

**DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF CODES AND STANDARDS**

1800 Third Street, Room, 260, P.O. Box 1407
Sacramento, CA 95812-1407
From TDD Phones 1 (800) 735-2929
(916) 445-9471 FAX (916) 327-4712
www.hcd.ca.gov



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INFORMATION BULLETIN 2005-02 (SHL)

**TO: City and County Building Officials
Interested Parties (SHL)
Division Staff**

SUBJECT: AUTOMATIC GAS SHUTOFF DEVICES

The purpose of this Information Bulletin is to provide information regarding automatic gas shutoff devices meeting the requirements of Title 24, Part 12, Standards 12-16-1 and 12-16-2, for seismic gas shutoff and excess flow gas shutoff devices respectively.

Senate Bill 1992 (Chapter 1051, Statutes of 2002) amended Section 19201 and added Section 19205 to the Health and Safety Code. These sections require the Department of Housing and Community Development (Department), in consultation with the Division of the State Architect (DSA) and the Office of the State Fire Marshal (SFM), to consider whether or not to propose building standards mandating the installation of seismic gas shutoff devices and/or excess flow gas shutoff devices in all or a portion of dwelling units, motels, hotels and lodgings throughout the state.

After careful consideration of all currently available information, including a study commissioned by a manufacturer of excess flow valves, the Department concluded that there was insufficient evidence to support a statewide requirement for the installation of seismic gas shutoff devices and/or excess flow gas shutoff devices. The Department recognizes; however, some jurisdictions, particularly those in seismically active regions of the state, may wish require the usage of such devices. The following information is provided to assist local governments that may want to consider mandating these type devices through enactment of local ordinances.

Two Types of Automatic Gas Shutoff Devices

The stated purpose for considering the installation of seismic gas shutoff devices and/or excess flow gas shutoff devices is to enhance safety and provide additional protection for residential occupants and first responders from unnecessary threats of injury or death and to reduce property damage from some residential gas pipeline failures that may result in a fire.

The following definitions apply to seismic gas shutoff devices and/or excess flow gas shutoff devices that are the subject of this Information Bulletin and which under current California law must be certified by the Division of the State Architect prior to sale and installation in a gas piping system.

Seismic Gas Shutoff Device: Means an earthquake-sensitive gas shutoff device intended to prevent gas flow in a gas piping line following a specified degree of seismic disturbance.

Generally, a single seismic gas shutoff device would be installed in a residential occupancy's gas piping system. This device normally is installed in the main gas line down-stream from the utility company's gas meter and service tee on the outside of the building. It is designed to activate only in cases when building shaking may be sufficient to cause damage to the gas piping system. Some require installation with a bracing device.

Excess Flow Gas Shutoff Device: Means a device or system designed to automatically shut off gas flow in a piping system in the event of significant overpressure surge or rupture of the gas supply line down-stream of the device or system.

Individual excess flow gas shutoff devices generally are installed at each appliance outlet between the gas piping system and the appliance connector. In addition, a main excess flow gas shutoff device is installed in the main gas line down-stream from the meter and service tee. The purpose of these devices is to shut off the flow of gas to individual appliances or the entire system when the flow of gas through the device is increased beyond its predetermined operating flow rate.

The operation of the device depends on the ability of a given piping system to generate the required excess gas flow. These valves will function on most incidents of catastrophic pipe breakage.

The following table, extracted from the California Seismic Safety Commission's report, *Improving Natural Gas Safety in Earthquakes*, provides a comparison of the general benefits and drawbacks for seismic gas shutoff devices, excess flow gas shutoff devices, and the currently required manual gas shutoff valve.

	Manual Shutoff Valve And Wrench	Seismic Gas Shutoff Device	Excess Flow Gas Shutoff Device
Basis of Operation	Utilities have installed manual shutoff valves near gas meters allowing owners with proper wrenches to shut off gas in emergencies.	Senses shaking in a building that is above a design level of shaking and automatically shuts off gas.	Senses gas flows that are above a design shutoff flow rate and automatically shuts off gas.
Benefits	All gas services already have valves installed. Guidance for occupants is currently provided in many public information documents like the telephone book.	Activates only in cases when building shaking may be sufficient to cause damage to the gas system. Someone does not need to be present to ensure shutoff.	Activates only in cases when excess gas flows downstream of the device. Someone does not need to be present to ensure shutoff.
Drawbacks	Only effective if someone is present, knows the valve location, has access to the valve, and has a wrench suitable to close the valve.	Can activate even if damage and hazards do not exist. Aftershocks can cause the device to activate after service has been restored. May activate from shaking not related to earthquakes.	Will not shut off gas if leakage is below the design shutoff flow rate, even if a slow leak exists. May not activate if the occupant changes gas systems downstream without modifying the device.

As discussed above, there are two types of automatic shutoff devices, the seismic gas shutoff and the excess flow gas shutoff devices. It is important to emphasize that these devices function differently and have different installation requirements based on the type of device installed. It is just as important to note that manufacturers of the same types of device may have different installation requirements as well. Any device installed within a gas piping system must be installed in accordance with the manufacturer’s installation instructions.

For example, some seismic and excess flow gas shutoff devices are required to be installed in the vertical position while others are required to be installed in the horizontal position, and still some may be installed in either position. Some manufacturers of excess flow gas shutoff devices indicate that, to ensure maximum protection and valve performance, a valve should be installed at each appliance as well as at the meter. Additionally, these devices are manufactured for high, medium, and low pressure piping systems, and have a number of flow settings.

It is important to know which type of device is being proposed for installation and who manufactures the device in order to determine the proper installation requirements, and to perform an adequate inspection of the installation. If these devices are not installed correctly, they can fail to function as designed or intended.

Local Ordinances

Local government authorities have a responsibility to consider the impacts of earthquakes in municipal decisions related to building construction methods and materials, building density, the existing built environment, capacity of fire protection services, and traffic management within the local community.

The Department recognizes local government's responsibility to determine if and when unique measures are needed to mitigate the impact of seismic events, floods, and/or other natural disasters. Among mitigation measures that may be considered by local governments is mandating the installation of seismic gas shutoff devices or excess flow gas shutoff valves in residential gas piping systems.

Pursuant to Health and Safety Code Section 17958.5, city and county local ordinances may make reasonably necessary modifications to state residential building standards based on local topographical, geological, or climatic conditions. The Department is aware that a number of jurisdictions in California have local ordinances mandating the installation of seismic gas shutoff valves or excess flow gas shutoff devices. To HCD's knowledge, each community that has adopted such an ordinance is located in "Seismic Zone IV" as identified in the 2001 California Building Code. This zone is considered by most scientists and geologists studying earthquakes to be a likely area in California to experience a major seismic event.

Mandating installation of one of the types of shutoff devices may be accomplished through enactment of a local ordinance to amend the California Building Standards Code based on local topographical, geological, or climatic conditions. The local jurisdiction is required to make an express finding that such modifications or changes to the state building standards are reasonably necessary because local conditions so warrant. The ordinance is required to be filed with the California Building Standards Commission in order for the ordinance to be lawfully enforced.

Questions concerning this Information Bulletin should be directed to the Department's State Housing Law Program staff at the address listed above or by telephone at (916) 445-9471.

Kim Strange
Acting Deputy Director