

PI-83-0101

January 26, 1983

Robinson/62392

ACTION: Recommendation for Establishing of Safety Standards in Part 192 and Revision of Part 195

Original signed by  
Richard L. Beam  
Associate Director for Pipeline Safety Regulation, DMT-30

Robert L. Paullin  
Associate Director for Operations & Enforcement, DMT-10

Your memo dated January 3, 1983, recommended the adoption of a design standard for scraper traps in Parts 192 and 195. We have reviewed the matter and find the following:

#### Liquid Pipelines

Section 195.124 requires that closures be designed in accordance with the ASME Boiler and Pressure Vessel Code. Section 195.426 requires certain safety devices on scraper traps. These two sections currently require all of the safety provisions recommended in your memo. Further, §195.402(a) and (c)(3) are sufficiently broad to require operating procedures for scraper traps. Finally, of the 4,250 liquid pipeline accidents reported between 1968 and 1982, 19 involved scraper traps causing \$56,000 in property damage, but none involved injuries or fatalities. Therefore, we do not believe that further rulemaking concerning design or operation of scraper traps is indicated for liquid pipelines.

#### Gas Pipelines

There is no current design requirement for scraper traps in Part 192 equal to §195.124, nor is there a requirement in Part 192 comparable to §195.426. However, the operating requirements of §§192.603(b) and 192.605(a) may be applied to scraper traps. Further, the B31.8 Code does not have specific design or operating requirements for scraper traps. Of the 6,588 gas transmission pipeline accidents reported between 1970 and 1982, 10 involved scraper traps resulting in 4 fatalities and 4 injuries, together with \$214,000 in property damage.

While one might argue that the absence of scraper trap regulations resulted in more serious scraper trap related accidents on gas transmission pipelines, we doubt that such is the case. More likely, we believe that a greater hazard is presented by the gas pipeline scraper trap because gas is compressible.

Would this greater hazard justify imposing additional scraper trap regulations on gas pipelines? We believe it unlikely that a design regulation similar to §195.124 can be justified for gas pipelines for two reasons: (1) Because we are not authorized to impose a design regulation retroactively, a new design rule would affect only new scraper traps and would leave unaffected the many in existence; and (2) Since about 1960, most scraper traps have incorporated the safety features of the ASME Boiler and Pressure Vessel Code. Consequently, for new facilities we doubt that a design requirement would result in anything other than what the industry now does.

Another alternative might be a gas pipeline regulation similar to the operations regulation for liquid pipelines given in §195.426. However, if we understand the accident reports correctly, the cause of the accidents involving scraper traps is not the lack of safety features but rather the failure to follow proper operating procedures. The solution to that problem, it seems to us, is a rigorous application of §§192.603(b) and 192.605(a) to assure proper scraper trap operation. If operator plans under these rules are inadequate to assure safe operation of scraper traps, Section 13 of the Natural Gas Pipeline Safety Act permits you to require that the plans be amended.

In conclusion, we do not believe a design requirement for gas transmission pipeline scraper traps can be justified. We believe the problem you cited is one of improper scraper trap operation and that §§192.603(b) and 192.605(a) can be applied to resolve the problem.

U.S. Department of Transportation  
Research and Special Programs Administration

Memorandum

Date: January 3, 1983

Subject: ACTION: Recommendation for establishment of Safety Standard in Part 192 and revision of 195.426

From: Robert L. Paullin  
Associate Director for Operations and Enforcement, DMT-10

To: Richard L. Beam  
Associate Director, Office of Pipeline Regulations, DMT-30

As a result of on site accident investigation and a review of other accident reports relating to the use of pipeline pig launchers or receivers, it is recommended that a new regulation be established for Part 192 and an existing regulation in Part 195 be revised.

There have been several accidents, some of them fatal, because operators have used procedures that were inconsistent with company guidelines or sound operating practices in regard to launching and receiving scrapers or spheres. If the barrel closure cover of a launcher or receiver unit was designed so that it would be impossible to open while there is pressure in the barrel, many injuries and fatalities would be prevented.

Though it is recognized that it is not possible to write regulations that will keep a person from negligent operating practices or from circumventing the use of safety devices, it is expected that by modifying the wording of 195.426 and adding a similar provision to Part 192 operators of pig launchers or receivers will be better protected even if prone to take shortcuts. Presently, 195.426 is not worded so that the equipment design prevents pressure from remaining in the barrel of the launcher or receiver when the closure cover is removed. The modification that we propose should result in the elimination of pressure in the barrel before the closure cover can be removed. This proposal is consistent with an existing rule contained in section VIII of the ASME Boiler and Pressure Vessel Code Part UG-35.

In support of this recommendation I have attached a report on a recent accident investigated by Jose L. de la Fuente of the Southwest Region, Office of Operations and Enforcement. It is expected that this accident would have been avoided if the barrel and closure cover had been installed in accordance with the regulation being recommended for part 192. Also attached are two Accident Briefs from the National Transportation Safety Board that describe accidents involving scraper traps at Enid and Slapout, Oklahoma.

