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Comments for Docket Number PG-061027

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Title of Comment: Improved Gas Leak DetectionTechnology and Global Warming Justify Increased Gas Leak Survey Frequencies and Reduced Repair Times

The noticed subject of possible rule making speaks to making ***corrections and clarifications to WAC 480-93-188***, among other rules. What is needed, however, are ***significant changes to WAC 480-93-188*** to (1) reflect technological advances in gas leak detection equipment since gas leak surveys were first mandated, (2) improve safety, and (3) help reduce global warming.

The standard schedules for performing leak surveys are generally once every year in business areas, and once every five years outside of business areas. These schedules were first developed with a balancing of safety considerations, leak detection equipment capabilities, available manpower, and budgetary considerations. They have not recently been amended to increase the frequency of surveys despite vast improvements in leak detection equipment that very significantly decreases the time, cost, and labor intensity of performing surveys.

Not only would an increase in frequency of inspections promote safety, it would also reduce global warming by decreasing the time that a natural gas leak can exist before it is discovered. Because methane is 22 times worse than carbon dioxide as a greenhouse gas, fugitive methane emissions have a significant effect on global warming.

When leaks are found they are classified as Class 1, 2, or 3 leaks. See Appendix A, below, *"GPTC – GUIDE MATERIAL FOR 'LEAK CLASSIFICATION AND ACTION CRITERIA.'"* Only Class 1 leaks are mandated for immediate repair. Class 2 leaks can be scheduled for repair on a "normal routine basis." Class 3 leaks do not even have to be repaired. They merely must be monitored. Despite the onset of global warming, these repair times have not been shortened. Finding and repairing these gas leaks faster would be one easy step towards solving the global warming problem.

The gas leak detection instruments contemplated by the gas leak survey rules are Combustible Gas Indicators (CGI's) or Flame Ionization devices (FI's). These were designed as hand held instruments to be used by workers walking the gas facilities. Over the years some users have learned to operate these instruments from vehicles. However, when operated from vehicles the typical survey speed is only two to four miles per hour. When a leak is suspected the operator must stop the vehicle and inspect on foot to be sure that it is a natural gas leak. Given the slow speeds at which gas leak surveys could be conducted with these instruments, practicality dictated that surveys be conducted over a long time frame. Hence, the general requirements that surveys be conducted every one to five years, depending on the development of the area.

Now, however, very sensitive, fast acting, infra red technology based equipment, integrated with global positioning system locating devices, and capable of being operated from land or air at speeds in excess of 100 miles per hour, offers a whole new capability of performing gas leak surveys rapidly, relatively inexpensively, and accurately. With these units whole residential areas, for example, could be quickly surveyed several times a year, instead of the once every five years required by existing rules, and more detailed walking surveys could be conducted less frequently than currently required.

Such a unit manufactured by Apogee Scientific, Inc., the Leak Detection System (see http://www.apogee-sci.com/LDS.html), continuously and simultaneously samples air for methane, total hydrocarbons, and carbon dioxide. It displays in real time on a video monitor the route being surveyed, and the concentrations of the three gases being measured. This latter feature allows the operator to distinguish natural gas pipeline leaks from emissions from engine exhausts, sewer lines, petroleum product pipelines, landfills, and other potential sources that frequently result in false positives when tested with a CGI or FI device. The unit records all the data acquired, including the location of any leak response encountered, the size of the response, the concentrations of the three gases present, and the path and the time of the leak survey. These units have operated several years without the need for recalibration.

In light of this new and improved technology, the Washington Utilities and Transportation Commission should amend its regulations to require more frequent gas leak surveys of natural gas pipelines and distribution systems. This would greatly increase the systems' safety. Coupled with amended regulations to require faster repair of identified leaks, this would also greatly reduce the very significant effect of fugitive methane emissions on global warming.

[*] The commenting party is a Registered Professional Chemical Engineer in the State of Washington, License No. 14789. He was a founder of Western Gas Resources, a large independent natural gas producer, gatherer, and processor that was recently acquired by Anadarko Petroleum Corporation. He was also a partner with Apogee Scientific, Inc., in the development of Apogee's Leak Detection System, and now has a royalty interest in the Leak Detection System.

Appendix A

GPTC – GUIDE MATERIAL FOR "LEAK CLASSIFICATION AND ACTION CRITERIA"

GPTC has developed guidance material for "Leak Classification and Action Criteria" (see FIGURE IV-13, TABLES 3A, 3B AND 3C).

FOLLOW-UP INSPECTION

The adequacy of leak repairs should be checked before backfilling. The perimeter of the leak area should be checked with a CGI. Where there is residual gas in the ground after the repair of a Class 1 leak, a follow-up inspection should be made as soon as practical after allowing the soil atmosphere to vent and stabilize. OPS suggests follow-up inspection within 24 to 48 hours, but in no case later than 1 month following the repair. In the case of other leak repairs, qualified personnel should determine the need for a follow-up inspection.

