr 4130, ABS EH36, ASTM A487 Gr 4 Cls B {8630})
- Turner Industries Group (2009) – Welding inspection surveillance of fabricated carbon steel and stainless steel pipe spools for BP refinery upgrade to process sour Canadian Crude Tar Sands. Included PMI verification for all CRA components and finished spools
- Rabigh Refining & Petrochemical Company (2008) – Metallurgical & Welding Fitness For Service assessment prior to start-up for 2.25Cr and 321 piping for refining section and 316L piping for ethylene and propylene service, Rabigh, Saudi Arabia
- Tatsa Mexico (1994) (now Trinity Industries) – Failure analysis and fabrication improvements for Ammonia transportation truck tanks and chassis fabrication (ASTM A517 cracking)
- Litton Precision Gear (1991) – Consultancy for Electron Beam Welding (EBW) support contractor for process improvement and reliability upgrade. Assisted client during vendor survey for helicopter transmission gear fabrication.

EXPERIENCE SUMMARY

Diversified background includes metallurgical engineering, welding engineering, and quality engineering in steel manufacturing, fabrication, construction, heat treating, aerospace flight hardware, and oil and gas production and transmission (sour and sweet), and refining. Very familiar with all major welding and brazing processes including “hands-on” experience with SMAW, GMAW, FCAW, SAW, & RSW. Experience includes test bed design, metallurgical processing for many alloy systems, welding metallurgy, welding technology, metallurgical failure analysis, specifications, SPC, DOE, sampling, and extensive failure analysis using SEM, mechanical testing, and metallographic techniques. Fabrication of ground based structures, pressure vessels and systems, maintenance and repair, and welding research experience also

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included aerospace welding of flight hardware and ground support equipment. Alloy expertise includes familiarity with processing of most steels and stainless steels, aluminum, and titanium. Limited experience with copper, nickel, and magnesium alloys. Reviewed, and developed, many welding procedures in accordance with internationally recognized specifications. Extensive work included ABS, AMS, API, ASME, ASTM, AWS, military and federal welding codes and specifications, BSI, BV, CEN, DIN, DNV, JIS, ISO, NACE, welding procedures for pressure vessel, structural, and aerospace applications. Developed first internationally recognized qualification system for Electric Resistance Welded (ERW) pipe which supports ASME and API. Familiar with NDT and inspection techniques (MT, PT, RT & UT) used on castings, forgings, wrought shapes, weldments, and brazements, and vibration analysis on rotating equipment.

Saudi Aramco Oil Company

Dhahran, Eastern Province, Saudi Arabia

Member of Consulting Services Dept., Materials Engineering & Corrosion Control Div., Materials Engineering Unit.

Metallurgical & Welding Engineer

8/96 to 9/07 (retired)

- Responsible Specifying Authority (RSA) for structural commodities, and fasteners, for buildings and alternate applications such as Space Frames and scaffolding.
- Surveyed numerous structural and vessel fabrication vendors both in and out of Kingdom
- Published NACE White Paper, "Qualification of ERW/HFI Manufactured Pipe for Wet, Sour Crude and Gas Services"
- Surveyed Enventure Global Technologies for expandable downhole tubulars demonstration at Citra Tubino at Batam Island, Indonesia
- Evaluated use of Thermal Spray Coatings (TSC) for corrosion and wear resistance for process piping, vessels, and structures and published Corrosion Technology Item
- Surveyed vendor pipe mills & forging factories for compliance with Aramco Standards:
 - Arabian Pipes Co.
 - Saudi Steel Pipe
 - National Pipe Co.
 - Precision Forging Factory
 - British Steel (Corus)
 - Ilva Taranto Steel
 - Mannesmann Pipe
 - Corinth Pipe
 - Volzhsky Steel
 - Vyksa Steel Works
 - SeAH Pipe
 - Nippon Steek
 - Kawasaki (JFE) Steel
 - Sumitomo Pipe
 - Lone Star Steel (USS)
- Reviewed national and international vendor submitted welding procedures to be in compliance with Saudi Aramco Engineering Standards and Material Specifications based on international specifications such as ASME, API, ASTM and NACE
- Working member on various Saudi Aramco Standards Committees for drafting and reviewing specifications
- Developed first internationally recognized specification and rationale for the qualification and process control of Electric Resistance Welded (ERW) (including High Frequency

