EXHIBIT A

Contact: Cheryl Cox, Policy Advisor - cxc@cpuc.ca.gov - 415.703.2495

Proceeding: R.11-02-019 **Date: August 2013**

DRA Motion to Require a Comprehensive Quality Assurance / Quality Control Plan

DRA Position: The NTSB and IRP Reports determined that the San Bruno Explosion resulted, in large part, from PG&E's failure to have a Quality Assurance (QA) Plan with Quality Control (QC) procedures in place. PG&E's response to DRA's motion shows that PG&E is performing QC on an *ad hoc* basis and that it does not have a comprehensive QA/QC Plan in place. The Commission should order PG&E to prepare such plans immediately to ensure the safety of PG&E's current and future PSEP work.

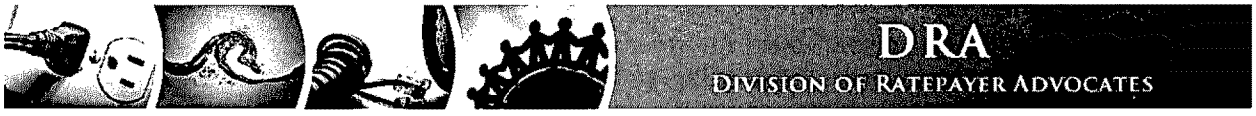
QA/QC Activities Guided by a Comprehensive QA/QC Plan Ensures Both Safety and Cost-Effectiveness

- In the context of pipeline safety, QA/QC plays a vital role:
  - **QA** activities aim to prevent errors through proactive planning.
  - **QC** activities aim to catch and correct errors that occur in spite of QA.
- A lack of adequate QA/QC was cited by the NTSB and the Independent Review Panel (IRP) report as factors contributing to the San Bruno explosion.
- QA/QC activities should be performed on the planning and engineering work during ***development*** of PSEP projects, as well as ongoing ***implementation*** of the PSEP.
  - Development is planning, engineering, and prioritizing projects.
  - Implementation is actually replacing or testing specific pipes.
- QA/QC activities should be guided by a comprehensive QA/QC Plan established in advance of work actually being performed.
- PG&E should be required to develop a QA/QC plan for all going forward work on its system in order to ensure the safety and cost effectiveness of that work.
- PG&E should be able to incorporate current QC activities into a QA/QC Plan.

DRA Discovery

- PG&E did not prepare a comprehensive QA/QC plan before starting the PSEP — as would be expected for a project of the PSEP's scale and from a company committed to developing a safety culture.
- PG&E is performing QC procedures on its PSEP design/prioritization and project costing work in an *ad hoc* fashion after the work is completed.
- PG&E fails to explain the QA/QC standards it is applying to determine whether the work has been done correctly.
- As of April 30, PG&E has completed or eliminated over 70% of proposed PSEP projects

(over)



DRA's Motion and PG&E Response

- DRA filed a Motion on July 8, 2013 requesting that the CPUC order:
  - PG&E to develop a comprehensive QA/QC Plan for all PSEP activities.
  - PG&E to perform QA/QC for all PSEP work consistent with the QA/QC Plan.
  - PG&E to document quality standards, procedures, results of QA checks, and how "sound engineering practice" will be achieved.
  - CPUC Safety and Enforcement Division (SED) review of QA/QC activities used by PG&E, except those related to PSEP costs.
- PG&E response to this Motion on July 23, 2013 stated that it will "describe and document" its QA/QC procedures in the pending Update Application, and that:
  - SED has been involved with MAOP Validation QA/QC since June 2011.
  - PG&E is in the process of developing QA/QC procedures which it will describe in testimony format in the Update Application.
  - PG&E's Project Management Office (PMO) is responsible for the accuracy and consistency of PSEP, including project design.
  - SED and its contractor have been involved with oversight of PSEP execution.
  - The flow chart of PSEP activities it provides is more accurate than DRA's flow chart.

DRA Conclusions

- DRA appreciates that there is evidence PG&E is performing after-the-fact quality control on some aspects of the PSEP work.
- DRA also appreciates that PG&E has committed to address some of DRA's concerns regarding QA/QC as part of the PSEP Update Application.
- However, retrospective documentation of QC activities is not a substitute for a proactive QA/QC Plan, and the Update Application is not the appropriate forum to address PG&E's QA/QC activities.
- The PSEP Decision D.12-12-030 authorized $28.9 million for a Program Management Office (PMO), in part, to pay for QA/QC activities.
- The Commission should order PG&E to prepare a comprehensive QA/ QC Plan for all going-forward PSEP activities and provide them for review as soon as practicable.
- The Commission should provide oversight of PG&E's QA/QC efforts independent of the pending updated PSEP application.
- The Commission should hold PG&E accountable for complying with its QA/QC Plan.
- PG&E's failure to embrace QA/QC and to develop legitimate QA/QC Plans demonstrate that it has not turned the corner to embracing a safety culture.

