

STATE OF CALIFORNIA

Edmund G. Brown Jr., Governor

DEPARTMENT OF INDUSTRIAL RELATIONS

Division of Occupational Safety & Health

Pressure Vessel Unit

1515 Clay Street, Suite 1302

Oakland CA 94612-1402

Tel: (510) 622-3052 Fax: (510) 622-3063



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September 14, 2012

James J. Kramer, P.E.
Principal Civil Engineer
Orange County Transportation Authority
550 South Main St
Orange CA 92863

Subject: Underground LNG Fuel Vessels

Dear Mr. Kramer,

Our office has reviewed the information you supplied in an email dated June 8, 2012 and followed up with additional information emailed dated June 16 and 22, 2012 concerning four underground Liquefied Natural Gas (LNG) vessels. These vessels are located at two different facilities; two are at the Garden Grove Bus Base 11790 Cardinal Circle Garden Grove CA and the other two are at the Anaheim Bus Base 1717 East Via Burton Anaheim CA. The LNG has been used to fuel your buses. The vessels were installed in 2000 and 2001. Acceptance of these installations was granted in letters dated January 13, 1999 and December 17, 1999, respectively, from the Division.

At each site, these LNG tanks are 25,000 gallons each and are ASME Code manufactured vacuum jacketed and are made of stainless steel. The vessels have continuously been monitored with an immersed current corrosion protection system to ensure that the vessel is protected from corrosion. The records you supplied indicate that vessel remain in good condition.

The vessels were installed without test plates that could be pulled up at a three year interval due to the immersed current system providing satisfactory corrosion protection. The original acceptance depended upon the vessels being exposed so a through external inspection could be performed at fifteen years after installation. This would be in 2015 and 2016.

Operations of the LNG facilities are scheduled to end in 2018. You have requested to not expose the tanks for an external inspection and wait until the operations cease and then remove them from service. This request is based upon the positive corrosion protection that has been in place since the vessels were installed. It is also based upon the low level of risk of a leak occurring and not being noticed. Because the vessels are vacuum jacketed, any through wall corrosion in the outer jacket will result in a loss of vacuum. This will cause the LNG contained in the inner vessel to increase in temperature and pressure which will result in a system upset and shutdown. If this occurs, the vessels shall be emptied and uncovered for a complete inspection prior to any filling operations taking place.

Your request is acceptable. The vessels shall be removed from no later than December 31, 2018.

Sincerely,

A handwritten signature in cursive script, reading "Donald C. Cook".

Donald C. Cook
Principal Safety Engineer