

Jacobs' Consultant Qualifications:

Jacobs' Consultants have collectively over 100 years' experience in the natural gas transmission and distribution industries. A considerable amount of this time was spent consulting to the industry building on experience actually working in the industry. The most experienced of these consultants are engaged in the PGL program. A sample of these consulting assignments follows:

- **Management Audits and Reliability Reviews (Regulatory Agencies)**

1. Conducted a major management audit of the \$800m capital budget contributions to safety, reliability, and adequacy of service for the gas and electric distribution operations of Pacific Gas & Electric, as mandated by the California Public Utilities Commission.
2. Conducted a management audit of Connecticut Light & Power for the Connecticut DPUC, including budget impacts on reliability and adequacy of service and an audit of the physical assets and cost accounting issues related to CL&P's street-lighting assets.
3. Completed an audit of the facilities contract for Southern California Edison.
4. Audited the five-year capital expenditures of the three gas distribution companies for the State of Victoria, Australia. These programs were valued at around \$50m each.
5. Conducted a three-year audit of the Vegetation Management Program of PG&E for the California Public Utilities Commission, focused on safety and reliability. This was an annual program valued at \$145m.
6. Conducted a review of the proposed merger of Exelon and PSE&G for the NJBPU relating to reliability, safety, and adequacy of service for the gas and electric delivery businesses and customer care area. Provided expert testimony relating to the gas delivery business as well as assisting with the development of briefs and possible merger conditions.
7. Conducted a stratified management audit of Yankee Gas for the Connecticut DPUC.
8. Carried out a workforce adequacy audit of all electric utilities in the state of Illinois for the Illinois Commerce Commission.
9. In addition to those listed above we have carried out for commissions management audits of PSE&G, CL&P, and UI.
10. Developed a national gas grid conceptual design for a natural gas transmission system for the country of India.

- **Management Audits and Reliability Reviews (Independent Operating Utilities)**

1. Implemented a safety audit, prepared implementation plans and monitored implementation for Washington Gas.
2. Reviewed cast iron and ductile iron mains replacement program, risk models, and budget adequacy for a major international gas utility and conducted an audit of the implementation of numerous recommendations regarding policy, practices, and procedures.
3. Supported the litigation, as potential expert witness, relating to gas explosions in England and Scotland for UK Transco. Supported the litigation defense, as potential expert witness, for Transco against charges of "culpable corporate homicide" for a gas explosion in Scotland.

4. Conducted a Mandated Safety and Compliance Audit/Review of Puget Sound Energy for the Washington Utilities Commission.
5. Carried out the development of engineering standards and policies for Scottish & Southern Energy's underground gas storage plants.
6. Carried out the development of several integrity management plans for major U.S. gas distribution companies and performed several audits of plans and execution of companies programs.
7. Developed an upgrading program for Integrys of its underground gas storage facilities, including an engineering report of pipe condition, conceptual design of new piping layout, and cost estimates and replacement strategy.
8. Conducted an analysis of plastic joint pipe failures and a review of cast iron and ductile-iron asset replacement approaches and surveillance techniques.

In addition to the above, Jacobs is about to begin projects that review the adequacy and effectiveness of quality management and training programs and field implementation for the construction of North American liquid pipeline systems, and assess processes and procedures for a large US gas distribution organization following an incident. Jacobs' consultants are also supporting a Program Management Office (PMO) Jacobs is establishing in Southern California to manage the PSEP implementation for a large Transmission and Distribution utility.

Some more specific detail follows:

Assessment of Pacific Gas & Electric Co. Pipeline Safety Enhancement Plan California Public Utilities Commission

In response to a CPUC order, PG&E submitted a Pipeline Safety Enhancement Plan (PSEP). The PSEP is a multiphase, multiyear, multibillion-dollar program that is in addition to PG&E's existing transmission pipeline maintenance and integrity management programs. Jacobs was asked by the CPUC to review the PSEP, supporting work papers, and testimony filed by PG&E, as well as by interveners TURN and DAR. The scope of Jacobs' assessment included the decision tree pipeline segment selection process, prioritization for pressure testing, use of remote control valves and automatic shutoff valves, pipeline records integration program, implementation plan and program management approach, and the overall reasonableness of the PSEP's cost.

