



Energy Independence through Hydrogen and Fuel Cells
3609 S Wadsworth Blvd, Suite 135
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Capabilities Statement

In the not too distant future, the hydrogen economy will become a reality. EPC will be a part of the design, construction and hydrogen equipment service marketplace by using its unique hydrogen experience to permit, design and construct hydrogen production, storage and distribution systems, and fuel cells systems for residential, industrial or commercial developments and pipelines for safe distribution and use.

Our specific capabilities include the following:

- *Design, construct, commission and operate hydrogen generating stations, compression storage and dispensing systems, pipelines and distribution systems. Completed projects include large industrial hydrogen plants, intra and interstate pipelines, compression systems, light duty and transit hydrogen vehicle and forklift fueling stations, residential and research hydrogen systems. We have specified, purchased and installed reformers and electrolyzers, compressors, ASME and UL listed tanks, high pressure pipelines, small diameter stainless tubing systems, and 350 and 700 bar retail and commercial dispensing stations.*
- *Safety in design, construction and operation is our highest priority. We consult on hydrogen safety, safety systems design and safety instrumentation. EPC has never had a reportable incident and our goal is to continue that record into the foreseeable future.*
- *Feasibility studies for hydrogen related installations including stationary power plants, anhydrous ammonia production, waste hydrogen recovery and reuse and technology implementation to meet regulatory and socially desirable objectives.*
- *Design, construct and commission fuel cell systems, renewably generated hydrogen production and storage for renewable firming and hydrogen internal combustion (ICE) and combined cycle turbine gensets for stationary or uninterruptible electric power generation. Our multidiscipline design capabilities include selection and procurement of available commercial fuel cells and complete design of balance of plant infrastructure. Construction and startup of power generation systems including hydrogen fuel, infrastructure design/construction as well as siting and permitting. There are five major fuel cell technologies, at least four electrolyzer options, at least three ICE genset manufacturers and over a half dozen reformer technologies, and multiple tank, compressor and dispenser technologies from which to choose. EPC can help determine which technology and manufacturers fit best in your project, and help you implement this new technology. We have designed*



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constructed or commissioned projects with solid oxide, direct methanol, molten carbonate and PEM fuel cell systems.

- *Fabrication of containerized hydrogen solutions. We shop-install into iso containers, interconnect and test hydrogen compressors, storage, related PLC and power panels, water treatment, -60F chillers, cascade control panels, air compressors and other commercially available components for hydrogen generation, CSD, and fuel cell systems to dramatically reduce field installation time and costs. We also provide orbital welding, dual plane tube straightening and proprietary expansion loop bending as part of our direct construction services, often using our mobile hydrogen system construction trailer and office 32 foot dry van with lift gate.*
- *Operation and maintenance of entire fueling stations, most commercial fuel cell, power production systems, electrolyzers and reformers. Our technicians have been trained by many of the major manufacturers and provide cost effective local performance monitoring and service for most brands and types of fuel cells and related infrastructure. We offer advantages of scale to multiple local hydrogen facilities by providing service and operations staffing to multiple owners in the same geographic region, while protecting proprietary design and technology information.*
- *Project and construction management for hydrogen and fuel cell projects. This includes concept/feasibility studies, scope development, estimating, cost and schedule control, material and equipment specification and procurement, vendor data management, Preventative Maintenance and warranty preparation, and operator training.*
- *Quantitative Risk Assessment. This computer modeling technique provides verifiable consequence modeling of likely failure modes from new hydrogen projects. It invariably demonstrates, in an easily understandable and graphical presentation, that the available energy from new hydrogen installations poses much less of a risk than many other hazards that we accept in our daily lives, thus greatly simplifying the permitting process and supporting the public education process.*
- *High pressure testing of hydrogen systems as required by ASME B31.3 and B31.12. EPC has developed portable test equipment to safely commission high pressure tubing found in most hydrogen production systems up to 20,000 psi.*
- *Forensic investigation of hydrogen related accidents. We provide code assessments, design reviews and expert witness testimony in cases involving hydrogen detonation or explosions.*
- *Seminar and educational presentations. EPC teaches about hydrogen safety, hydrogen production, and fuel cells and delivers seminars about the technology, commercial options and the future of the hydrogen economy at colleges, government facilities and public corporations. We teach a*



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DOE funded class called Hydrogen Safety for First Responders which has been designed and used to qualify local fire and other agencies to competently respond to hydrogen related emergencies. We perform safety reviews, constructability reviews, HazOps and FMEA analyses and value engineering. We also provide forensic engineering for hydrogen related accident investigations and expert testimony related to safe hydrogen design and operations.

- *Quality Assurance. As required by B31.12, risk mitigation and Integrity Management procedures are required for all new hydrogen facilities. EPC prepares risk management plans that allow owners of hydrogen facilities to understand their liabilities and to have assurance that their operators are performing maintenance to the standards of the industry to mitigate financial exposure from any accidental damage to property or personnel injury.*
- *Grant writing and project advocacy. EPC can provide technical or administrative support to champion a project through the funding stage within your budget process, or help you to obtain matching funds, grants and tax credits that are available for hydrogen and fuel cell projects.*

Since the hydrogen and fuel cell industry is our only market, EPC is differentiated from larger more generalized AE firms. EPC does not have equity in any individual technology, so we may fairly evaluate the technical options and make balanced professional recommendations regarding equipment and manufacturers that best meet your project needs.

EPC's mission statement includes positioning itself to participate wherever it can add value to the design, construction and service sectors of the Hydrogen Economy. By continuing to add hydrogen and fuel cell design and construction projects and capabilities to our resume, we intend to define ourselves as the premier provider of design, procurement, construction and O&M services when the Hydrogen Economy matures.

EPC has repeatedly demonstrated our ability to assemble the teams of professional and craft resources needed to successfully implement the types of projects that result from government/industry demonstration programs as well as actual commercial facilities that form the genesis of the world wide Hydrogen Economy. We also have significant experience preparing and negotiating successful proposals to federal agencies and negotiating scope for award of successful contracts, both lump sum and reimbursable.

We perform contract services throughout North America for government, municipal and private clients from our offices in Lakewood, Colorado, Danville, California and Herten, Germany. Our bonding capacity is in excess of \$10,000,000. We have active engineering and contractor licenses in 10 states including California.