

PI-76-0115
September 28, 1976

Mr. Gordon T. Tyree
Quality Control - Field Surveillance , Officer
State of Alaska
Office of the Pipeline Coordinator
P. O. Box 1782
Anchorage, AK 99510

Dear Mr. Tyree:

This is in response to your letter of August 3, 1976, in which you asked about repairing a defect in a girth weld located on the side opposite from where another defect was repaired as shown in the sketch enclosed with your letter.

In accordance with Section 195.230(b):

"A weld that is found unacceptable under Section 195.228 may not be repaired unless -

(b) The segment of the weld to be repaired was not previously repaired."

Also, in accordance with Section 195.232(c):

"A cylinder of the pipe containing a weld must be removed and the ends rebeveled whenever -

(c) The weld was repaired and the repair did not meet the requirements of Section 195.228."

The requirement prohibiting double repair of girth welds was adopted from the B31.4 and B31.8 codes used by the liquid and gas pipeline industries, respectively. It apparently was placed in the codes to maintain a high level of workmanship which has been the rule in pipeline welding as evidenced by a low accident rate each year from girth welds. Of the total accidents reported to us from liquid pipelines, less than 2 percent annually originate from girth welds.

There were no comments to this prohibition by companies from either the gas or liquid pipeline industries when the regulations were proposed. This indicates the desire of the pipeline industry to continue the practice of not allowing double repair.

Our primary concern with double repair is that excessive concentration of stress will result in the heat affected zones where the repair is made. Repeated repairs in the same segment without completely removing the weld metal of the previous repairs will increase this stress concentration and possibly result in failure of the weld. Repeated cycles of alternating heating and cooling of the weld can embrittle the weld and also lead to possible failure.

This problem exists also where there are defects which are repaired from both the outside and inside of the pipe as your sketch indicates. The heat affected zone could be common for the repairs of each and the resultant high stress concentration cannot be tolerated.

Therefore, where more than one weld defect exists at one location in a girth weld and a single repair does not eliminate the defects, the second repair is not allowed, unless the second repair is not in the same segment as the first, a segment being defined as that portion of the weld which has been subjected to one repair, including the heat affected zone incident to that repair. In your example, the second repair would probably be allowed if it is made from the opposite side of the weld from the first and the opposite side repair area does not come into contact with the original repair area, including heat affected zones.

Thank you for your interest in pipeline safety.

Sincerely,
SIGEND
Cesar DeLeon
Acting Director
Office of Pipeline
Safety Operations