A method to remember when investigating gas leaks and determining the classification is to ask, "WHERE is the Gas?" as follows:

- **Where is the gas? (Use a detector to confirm gas is present)**
- How much is there? (Take readings on the CGI)
- Extent of the spread? (Determine the migration pattern)
- Relation to other structures? (Is gas detected in or near buildings or in manholes?
- Evaluate/evacuate? (Classify the leak and take appropriate action)

TABLE 3A-LEAK CLASSIFICATION AND ACTION CRITERIA-GRADE 1

GRADE	DEFINITION	ACTION CRITERIA	EXAMPLES
1	A leak that represents an existing or probable hazard to persons or property, and requires immediate repair or continuous action until the conditions are no longer hazardous.	Requires *prompt action** to protect life and property, and con-tinuous action until the condi-tions are no longer hazardous. *The prompt action in some in-stances may require one or more of the following: a. Implementation of company emergency plan (§192.615). b. Evacuating premises. c. Blocking off an area. d. Rerouting traffic.	1. Any leak which, in the judg-ment of operating personnel at the scene, is regarded as an immediate hazard. 2. Escaping gas that has ignited. 3. Any indication of gas which has migrated into or under a building, or into a tunnel. 4. Any reading at the outside wall of a building, or where gas would likely migrate to an out-side wall of a building. 5. Any reading of 80% LEL, or greater, in a confined space.

		e. Eliminating sources of ignition. f. Venting the area. g. Stopping the flow of gas by closing valves or other means. h. Notifying police and fire de- partments.	6. Any reading of 80% LEL, or greater in small substructures (other than gas associated sub structures) from which gas would likely migrate to the outside wall of a building. 7. Any leak that can be seen, heard, or felt, and which is in a location that may endanger the general public or property.

TABLE 3B-LEAK CLASSIFICATION AND ACTION CRITERIA-GRADE 2

GRADE	DEFINITION	ACTION CRITERIA	EXAMPLES
2	A leak that is recognized as being non-hazardous at the time of detection, but justifies scheduled repair based on probable future hazard.	Leaks should be repaired or cleared within one calendar year, but no later than 15 months from the date the leak was reported. In determining the repair priority, criteria such as the following should be considered: a. Amount and migration of gas. b. Proximity of gas to buildings and subsurface structures. c. Extent of pavement. d. Soil type and soil conditions (such as frost cap, moisture and natural venting). Grade 2 leaks should be reevaluated at least once every six months until cleared. The frequency of reevaluation should be determined by the location and magnitude of the leakage condition. Grade 2 leaks may vary greatly in degree of potential hazard. Some Grade 2 leaks, when evaluated by the above criteria, may justify scheduled repair within the next 5 working days.	A. *Leaks Requiring Action Ahead of Ground Freezing or Other Adverse Changes in Venting Conditions.* Any leak which, under frozen or other adverse soil conditions, would likely migrate to the outside wall of a building. B. *Leaks Requiring Action Within Six Months* 1. Any reading of 40% LEL, or greater, under a sidewalk in a wall-to-wall paved area that does not qualify as a Grade 1 leak. 2. Any reading of 100% LEL, or greater, under a street in a wall-to-wall paved area that has significant gas migration and does not qualify as a Grade 1 leak. 3. Any reading less than 80% LEL in small substructures (other than gas associated substructures) from which gas would likely migrate creating a probable future hazard. 4. Any reading between 20% LEL and 80% LEL in a con-

	Others will justify repair within 30 days. During the working day on which the leak is discovered, these situations should be brought to the attention of the individual responsible for scheduling leak repair. On the other hand, many Grade 2 leaks, because of their location and magnitude, can be scheduled for repair on a normal routine basis with periodic reinspection as necessary.	fined space. 5. Any reading on a pipeline operating at 30 percent SMYS, or greater, in a class 3 or 4 location, which does not qualify as a Grade 1 leak. 6. Any reading of 80% LEL, or greater, in gas associated sub-structures. 7. Any leak which, in the judgment of operating personnel at the scene, is of sufficient magnitude to justify scheduled repair.

TABLE 3C-LEAK CLASSIFICATION AND ACTION CRITERIA-GRADE 3

GRADE	DEFINITION	ACTION CRITERIA	EXAMPLES
3	A leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous.	These leaks should be reevaluated during the next scheduled survey, or within 15 months of the date reported, whichever occurs first, until the leak is regraded or no longer results in a reading.	*Leaks Requiring Reevaluation at Periodic Intervals* 1. Any reading of less than 80% LEL in small gas associated substructures. 2. Any reading under a street in areas without wall-to-wall paving where it is unlikely the gas could migrate to the out-side wall of a building. 3. Any reading of less than 20% LEL in a confined space.