Report of the Independent Review Panel, San Bruno Explosion California Public Utilities Commission

On September 9, 2010, a portion of a 30-inch diameter natural gas transmission system suddenly ruptured resulting in the loss of eight lives in total destruction of 38 homes. In response to the incident, the California Public Utilities Commission (CPUC) formed an Independent Review Panel (Panel) of experts. Included in the Panel's scope of work was to gain an understanding for the underlying reasons for the incident, delve into the complexities of how pipeline integrity management and regulatory oversight operate, and to offer recommendations for actions, which the operator and regulators could consider to

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reduce the likelihood of future incidents. Jacobs Consultants were retained by the Panel to gather and review facts and suggest recommendations for the improvement and safe management of Pacific Gas & Electric's (PG&E) natural gas transmission lines. Serving as project manager, over 100 document requests were submitted and almost 30 interviews were conducted. The wide ranging investigation addressed such items as: worker safety versus system safety, data management, threat identification, the spirit of regulatory compliance, organizational effectiveness, resource allocation, quality assurance, and the strategic integrity plan. As a result of the Panel's investigation, multiple weaknesses in PG&E's management and oversight, as well as the CPUC's resources and organizational focus were identified.

***Management Audit of Fitchburg Gas and Light Company d/b/a Unitil
Massachusetts Department of Public Utilities***

Jacobs Consultancy was asked to conduct an independent management audit of Fitchburg Gas and Electric Light Company (FG&E) d/b/a Unitil by the Massachusetts Department of Public Utilities (DPU). Serving as project manager, the management practices of both FG&E and Unitil were assessed in the areas of strategic planning, staffing, and workforce management, management and control, customer and public relations and emergency preparedness and response planning.

***Mandated Audit of Management, Construction, Operations and other Gas Safety Activities –
Puget Sound Energy, Seattle, WA
Washington Utilities and Transportation Commission, Olympia, WA***

Jacobs' served as project manager for the Washington Utilities and Transportation Commission (UTC) mandated gas safety audit of Puget Sound Energy (PSE). The focused review covered an in-depth assessment of various aspects PSE's gas operations, including:

- Construction Contracts with service providers are structured to ensure that gas facilities are installed repaired or replaced properly, safely, and cost-effectively.
- Programs, structures, and incentives that are in place to maintain a "culture of safety and compliance" for PSE and its contractors such as quality systems.
- Appropriateness and effectiveness of training provided to or required of its employees and contractor personnel for compliance with standards and procedures.
- Methods employed to track and document work for compliance.
- Effectiveness of practices related to 49 CFR 192.613 Continued Surveillance.
- Adequacy of resources provided to the gas safety compliance program to effectively monitor mandated safety activities and programs for compliance.

***Workforce Study Analysis of Illinois Electric Utilities
Illinois Commerce Commission***

The Illinois Commerce Commission retained Jacobs Consultancy to conduct a workforce study analysis of the five major electric utilities located in Illinois. The utilities involved included:

- Commonwealth Edison (ComEd)
- MidAmerican Energy Company (MEC)
- Central Illinois Light Company (AmerenCILCO)

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- Illinois Power Company (AmerenIP)
- Central Illinois Public Service Company (AmerenCIPS)

Served as project manager for the comprehensive nine-month long study; 120 interviews were conducted, and over 600 documents were reviewed. The intent of the analysis was to determine the adequacy of in-house staffing in each job classification or job title critical to maintaining quality reliability and restoring service in each utility's service territory. The investigation also included: an assessment of asset management practices, use of technology, operational practices, system maintenance and condition, call center, safety and training. To assess workforce adequacy in each of these areas, we examined ratios of staffing levels, use of contractors, overtime, work order backlog, system reliability performance, and customer satisfaction. We then balanced our analysis with each individual's utilities outsourcing philosophy. In addition to developing final reports for each utility, five public hearings were attended.