PG&E Pipeline Data & PSEP Update Reference Process Flow

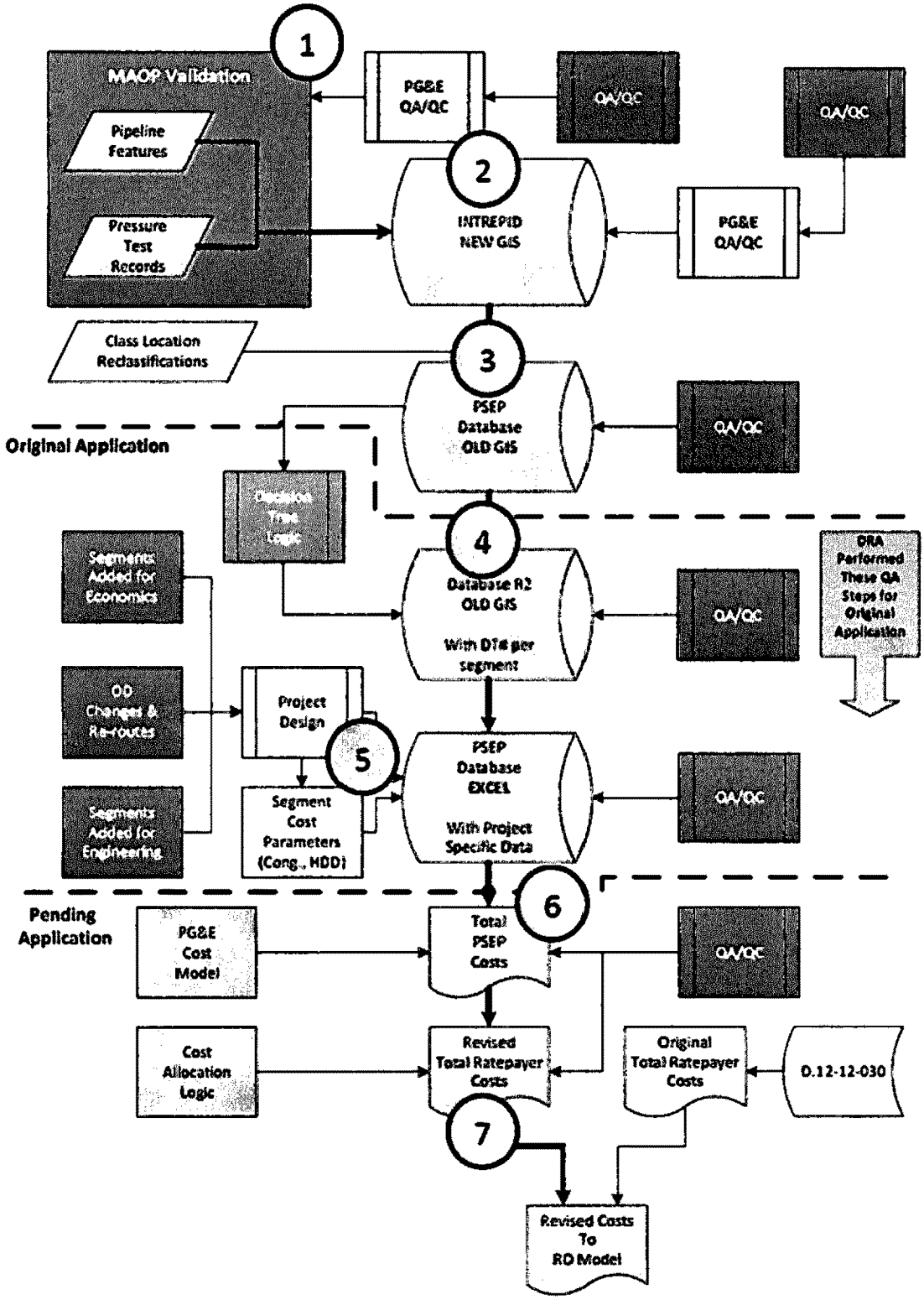


EXHIBIT B

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to Adopt New Safety and Reliability Regulations for Natural Gas Transmission and Distribution Pipelines and Related Ratemaking Mechanisms.	Rulemaking 11-02-019 (Filed February 24, 2011)

REPLY OF THE DIVISION OF RATEPAYER ADVOCATES ("DRA") TO PACIFIC GAS AND ELECTRIC COMPANY'S ("PG&E") RESPONSE TO DRA'S MOTION FOR THE COMMISSION TO REQUIRE QUALITY ASSURANCE AND QUALITY CONTROL PLANS FOR THE DEVELOPMENT AND IMPLEMENTATION OF PG&E'S PIPELINE SAFETY PLAN ("PSEP")

KAREN PAULL
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August 1, 2013

75205109

In accordance with Rule 11.1(f) of the Commission's Rules of Practice and Procedure and the permission of Administrative Law Judge ("ALJ") Bushey granted on August 1, 2013 by e-mail, the Division of Ratepayer Advocates ("DRA") hereby replies to Pacific Gas and Electric Company's ("PG&E") July 23, 2013 Response to DRA's Motion filed July 8, 2013.

DRA's Motion requests that the Commission direct PG&E to prepare Quality Assurance and Quality Control Plans ("QA/QC Plan") for the development and implementation of its Pipeline Safety Plan ("PSEP"). PG&E claims such an order is not necessary, and that it will provide appropriate QA/QC documentation in the testimony that accompanies its PSEP Update Application, which would have been due July 31, 2013, but has now been extended to October 29, 2013.

As the DRA Motion explained, PG&E's historic lack of quality assurance and quality control procedures have been extensively noted and criticized by both the National Transportation Safety Board ("NTSB") and the Independent Review Panel ("IRP") compiled to by this Commission to examine the causes of the San Bruno Explosion.[1]

DRA appreciates that, as described in PG&E's Response and its data responses to DRA, there is evidence that PG&E is performing after-the-fact quality control on some aspects of the PSEP work. DRA also acknowledges that PG&E has committed in its Response to address some of DRA's concerns regarding QA/QC as part of the PSEP Update Application. However, *retrospective narrative documentation of QC activities is not a substitute for a* ***proactive QA/QC Plan***. PG&E's Response to DRA's Motion reflects that PG&E' is engaging in *ad hoc and after the fact* QC; this does not add up to the QA/QC Plan that the Commission should expect for a multi-billion dollar rebuild of PG&E's gas transmission system.

PG&E, or at least some parts of PG&E, knows better. The attached letter dated August 2, 2012, from PG&E to the U.S. Nuclear Regulatory Commission reflects that PG&E knows what a "Quality Assurance Plan" is and has one in place for its operations at its Diablo Canyon Nuclear Facility.[2]

DRA recognizes that QA/QC activities are normally guided by a comprehensive QA/QC Plan established in *advance* of work actually being performed, and that PG&E has already

[1] DRA Motion, pp. 3-5.

[2] See Attachment A.

performed a significant amount of PSEP work. However, it is not too late to require PG&E to produce a QA/QC plan for all going forward work on its system in order to ensure the safety and cost effectiveness of that work. Among other things, PG&E should be able to incorporate current QC activities into a QA/QC Plan. Effective QA/QC is an indispensable risk management tool for such a large and important project. It would be irresponsible to allow PG&E to continue its PSEP work without an adequate QA/QC Plan.

PG&E has sufficient funding to develop a QA/QC Plan. The PSEP Decision D.12-12-030 authorized nearly $29 million for a Program Management Office ("PMO"), in part, to pay for QA/QC activities.[3]

Given the delay in the PSEP Update Application schedule and the Commission's directive that the PSEP Update Application be limited in scope and expedited, DRA now recognizes that the Update Application is not the appropriate forum to address PG&E's QA/QC activities. Instead, the Commission should *immediately* order PG&E to prepare a comprehensive QA/QC Plan for all going-forward PSEP activities and provide the Plan for review *as soon as practicable*.

Further, the Commission should provide oversight of PG&E's QA/QC efforts independent of the pending updated Update Application proceedings and the Commission should hold PG&E accountable for complying with its QA/QC Plan going forward. Absent such affirmative active by the Commission, PG&E will continue to operate in the same manner that contributed to the San Bruno Explosion. Despite the observations of the National Transportation Safety Board and the Independent Review Panel,[4] it appears that PG&E is planning to perform all of the PSEP work – indeed all of its gas transmission testing and replacement work in the coming decades – without adequate QA/QC in place.

