EDM Services, Inc.

Engineering

Design

Project Management

Pipeline Engineering Services

System Automation and Process Control

Civil and Public Works Services

Regulatory, Compliance, Environmental Permitting and System Safety

Construction Support

Trip Wire® System

Cathodic Protection

Pipeline Services

The EDM Services team has extensive onshore and offshore pipeline experience. Our firm can secure permits, enhance constructability, reduce risks to the public and the environment, optimize operations, and minimize maintenance requirements. EDM Services has *designed, permitted, constructed, operated and maintained* these facilities. This can result in significant initial construction cost savings, and additional operating and maintenance savings throughout the project life. Specifically, EDM Services provides the following for cross country and urban pipeline projects:

- Routing and feasibility studies;
- Preliminary engineering and permitting;
- Final designs including hydraulic analyses, stress analysis, finite element modeling, site plans, piping designs, structural designs, erosion and environmental controls, earthwork and grading, specification writing, etc.;
- SCADA and leak detection system design, fabrication, installation, and training;
- Contractor bid walks;
- Bid evaluation and contract award recommendation;
- Cathodic protection system design, evaluation, and installation;
- Structural and civil engineering designs;
- Construction management/contract administration;
- Risk mitigation for severe service pipelines and pipelines located in Unusually Sensative Areas (USA's) and High Consequence Areas (HCA's);
- Construction oversight.

In addition, EDM can perform the following special services:

- Pipeline operations efficiency and other studies,
- *Trip Wire®* (Patent Pending) third party intrusion detection and locating system,
- Hydrostatic test plans,
- Emergency response plans,
- Mapping systems,
- Leak detection and programmable logic controllers,
- Operations and Maintenance manuals,
- Complete supervisory control and data acquisition (SCADA) systems,
- Emergency/Spill Response Plans,
- Turn-key design/construction projects,
- Measurement facility designs,
- Material procurement.

Construction crews install a 12" gas main for Southern California Gas Company. EDM Services designed this line, which included preparing traffic control plans and other measures to mitigate urban construction impacts. This line is a major source of energy to the University of California at Los Angeles (UCLA).

CASE STUDY

Southern California Gas Company/Sempra Energy -

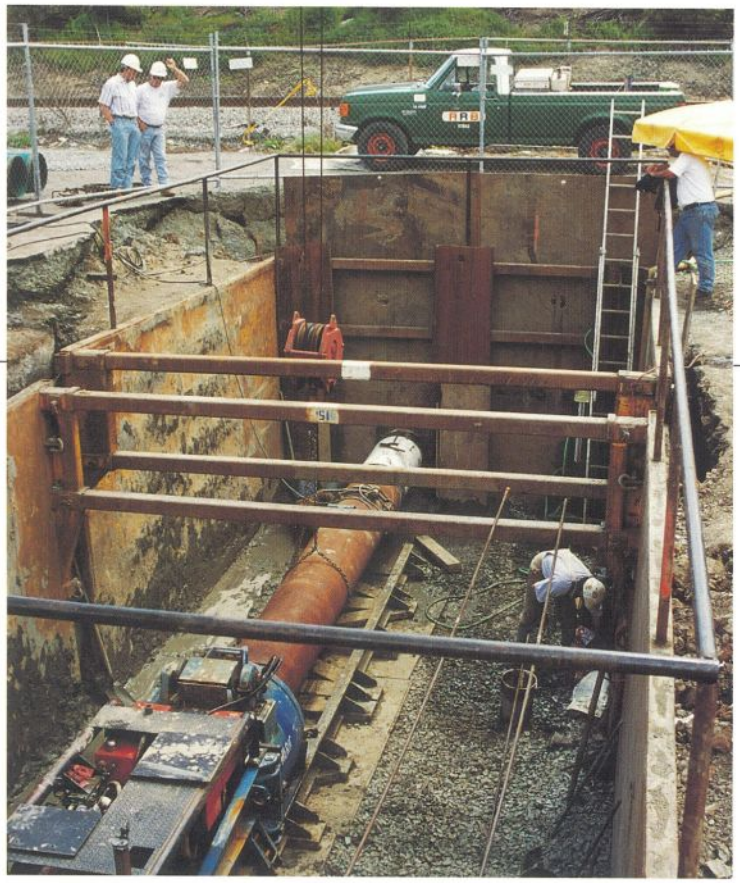
EDM Services designed a 12" gas main, which provided a major energy source to the University of California, Los Angeles (UCLA). This line was constructed through urban areas. Specialized traffic control plans and other measures were developed to mitigate urban construction impacts. The firm has also designed gas gathering systems, pipeline replacements and relocations; prepared traffic control plans; designed, fabricated, programmed, and installed station control systems; and provided other professional services to this customer.

