

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

Log P. 89

ISSUED: October 31, 1977

Forwarded to:

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Washington, D.C. 20590

SAFETY RECOMMENDATION(S)
P-77-34 through P-77-36

At 11 a.m., c.s.t., on December 7, 1976, a natural gas compressor operating at 1,000 psig pressure failed and then exploded and burned at an Exxon Gas System, Inc., station near Robstown, Texas. An emergency shutdown system was activated by a worker at the station, but the four automated fire gate valves on the two pipelines that supplied the station did not close. Another emergency control system also failed to automatically close the shutoff valves leading to two of the five compressors in the station. 1/

At 11:30 a.m., a second explosion occurred within the burning building in one of the compressors that had not shut down automatically. Pipeline valves upstream and downstream of the station had to be closed manually. Gas burned for 3 hours until the pipeline pressure decreased to 250 psig and the fire gate valves could be approached and closed manually. The fire killed one person, injured two persons, and destroyed three engine-driven compressors and the compressor building. Property damage and gas loss was estimated to be \$5 million.

In the investigation of this accident the Safety Board has learned of past failures of studs and reliability problems with shutdown devices. Several gas transmission companies have stringent torquing and testing procedures for studs on compressors. Title 49 CFR 192 does not have any minimum safety standards concerning this maintenance activity which is a common occurrence in all compressor stations. Also, several gas transmission companies inspect and test their remotely controlled shutdown devices as frequently as every 1 to 3 months. The Safety Board believes that the currently allowable 1-year period between inspections is too long for such critical control equipment.

1/ For more detailed information about this accident read: "Pipeline Accident Report, Exxon Gas System, Inc., Natural Gas Explosion and Fire, Robstown, Texas, December 7, 1976" (NTSB-PAR-77-3).

There are no requirements or mention in 49 CFR 192 of instrument air controls use in conjunction with emergency shutdown devices. If instrument air is used for this application, there should be provisions for backup or emergency pneumatic facilities so that one failure event will not make the emergency control system inoperative.

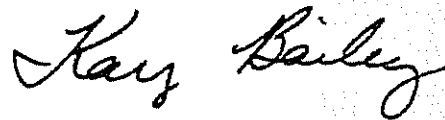
Therefore, the National Transportation Safety Board recommends that the Materials Transportation Bureau of the U.S. Department of Transportation:

Review compressor station accidents to determine if there have been similar problems with remote-control shutdown devices. If there have been reliability problems, make a survey to determine the optimum time between inspections and amend 49 CFR 192.731(c) by decreasing the time interval between inspection and testing from the current minimum of 1 year to reflect these findings. (Class III, Longer Term Followup) (P-77-34)

Add to 49 CFR 192 a requirement for pneumatic-operated compressor station equipment, similar to the requirement in 49 CFR 192.167(3) for electric-operated equipment, to isolate instrument air supply to automatic facilities, and to provide backup or separate emergency pneumatic facilities. (Class III, Longer Term Followup) (P-77-35)

Add to 49 CFR 192.729 a section to require the proper torquing procedures for studs, as specified by the compressor manufacturer, when reassembling compressors after maintenance work. Include periodic testing of these studs, by ultrasonic or other means, to insure their integrity during operation. (Class III, Longer Term Followup) (P-77-36)

BAILEY, Acting Chairman, McADAMS and HOGUE, Members, concurred in the above recommendations. HALEY, Member, did not participate.



By: Kay Bailey
Acting Chairman