[3] *See* D.12-12-030, p.23 and Late Filed Exhibit ALJ-5, Tables 4 and 5. This figure reflects a decrease from the $34.8 million requested by PG&E due to adjustment of the escalation factor.

[4] PG&E Motion, pp. 3-5.

PG&E's failure to embrace QA/QC and to develop a legitimate QA/QC Plan demonstrates that PG&E has not turned the corner to embracing a safety culture. The Commission must take a proactive role in making it happen.

Respectfully submitted,

KAREN PAULL
TRACI BONE

/s/ Traci Bone

TRACI BONE

Attorneys for the Division of Ratepayer Advocates
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
Phone: (415) 703-2048
Email: tbo@cpuc.ca.gov

August 1, 2013

ATTACHMENT A

Letter Dated August 2, 2012, from PG&E to the U.S. Nuclear Regulatory Commission

EXHIBIT C

Pacific Gas and Electric Company

James M. Welsch
Station Director

Diablo Canyon Power Plant
Mail Code 104/5/502
P. O. Box 56
Avila Beach, CA 93424

805.545.3242
Internal: 691.3242
Fax: 805.545.4234
Internet: JMW1@pge.com

August 2, 2012

PG&E Letter DCL-12-069

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Submittal of Quality Assurance Plan and Revised Phase 1 Documents for the License Amendment Request for Digital Process Protection System Replacement

References:
1. PG&E Letter DCL-11-104, "License Amendment Request 11-07, Process Protection System Replacement," dated October 26, 2011 (ADAMS Accession No. ML11307A331).
2. Digital Instrumentation and Controls DI&C-ISG-06 Task Working Group #6: "Licensing Process Interim Staff Guidance," Revision 1, January 19, 2011 (ADAMS Accession No. ML110140103).
3. NRC Letter "Diablo Canyon Power Plant, Unit Nos. 1 and 2 - Acceptance Review of License Amendment Request for Digital Process Protection System Replacement (TAC Nos. ME7522 and ME7523)," dated January 13, 2012.
4. NRC Letter "Summary of June 13, 2012, Teleconference Meeting with Pacific Gas and Electric Company on Digital Replacement of the Process Protection System Portion of the Reactor Trip System and Engineered Safety Features Actuation System at Diablo Canyon Power Plant (TAC Nos. ME7522 and ME7523)," dated June 27, 2012 (ADAMS Accession No. ML12170A866).
5. Invensys Operations Management Letter, "Invensys Operations Management Letter Submittal to Support License Amendment Request from PG&E for Replacement of the Eagle 21 Process Protection System at Diablo Canyon Power Plant," dated October 26, 2011 (ADAMS Accession No. ML113190392).

Dear Commissioners and Staff:

In Reference 1, Pacific Gas and Electric (PG&E) submitted License Amendment Request (LAR) 11-07 to request NRC approval to replace the Diablo Canyon Power

Plant (DCPP) Eagle 21 digital process protection system (PPS) with a new digital PPS that is based on the Invensys Operations Management Tricon Programmable Logic Controller, Version 10, and the CS Innovations, LLC (a Westinghouse Electric Company), Advanced Logic System. The LAR format and contents in Reference 1 are consistent with the guidance provided in Enclosure E and Section C.3, respectively, of Digital Instrumentation and Controls (I&C) Revision 1 of Interim Staff Guidance Digital I&C-ISG-06, "Licensing Process" (ISG-06) (Reference 2). In Reference 3, the NRC staff documented its acceptance of Reference 1 for review.

The PG&E Quality Verification group has developed the quality assurance plan document "Quality Assurance Plan for the Diablo Canyon Process Protection System Replacement". This plan is contained in Attachment 1 to the Enclosure and addresses the Open Item Number 27 contained in Enclosure 2 of Reference 4.

PG&E has revised the ISG-06 Phase 1 documents, "DCPP Units 1 & 2 PPS Replacement Functional Requirements Specification (FRS)" and the "DCPP Units 1 & 2 PPS Replacement Interface Requirements Specification (IRS)." The revised "DCPP Units 1 & 2 PPS Replacement FRS, Revision 5," and the "DCPP Units 1 & 2 PPS Replacement IRS, Revision 6," are contained in Attachments 2 and 3 to the Enclosure, respectively. These revised FRS and IRS documents supersede the documents previously submitted in Attachments 7 and 8 to the Enclosure of Reference 1, respectively.

Invensys Operations Management has created document "993754-1-916, V10 Tricon Reference Design Change Analysis," that addresses the impact of changes between Tricon version 10.5.1 and Tricon version 10.5.3. Tricon version 10.5.3 is intended to be installed for the Diablo Canyon PPS replacement. The Invensys Operations Management document "993754-1-916, V10 Tricon Reference Design Change Analysis, Revision 0" is contained in Attachment 4 to the Enclosure.

Invensys Operations Management submitted, in Reference 5, the following Invensys Operations Management ISG-06 Enclosure B Phase 1 Tricon documents to support Reference 1; "993754-1-802, Revision 1, Software Verification and Validation Plan," "993754-1-813, Revision 0, Validation Test Plan," and "993754-1-906, Revision 0, Software Development Plan." These Invensys Operations Management documents have been revised to address NRC comments contained in Enclosure 2 of Reference 4. The non-proprietary versions of the Tricon Software Verification and Validation Plan, Validation Test Plan, and Software Development Plan are contained in Attachments 5, 6, and 7 of the Enclosure, respectively, and the proprietary versions are contained in Attachments 9, 10, and 11 of the Enclosure, respectively. These revised Tricon documents supersede the documents previously submitted in Reference 5.

This letter contains Invensys Operations Management documents contained in Attachments 9, 10, and 11 to the Enclosure that contain information proprietary to Invensys Operations Management. Accordingly, Attachment 8 to the Enclosure includes Invensys Operations Management Affidavit No. 993754-AFF-38T. The affidavit is signed by Invensys Operations Management, the owner of the information. The affidavit sets forth the basis on which the Invensys Operations Management proprietary information contained in Attachments 9, 10, and 11 to the Enclosure may be withheld from public disclosure by the Commission, and it addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR 2.390 of the Commission's regulations. PG&E requests that the Invensys Operations Management proprietary information be withheld from public disclosure in accordance with 10 CFR 2.390. Correspondence with respect to the Invensys Operations Management proprietary information or the Invensys Operations Management affidavit provided in Attachment 8 to the Enclosure should reference Invensys Operations Management Affidavit No. 993754-AFF-38T and be addressed to Roman Shaffer, Project Manager, Invensys Operations Management, 26561 Rancho Parkway South, Lake Forest, CA 92630.

