

NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

ISSUED: September 24, 1981

Forwarded to:

Mr. Phillip Lathrap
 Chairman
 American Society of Mechanical Engineers
 c/o Pacific Gas and Electric Company
 77 Beale Street
 San Francisco, California 94106

SAFETY RECOMMENDATION(S)
P-81-37

The National Transportation Safety Board has conducted a study of excess flow valves designed for use in gas distribution systems. ^{1/} These devices, intended to stop the flow of gas to a customer in the event of a major leak in the gas service, have been the subject of considerable controversy in recent years.

In order to gain an insight into the potential impact of excess flow valves on gas distribution safety, the Safety Board obtained technical data from several manufacturers and used these to develop criteria under which excess flow valves may be expected to perform their intended function. These criteria were used to screen a 2-year sample of Materials Transportation Bureau (MTB) leak reports. It was found that excess flow valves could potentially have been activated in 23 percent of the reported distribution leaks in 1978 and 1979. These leaks accounted for 8 percent of the fatal accidents, 20 percent of accidents causing personal injury, 17 percent of the explosions, and 22 percent of the accidents in which gas ignited.

The Safety Board interviewed 46 gas distribution companies in order to obtain their views of and experiences with excess flow valves. Most of these companies could envision a series of circumstances in which an excess flow valve by activating under normal no-leak conditions (false closure) could increase the risk to public safety. The most commonly cited causes of false closures are: the use of an excess flow valve not properly sized for the service, rapid purging, and rapid opening of the service valve. Many companies reported that these problems diminished in frequency as personnel became familiar with the operating characteristics of excess flow valves, and as a result, some companies modified their existing procedures. Other causes of false closures, which may not be remedied as easily, are accumulations of various contaminants within the devices and unanticipated increases in service demand flow of gas. The reported experiences of the gas operators who have more than 150,000 excess flow valves installed show that while false closures do occur, they have not led to accidents in which gas ignited, exploded, or caused personal injury.

^{1/} For more detailed information, read Special Study—"Pipeline Excess Flow Valves" (NTSB-PSS-81-1).

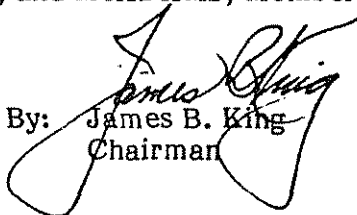
Excess flow valves appear to operate reliably when the service is damaged. More than 88 incidents occur annually in which an excess flow valve activates. Nearly all of these leaks are caused by excavation equipment damage. Only one case was reported to the Safety Board in which an excess flow valve may have failed to be activated by a major service leak. In this case, the gas operator speculated that an excess flow valve may not have been installed on the damaged service.

At this time, there are no guidelines available to the gas distribution industry for use in determining where excess flow valves may be effectively utilized. Research is required to determine the specific operating characteristics of commercially available excess flow valves and to assess the potential of excess flow valve concepts for more varied applications.

As a result of this special study, the National Transportation Safety Board recommends that the American Society of Mechanical Engineers (ASME) Gas Piping Standards Committee:

Develop guidelines, using Gas Research Institute test and evaluation results when they become available, to assist the gas distribution industry in determining the conditions under which excess flow valves should be installed in gas services. (Class III, Longer Term Action)
(P-81-37)

KING, Chairman, GOLDMAN, and BURSLEY, Members, concurred in this recommendation. DRIVER, Vice Chairman, and McADAMS, Member, did not participate.

By: 
James B. King
Chairman