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Induction Welded (HFIW) line pipe, structural pipe, and OCTG casing and expandable tubing

- Conducted numerous failure analyses of components (carbon steel, HSLA, 2.25Cr-1.5Mo, 5Cr, 304, 316, 309, 310, 904L, 256SMo, Duplex, IN600, IN625, IN800, AA6061) throughout the company
- Performed many material selections, and specified processing requirements, in accordance with company specification and needs at various plant and processing locations (Upstream production, platforms, mooring piles, well head, subsea rigid and flexible pipe and flanges, onshore pipelines for sour liquid and gas, pumping stations, separators/slug catchers, gas plants, refineries, bulk plants, and tankage).
- \$50MM was saved by implementing insitu cement lining process for rejuvenation of fire water piping systems rather than full replacement
- Served on various Value Engineering committees with approved vendors for improvements to company specifications (typical savings: \$5 - \$50MM).

Publications: Qualification of ERW/HFI Manufactured Pipe for Wet, Sour Crude and Gas Services – NACE MECC10

Raytheon Engineers and Constructors, EBASCO Div.
NASA/JSC Houston, Texas

Principle Engineer
3/90 – 8/96

Metallurgical, Welding, and Quality Engineer in Special Processes Group providing technical support to NASA directorates and contractors.

- Lead engineer for Safety, Reliability and Quality Assurance Department when required
- Materials selections, metals processing, heat treating, and welding engineering for:
 - Fabrication of ground support equipment structures,
 - Ground based pressure vessels and pressure systems,
 - Facilities construction,
 - Human-rated training hardware, and
 - Flight and Space hardware
- Qualified and published several orbital arc tube welding (GTAW) procedures (210 welded joints) using 304L, 316L and Inconel 718 tubing for the Special Apparatus For EVA Rescue (SAFER) for manned maneuver in space
- Developed and qualified numerous other welding or brazing procedures and personnel performance tests in support of MIL-STD-1595A, MIL-STD-2219, MIL-W-6858, ASME Section I, IV, VIII and IX, B31 .1, B31 .3, B31 .5, B31 .9 and AWS B2.1, and B2.2, CI .1, C3.4, C3.6, C3.7, DI .1, DI .2, DI .3, and D9.1
- Earned NASA Manned Flight Awareness Award while member of failure investigation team of leaking Space Shuttle high pressure helium tanks
- Specified and directed welding repair of aluminum motion base flight simulator for astronaut training
- Developed and implemented framework for Space Center-wide welding program formally endorsed by NASA Engineering for all hardware built by or for Johnson Space Center
- Performed metallurgical failure analysis and evaluations on ground based assemblies

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McDonnell Douglas Helicopter Co. (now Boeing)
Mesa, AZ

Member Technical Staff III
12/84 - 2/90

One of several welding engineers responsible for metallurgical and welding engineering and processing technology with special emphasis on welding – SMAW, GTAW, GMAW, RW, TB, FB, EBW, Friction Welding, electrical soldering for AH-64 Apache Attack Helicopter and MD50 Commercial Helicopter

- Material selection and regulations for Design, Manufacturing, Product support, and Vendor support – E4130 and AA6061-T6, AA6063-T6 transportability equipment, 6Al-4V-Ti tubing, Magnesium transmission cases, AA2024 and AA7075 fuselage, E4340 armor, landing gear, and ballistic tolerant flight hardware, 25mm & 30mm Chain-guns and ordnance structures, 15-5PH ammo carriers, 17-7PH springs, 13-8PH fasteners, and MP35N forged rotor blade knuckles
- Member Conceptual Design Team for MD50 NOTAR (No Tail Rotor) patented design
- Surveyed many vendors for acceptance to approved vendor list – Welded, Brazed, and Heat Treated subassemblies
- Optimized Electron Beam Welding (EBW) at approved vendors for fabrication of rotor drive transmission helical gear (carburized E9310).
- Performed numerous failure analysis using SEM and metallographic techniques on airframe, drive train, ordnance, and ground support equipment
- Demonstrated significant program savings by developing GTAW repair of rejected EB welded and carburized 9310 steel helicopter transmission gears while maintaining optimum metallurgical properties
- Evaluated fabrication procedures and inspection results for transmission test stand oil piping system built to ASME B31.1, and recommended vendor corrective action
- Responsible for supervision of all process procedure qualification (MIL-STD-2219), and personnel performance qualification (MIL-STD-1595), activities for welding, brazing, and thermal spraying for wear pads

