



**MEETING MINUTES**  
**December 9, 2014**

**Attendees:**

Bart Coombs	Golder Associates	<a href="mailto:Bcoombs@Golder.com">Bcoombs@Golder.com</a>
Bijan Khamanian	Hobas	<a href="mailto:bkhamanian@hobaspipe.com">bkhamanian@hobaspipe.com</a>
Bill Chavez	SRCS	<a href="mailto:chavezb@Sacs sewer.com">chavezb@Sacs sewer.com</a>
Collins Orton	TT Technologies	<a href="mailto:Corton@Tttechnologies.com">Corton@Tttechnologies.com</a>
Danny Yang	Whitley Burchett & Assoc.	<a href="mailto:dyang@whitleyburchett.com">dyang@whitleyburchett.com</a>
Don Wible	Nor-Cal Pipeline	<a href="mailto:don@norcalpipe.com">don@norcalpipe.com</a>
Jacquie Jaques	Sekisui	<a href="mailto:Jacquie.jaques@sekisui-spr.com">Jacquie.jaques@sekisui-spr.com</a>
Jennifer Glynn	RMC	<a href="mailto:jglynn@rmcwater.com">jglynn@rmcwater.com</a>
Jill Sylvester	NV5	<a href="mailto:Jill.sylvester@nv5.com">Jill.sylvester@nv5.com</a>
Jimmy Dang	Oro Loma Sanitary District	<a href="mailto:Jdang@oroloma.org">Jdang@oroloma.org</a>
John Tricamo	Mladen Buntich	<a href="mailto:johnt@buntich.com.com">johnt@buntich.com.com</a>
Kevin Kai	Brown and Caldwell	<a href="mailto:kkai@brwncald.com">kkai@brwncald.com</a>
Kevin Widmer	Cues	<a href="mailto:Kwidmer@cuesinc.com">Kwidmer@cuesinc.com</a>
Mark Meyer	Underground Solutions	<a href="mailto:Mmeyer@rdoequipment.com">Mmeyer@rdoequipment.com</a>
Michael Heaton	B&V	<a href="mailto:heatonmi@bv.com">heatonmi@bv.com</a>
Mike Garcia	Contech Engineered Solutions	<a href="mailto:mgarcia@conteches.com">mgarcia@conteches.com</a>
Neamal SlevelNilforoushan	Rinker	<a href="mailto:neama.nilforoushan@cemex.com">neama.nilforoushan@cemex.com</a>
Rob McMullin	EBMUD	<a href="mailto:rmmculli@ebmud.com">rmmculli@ebmud.com</a>
Robert Allen	CDM Smith	<a href="mailto:allenrob@cdmsmith.com">allenrob@cdmsmith.com</a>
Russell Tripp	California Precast Concrete Pipe	<a href="mailto:russell@concrete-pipe.org">russell@concrete-pipe.org</a>
Rusty Arend	Jacobs Assoc.	<a href="mailto:arend@jacobssf.com">arend@jacobssf.com</a>
Vern Phillips	Harris & Associates	<a href="mailto:vphillips@harris-assoc.com">vphillips@harris-assoc.com</a>

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**Presentation:** In-Service Welding. Presented by Bart Coombs, Golder Associates.

***Highlights from the presentation include:***

Mr. Bart Coombs is a mechanical engineer with 25 years' experience in the pipeline industry. Throughout his career Mr. Coombs has specialized in oil and gas pipelines. He has completed projects all over the western hemisphere, living for 15 years in South America. He is currently employed with Golder Associates in Walnut Creek, CA.

Mr. Coombs presented an overview of pipeline repair in the gas industry, specifically focusing on in-service welding of the pipe due to:

- Repair of corrosion damage using a reinforcing sleeve
- Installation of branch connections
- Installation of plugging fittings.

Some of the issues with In-Service Welding involve:

- Hydrogen cracking (also known as delayed cracking, underbead cracking, hydrogen induced cracking) which could occur within 48 hours
- Burnthrough

Mr. Coombs showed a video which described the source and prevention of hydrogen cracking. The video emphasized that hydrogen cracking depends more on the materials welded than the welders experience. Preheat allows the hydrogen to dissipate. Preheat and weld thickness affect the amount of hydrogen and thus the potential for hydrogen cracking.

Weld rods – H4R maintain low hydrogen in the weld.

Preheating, interpass temperature control, and post heating reduce hydrogen, allow more hydrogen to diffuse.

Mr. Coombs recommended using low hydrogen electrodes. He showed an Iron-Iron Carbide Phase Diagram and a Time Temperature Transformation Diagram. The method of quenching affects the type of steel and the resulting susceptibility to hydrogen embrittlement. Fast quenching results in a Martensitic steel which is very brittle and subject to hydrogen embrittlement.

Techniques:

- Temper bead / pipe buttering
- Controlling heat input

Mr. Coombs discussed the benefits of keeping the pipe full during the entire welding operation. Keeping the carrier fluid moving, including natural gas, helps control the weld heat, dissipating the heat down the pipeline.

In-service welding also applies to other utility applications such as high pressure water, high pressure gas, and other fluids.

