

Memo of Findings

Discussion with Commission/Director Mandli re: Potential PW Class II Emergency

12/3/2021

Director Mandli asked me to consider declaring a Class II PW Emergency to get the stainless steel piping corrected before snowfall on the newly built, higher capacity, CNG fueling facility at the East District Campus. The construction was complete and the commissioning agent could not certify the system for operation because it did not meet code. The Design Engineer apparently made an error and the contractor installed the system per this flawed design. The apparent error involved a design using mechanical compression fittings underground, to join the $\frac{3}{4}$ inch stainless steel tubing, which provides CNG to the pumps.

The potential fixes and estimates that were reviewed by PW and W&R staff (which included Informal quotes) were:

-\$31 k to repair currently installed $\frac{3}{4}$ " stainless steel (s.s.) tube with orbital welds replacing mechanical fittings. (Questionable whether this option would meet our capacity needs.) ~ 3 weeks to perform plus commissioning completion time.

-\$50 k installed replacement 1" s.s. diameter tube in 20' sticks welded for, 1.5 weeks for material ~ 1 week plus commissioning completion time.

-\$70 k installed continuous 1" tube on a spool, ~4 week lead time for material and 1 week to install plus commissioning completion time.

The Director added that the Waste & Renewables Gas Engineer (who was recently hired) has significant experience installing and operating the type of CNG fueling facility being installed at the EDC Highway location. He was instrumental in aiding to find multiple informal quotes for material options and felt that the $\frac{3}{4}$ " tube as originally designed, would be questionable in meeting the Highway Department's needs, even if it had been installed correctly. He drew this conclusion from his past experience but also after reviewing and understanding how the system would be used in practice. This led to the recommendation for replacing with 1" tubing, to match the above ground manifold and provide nearly twice the capacity of original $\frac{3}{4}$ " tubing.

The Director explained that with winter plowing fast approaching and the addition of 8 new CNG Triaxles, there is a critical need to get this system repaired and operational before major snow events occur. The scope of this work, by change order, would normally require Board approval. Due to the holidays, the process would delay repairs which could result in winter response issues and delays in critical services.

I then contacted Chair of P&F Patrick Miles and we, along with Director Mandli discussed the above options and after review the Chair of P&F and I, as Chair of PW&T declared a Class II Public Works Emergency. The solution to rectify the emergency was the second option to install replacement 1" s.s. diameter pipe in 20' sticks welded together for an initial estimate of \$50k. I asked the Director if he had received informal quotes and he affirmed this. The Director next step was to tell the Project Manager to reach out to the Contractor to share this approach and continue working on schedule, ways to expedite it and locking in material price and delivery time.

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December 10, 2021 Update

Director Mandli explained that there were several items which hadn't been taken into account and unfolded as materials as well as construction methods were explored during the week. The final estimate for the repair option chosen is actually ~\$75,000. An email from the PW Project Manager working on this job, analyzing the details, is included. The major differences accounting for the change from the initial estimates presented are:

-Actual labor costs are higher as the original quote assumed labor would be about the same with the cost of materials being the difference. The first option assumed reusing existing 3/4" tubing (pipe). The 2nd two remove and replace it with 1".

-The quantity, actual after measurement, for tube replacement is higher than initial estimate.

-There now is a protective carrier casing that makes installation faster and easier that wasn't included in initial estimate.

Requires x-ray of welds wasn't included.

The included email has more details. The Director reported that the contractor is proceeding and anticipated receiving materials by the end of the week of December 13, 2021. A schedule for completion has not been received yet.

12/29/2021 Update

The quote for work to remedy the emergency did not include an estimate for hooking the new pipe to the storage tanks but assumed tying into the existing pipes running to the storage tanks. The quote for this additional work is estimated at approximately \$8,500.

12/29/2021 Estimated Total \$76,000 +\$8,500 = \$84,500

Memo of Findings

From: "Shore, Ryan" <Shore@countyofdane.com>

Date: December 8, 2021 at 3:47:55 PM CST

To: "Mandli, Jerry" <Mandli@countyofdane.com>

Subject: CNG Tubing cost comparison

Jerry, Here are the differences in the two COPs:

COP Initial (re-using the existing ¾" tubing):

Subtotal (material,labor,equipment)	\$ 14,630.00
15% OH&P	\$ 2,194.50
Subcontracts (1901)	\$ 12,788.00
Subcontract Markup +7.5%	\$ 959.10
Total Change Order Cost	30,571.60

COP Revised (using new 1" tubing):

Subtotal (material,labor,equipment)	\$ 14,630.00
15% OH&P	\$ 2,194.50
Subcontracts (1901)	\$ 54,976.00
Subcontract Markup +7.5%	\$ 4,123.20
Total Change Order Cost	\$ 75,923.20

The additional ~\$45k can be accounted for with these items not included in the initial COP:

1100' of new 1" SS tubing @ \$20/ft. =	\$22,000.00
Xray inspection of welds	\$ 6,000.00
Additional Labor (removal of old Tube, bend & install new)	\$ 6,000.00
Materials and Equipment	
(New cont. tube sleeve, tube bender rent, dispose existing ¾")	\$11,000.00

Hope that helps,

Ryan

Ryan L. Shore, CPESC

Project Manager

Dane County Public Works

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Madison, WI 53713

Memo of Findings

Corrugated HDPE Coils

SIZE	COLOR	PART NO.	NOMINAL I.D.	NOMINAL O.D.	PULL TAPE	COIL LENGTH (FT.)
1"	Orange	PEC-100T-500	1.049"	1.35"	900 lb	Up to 500
1 1/4"	Orange	PEC-125T-500	1.25"	1.56"	900 lb	Up to 500
1 1/2"	Orange	PEC-150T-350	1.57"	1.80"	900 lb	Up to 350

Sample Part Number

PE	C	100	T	S	2500
Polyethylene (High Density)	Corrugated	1" (I.D.)	Polyester Tape	*Slit Duct (optional)	Put-Up

* Pull tape not available w/ Slit Duct.

➔ RISER RATED

Features & Benefits

- Available in industry standard orange or white color for easy identification.
- Rugged corrugated design is flexible, light-weight yet provides excellent crush resistance.
- UL listed designed for riser applications per NEC articles 770 & 800 and UL standard 2024.
- 1", 1-1/4", 1-1/2" and 2" to accommodate your specific fiber cable diameter.
- Sequential footage markings and product identification printed every 2 feet.
- Standard lengths ranging from 250 ft. coils to 5000 ft. reels.



GENERAL INFORMATION:

Our riser is ideally suited for use as a nonmetallic flexible raceway for protecting and organizing optical fibers in riser applications. Our riser is listed by Underwriters Laboratory (UL) for use with riser or general purpose optical fiber cables per National Electric Code (NEC) article 770 or communication cables per article 800.



Upper Left –Continuous Carrier pipe Upper Right- Orbital Weld Bottom Left- Pipe Bender