ARMCO, Inc. (now AK Steel)
Middletown, OH

Research Welding Engineer
5/81 - 11/84

Responsible for process and product development and technical services for many product lines at various corporation plant locations throughout the country:

Product Support -

- Technical direction of welding wire product line from melting, rolling, wire drawing and coating, and product qualification to AWS A5.17 and A5.28
- Responsible for ASME Section IX welding procedures to qualify each production batch of weld wire to AWS, and demonstration of weld wire or plate product ability to meet fabrication and heat treatment requirements for ASME vessel and piping applications
- Supported numerous corporate products –
 - Steel plate products for storage tanks (API 12D)
 - Vessel fabrication (ASME) and seamless pipe for other ASME and API assemblies
 - Structural construction projects (AWS D1.1, D1.3, D1.6)
 - Line pipe (API 5L) and Well casing (API 5D)
 - GTA welded stainless piping (API 5CRA) for refinery applications
 - Drill through equipment (API 16A) and Well head equipment (API 6A)

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Research Activity -

- Developed a forgeable, heat treatable, NACE accepted (MR0175), high strength, high toughness (-50 F) weld wire (GTAW, GMAW, SAW) for ASME and API applications such as, vessels, piping, forged and heat treated fittings, and valve bodies
- Qualified MIL100S-1 GMAW and SAW wire for Navy QPL to MIL-E-23765/2 for fabrication of HY-80 plate for submarine hulls
- Developed detailed welding procedures for:
 - Specialized FCAW nickel alloy (Udamet 720) overlay of rotary forging dies
 - Wire and strip SAW overlay of plate, vessels, and concast rolls
 - GTAW procedures for tool steel reclamation in machine shops
 - Developed and implemented heat straightening and repair welding procedures for cast iron coke oven doors
 - Overlay welding for reclamation of Eddy Current Brake motors
- Developed proprietary coated SMAW electrode for repair welding of 316L piping for pulp and paper industry
- Served on various AWS sub-committees and published numerous corporate welding procedures to AWS and ASME requirements.
- Assisted during personnel performance qualifications and welding procedure qualifications at Middletown Works for new blast furnace construction project

ARMCO, Inc. (now AK Steel)
Kansas City, MO

Product Metallurgist
6/69 - 5/81

- Resident plant welding metallurgist supervised Metallurgical Services Group.
 - Responsible for Structural Steel Bar Joist and Joist Girder Quality Assurance program
 - Incorporated SPC and DOE on in-coming structural materials and production process for improved strength and quality assurance of final joist and girder product line, which demonstrated real savings and a significant drop in rejections.
 - Joist customer complaints and process quality audits
 - Qualified all structural production welders to AWS D1.1
 - Designed, built, and directed use of testing fixture for steel joist qualification load testing program to demonstrate Steel Joist Institute compliance of new and existing product designs
 - Maintenance and repair welding engineering support to plant operations machinery components
 - Vibration analysis of operations rotating equipment
 - NDT services (VT, MT, PT, UT) during annual plant maintenance shut downs
 - Directed NDT evaluation and repair of all defective transverse box girder welds in plant overhead cranes
- Product metallurgist for fabrication and testing of wire rope, concrete post-stressing wire and strand, and spring wire
- Product metallurgist for hot rolled products: Blooming mill, Merchant bar and structural shapes mills, Rod mill
- Associate product metallurgist in Electric Furnace steel making and hot rolling facilities for product and process improvements

REGISTRATIONS

Professional Engineer (Metallurgical Engineering) Missouri, No. 15896 (Inactive)
Ohio, No. 046577 (Inactive)

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CERTIFICATIONS

ASQC Certified Quality Engineer - No. 31523 (inactive)

AWS Certified Welding Inspector- No. 91040411 (ASME Sec. VIII & API 1104) (inactive)

ASNT - Certified Level II UT inspector per SNT-TC-1A (inactive)

PROFESSIONAL AFFILIATIONS

American Society for Metals - Member, Secretary (1976)

American Welding Society - General Member and previous Committee (C7B & D17) member

American Society for Quality Control - General member

EDUCATION

1969 Colorado School of Mines; Golden, CO; Prof. Degree (BS), Metallurgical Engineering

1976 Raytown Vocational School, Raytown, MO; Certified Welder in SMAW, GMAW