

WESTERN STATES SEISMIC POLICY COUNCIL
Policy Recommendation 19-12

Earthquake-Actuated Automatic Gas Shutoff Devices

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WSSPC recommends that each state, province or territory that is considering implementing requirements for installing earthquake-actuated automatic gas shutoff devices in schools, industrial, commercial and/or residential applications assure that shutoff valves meet the provisions of the most currently available revision of ANSI/ASCE/SEI Standard 25 (Earthquake-Actuated Automatic Gas Shutoff Devices) and be installed in conformance with the manufacturer's installation instructions. The cost versus benefit of turning gas on after an event or the analysis of false activation is left to the authority having jurisdiction. The policy only advocates that if a decision is made to proceed with earthquake actuated automatic gas shutoff devices that the current standard be utilized.

Executive Summary

Natural gas piping and appliances may be damaged during earthquakes, causing gas leaks. These leaks, if ignited, can result in fires and explosions that may result in significant damage to structures and/or jeopardize personal safety.

Fires and explosions may be more destructive to buildings than the earthquake itself. The ability to manually shut off a gas valve after an earthquake may be difficult or impossible due to debris or ground movement. Risk of gas-related damage is further exacerbated if structures are unoccupied, thus placing the burden of shutting off gas service upon utilities or government agencies. Several types of devices or systems are available to automatically shut off gas flow within structures if leakage occurs. These include excess flow valves and methane detectors connected to solenoid valves. Hybrid detection systems are available that can combine vibration sensing, excess gas flow and the presence of methane to cause valve closure. Earthquake actuated automated gas shutoff valves rely on ground motion to initiate closure. The reliability of automatic gas shutoff valves has been greatly improved with the adoption of ANSI/ASCE/SEI Standard 25.

Background

The number of post-earthquake fire ignitions related to natural gas can be expected to be between 20% and 50% of the total post-earthquake fire ignitions. (California Seismic Safety Commission, 2002).

While the installation of excess flow valves is currently mandated by Federal Code on new or replacement natural gas service lines serving single family residences, these valves alone may not detect leakage within structures caused by damaged or overturned appliances or equipment. The value of these may be enhanced by the addition of an automatic gas shutoff valve. Earthquake-activated automatic gas shutoff devices are relatively inexpensive and a proven method to prevent the loss of gas, resultant fires, and potential community conflagrations. However, these valves may close in situations where no gas leakage has occurred, leading to increased gas system restoration time since operators must visit each customer where gas service has been interrupted.

References

ANSI/ASCE/SEI 25-2016, 2016, Earthquake-Actuated Automatic Gas Shutoff Devices, <https://webstore.ansi.org/standards/ASCE/ANSIASCESEI252016>

California Seismic Safety Commission, 2002, *Improving Natural Gas Safety in Earthquakes*