***Management Audit of Yankee Gas Services
Connecticut Department of Public Utility Commission***

Conducted a management audit of Yankee Gas Services Company. The diagnostic review covered all functions of Yankee, including: a review of the company's organization structure, strategic and corporate planning, gas supply, system design and planning, system operation and maintenance, asset management, accounting and tax, budget management and control, wage and salary policies, employee benefits, labor relations, process management, all aspects of customer services, including: meter reading, external relations, and all support services provided by its parent company, Northeast Utilities. Special areas of focus during the audit were affiliate transactions and Yankee's commitment to load growth.

***Management Audit of Connecticut Light and Power
Connecticut Department of Public Utility Commission***

Served as project manager and lead electric analyst conducting a complete diagnostic review the major functions of Connecticut Light & Power (CL&P). The scope of the audit included: organization and management, financial systems and controls, marketing, engineering and operations, information technology, customer-service operations, and relationships with affiliate companies.

- Determined the broad base practices and policies in place and evaluated their appropriateness and consistent implementation throughout the organization.
- Reviewed the present practices and procedures in place and made 64 recommendations for modification or change to improve overall efficiency and effectiveness.
- Assessment of CL&P, whose revenues exceed \$2.5 billion per year, included conducting 65 interviews, reviewing 200 documents, and benchmarking to comparable companies.

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***Management Audit of Public Service Electric and Gas Company
State of New Jersey, Board of Public Utilities***

Jacobs Consultancy was asked to participate in an independent management audit of Public Service Electric and Gas Company (PSE&G) mandated by the State of New Jersey's Board of Public Utilities (BPU). Serving as Jacobs' project manager, the technical and management practices of PSE&G were assessed in the areas of electric transmission and distribution, gas transmission and distribution, gas procurement and supply, and contractor performance. Balancing our analysis against industry best practices in each of the above focus areas, we developed 14 recommendations for improvement. Recommendations included conducting an in-depth study to explore the benefits of accelerating the cast-iron replacement program.

***Audit of Capital Budget Expenditures of Pacific Gas & Electric Company
California Public Utilities Commission***

The State of California required that a Capital Budget Audit be conducted for Pacific Gas and Electric Company. The audit was to cover all electric and gas distribution construction expenditures in the year 1999. The Construction Expenditure Budget consisted of over 10,000 projects with aggregate value exceeding \$800 million. Jacobs' consultants were lead consultants for the review of electric projects. Significant challenges included: arriving at an approach that would be statistically valid and highlighting how the expenditures contributed to the reliability, integrity, and growth of the distribution systems. The project planning process, engineering specifications, and construction work quality were examined and facilities inspected against company policies and procedures, and industry practices.

***Development of a National Gas Grid for India
Government of India***

Served as Project Manager to the Indian Ministry of Petroleum and Natural Gas on the development of a National Gas Grid for India. The scope of work included the forecast of gas supply and demand, development of a commercial operating framework, conceptual design of a national gas grid, capital investment, network operational philosophy, and HSE. Specific areas of interest included the comparison of the North American, UK, European and Australia regulatory frameworks of commercial practices, system safety, security and emergency response, centralized vs. decentralized gas management and SCADA/communications systems, and gas quality/interchangeability.

***Price Control (Rate-Case) Support
UK Scotia Gas Networks PLC***

All Gas Distribution Networks (GDNs) operating in the United Kingdom must file a business plan, similar to a rate case in the US, to the regulator, Ofgem. In the recent past the price control period was five years. Ofgem has determined to extend to price control period to 8 years. This places more pressure on the GDNs to more accurately estimate their expenditures for capital and operation, as the risk is higher over the longer period. Ofgem is comparing GDNs against each other using a variety of metrics related to the business plans, and rating each GDN accordingly. SGN requested Jacobs to assist in a careful review of their business plan to identify areas that required improvement or clarity of argument and to review the entire document for consistency in message, proper and clear signposting and use of commonalities to

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provide nexus in the overall document. A significant part of the business plan was capital expenditure on a multiyear, multi-billion pound cast and ductile iron main replacement program.