CASE STUDY

Jacobs Engineering Group -

The firm, under subcontract to Jacobs Engineering Group, designed a seven mile liquid chlorine pipeline for a major chemical company in Louisiana. At the time of construction, this was the largest liquid chlorine pipeline in North America. The design included alignment sheet preparation; permitting support; pipe stress analysis; mitigation measure development and design; and SCADA and leak detection system design, fabrication, programming, installation and training. The firm's vast pipeline experience enabled the development of state-of-the-art measures to mitigate the unique risks associated with a chlorine pipeline system. These included the firm's *Trip Wire®* (Patent Pending) system, used to detect and locate third party intrusions. In addition, a fiber optic communications system was designed which featured redundant communications.

This pipe and pedestrian bridge was designed, permitted and constructed by EDM Services on a turn-key design/construct contract for Ultramar Diamond Shamrock.



CASE STUDY

Exxon Company, U.S.A. -

The pipeline services provided to Exxon have included: hydrogen, water, and crude oil pipeline designs; pipeline right-of-way acquisition; pipeline operations and maintenance manual preparation; pipeline permitting support; pipe mill inspections; pipeline risk assessments, etc. These services have been provided to support the Benecia Refinery and Santa Ynez Unit Development.

CASE STUDY

Wickland Oil -

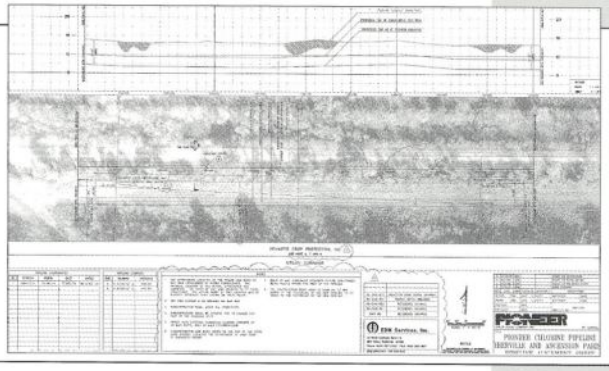
The firm designed and assisted with permit acquisition of the Wickland Oil Martinez pipeline expansion project. This $6,000,000 project included two miles of 16" crude oil pipelines, two miles of 12" refined petroleum product pipelines, over one mile of 10" product pipeline, and a separate 6" natural gas line. In addition, EDM Services designed, fabricated, and installed a communications system and a supervisory control and data acquisition (SCADA) system.

This 24" diameter bored and jacked crossing of Union Pacific Rail lines was designed for Wickland Oil Company. EDM Services also designs shoring systems, prepares traffic control plans, etc. to support a variety of construction projects.

Specialized Mapping and CAD Drafting Services -

The EDM Services team is very experienced in the creation of CAD drawings and maps. AutoCAD®, Intergraph Microstation®, ArcView® and ArcInfo® are typically used to meet customer requirements and project needs.

Although significantly reduced in size, this is an example of a pipeline alignment sheet created using the orthographic photo process. This results in significant engineering cost savings on cross country pipeline projects.



Typical terminal pipeline connection. This is the above grade portion of a pipeline connecting two terminals, enabling product transfers.

CASE STUDY

[redacted] Bay Area Products Pipeline, Sacramento Ship Channel Replacement and Corrosion Repair Projects -

These related projects are unique because they presented tremendous permitting obstacles. The EDM Services team was responsible for the design and permitting of this project. The project included a nearly one-mile directional drill beneath a portion of the San Francisco Bay, with a tie-in on the Bay floor. The repairs resulted from a smart pig run which revealed numerous locations which would require inspection and possible mitigation. The permitting issues included mitigation of several different endangered and listed plant and animal species, work within wetland habitats, archaeological artifacts, etc. Permits were required from the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, the Bay Area Conservation District, the California State Lands Commission and others.