If you have any questions, or require additional information, please contact Tom Baldwin at (805) 545-4720.

This information does not affect the results of the technical evaluation or the significant hazards consideration determination previously transmitted in Reference 1.

This communication does not contain regulatory commitments (as defined by NEI 99-04).

I state under penalty of perjury that the foregoing is true and correct.

Executed on August 2, 2012.

Sincerely,

James M. Welsch
Interim Site Vice President

kjse/4328 SAPN 50271918
Enclosure
cc: Diablo Distribution

EXHIBIT D

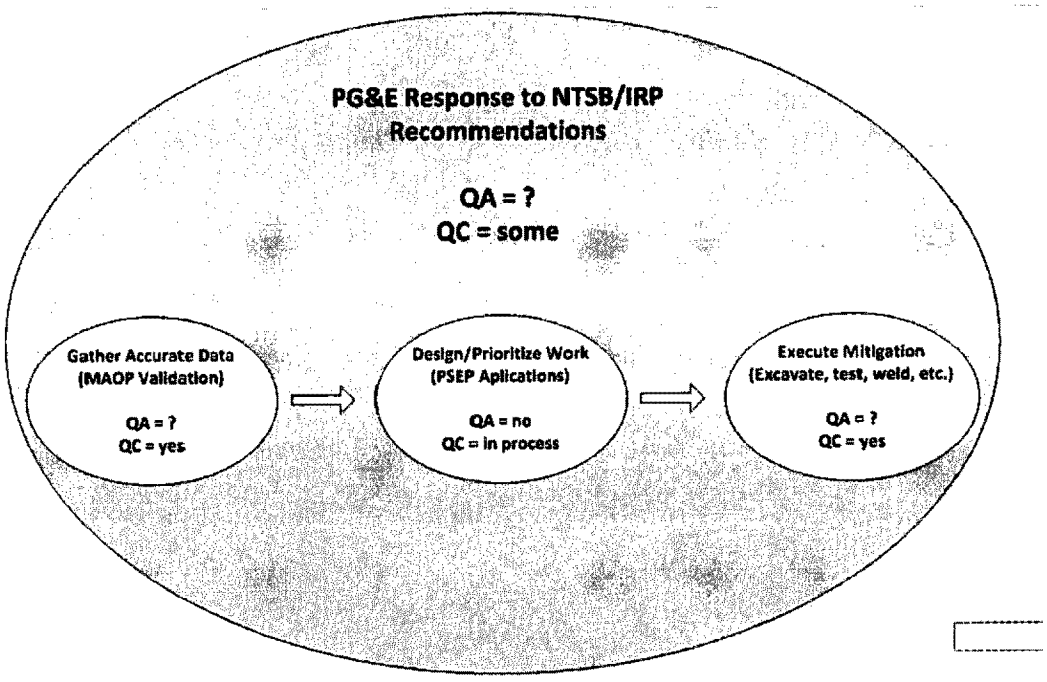

PG&E Response to NTSB/IRP Recommendations
QA = ?
QC = some
Gather Accurate Data (MAOP Validation)
QA = ?
QC = yes
Design/Prioritize Work (PSEP Aplications)
QA = no
QC = in process
Execute Mitigation (Excavate, test, weld, etc.)
QA = ?
QC = yes

EXHIBIT E

August 6 2013

Subject: AMEC Quality Assurance Program

AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to present information on our capabilities and qualifications.

COMPANY BACKGROUND

AMEC is a focused supplier of consultancy, engineering and project management services to its customers in the world's oil and gas, mining, clean energy, environment and infrastructure markets. With annual revenues of some $6.6 billion, AMEC designs, delivers and maintains strategic and complex assets and employs over 29,000 people in around 40 countries worldwide. See amec.com.

AMEC has an experienced and knowledgeable team that provides the depth of qualified resources, construction support experience, and strong understanding of the challenges associated with pipeline projects.

AMEC is a leading construction management, civil engineering and environmental services firm, with more than 8,000 employees in North America and more than 220 employees in Northern California. AMEC possesses the local resources necessary to deliver inspection services in a cost-effective, timely, and safe manner. Some of our successes on a number of key local pipeline and large construction projects are highlighted in Appendix A.

COMPANY EXPERIENCE

AMEC's national experience includes global energy provider, numerous utility companies, including nine nuclear plants and over 35 State DOTs. Our local experience extends to California Department of Transportation, Bay Area Rapid Transportation, SFPUC, and the Santa Clara Valley Transportation Authority. The most relevant local experience relevant to PG&E projects has been our work for the SFPUC conducting Quality Control and Quality Assurance Inspections.

QUALITY ASSURANCE CAPABILITIES

AMEC utilizes only personnel with appropriate training and certification to perform inspection and testing procedures. Nondestructive testing (NDT) personnel are certified in accordance with AMEC's Written Practice for Nondestructive Examination Procedures for Personnel Qualification and Certification. These written practices meet or exceed the requirements of SNT-TC-1A. Welding inspection services are performed by personnel that are qualified and certified in accordance with AWS QC1 as CWI. (See Appendix B for sample personnel resumes.)

Steel inspection and non-destructive testing is a core business of AMEC. Our technicians have experience providing Quality Assurance inspection of field welding on water transmission pipelines using AWWA, AWS, and ASME requirements. Our inspectors verify the welding quality control plan requirements as well as conduct visual and NDT inspections as required.

Welding successes and quality cannot be inspected into a structure. A well planned and complete procedure must be established and followed to achieve the desired results. Our team of engineers and inspectors know and understand this concept and recognize that ultimate success is achieved before and during welding and that final inspection should be a confirmation of correctly implemented procedures executed by a skilled craftsman. This can only be accomplished by following the pre-developed procedures including a properly prepared weld joint that is acceptably clean, with acceptable

Correspondence:
AMEC Environment & Infrastructure, Inc.
2101 Webster St, 12th Floor
Oakland, CA 94612
Tel +1 (510) 663- 4100
Fax +1 (510) 663-6360
amec.com

fit-up and welded within the established welding procedure (WPS) parameters by properly trained and certified welder.