We recommend the following addition to part 192 and that 195.426 be revised to read the same:

192. \_\_\_\_\_ Scraper and sphere facilities.

- (a) No operator may use a launcher or receiver that is not equipped with a relief device capable of safely relieving pressure in the barrel before insertion or removal of scrapers or spheres.
- (b) Except for the multibolted type of closure, no operator may use a launcher or receiver with quick-actuating closures unless the barrel closure is equipped with a locking mechanism or device so designed that, (1) the pressure cannot be built up for launching a scraper or sphere unless the closure mechanism is fully engaged in its intended operating position, and (2) the closure mechanism cannot be disengaged for removing a scraper or sphere until pressure in the barrel has been fully released.

## Memorandum

U.S. Department of Transportation  
Research and Special Programs Administration

Date: May 12, 1982

Reply to Attn. of: DMT -17

Subject: Failure of a 22" Unibolt Closure on Southern Natural Gas Pipeline Company's Gate No. 6 Valve Platform @ Mile Post 39.632 in a Marshy Area of Plaquemine Parish, Louisiana

From: Jose L. de la Fuente, Staff Engineer

To: Robert F. Aubry, Chief, Southwest Region

### I. SYNOPSIS

At 9:35AM on Thursday, April 8, 1982, a 22" pig launcher under approximately 840 psig pressure on an offshore valve platform exploded, killing two company employees as they were attempting to open the closure. The force behind the 840 psig of pressure was of such magnitude that, after one stud bolt had been totally removed by the employees, and the other one partially removed to the point where only half the threads on the nut were holding the stud bolt, the threads stripped and the unibolt flange (nut member) rotated, causing the blanking plug to swing open. The tremendous, rapid release of energy tore the blanking plug from the hinge arm, sheared two small bolts holding the plug to the hinge arm, and propelled the blanking plug with such force that it damaged a concrete support directly in front of it and hit and damaged a guard rail as it sailed through the air before it hit the water, where it was lost. This full force caught the two men as they were working on the closure and mangled and partially dismembered one of them and propelled the other one approximately 450 feet in the air, severing the body in two in the process.

### II. PROBABLE CAUSE

The probable cause of this accident was the inadvertent attempt to open the closure under approximately 840 psig pressure. This was evident by the fact that one eye on the unibolt flange (nut member) showed no evidence of damage, indicating the stud bolt was purposely removed prior to the release of energy. The opposite eye on the unibolt flange was shiny and slightly flat on bottom, coinciding with the bolt pull out and flange rotation when the nut was backed off to the point at which only half the threads were holding the stud bolt. Inspection of the nut clearly showed that half the threads were in good condition while the other half were completely stripped.

### III. THE ACCIDENT

Pigging operations on the second loop, east leg, 20" mainline had been in progress since April 6th. On the morning of April 8, 1982, the pig was inserted in the 22" launcher on the valve platform, the blanking plug was closed and the barrel was pressurized by opening a 6" gas supply valve. Once the chamber was pressurized, the 6" gas supply valve was closed and the 20" mainline gate valve was opened to equalize the pressure. When pressure was equalized, the 6" gas supply valve was opened, allowing the pressure differential to propel the pig down the pipeline.

After the three-man crew felt certain they heard the pig leave the launcher and travel through the pipeline, they gave it one more minute to make sure the pig had cleared the platform. When the

minute had elapsed, two men closed the 6" gas supply valve and the 20" mainline gate valve to isolate the launcher while their supervisor instructed them to bleed down and open the trap. The supervisor then proceeded downstairs to the boat to call in the report that the pig had been launched, and he did not observe whether or not an attempt was made to open the 6" blow down valve on the pig trap. As the supervisor was making notes on the back of the boat at approximately 9:35AM, he heard a "quick boom", like a short, loud explosion, up on the valve platform, and he and the boat captain proceeded to investigate. Upon arrival upstairs they found one mangled and partially dismembered body lying on the platform deck next to the pig trap, which had blown open. They saw no trace of the other crewman, and proceeded downstairs to the boat to report the accident and to look for the other body.

At approximately 9:46AM a company helicopter was in the air, followed by another one at 9:48AM, enroute to the site. The missing body (upper torso only) was located by helicopter on a small island approximately 450 feet S.W. of the valve platform.

The bodies were recovered and transported to Plaquemine Parish Hospital in Port Sulpher, Louisiana, by air carrier helicopter.

All valve positions on the platform were checked, and the platform was secured by 11:27AM.

#### IV. CONCLUSIONS

This accident was the result of an inadvertent act committed by two experienced personnel which cost them their lives.

#### V. RECOMMENDATIONS

Although it is recognized that human error cannot be effectively regulated, nevertheless, had a regulation similar to Sec. 195.426 been in effect, this tragic occurrence may not have taken place. Therefore, I am recommending that a regulation similar in content to Sec. 195.426 be incorporated in Part 192.