***Studies of Public Safety Elements of Gas Distribution Operations
Canadian Gas Distribution Company, Canada***

Reviewed current practice and advised a Canadian Gas Distribution company on what it takes to be a leader in the operational areas of system integrity, damage prevention, public and system safety and leak management. This was to assist the company in identifying the level of commitment needed to assume a leadership position in these and other key areas of concern for the company.

***Review of Capital Project Execution
Confidential Client Natural Gas Pipeline and Distribution Operator Houston, TX***

The client develops and operates gas transmission, distribution and storage assets throughout the United States and Canada. The level of capital investment has grown rapidly in recent years to a level exceeding \$1 billion annually and is expected to continue at this level through 2012. The types of capital investment projects include capital maintenance, organic growth and Greenfield development. The client is experiencing unexpected project cost escalation, schedule delays and budget overruns that are adversely affecting some project's ROI. The client employed Jacobs Consultancy to review their project development and project management process from conception through project commissioning. They wanted to retain an independent professional services firm with pipeline industry knowledge and experience in engineering, procurement, and construction management.

***Critical Assessment Study of Project Execution of Major Gas Pipeline Project
Confidential Client, Houston, TX***

Performed a Critical Assessment Study of Project Execution for the New Jersey-New York Pipeline Expansion Project. Client had already completed the FERC filing and was proceeding with the filing of environmental and non-environmental permits, right-of-way acquisition, completion of detailed design drawings, preparation of material orders and bid packages; also performed a number of Monte Carlo analyses covering both risk and schedule aspects of the project. As project manager, coordinated a review of the risk mitigation areas already recognized, and identified additional issues that may arise, which could impede permitting and construction of the project.

***Develop a Distribution Integrity Management Program
Delmarva Power***

Having developed an integrity management plan for DOT transmission pipeline and recognizing that some form of distribution integrity management was on the regulator's horizon, Delmarva Power elected to develop a distribution integrity management program in advance of the Rules enactment. As project manager, Jacobs' role was to determine how each transmission integrity management element might apply to distribution pipe. A program was then written reflecting Delmarva's operating practices, the seven elements identified in the PHMSA, Phase 1 Report, and the program management plans from ASME

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Code for Managing Integrity of Gas Pipelines. Delmarva Power's Distribution Integrity Management Program was presented at the 2007 AGA Operating Conference.

***Gas Operations Review in Connection with the Exelon-PSEG Proposed Merger
New Jersey Board of Public Utilities***

Reviewed, for the New Jersey Board of Public Utilities, the gas operations of Public Service Gas and Electric in the context of a proposed merger with Exelon Corporation of Chicago. This involved comparative studies of gas operations at PECO, a gas distribution utility in suburban Philadelphia, and a subsidiary of Exelon. The reviews included thorough investigations of distribution procedures, including main replacement policies and programs in well-established and aging networks.

***System Safety Studies
US and UK Transmission and Distribution Utilities***

Project Consultants on system safety studies for distribution and transmission companies. These studies assessed company engineering and operating processes, policies, procedures, and practices from regulatory compliance and widespread industry practice. Conducted focused reviews into system design, material selection, construction methods, regulator station design and overpressure protection, threat identification and root cause analysis, prevention and mitigation actions, gas quality, operator training and emergency preparedness. Presented findings, conclusions, overall recommendations including implementation action plans, implementation benefits and barriers, and implementation of program auditing. In addition to companies listed above these were for companies including NGPL; Southern Natural Gas; United Texas Transmission Co; Transco; Connecticut Natural; Washington Gas; Kansas City Power and Light, and CILCO. This represents more than 2 decades of experience for Jacobs' Consultants.

