

**TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
TECHNICAL PEER REVIEW DOCUMENT**

<i>This Section to be Completed by Issue Initiator</i>	
TITLE OR ISSUE	
Primary monitoring system problems: Without a quality assurance/quality control (QA/QC) program, the reliability of a primary monitoring system, and hence the self-reported monitoring data, can be questioned. How to address this instrumentation issue pursuant to an UIC inspection?	
DOCUMENT INITIATED BY (Name/Office/Phone Number)	DATE
Aron Athavaley, Field Investigator, Region 12-Houston, TNRCC	6/9/1999
ISSUE DESCRIPTION	
Today's injection well monitoring involves the use of two instrumentation systems: (i) field pressure and flow gauges referred to as the backup monitoring system and (ii) in-line electronic instruments (pressure transmitters and transducers) with recorders (strip chart or data acquisition system) referred to as the primary monitoring system. There is no problem pertaining to the self-monitoring and reporting as long as both the systems are in good working order as described in Program Issue 1. However, guidance is needed for a situation when instrument problems are detected.	
WHO'S AFFECTED?	
Those facilities which may not be using adequate primary monitoring system.	
<i>This Section to be Completed by Peer Review Team</i>	
FACTORS CONSIDERED	

Based on the industry standards and engineering practices for the instrument maintenance, following factors were reviewed:

How other programs address this issue?: The regulatory guidance criteria are program specific. For example, Water Quality Program recommends, at a minimum, annual calibration for a flow measuring device, generally located at a discharge plume. The calibration certificates are reviewed at the time of inspection. The certificate typically indicates 4 to 20 milli-amp transducer outputs as related to zero and span flow limits for the flow measuring device. In the Air Quality Program, the performance certification and accuracy test reports for a continuous emission monitoring system are mandatory in accordance with Appendix F of 40 CFR part 60. The RCRA regulations for the incinerators and boilers are similar to the air quality. Under the UIC program, TAC 331.64(b) and (c), gauges and recorders should be maintained in good working order. The regulation is not specific to maintaining calibration test reports.

General QA/QC program for instrument maintenance: Most UIC facilities have a trained and qualified instrument personnel for specific maintenance (QC) of pressure and flow instruments. Based on the manufacturer's literature, specific maintenance for differential pressure (DP) transmitters and transducers include calibration procedures to be performed on a regular or as required basis. It is necessary to check the calibrations as the transmitters and transducers are exposed to hostile environment of operating conditions. For example factors such as corrosion, solids deposition, general wear and tear could affect the calibration. Many UIC facilities check the required calibration as needed and on regular basis-quarterly, semi-annually or annually. The calibration procedure generally involves zero and span check and subsequent adjustments.

Furthermore, a primary monitoring system involving pressure transmitters and transducers is related to the factory certifications and use of dead weight tester, a standard traceable to the National Institute of Standards and Technology. This type of arrangement supports the manufacturer's instruments and gauges.

Redundant measurements: An operator may choose to add a second set of standby transmitters and transducer monitoring system to ensure uninterrupted data collection. Both primary and standby monitoring systems can be calibrated and operated. The redundant measurements are performed at this time by a few UIC operators including the commercial wells. A concurrent operation allows a single monitoring system to be removed from service for maintenance without affecting continuity of data collection. Also, redundant monitoring system greatly increases the calculational and input-output requirements of the high-tech electronic data acquisition system (DAS).

UIC inspections: A state inspector would check whether the field gauges and primary monitoring instruments closely agree with one another, and they are maintained in a good working order. He may also check the calibration records maintained by instrument personnel. If a permittee is required to monitor the fluid pH, an inspector would check the QA/QC records for a pH meter.

The federal regulations are very specific to self-reported pH measurements which should be performed per Method 9040, EPA publication SW-846, as incorporated in 40 CFR 260.11. This means a pH meter used in the laboratory will have to be calibrated on a daily basis against two known standard solutions before a sample pH is measured. The operator would make the pH calibration records available for inspection. A laboratory also measures fluid densities on a daily basis. The density measurement is performed by a gravimetric method involving QA/QC for using standard weights.

Monitoring system failure: A scenario concerning primary monitoring system failure was reviewed during the UIC subcommittee meeting in December 1997. For reasons like power failure, a primary monitoring system may become non-functional. Under such a case, an operator should perform manual monitoring and record keeping using the well head flow and pressure gauges. The pump gauges, if available, should then become the backup gauges. The quarterly self-monitoring reports should provide a comment pertaining to the failure of the primary monitoring system. A facility having non-operating primary monitoring system is subject to enforcement actions by the commission.

FINDING(S) AND RECOMMENDATION(S)

- o In-line electronic instruments (pressure transmitters and transducers) with recorders (strip chart or data acquisition system) should be referred to as primary monitoring system subject to QA/QC maintenance program.
- o The primary pressure transmitters and transducers should be calibrated for their zero and span outputs by trained and qualified instrument personnel. This calibration should be performed as required and on a regular basis, that is, quarterly, semi-annually, or annually. Records of these calibrations and vendor certifications for the factory set standard instruments should be made available for a compliance review at the time of inspection.
- o As an operator performs his daily site inspection of the UIC facility, pressure and flow values indicated by the well head field gauges should be logged and compared with those recorded by the primary monitoring system. If the pressure values do not closely agree with one another (see Program Issue 1) and discrepancy is detected in the primary monitoring system, qualified instrument personnel should be asked to look into the problem and correct the monitoring system.
- o If primary monitoring system failure occurs due to power failure or any other reasons, an operator should perform manual monitoring and record keeping as described in Issue 3 and 4. The quarterly self-monitoring reports should provide a comment pertaining to the failure of the primary monitoring system.

COMMENTS

REVIEW COMPLETED BY	NAMES	INITIALS	DATE
<input checked="" type="checkbox"/> Technical Review Group	Ben Knape, URW	_____	_____
	Charles Greene, URW	_____	_____
	Hong Guo, URW	_____	_____
<input type="checkbox"/> Section Technical Panel	Aron Athavaley, Region 12	_____	_____
	Van Boone, BP Amoco	_____	_____
<input type="checkbox"/> Division Senior Technical Committee	Steve Fotiades, DuPont	_____	_____
	James Clark, DuPont	_____	_____
<input checked="" type="checkbox"/> Chief Engineer/Senior Technical Council	Scott McDonald, Sterling	_____	_____
	Ed Fiesinger, Solutia	_____	_____
	Paul Dang, Lyondell	_____	_____
	Bobby Atkins, BASF	_____	_____
	C.C. Rice, ISP	_____	_____
	Ken Anthony, BP Amoco	_____	_____
	Cecilia Jasper, BASF	_____	_____
	M.H. Shah, Hampshire	_____	_____
	Fred Duffy, URW	_____	_____
	Johnny Williamson, URW	_____	_____
	Mike Hull, Region 1	_____	_____
<input checked="" type="checkbox"/> Management Review	Alice Hamilton Rogers, URW	_____	_____

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