

February 14, 1977

Mr. T. V. Bruno
Metallurgical Consultants, Inc.
P.O. Box 88046
Houston, TX 77004

Dear Mr. Bruno:

This is in reply to your letter of July 30, 1976, requesting an interpretation of the requirements of 49 CFR Part 195, "Transportation of Liquids by Pipeline," relating to the length of allowable internal undercutting of pipeline welds.

Question: What is the limit of any individual length of undercutting?

Question: Is there a limit of length of undercutting in any given continuous length of weld (e.g., 12 inches, 1/6 the total weld length, 8 percent of the total weld length) and if so, what is the limit?

Answer: In regard to the above two questions, Part 195 has incorporated by reference API Standard 1104 for standards of acceptability for welding. Subsection 6.9, Undercutting, of that standard prescribes the limits of undercut. As stated in that standard, where depth of undercut is between 1/64 inch and 1/32 inch, the length of any continuous undercut should not exceed 2 inches or 1/6 the length of the specific weld, whichever is smaller.

Consultation with Mr. R. B. Gwinn, Secretary, API-AGA Joint Committee on Oil and Gas Pipe Line Field Welding Practices, had indicated that this requirement as specified in the 13th edition of API Standard 1104 is in error. Mr. Gwinn has advised that this matter would be corrected in the 14th edition soon to be published and that for undercut depth between 1/64 inch and 1/32 inch the limitation for undercutting length will be 2 inches in a continuous weld length of 12 inches or 1/6 of the length, whichever is smaller.

Question: Does Subsection 6.8 of API Standard 1104 include undercutting in determining accumulation of discontinuities?

Answer: The intent of Subsection 6.8 of API Standard 1104 is not only to exclude high-low condition but also undercutting in determining accumulation of discontinuities. We have been advised that API will also revise this section in the 14th edition of 1104 to clarify this intent.

Upon receipt of this new edition, OPSO will analyze its content and proceed to determine if it is appropriate for incorporation by reference in OPSO's regulations.

I trust that this adequately responds to your inquiry.

Sincerely,

Cesar DeLeon
Acting Director
Office of Pipeline
Safety Operations

July 30, 1976

Ref: 476-76-2303
Subj: Interpretation of
49CFR195

Mr. Cesar DeLeon
Office of Pipeline Safety Operations
Department of Transportation
Materials Transportation Bureau
Washington, D.C. 20590

Dear Mr. DeLeon:

The purpose of this letter is to request an official interpretation of the requirements of 49 CFR Part 195 relating to the length of allowable internal undercutting of pipeline girth welds.

As revised on October 1, 1975, paragraph 195.228 applies the standards of acceptability of subsection 6.9 of the 1973 edition of API Standard 1104 to undercutting only if the undercutting is measured visually on each girth weld of the same diameter. There is no specific statement concerning what standards apply if undercutting is not measured visually.

If undercutting is measured only by radiography, I presume the only criterion of acceptability is length of undercutting. Subsection 6.9 of the 1971 edition of API Standard 1104 states:

"Undercutting adjacent to the root bead on the inside of the pipe shall not exceed 2 in. in length, or 1/6 of the length of the weld, whichever is smaller."

At least two interpretations have been applied to this statement.

One interpretation is that it limits the accumulated length of all undercutting to 2 inches or 1/6 the length of the weld, whichever is smaller; the other is that it limits any individual occurrence of undercutting to 2 inches or 1/6 the length of the weld with no limit on accumulated length.

Another subsection of API Standard 1104 that may relate to undercutting, subsection 6.8, is also subject to more than one interpretation. Subsection 6.8 is the same in both the 1971 and 1973 editions of API Standard 1104 and states:

"Excluding high-low condition, any accumulation of discontinuities having a total length of more than 2 in. in a continuous weld length of 12-in. or more than 8 percent of a continuous weld length if the total weld

length is less than 12-in. is unacceptable. Any

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accumulation of discontinuities which total more than 8 percent of the weld length associated with an entire joint is unacceptable."

Some people have interpreted this statement as including undercutting in determining the allowable length of accumulated discontinuities. Others, however, have reasoned that since the subsection on undercutting, (6.9), apparently was deliberately placed after the subsection on accumulation of discontinuities, (6.8), while subsections covering other discontinuities were placed before it, the subsection on accumulation of discontinuities was not intended to apply to undercutting.

In view of the above considerations, I would appreciate an official interpretation from OPSO of the requirements of 49 CFR 195 pertaining to allowable length of undercutting determined by radiography, specifically:

1. What is the limit of any individual length of undercutting?
2. Is there a limit of length of undercutting in any given continuous length of weld (e.g. 12 inches, 1/6 the total weld length, 8 percent of the total weld length) and if so, what is the limit?
3. Does subsection 6.8 of API Standard 1104 include undercutting in determining accumulation of discontinuities?

We are currently involved in several pipeline projects that must meet federal requirements and would appreciate an early reply.

Very truly yours,

T. V. Bruno