Engineering Aspects of Corrosion Protection Systems for Water Pipelines
February 25, 2010

Background: A policy advisory opinion request was originally submitted to the Policy Advisory Committee (Committee) asking if the Texas Board of Professional Engineers (TBPE) allowed the use of a National Association of Corrosion Engineers (NACE) certified specialist to design corrosion protection systems for water storage tanks and pipelines as is allowed in the design of corrosion protection systems for petroleum and gas pipelines. The Texas Commission on Environmental Quality (TCEQ) is the state agency charged with regulating the design, operation and maintenance of public water drinking systems. Their chapter 290 rules require that professional engineers submit water system design plans and for those plans to follow the design recommendations of the American Water Works Association (AWWA). TCEQ rules and the AWWA guidelines require that the engineer incorporate corrosion protection into the water system design. The original request would require the Committee to consider if TCEQ would accept design plans submitted by a NACE certified person for corrosion protection systems on a public water system, which is outside of the jurisdiction of the Committee. The Committee requested a re-statement of the policy advisory request to address only the engineering issues associated with corrosion protection systems. The revised request is, "**What portions of corrosion protection system design require a professional engineer?**"

Overview of Corrosion Protection: Corrosion protection systems fall into three general categories:

1) Cathodic protection
    a) Sacrificial anode
    b) Impressed current

2) Protective coatings

3) Corrosion inhibiting design
    a) Site drainage
    b) selected fills

These protection systems isolate the pipeline or tank from the galvanic current path, re-direct the galvanic current, or sacrifice anode material in place of the metal to be protected.

Effective corrosion protection of a buried or submerged object usually requires application of two of the listed categories. All of these protection systems can be designed by a professional engineer and all of them are available as products from manufacturers and therefore could be provided by a non-engineer.

Analysis: It is common industry practice for engineers to hire corrosion protection consultants to submit proposals for corrosion protection systems. These consultants range from manufacturer representatives (not licensed engineers) to engineering firms that perform the system design. Ultimately, the water system design engineer would select the appropriate proposal and incorporate the corrosion protection system into the overall water distribution system design. If the engineer chose a system provided by a manufacturer, it would be the engineer's responsibility to verify that the system is suitable and works with the overall design of the water system. An engineered system would be incorporated in the water system design with the responsibilities noted on the design drawings.

The diverse nature of water system designs and possible solutions to corrosion issues would prevent the Committee from developing Board guidelines or stating exactly when an engineer would be required to design all corrosion protection systems. It is the position of the Committee that the question is answered by the existing statute and specific determinations of the engineering aspects of corrosion design would need to be considered on a case by case basis.