

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

TECHNICAL PEER REVIEW DOCUMENT

<i>This Section to be Completed by Issue Initiator</i>	
TITLE OR ISSUE	
Timing for shutting in a disposal well in response to an alarm condition.	
DOCUMENT INITIATED BY (Name/Office/Phone Number)	DATE
Jim Boswell - UIC Team (Initial Draft) Mark Cheesman - Merichem (Final Version)	12/18/96
ISSUE DESCRIPTION	
The regulations under 30 TAC §331.64(c) require alarms and shutoff systems be installed and used when pressures, flow rates or other parameters exceed a range and/or gradient specified in permits. Do the regulations require "slammed" shut-in of a well which may cause harm to equipment and the injection zone?	
WHO'S AFFECTED?	
Class I Well Operators, I&HW Enforcement and Regional Inspectors.	
<i>This Section to be Completed by Peer Review Team</i>	
FACTORS CONSIDERED	
<p>Permit, operation, siting, and construction requirements placed on Class I UIC Wells are generally intended to prevent the contamination of the USDW. Automatic alarms and automatic shutoff systems based on the continuously monitored injection tubing pressures, injection flow rates, and annulus tubing pressure are required by the regulations to prevent damage to the injection zone and/or contamination of a USDW. An operator is required to cease injecting waste fluids in the event that the well appears to be lacking mechanical integrity. An operator shall immediately cease injection of waste fluids if the loss of mechanical integrity is discovered via one of the continuously monitored parameters or during periodic mechanical integrity testing. Ceasing injection by "slamming" shut the well may cause severe damage to injection equipment and the injection zone. Controlled shutdown of an operating well minimizes potential damage to equipment and the injection zone. Reasonable time should be allowed for investigating the cause of an alarm condition, determining whether mechanical integrity is being maintained, and taking corrective action.</p>	
FINDING(S) AND RECOMMENDATION(S)	

The regulations under 30 TAC §331.64(c)(1) require operators to install and use automatic alarms and shutoff systems which sound and shut-in the well when pressures and flow rates exceed a range and/or gradient specified in the well permit. Instead of automatic shutoff systems, an operator can certify that a trained operator will be on location and immediately respond to alarms at all times when the well is operating (30 TAC §331.64(c)(2)). If an automatic alarm or shutdown is triggered, an immediate investigation must be conducted to identify as expeditiously as possible the cause of the alarm or shutoff (30 TAC §331.64(c)(3)). If the investigation reveals that the well appears to be lacking mechanical integrity or one of the parameters monitored indicates that the well may be lacking mechanical integrity, the operator shall cease injection of waste fluids (30 TAC §331.64(c)(3)(A)). An operator shall **immediately** cease injection of waste fluids if there is loss of mechanical integrity which is discovered via one of the continuously monitored parameters, an investigation of an alarm condition reveals an actual loss of mechanical integrity, or periodic mechanical integrity testing reveals the loss (30 TAC §331.64(c)(4)(A)).

The key point is the regulations only require an operator to **immediately** cease injection of waste fluids in the event that specific monitored parameters, an investigation of an alarm condition, or during periodic mechanical integrity testing reveals the well is lacking mechanical integrity. If there is only the appearance that the well is lacking mechanical integrity, the operator shall cease injection of waste fluids unless authorized by the Executive Director to continue or resume injection. The implication is that substantiated proof that the well is lacking mechanical integrity is required before immediately ceasing injection of waste fluids. For both cases, ceasing injection of waste fluids can be interpreted to mean initiating a controlled shutdown of the disposal well. The use of the modifier "immediately" implies that the controlled shutdown must be started at once due to actual mechanical integrity being lost. Thus a controlled shutdown must be started at once if information obtained during a periodic mechanical integrity test indicates a loss of mechanical integrity or a total (catastrophic or instantaneous) loss of annulus fluid is indicated by the continuous monitoring devices which indicates actual loss of mechanical integrity. All other monitored parameters require investigation before a determination can be made as to the loss of mechanical integrity. If an investigation of an alarm or automatic shutdown condition reveals a loss of mechanical integrity, a controlled shutdown of the well must be started at once. Therefore, alarms of other monitored parameters which indicate an exceedance of a permit parameter are violations reportable to the TNRCC, but do not require an operator to immediately cease injection of waste fluids. Automatic shutdowns can be controlled (ramped) and delayed pending investigation to determine the cause of the alarm or shutdown condition. The timing for the controlled shutdown is dependent on the specific injection well operation. There must be a clear indication that a shutdown has been initiated.

Therefore, based on the above discussion, the following recommendations are made:

1. A controlled (ramped) shutdown of a Class I well must be started at once (immediately cease) if:
 - a. There is a total loss of annulus fluid as indicated by a nearly instantaneous drop in annulus pressure.
 - b. A periodic mechanical integrity test reveals a loss of mechanical integrity
 - c. An investigation of an automatic alarm of shutdown indicates an actual loss of mechanical integrity.
2. All other automatic alarms which indicate a violation of a permit parameter must be investigated immediately. The cause must be determined and any necessary corrective action started in a reasonable time.

COMMENTS

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