AMEC Inspectors also understand the importance of accurate, timely and thorough reporting. AMEC inspection reports are reviewed by a Senior Technician or Engineer to ensure they meet the project requirements. For example, AMEC developed customized reports for the SPFUC Bay Division Pipeline #5, a project where inspection reports had previously been insufficient to address welding issues when they arose (see Appendix A, first project, for additional information).

MATERIAL ENGINEERS AND EXPERT SUPPORT

AMEC's experts provide a direct link to national committees and cutting edge developments in Steel, Welding, and NDT. When an issue arises, AMEC can provide specification and code interpretations providing all involved with intent and solutions to avoid delay or claims. AMEC has members on key national committees for steel and welding:

- Committee Member AWS D1 Main Committee
- Committee Member AWS D1 Subcommittee: 4 Inspection
- Committee Member AWS D1 Subcommittee 9 Reinforcing Steel (Chairman)
- Committee Advisory Member AWS D1.1 Task Group on Seismic Issues
- Committee Advisory Member AWS D1.5 Subcommittee 10 Bridge Welding

AMEC has developed auditing procedures, audit questions and checklists; trained technical auditors for clients and conducted audits in numerous facilities throughout the United States and around the world. We have conducted over 40 audits at fabrication, casting, wire facilities, concrete precast and batch plant facilities in support of the large construction and retrofit projects.

LABORATORY TESTING SERVICES

If needed, AMEC can provide lab testing services for an extensive list of test methods and standards. Clients include many large scale projects on state, local and Federal projects and nuclear plants for over the last 60 years. AMEC has a fully accredited AASHTO laboratory in San Diego and partners in the Bay Area for local testing as well.

Thank you for the opportunity to provide information on our company. We look forward to a favorable review and the opportunity to meet and discuss any opportunities with you. Please do not hesitate to contact Aaron Franklin at (858) 699-0513 or Francis Wiegand at (858) 514-5423 regarding this letter.

Sincerely,
AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

Aaron Franklin, PE
Project Manager / Principal Engineer

Francis Wiegand, PE
Principal Program Manager

Attachment:

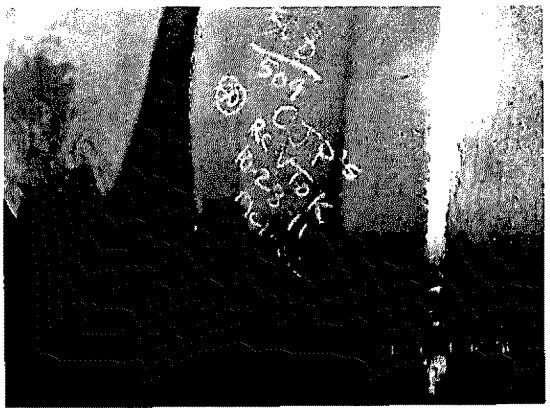
A. Example Projects
B. Personnel Resumes
C. Example QA Plan TOC for a local agency
D. AMEC capabilities placemat

A. EXAMPLE PROJECTS

WD-2542 Bay Division Pipeline (BDPL) Reliability Upgrade, Pipeline No. 5 – Peninsula Reaches, Mountain Cascade Inc. SFPUC, 2011-2012

AMEC performed welding quality control inspections and materials engineering for Mountain Cascade Inc (MCI). AMEC tasks included:

- 3 QC Inspectors (CWI, UT-II, MT-II) for welding 8 miles of pipeline
- Individual inspection reports for every joint
- Joint inspection tracking
- Welding procedure development
- Welder certification documentation
- Welding related RFI's

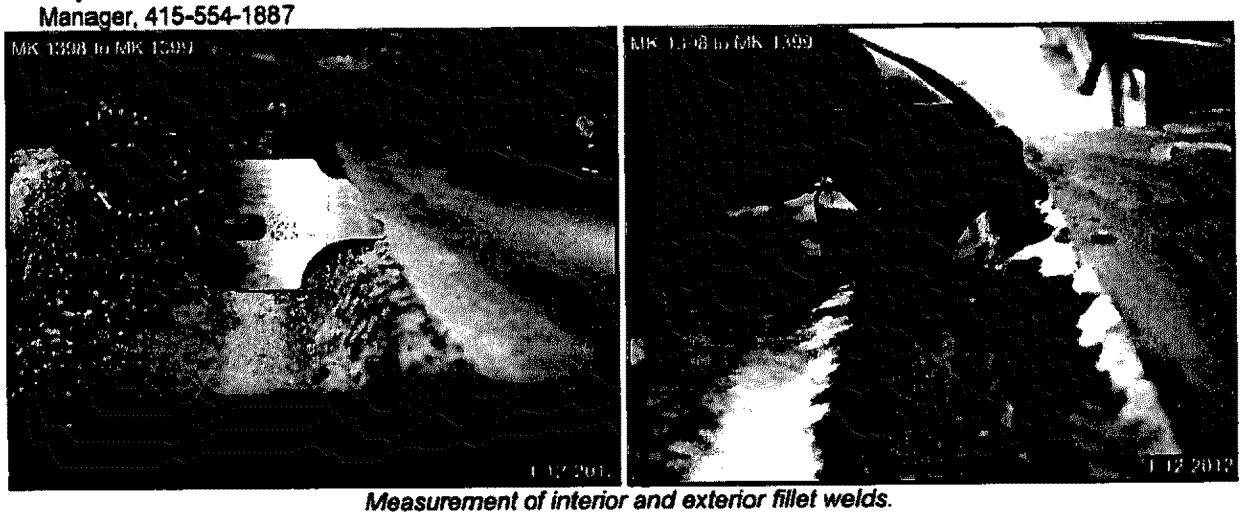


Final inspection, CJP on 14" wide backing strap

Project Background: Approximately half of the pipe had been installed when the SFPUC stopped work on the piping due to discrepancies in the welding inspector reports and concerns for weld quality. SFPUC's Regional Construction Manager Ben Leung referred AMEC to MCI as an expert resource. AMEC cataloged all the existing available welds and developed a repair plan. AMEC inspectors oversaw repair of existing welds and welding of all new welds.