***Innovation Workshops
UK Scotia Gas Networks PLC***

In order to prepare for the upcoming price control period, which runs from 2013 to 2021, Scotia Gas Networks (SGN) desired to drive innovation in the management of its gas transmission and distribution system. Utilizing the Innovation Funding Incentive (IFI) scheme, gas networks in the United Kingdom are encouraged to invest in innovative ideas and technologies and recover significant amounts of related costs. To maximize the value from its innovation efforts, Jacobs was requested to facilitate to innovation workshops for SGN. Conducting one workshop in Scotland and one in the south, SGN staff formulated ideas and strategies for innovation, prioritization and implementation. Serving as project manager, Jacobs' efforts included:

- Presentation of innovative technologies and processes previously presented.
- Presentation of additional technologies and processes that are being used elsewhere.
- Facilitated group discussion for additional input.
- Facilitated group discussion on benefits, potential ranking, and implementation barriers.

Outputs from the workshops included identification of numerous innovative technologies ranging from use of the entire Vac-Ex/coring/Small Hole System to a coordinated asset replacement process.

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Jacobs' Construction Program Management Qualifications:

Jacobs Engineering Group Inc. has some 65,000 employees worldwide, of which some 32,000 are in "Field Services" companies (roughly half).

Field Services includes Program Management services and Construction Management. Total company revenues approach \$11 billion annually, so around 1/2 the revenue total is derived from field services. North America Infrastructure division (which manages PGL's Program has 3020 employees, with approximately 1/3 involved in field service activities. Field Services include what is sometimes called "Back Office" services such as project controls (document control and management and cost management); safety; quality management; scheduling; permitting; contract administration, among others.

Client companies across a wide range of industries contract with Jacobs for these services such as Exxon Mobil; Shell; Chevron; AT&T; Dow Chemicals; Merck; Chicago Transit Authority.

Other client companies, with some added detail as to the nature of the program under management, and including some specific program management deliverables, are:

Program and Construction Management:

Confidential Client

Los Angeles/San Diego, California

Jacobs has been engaged by a confidential client to be Program Manager of its Pipeline Safety Enhancement Plan (PSEP). This is a multi-phase, multi-year, multi-billion dollar program in addition to the companies' existing transmission pipeline maintenance and integrity management programs. It involves hydrostatic testing of miles of gas transmission (high pressure) pipelines to establish maximum allowable operating pressure of the facilities. This program will also involve specific construction services with the replacement of transmission line where decisions are taken to replace rather than test, or issues arise in the course of testing. These pipelines are in built-up residential and commercial areas of Southern California as well as in rural areas.

BP's Texas City Refinery

Texas City, TX

On Jacobs' capital projects program for BP's Texas City Refinery, we provided program management and EPC services for project delivery on a multi-year basis. Prior to us taking over the capital projects program as the program manager, this facility was evaluated by IPA to be in the fifth quintile of performance (lowest performing capital projects program amongst BP's 18 similar facilities worldwide). Our scope included program management of a portfolio that included approximately 140 projects in some stage of execution at any given time during the year with an annual spend in excess of \$350 million. Individual projects ranged in size from \$100 thousand to \$127 million. We provided EPC services for project delivery on a majority of the projects and subcontracted project delivery on a small number of projects. Through our

approach we were able to take project delivery performance in this facility from lowest performing to winning BP's Helios award for top performance in the first two years of the program.

ARCO Pipeline Alliance Program

Houston, Texas

The ARCO Pipeline program reflects Jacobs' capabilities in delivering large pipeline projects. Jacobs and ARCO Pipeline formed an alliance, the ARCO Pipeline Alliance Program, to provide project management, engineering and construction services to maintain, operate and expand ARCO Pipeline's system-wide operations. ARCO Pipeline selected Jacobs to serve as their alliance partner because of our expertise in project execution and our long and successful track record with alliances.

Jacobs provided construction management services for all 200 construction contracts. Safety was of paramount importance on this jobsite and we were responsible for the safety oversight of all construction activities. We conducted project controls audits on the contractor's reports to maintain accurate communications rolling up to the client owner. We also provided a resident site field team that dealt rapidly with questions and issues that arose during construction and startup. This investment saved the client cost and schedule. As part of the construction activity, we coordinated NDE inspection, pressure testing, chemical cleaning and pigging as required for 3.1 million feet of piping and utility systems. Traffic studies were performed and heavy haul roads were established with multiple gate systems. We coordinated with state, county and city transportation departments to obtain permits and mitigate roadway damage.