What testing methods are used with In-Service Welding? Not X-ray since the line is in service. Ultrasonic or dye penetrant testing are the two most common methods employed in the field.

Is welding difficult with Low Hydrogen Weld Rods? Yes. Low hydrogen rods are tricky to run. Welding is an art.

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It is not difficult to prevent burnthrough for a ¼-inch thick pipe wall. Thinner shells are more difficult.

In summary, Mr. Coombs noted that written welding procedures in Section 1104 provide detailed descriptions of the welding and test procedures. The industry has developed a very specific welder qualification process.

**Handouts:** None.

Thank you for the outstanding presentation! We appreciate your help with PUG.

**General:**

**October 14, 2014 Meeting Minutes:** The meeting minutes were read and approved with one minor correction.

**Announcements:**

**HDPE Roadshow / Black Diamond Brewery Tour:** The HDPE Roadshow was presented on November 18 by Alliance for PE Pipe at CCCSD from noon to 3 PM. The seminar was followed by tour of the Black Diamond Brewery. The seminar and the tour were well attended.

**2014/2015 Membership:** The 2014/2015 membership renewal forms are available and located on the PUG website: [www.norcalpug.com](http://www.norcalpug.com). Memberships cost is \$350 per entity. Membership has numerous benefits, such as discounts for courses and conferences, participation in raffles held at random monthly meetings, discounts on attending the annual seminar, etc. Get your renewals and/or new member applications in today. Payment options include Paypal or check.

**Financial Updates:** The current total in the organization account is \$37,635.73.

Rob McMullin noted several articles of interest.

**L.A. Identifies Riskiest Pipes in Aging Water System:** An article from the LA Times highlighted the issues associated with the aging water system in Los Angeles.

**Aging Pipes Containing Asbestos Present Unique Set of Regulatory Challenges:** An article from the July 2014 issue of Underground Construction by D. John Matthews and Dr. Sal Vaidya highlighted the risks of AC pipe in service throughout our water systems.

**Microtunneling Short Course:** The Colorado School of Mines is presenting a Microtunneling Short Course in Colorado on February 10 – 12, 2015.

**NASTT Pipebursting Training Course:** Collins Orton noted that the pipebursting class is being presented in Edison, NJ on February 4, 2015.

**APWA In the Works:** Weekly updates can be found at [www.apwa.net](http://www.apwa.net).

**LinkedIn:** LinkedIn has active discussions related to the pipeline industry. Check out Trenchless Technologies on LinkedIn.

**NASTT's 2015 No-Dig Show:** Conference will be held on March 15 - 19 in Denver, Colorado. For more information please go to the NASTT website: <http://www.nodigshow.com/>. Collins Orton noted that the conference was organizing a ski day on Thursday after the conference.

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**NASTT Webinars:** NASTT hosts complimentary webinar series to bring you professional instruction from leading experts in the field of trenchless technology. They can be found at [www.nastt.org/webinars](http://www.nastt.org/webinars). Recent webinars are archived on the website.

**TT Magazine: 2013 Pipe relining Guide:** is available at <http://www.trenchlessonline.com/>.

**UIM Webinars:** The Water Utility Infrastructure Management (UIM) website hosts on-line and provides archived webinars related to water management. For more information, visit the UIM website: [www.uimonline.com/index/webinars](http://www.uimonline.com/index/webinars).

**Underground Construction Magazine:** is available at [www.ucononline.com](http://www.ucononline.com).

**ASCE Pipelines 2105 Conference:** Conference will be held on August 23 – August 26, 2015 at the Baltimore Marriott Waterfront Hotel in Baltimore, MD. Registration opens in March 2015. For more information please go to the ASCE Pipelines Conference website at: <http://www.pipelinesconference.org/>.

**PUG 23<sup>rd</sup> Annual Sharing Technologies Seminar:** The seminar is February 19, 2015 at Hs Lordships at the Berkeley Marina. The key note speaker will be David Sedlack who will be talking about Water 4.0. There will be seven presentations.

1. Trenchless Methods Used on Recent Sewer and Water Line Replacements in California by Lee Abramson, Craig Camp, and Nick Goodenow with Hatch Mott MacDonald.
2. Taking the Bluff Out of Hard Rock Tunneling by Randall Berry and Vern Phillips with Harris & Associates and Ron Drago, City Engineer of Rancho Palos Verdes.
3. Water Pipe Replacement Strategies for Seismic and Pipe Aging by John Eiding with G&E Engineering Systems.
4. The Mokelumne Aqueduct Recoating Project by Mark Lewis with EBMUD.
5. VSFCD's New Outfall to the Mare Island Strait by Douglas Wing with Carollo Engineers and Rolf Ohlemutz with VSFCD.
6. Challenging Microtunnel Project Along Peninsular Shores by Teresa Herrera with SBSA and Michael Jaeger with the Covello Group.
7. South Napa Earthquake August 2014 – 120 Water System Leaks in 5 Days ... and More by Joy Eldredge with the City of Napa.

There will be two raffles and a hosted cocktail hour after the seminar.