Highlights

- **Critical project issues require a firm that is proactive, solution oriented, and able to team with the Contractor and the Owner.** – AMEC's Principal Welding Engineer worked closely with the MCI to assess the situation and provide a clear path forward that would be acceptable to the SFPUC.
- **Ability to provide real-time solutions to accelerate the project and minimize delays.** – AMEC provided Licensed Engineers and CWI's onsite as needed to collect measurements on the existing welds and develop a repair plan to address the SFPUC's concerns.
- **AMEC tracking and reporting.** – AMEC tracked all welding and inspections, and provided thorough reporting that will withstand future scrutiny.
- **Project Owner and reference** San Francisco Public Utilities Commission, Ben Leung, Regional Construction Manager, 415-554-1887



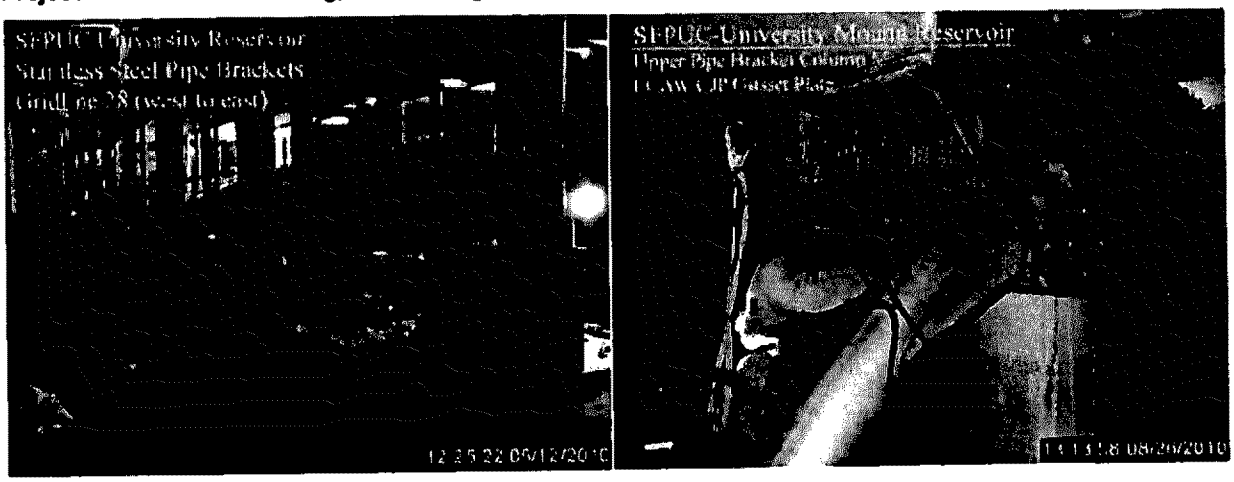
Measurement of interior and exterior fillet welds.

University Mound Reservoir North Basin Seismic Upgrades, San Francisco Public Utilities Commission. 2009-2011.

The construction project consists of seismically retrofitting the roof of the University Mound Reservoir North Basin to withstand a major seismic event. This structure is a water reservoir serving half of the city of San Francisco. The project includes improving the reservoir walls and roof with seismic joints, shear walls, diagonal bracing and brackets, and foundation improvements. Key items in the retrofit include fabricating and installing the stainless steel tubular roof support braces and brackets. There were 1,400 feet of tubular braces manufactured at Bristol Metals in Bristol Tennessee and associated brackets that were fabricated at Olson Steel in San Leandro, California. AMEC supported the SFPUC by serving as the "Owner's Testing Agency" for onsite and offsite inspections, deploying inspectors to Tennessee and throughout California and at the jobsite as well. AMEC inspection services included verification of material, verification of fabricator's quality control program, ultrasonic testing of complete joint penetration welds, and concrete inspection at the jobsite. AMEC provided welding and fabrication recommendations to the SFPUC. AMEC also conducted an audit assessing the capabilities of the primary fabricator Olson Steel.

- **AMEC saves the project time and money by auditing key steel fabricator.** When it was determined that the fabricator did not have a required certification, AMEC provided the SFPUC an alternative solution to restarting the project with a new fabricator. AMEC developed and conducted a project specific audit to verify the capabilities of the existing fabricator. AMEC provided a comprehensive audit report and recommendation which was used by the SFPUC to approve the fabricator.
- **AMEC smartly deploys inspectors where and when they are needed.** AMEC leveraged its national presence to save the client costs. AMEC utilized qualified inspectors from nearby offices in Alabama to cover inspection of the tubular braces manufactured in Tennessee. This cut travel time and travel costs in half compared to deploying an inspector from California.
- **AMEC welding and fabrication experts make a difference.** SFPUC engineers relied on AMEC experts for recommendations to tough technical welding and fabrication issues.

Project Reference: Ben Leung, SFPUC Regional Construction Manager, 415-554-1887



View of the Interior of the Reservoir during the retrofit.

Seismic Retrofit of the Antioch and Dumbarton Bridges for the California Department of Transportation, 2010-2013

AMEC provided materials engineering, inspection and testing services for the Caltrans Seismic Retrofit projects on the Dumbarton (1.6 miles long) and Antioch Bridge (1.8 miles long). AMEC conducted QA inspection and testing to verify that contractor QC activities are being performed and materials are being produced in accordance with project specifications, at fabrication facilities in Arizona, Washington, South Korea as well as at the jobsites. Items inspected included structural steel fabrication and welding, PC/PS concrete piles, fasteners, and bearing pads. Conducted Ultrasonic and Magnetic Particle testing on welding. Witnessed shop and field painting operations. Inspected Friction Pendulum Isolation Bearings and documented QC and QA laboratory testing.
Project Reference: Keith Hoffman, 510-376-7627, Office of Structural Materials Branch Senior, Materials Engineering and Testing. Hazzaa El-Mahmoud, 510-714-7072, Structures Representative, Caltrans

Aerial Photograph of Dumbarton bridge work during 2012 Memorial Day closure (left) and welding inside bridge.

Materials Inspection and Testing Services for California Department of Transportation, Northern and Southern California Districts, 2005-2011

AMEC performed for Caltrans a variety of engineering support services for concrete and steel inspection and testing at the jobsite and at the source of supply for Caltrans. AMEC provided steel and concrete inspectors and Structural Materials Representatives to the Caltrans Office of Structural Materials. Project services included conducting technical meetings (preconstruction, prejob, pre-welding, pre-fabrication and status meetings), review of contract plans and specifications, responding to RFIs, quality control manual reviews, and inspection resource management. Inspection and testing services included welding inspections by AWS CWI certified personnel, precast concrete plant inspections by PCI Level II certified personnel, nondestructive testing of welding by UT, MT, RT Level II certified personnel and Source (point of fabrication) Inspection (steel piling, CISS piling, PS/PC concrete piles, sign structures, fasteners, and pole structures).
Project Reference: Keith Hoffman, 510-376-7627, Office of Structural Materials, Materials Engineering and Testing Services, Caltrans

B. RESUME HIGHLIGHTS

Kevin Carpenter, AMEC Level III/II, CWI / NDT– Welding Quality Control Manager. As a Senior Inspector and AMEC Level III in UT & MT, Mr. Carpenter has over 24 years of experience in materials testing and fabrication inspection. Kevin has worked in QCM roles on projects throughout the Bay Area, to include the Bay Division Pipeline #5, the SFOBB, and the Dumbarton Seismic Retrofit.

