

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

P-119

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Forwarded to:

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SAFETY RECOMMENDATION(S)

P-79-1

At 3:20 p.m., c.s.t., on January 27, 1978, a signal was received at the Robstown (Texas) Compressor Station of the Florida Gas Transmission Company. The signal came over the Radio Alarm Relay Systems (MARS) and indicated that a unit of the company's remote Murdock Pass Compressor Station on Padre Island, Texas, had shut down. An investigator who went to the Murdock Pass station to check the indicated problem found the station was on fire. He tripped the manual emergency shutdown (ESD) system at 5:05 p.m. This action shut off the gas supply and "blew down" the station. Of the station's three compressor units, two were destroyed and the third was badly damaged. There were no injuries.

Records indicate that the compressor station maintained a steady flow from 8:00 a.m. to 2:40 p.m. The Safety Board's examination of the damaged station and related MARS signals and pressure/flow data from an upstream orifice meter chart determined that, beginning at 2:40 p.m., a series of events took place that caused the fire not to be immediately reported to the manned station at Robstown. These events were:

1. A leak developed at a flange on the bypass end of the suction header of unit No. 2,
2. Escaping gas gained access to the only running compressor unit (No. 2) and was ignited,
3. The resulting explosion caused unit No. 2 to shut down by vacating combustion air to its engine,

4. Monitored engine functions continued momentarily within acceptable limits,
5. An alarm was not sent via MARS when monitored engine functions did cease operating because the engine magnetos of the compressor unit activate MARS and the engine had shut down,
6. Flames being fed by the leaking gas at the flange heated the 2-inch riser on the discharge side of the bypass to a point where it failed,
7. Gas leakage rate increased due to the failure and fire damage became more extensive, and
8. The fire burned through a MARS unit cable causing an electrical short, and a signal was sent to Robstown indicating the shutdown of unit No. 1 instead of a fire.

An analysis of these events shows that the emergency alarm system at the Murdock Pass station was inadequate. The emergency situation deactivated the alarm system before the alarm could be sent. Other gas compressor station emergency shutdown alarms exist which could also be circumvented. The Florida Gas Transmission Company took these actions to make the alarm system more fail-safe:

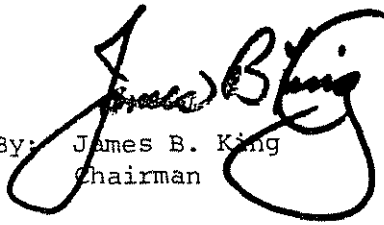
1. An ultraviolet light fire detection system has been ordered. This system will be tied to the ESD system. This tie-in will cause automatic isolation and blow-down of the station in the event of a fire in or near the station.
2. The ESD is now tied to oil pressure-sensitive switches on the two replacement units. This will activate the ESD system in the event that one or both units are down for any reason, in which case the station will be isolated and blown down.
3. The MARS system has been revised to be independent of the engine magnetos of the compressor unit. It is now tied to an oil pressure-sensitive switch on each unit.

In order to increase the overall operational safety of the remote station, a 12-inch check valve has been installed below ground in the station discharge line approximately 70 feet from the station. This check valve will prevent a gas backflow from the lateral in the event of a break.

Therefore, the National Transportation Safety Board recommends that the American Gas Association and the Interstate Natural Gas Association of America:

Advise member companies of the circumstances of this accident and urge them to review their remote installation alarm systems and to correct any deficiencies found. (Class I, Urgent Action) (P-79-1)

KING, Chairman, DRIVER, Vice Chairman, McADAMS and HOGUE, Members, concurred in the above recommendation.

By:  James B. King  
Chairman