

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

<i><b>This Section to be Completed by Issue Initiator</b></i>	
<b>TITLE OR ISSUE</b>	
Annulus monitoring requirements during start-up, shut-down, changes in operation, and reporting momentary anomalies (“spikes”) in annulus monitoring data.	
<b>DOCUMENT INITIATED BY</b> (Name/Office/Phone Number)	<b>DATE</b>
Ben Knappe/UIC Permit Team/URW/I&HW/OWM	11/19/98
<b>ISSUE DESCRIPTION</b>	
What are the requirements for annulus monitoring of Class I wells during start-up, shut down , and significant changes in operation? Should all momentary anomalies (“spikes”) in annulus monitoring data during which the annulus differential is less than 100 psi be considered violations of 30 TAC §331.63(d) and be among the data set from which reported maximum and minimum parameter values are determined? Uniform standards on these issues should be developed for application to all Class I wells.	
<b>WHO'S AFFECTED?</b>	
All Class I injection well operators, and TNRCC UIC program staff.	
<i><b>This Section to be Completed by Peer Review Team</b></i>	
<b>FACTORS CONSIDERED</b>	
<p>30 TAC §331.63(d) states that “the annulus between the tubing and long string casing shall be filled with a non-corrosive or corrosion-inhibiting fluid approved by the Commission. The annulus pressure shall be at least 100 psi greater than the injection tubing pressure to prevent leaks from the well into unauthorized zones and to detect well malfunctions, unless the Executive Director determines that such a requirement might harm the integrity of the well.” The federal requirements found under 40 CFR §146.67(c) are similar but only require that the annulus pressure “exceeds the operating injection pressure, unless the Director determines that such a requirement might harm the integrity of the well.” Thus the state requirements are more stringent than the federal requirements. In addition, 30 TAC §331.64(c) requires continuous recording of annulus pressure and volume. If an alarm condition associated with monitoring and recording annulus pressure and volume occurs, and this alarm condition reveals a loss of mechanical integrity, an operator is required to immediately cease injection of waste fluids (30 TAC §331.64(c)(4)(A)).</p> <p>The annulus system and associated monitoring and recording are required by the regulations for the purpose of protecting the nearest USDW. The annulus acts as protection to the nearest USDW by being operated at a pressure greater than the injection pressure without a significant loss of annulus fluid. Changes in well operating parameters, such as those that occur during start-ups and shutdowns, can cause the annulus pressure to drop below 100 psi greater than injection pressure. No loss of mechanical integrity is indicated and the protection provided by the annulus system remains intact. Thus, recent Class I UIC disposal well permits have included language which allows the annulus pressure to be below normal permit requirements for up to 15 minutes during well start-up and shut-down. Not all Class I UIC permits contain this language.</p>	

Operating variations during start-ups and shut-downs which can cause a rapid injection pressure change and/or a drop in annulus pressure can also occur during normal well operations. These variations, which are both controllable and uncontrollable, include changes in injection flow rate, changes in injection fluid or annulus fluid temperature (and thus density), and changes in injection pressure. Thus, annulus pressure can drop below 100 psi greater than injection pressure without loss of mechanical integrity. A dramatic loss of annulus differential pressure to 0 psi or less is an indication of an operating problem which requires investigation. Program Issue No.14 addresses the requirements for shutting down a Class I well and investigation of an alarm condition.

Reporting to the TNRCC the lowest value for annulus pressure differential on the UIC Class I Injection Reporting Forms was addressed in Program Issue No. 6. Specifically, Class I well operators are to report the lowest monthly annulus differential pressure occurrence that is in excess of 15 minutes. Thus, it has been determined and agreed upon, that a momentary anomaly or spike is an event or situation which lasts less than 15 minutes.

#### **FINDING(S) AND RECOMMENDATION(S)**

The Technical Review Team is striving for consistent interpretation and application of the Class I UIC regulations without increasing the risk to any USDW's. The allowance for annulus pressure to be below normal permit requirements for up to 15 minutes during well start-up and shut-down without being a violation should be applicable to all Class I operators. Other conditions exist outside of well start-up and shut-down, which can be documented, which the 15 minute allowance for annulus pressure differential should also be applicable. Thus the Technical Review Team recommends the following:

Compliance with 30 TAC §331.63(d) and associated reporting requirements is interpreted to be:

1. During well system start-ups and shut-downs annulus pressure may be less than 100 psi above injection pressure for periods up to 15 minutes. Documentation of these situations must be maintained by the well operator. No reporting on the UIC Class I Injection Reporting forms is required unless the period exceeds 15 minutes.
2. During documented operating changes (e.g. switching injection pumps, switching annulus pressurization systems, switching filters, sudden changes in outside temperature, etc.) annulus pressure may be less than 100 psi but must be greater than 0 psi above injection pressure for periods up to 15 minutes. Any period of time outside of start-ups and shut-downs where the annulus pressure is less than or equal to the injection pressure is not in compliance with 30 TAC §331.63(d). Documentation of these situations must be maintained by the well operator. No reporting on the UIC Class I Injection Reporting forms is required unless the period exceeds 15 minutes or the differential pressure drops to or below 0 psi.
3. Instrument calibration spikes are still not considered in determining permit compliance.

The TNRCC's UIC Inspection Checklist should be modified to reflect the above interpretations. In addition TNRCC regional offices and UIC Class I operators should be notified of these interpretations.

#### **COMMENTS**

REVIEW COMPLETED BY	NAMES	INITIALS	DATE
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