Chuck Patrick –CWI / NDT. Mr Patrick has experience in quality assurance and quality control inspection, materials source inspection and non-destructive testing. Mr. Patrick has performed inspection of structural members on water transmission pipelines, major bridges, and steel structures. For 13 years, Mr. Patrick worked at Napa Pipe as QC of fabrication and UT of large diameter pipe for oil and gas lines. Mr. Patrick inspected both at jobsites and fabrication facilities in accordance with AWS D1.1, D1.5 and AWWA, and ASME.

Bruce Berger, AMEC Senior Level III/II, CWI / NDT. Mr. Berger is a Level III in MT, PT, UT, and RT disciplines, non-destructive testing technician and inspector with over two decades of experience in the construction and industrial sectors, performing non-destructive testing (NDT) and quality assurance inspection. He has written inspection procedures to numerous codes, including ASME, AWS and AWWA. He has performed inspections and NDT testing for clients of piping, structural steel in bridges and buildings, and overhead sign structures.

Aaron Franklin, PE – Quality Assurance Inspections Manager. Mr. Franklin is an experienced principal engineer with client relationship and project management experience. Mr. Franklin has led inspection and testing programs during the construction of major construction projects for private and government clients. He has extensive work and consulting in materials engineering, materials inspection, cost estimating, and management of engineers and engineering technicians. He has served as a consultant to clients in trouble-shooting materials problems, review of appropriate codes including: PCI, AWS, ASME, API, AWWA and other international codes, specifications and detail drawings, and in providing recommendations for quality assurance and testing programs. He has provided technical recommendations on all aspects of structural materials during construction. Prior to joining AMEC, Mr. Franklin was an Engineer Officer for four years with the U.S. Army Corps of Engineers.

Jim Merrill, PE – Principal Welding Engineer. A registered metallurgical / professional engineer, Certified Welding Inspector, and Non-Destructive Technician, Mr. Merrill has project management experience conducting welding inspection programs for numerous state DOT bridge construction and rehabilitation projects and other facilities throughout the U.S. He is an AMEC Senior Principal Welding Engineer. Inspection services have included examination of weldments by non-destructive and visual methods, bolted connection examinations, and other fabrication and erection testing. Mr. Merrill has served as a consultant to clients in trouble-shooting welding problems, development of welding procedures, review of appropriate codes, specifications and detail drawings, and in providing recommendations for quality control and testing programs. Mr. Merrill has extensive experience writing and reviewing welding procedures, performing audits of fabrication facilities, welding inspections, materials evaluation, cost estimating and management of engineers and engineering technicians.

C. Example QA Plan TOC for a local agency

Source Inspection Quality Management Plan

I-880/Stevens Creek Interchange Improvements

Project No.: C12048F

Caltrans EA: 04-445604

Prepared for:

Caltrans Materials Engineering and Testing Services (METS) Attention:

Caltrans Oversight Structural Materials Representative

November 16, 2012

Prepared by:

Santa Clara Valley Transportation Authority

Table of Contents

D. AMEC capabilities placemat

amec

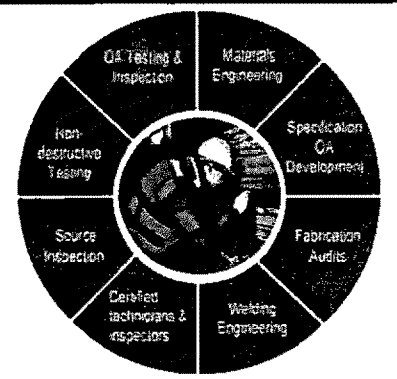
Our business by the numbers
Environment & Infrastructure

Annual Revenue You're partnering with a team that has extensive engineering experience	$6.6 billion
Depth of Resources Our employees provide innovative solutions using unmatched expertise and uncompromising integrity	29,000
Years in Business We meet the demands of today's complex global engineering and environmental projects	140
Safety is Paramount Our commitment to 'Beyond Zero' safety culture continues without occupational illness or injury	53 EMR
Cost Savings Delivered Our unwavering commitment to quality, efficiency, and cost-effective solutions has led to billions in client savings	$1+ billion

Quality assurance best practices
Winning programs, procedures and technologies

- Value engineering
- Safety Culture
- Proactive Approach
- Prequalification of Fabricators
- Site Audits
- Specification Review
- Cross-trained staff
- Materials engineers
- Proactive mitigation of issues
- Source inspection
- Experience with all domestic and most global manufactures

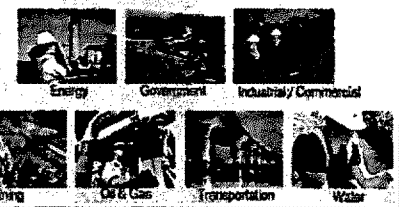
Quality assurance services
Covering a broad range of transportation activities



Sectors and service capabilities
Quality assurance across all services

Full-suite of services

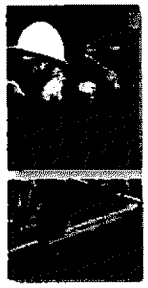
- Energy and Sustainability
- Environmental Monitoring
- Permitting/ Compliance
- Materials Forensics
- Nondestructive testing
- Geotechnical / Geology
- Construction Management
- Materials Testing & Inspections
- In-House/Mobile Laboratory
- Quality Assurance Plans



Qualifications
Employee certification and licenses

Steel inspection and non-destructive testing is a core business of AMEC. Our technicians have experience providing Quality Assurance inspection of field welding on water transmission pipelines using AWWA, AWS, and ASME requirements. Our inspectors verify the welding quality control plan requirements as well as conduct visual and NDT inspections as required.

- **Registered Civil / Metallurgical/ Mechanical Electrical Engineers – Certified Technicians**
  - QA, Schedule Management
- **Fabrication Experience**
  - Steel / Precast Concrete
  - AWS/ ASME/ NACE
  - PCI AQ
- **National Committee Members**
  - AWS D1 Committee and Sub Committees
- **Certified ASNT / AWS Technicians**
  - AWS Welding Inspectors (CWI)
  - NDT Level II and III
  - NACE Level II and I
- **Competent Trade Specialists**
  - Certified Power Linemen
- **25 years average inspection experience**



Laboratory capabilities
Largest AASHTO accredited lab in Southern California

We are capable of providing all the required testing in-house to reduce delays and increase responsiveness. We have a proven history of meeting turn-around times on all testing to support needs.