**ASCE Pipelines 2014 Conference Report:** Rob McMullin gave a report about two presentations he attended at the ASCE Pipelines Conference in Portland, Oregon on August 3 - August 6, 2014. The theme of the conference was **From Underground to the Forefront of Innovation and Sustainability**. Rob noted that there were over 80 exhibits and 200 presentations in an 8-track program. Rob reported on two presentations he attended and one he presented: **Importance of Haunching, Tacoma's Pipeline Assessment Project: Replacing the Right Mains at the Right Time**, and **Pipeline Fragility Assessment Against Liquefaction-Induced Differential Settlement in the Cities of Alameda and Oakland, California**.

**Importance of Haunching** by Jeff Boschert and Amster Howard.

The presentation addressed four conditions of bedding designated by letters:

- A. End dumped crushed rock with a push rod measurement
- B. Shovel sliced crushed rock with a push rod measurement
- C. End dumped crushed rock with a pull strap measurement
- D. Shovel sliced crushed rock with a pull strap measurement

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The relative stiffness of crushed rock placed into pipe haunch areas was measured by both pushing rods and pulling straps at the pipe-soil interface. The work indicated that significant differences in circumferential support were seen between dumped rock and shovel sliced rock. In these experiments, shovel slicing increased the support for the pipe about tenfold.

Summary: Good trench support significantly increases load carrying capacity of the buried pipeline.

***Tacoma's Pipeline Assessment Project: Replacing the Right Mains at the Right Time*** by R. M. Flynn, M. Coleman and K. Laven.

Over a two year period, the project assessed the wall thickness of existing water mains currently in service in the Tacoma, WA area. In 2011 and 2013, Tacoma Water assessed 19 and 12 miles of distribution mains using an acoustic method for measuring the average remaining structural wall thickness of water mains. This method is fully nondisruptive, requiring no insertion of sensors into the mains, and no interruption of service for customers. These results were used to calculate the remaining useful life of each of the mains, which guided the prioritization of main replacement projects. This paper provides details of the Tacoma Water condition assessment projects, the technology used, the benefits of performing condition assessment, and how this has shaped the pipe replacement decision process in Tacoma Water. The field work was performed by Ecologics.

***Pipeline Fragility Assessment Against Liquefaction-Induced Differential Settlement in the Cities of Alameda and Oakland, California*** by Yogesh Prashar, Roberts McMullin, Xavier Irias, Mario Flores, and Kavin Khatri.

Previous studies have suggested that water pipelines are damaged during earthquakes when settlements impose high stresses on the pipeline and its components. Permanent ground deformation is estimated from seismic hazards such as a landslide, fault offset, or liquefaction-induced settlements. A service area that represents this scenario is the City of Alameda, where soil is highly liquefiable in the event of an earthquake. The geology of the city is compromised predominantly by artificial fill and Holocene alluvial fan deposits, with the artificial fill being the most vulnerable to liquefaction. Using 212 cone penetration tests (CPT) soundings located throughout the City of Alameda and geographic information systems (GIS), a pipeline fragility study is performed to determine pipeline segments that have the potential for failure or some level of damage during an earthquake event. In addition, a pipeline map similar to the United States Geologic Survey (USGS) ShakeMap will be created to identify damaged pipeline segments and their corresponding level of damage. After identifying pipeline segments with potential for failure, a repair program is outlined by the authors. The researchers generate the prediction model for the pipeline fragility study for the EBMUD service area, the City of Alameda, based on settlement values obtained by peak ground acceleration values (PGA) and a M7.0 earthquake magnitude. Estimated liquefaction-induced settlement values are verified using the program software SHAKE2000

### **Project Discussions:**

***Vern Phillips*** with Harris and Associates spoke about a CIPP and Point Repair project in Salinas. Two bids were received. The engineer's estimate was \$3.2 million. Southwest is the apparent low bid at \$3 million. The second low bidder was Michels. The project involved 20,000 feet of 8" to 15" pipe. Southwest bid \$30 to \$32 per foot for 8" CIPP, \$49 per foot for 15" CIPP, with \$20 each for lateral reinstatement. No top hats. Grout injection.

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**Collins Orton** with TT Technologies spoke about a pneumatic pipe bursting project in San Jose that involved upsizing 2,500 linear feet of an existing pipe from 8-inch to 20-inches. The pipe bursting subcontractor was Mocon. The work was adjacent to several sensitive industries including an LED lighting manufacturer. Traffic control was critical with the high traffic volume. The cost was \$120 per foot, not including access excavations which were done by the general contractor.

**Rob McMullin** discussed the need for a method to track and report bid results for recent projects. It was generally felt that bid tabulations would provide the best information. The person reporting the bid results could scan the bid tab and email as a pdf. Rob suggested that this should be task for the PUG board to follow-up on in the future.

**Next Meeting:**

The next general meeting is scheduled for Tuesday, January 13, 2015. The presentation topic is "Axis Guided Boring".

Please call Bob Allen at 925-296-8038 or email [allenrob@cdmsmith.com](mailto:allenrob@cdmsmith.com) for additional information on this month's meeting minutes.