Confidential Client Large Diameter High Pressure Gas Transmission Pipeline

We recently assisted a confidential client in program management for the replacement or new construction of approximately 20 miles of large diameter high pressure gas transmission pipeline. This program included new metering stations, modifications to an existing compressor station, and various value modifications. Under our guidance, the program team created a risk register that lists 26 separate events or occurrences that could adversely affect the program. We ranked each element and identified its potential capital affect. We identified mitigation strategies for each risk; assigned someone as the lead for each risk element; and tracked the status of each element monthly. By highlighting each potential risk and tracking the mitigation actions being taken for each element, the costs for each risk is avoided through the mitigation steps.

Contract Management Systems:

AT&T Eastern Turf Program

The present three-year program of \$75 million design and construction projects of over 1000+ towers in the eastern United States. This is a fast-paced program consisting of 60-100 new short duration projects each month. The project management system (Primavera Contract Manager) is a web-based collaborative system which includes scheduling, budget/cost control;

earned value reporting, change management, document control, and record management. The system allows the management team to have a clear, real-time, view of budgets and commitments and ties the operation to our financial systems for billing and vendor payments.

Amtrak Accessible Station Development Program

We are managing the present 5-year, \$800 million program for design and construction of over 400 station projects using Primavera Contract Manager. The system is a web-based collaborative system which includes scheduling, budget/cost control, change management, document control, record management, and earned value reporting. Full procedures and work instructions have been a key to the successful management of the program in a highly collaborative environment. A fully functional system including documentation and user training for 150 Amtrak and Jacobs team members was deployed in under three months to provide program and project visibility per Amtrak's requirements.

Amtrak ARRA Nationwide Program

We implemented a web-based collaborative system which included scheduling, budget/cost control, change management, document control, record management, earned value reporting for our \$500 million design-build and construction management projects. The project management systems used to manage this process was an off the shelf prolog product that we tailored to 1408 Amtrak specifications.

Project Controls - Scheduling:

Dallas Water Utilities (DWU)

Dallas, TX

DWU was producing an annual schedule for maintenance shutdowns for the various plants. This schedule did not include scheduled shutdowns for the plants necessary for construction. This was causing shutdowns that were redundant; not coordinated system wide; back-to-back shutdowns of durations that were too long, etc. Jacobs was able to take all known shutdowns, necessary for any reason, and put them on one schedule. This allowed shutdowns to be coordinated on a system wide basis so that the system was able to meet minimum capacity requirements at critical times of the year, like high demand weeks in the summer. The new schedule had all necessary information related to plant and system shutdowns all in one document and contributed to documented cost avoidance, and cost savings of approximately \$9 million. To date, approximately \$3 million in cost savings have been realized at the East Side Water Treatment Plant.

Project Controls - Records Management:

Confidential Client

Seattle, WA

As the Construction Manager on the Brightwater Conveyance Project in support of the King County WA Wastewater Treatment Division, we implemented a records management system that has met the changing needs of our client and offered scalability such that the client was able to roll out the same system across the entire program, not just the conveyance project. Using a Business Process Management (BPM) platform we wrote the application to model all our existing processes, going from zero to a live site with the first two processes (RFIs and Submittals) in eight weeks. At the height of construction we had 400 users from over 30 companies and the client working on the project, all logging into the system. The system offers an effective and structured process to control access and use where required. The Brightwater records management system was required to manage multiple construction contracts ranging from \$1 million to \$200 million in value. Overall Construction value is \$1.5 billion. The system enabled us to minimize document control personnel, while never losing track of on-going document-related processes. The quantity of data in the system is vast (and all searchable using a series of powerful Browser utilities we designed). Brightwater is a program to add a third party wastewater treatment plant and associated tunnels to King County's existing system. We are providing CM Services for "Conveyance" section - 14 miles of tunnels and pipelines. We developed Intellect application and deployed it across the whole program.