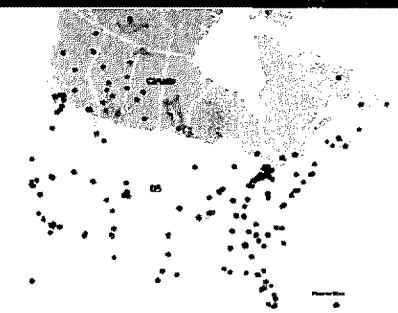
The agencies below have inspected and accredited our laboratories.

Program	Agency	Accreditation Certification
Accreditation	AASHTO, National Institute of Standards & Technologies (AMRL)	1991 - Present
Certification	Cement and Concrete Reference Laboratory (CCRL)	1997 - Present
	DSA	1995 - Present
Sample Proficiency Program	City of San Diego	1995 - Present
	CCRL	1997 - Present
	AMRL	1991 - Present
	Caltrans - Reference Sample Program	1997 - Present
	Asphalt Pavement Association California Round Robin Proficiency Test	1996 - Present

Proven experience
Clients we support

NVEnergy, aps, TXU energy, LG Power, First Solar, EDISON, SOUTHERN COMPANY, nalcor, PG&E, Exelon, Dominion, Duke Energy, SCANA, SUDGE, Progress Energy, Sempra Energy, PSEG

North American presence
Where you need us, when you need us



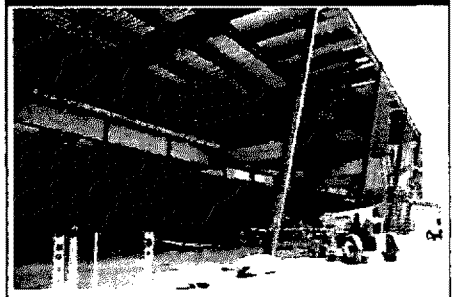
AMEC is an industry-leading infrastructure engineering, environmental consulting and construction services company with more than 8,000 professionals in the United States.

amec

Bay Division Pipeline
San Francisco Public Utilities Commission

- 3 QC Inspectors (CWI, UT-II, MT-II) for welding 6 miles of pipeline
- Materials Engineering
- Individual inspection reports for every joint
- Joint inspection tracking
- Welding procedure development
- Welder certification documentation
- Welding related RFI's

Green Build (Terminal 2)
San Diego County Regional Airport Authority

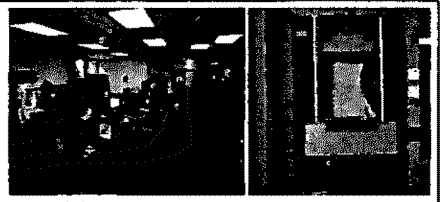


- $1.5B project with aggressive schedule
- Structural Steel Erection
- Cost concerns
- Lack of QA/QC
- Cross-trained staff reduced effort – Delivered 21.5 % under budget
- State-of-the-Art Equipment reduced effort

North Basin Seismic Upgrades
San Francisco Public Utilities Commission

- Owner's Testing Agency' for onsite and offsite inspections
- Deploying inspectors to Tennessee and throughout California
- Verification of material and fabricator's quality control program
- Ultrasonic testing verification of complete joint penetration welds, and concrete inspection at plants

Mobile Testing Labs & Inspection
Ongoing risk to ensure no costly delays



Qualified Resources

- Qualified licensed structural, welding, and metallurgical engineers
- 20 years average QA/QC inspector level of experience

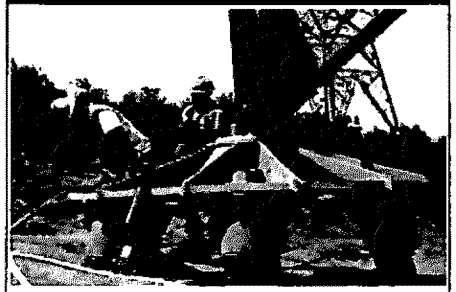
Testing Capabilities

- Soils
- Aggregates
- Asphalt
- Concrete
- Masonry
- Reinforcing Steel
- Bolting
- Petrography
- Non-destructive testing
- Chemistry

Testing Equipment

- Pavement skid testing equipment
- Marshall testing equipment
- Balances and scales
- Load frames
- Ovens/hotplates
- Proving rings/load cells
- CBR apparatus
- Consolidometers
- Direct shear device
- Sieve shakers and sieve sets
- Vibratory compaction table
- Permeameter cells
- Liquid limit devices
- Asphalt binder testing equipment
- Non-destructive testing equipment for concrete and Steel
- Triaxial shear cells
- Triaxial shear machines
- Triaxial / permeability / consolidation panel boards
- Hamburg wheel tracking devise
- Testing machines – compression
- Testing machines – flexural
- Testing machines – universal (constant strain)
- Testing machines - universal (tension / compression)
- Knowledge of Caltrans paving changes
- Concrete and aggregate petrography equipment
- Dynamic soil testing (cyclic triaxial, resonant column, etc.)

Sunrise Powerlink
SDG&E

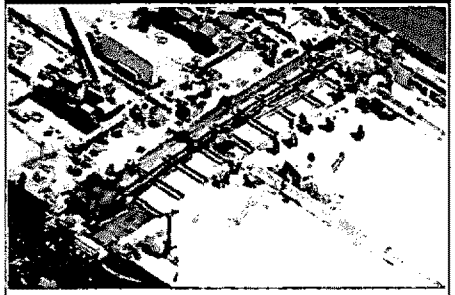


- A $1.9B utility project crossing the interstate five times
- 119-mile high-voltage transmission using 438 tower sites
- Extreme weather and sensitive environmental conditions
- Limited environmental impact
- No accidents or incidents
- Responsive to project dynamics
- Innovative pile cap design
- 2.5% savings delivered

One Nevada (ON) Line
Nv Energy

- Enables the development of numerous renewable energy projects in Nevada
- 25M pounds of steel
- 231-mile long line, 500kV
- Highly complex design
- QA/QC Inspections
- Shop fabrication inspection
- Weld inspections
- Materials and NDT testing

Seismic Bridge Retrofit Program
Caltrans Statewide



- $8 billion program consisting of 2,200 bridges statewide
- Quality Assurance Inspection
- Nondestructive Testing
- Concrete and steel inspection
- Fabrication shop inspection
- Review welding procedures
- Visual inspection of base metal surfaces and edges and for dimensional conformance