CASE STUDY

[redacted] Companies -

EDM Services has successfully completed over one hundred pipeline projects for this customer. This continued business relationship demonstrates the firm's ability to *Partner* with major corporations. These projects have included pipeline and pump station automation, new pipeline designs, pipeline replacements and relocations, pipeline repairs, metering and pumping facilities, etc.

CASE STUDY

County, State and Federal Agencies -

EDM Services has provided plan check, construction inspection, and system safety services to several agencies on various pipeline and plant projects. These agencies have included: U.S. Department of Energy, U.S. Department of Agriculture - Forest Service, California Energy Commission, California Public Utilities Commission, California Department of Fish and Game, California State Fire Marshal, etc.

CASE STUDY

Ultramar Diamond Shamrock Corporation

EDM Services has provided a variety of design, regulatory compliance and permitting services to this customer. The pipeline projects have included: the design of butane, crude oil, refined petroleum product, hydrogen, steam, and water pipelines; preparation of oil spill contingency plans; preparation of emergency response plans; preparation of operations and maintenance manuals; pipeline risk assessments; GIS mapping; pipeline mapping; and other related projects.

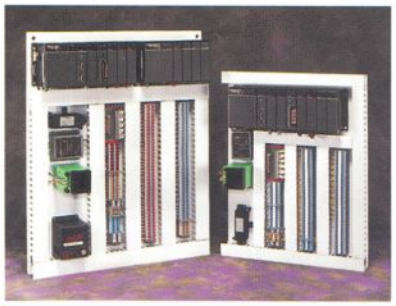
Typical urban pipeline construction project - multiple pipelines designed and permitted for Ultramar Diamond Shamrock Corporation.

Other EDM Services

Plant Engineering Services

The EDM Services team has decades of combined experience designing, permitting, constructing, operating and maintaining rail, pipeline pump station, terminal, tank farm, chemical plant and refinery facilities. Some of these facilities have included:

- pipeline pump stations
- custody transfer measurement facilities
- marine terminals
- piping manifolds
- crude oil and refined petroleum products tank farms
- support structures and bridges
- chemical plants and refineries



System Automation and Process Control

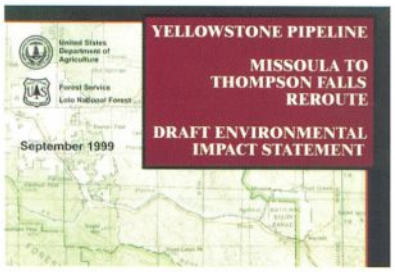
EDM Services designs, programs, fabricates, and installs Supervisory Control and Data Acquisition (SCADA) systems; Programmable Logic Controllers (PLC's); and communications systems. Some of these system automation and process control services include:

- Underwriter Laboratory® (UL) registered industrial panel fabrication
- *Trip Wire®* (Patent Pending) third party intrusion detection and locating system
- Wonderware® Approved System Integration Partner
- Programmable Logic Controller (PLC) programming
- Human Machine Interface (HMI) development
- dedicated and integrated communications systems
- customized applications
- redundant and "hot standby" systems
- operating data archieving/databases
- turnkey systems

Civil and Public Work Services

The EDM Services team is experienced in public works/land development engineering. The firm provides the following engineering/design services:

- grading plans
- surveying
- site plans
- street improvements
- traffic studies
- storm drains
- hydraulic studies
- hydrology studies
- sewer systems
- water systems
- steel design
- timber design
- foundation design
- structural analysis
- traffic control plans
- land development
- reinforced concrete design
- pressure pipeline design



Regulatory Compliance, Environmental Permitting and System Safety

The firm provides a variety of specialized environmental and system safety services. These include:

- environmental permitting with local, state, and federal agencies
- regulatory compliance
- risk assessments
- system safety analyses

Construction Support

The EDM Services team has considerable construction experience. This expertise allows the firm to provide the following construction support services:

- site specific shoring designs
- traffic control plans
- permitting
- construction observation
- project and construction management

EDM Services, Inc.

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