

Agenda Item: 620-2083

Title: API 620 Permanent Attachments

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Purpose: Addition of design requirements for permanent attachments in API 620 similar to API 650

Source: H. Iizuka's email to R.Challa dated 04/28/2026

Revision: 0

Impact: None

RATIONALE

API 650 section 5.8.1.2 (excerpt below) provides detail design requirements for permanent attachments, such as leg length of welds, spacing requirements from horizontal and vertical joints, etc. However, API 620 does not provide such requirements.

5.8.1.2 When attachments are made to shell courses of material in Group IV, IVA, V, or VI, the movement of the shell (particularly the movement of the bottom course) under hydrostatic loading shall be considered, and the attachments shall meet the following requirements:

- a) Permanent attachments may be welded directly to the shell with fillet welds having a maximum leg dimension of 13 mm ($\frac{1}{2}$ in.). The edge of any permanent attachment welds shall be at least 75 mm (3 in.) from the horizontal joints of the shell and at least 150 mm (6 in.) from the vertical joints, insert-plate joints, thickened insert plate joints, or reinforcing-plate fillet welds. Permanent attachment welds may cross shell horizontal or vertical butt welds providing the welds are continuous within these limits and the angle of incidence between the two welds is greater than or equal to 45 degrees. Additionally, any splice weld in the permanent attachment shall be located a minimum of 150 mm (6 in.) from any shell weld unless the splice weld is kept from intersecting the shell weld by acceptable modifications to the attachment.

This requirement in API 650 pertains to high strength materials having tensile strengths equal to or greater than 70ksi. Since API 620 does not have groupings as in API 650, the proposal requires the spacing requirements to be pertinent to materials having tensile strength equal to or greater than 70 ksi.

PROPOSAL:

7.16.3.1 Permanent attachments are items welded to the tank wall that will remain while the tank is in its intended service. This does not include openings such as nozzles, manholes, and flush type cleanouts. It does include items such as wind girders, stairs, gauging systems, davits, riser pipe supports, tank anchors, walkways, supports for internal items such as heating coils or other piping, ladders, floating roof supports welded to the shell wall, and electrical conduit and fixtures. ~~For other plate materials, the weld connecting the permanent attachment to the tank surface shall be examined visually and by the magnetic particle method (or at the option of the purchaser, by the liquid penetrant method). Refer to Section 7 for the appropriate examination criteria. The welds for permanent attachments installed above the maximum liquid level of the tank do not require examination by the magnetic particle method.~~ Permanent attachments shall meet the requirements of 7.16.3.1.1 and 7.16.3.1.2.

7.16.3.1.1 For plate material having a tensile strength of 70,000 psi, or greater, permanent attachments may be welded directly to the shell with fillet welds having a maximum leg dimension of 1/2 in. The edge of any permanent attachment welds shall be at least 3 in. from the horizontal joints of the shell and at least 6 in. from the vertical joints, insert-plate joints, thickened insert plate joints, or reinforcing-plate fillet welds. Permanent attachment welds may cross shell horizontal or vertical butt welds where, at the location of crossing, the butt welds are not subjected to radiography or Annex U ultrasonic examination in lieu of radiography, provided the permanent attachment fillet welds are continuous within these limits and the angle of incidence between the two welds is greater than or equal to 45 degrees. Permanent attachment welds shall not cross shell horizontal or vertical butt welds where radiography or Annex U ultrasonic examination in lieu of radiography is performed. Additionally, any splice weld in the permanent attachment shall be located a minimum of 6 in. from any shell weld unless the splice weld is kept from intersecting the shell weld by acceptable modifications to the attachment.

7.16.3.1.2 For other plate materials, the weld connecting the permanent attachment to the tank surface shall be examined visually and by the magnetic particle method (or at the option of the purchaser, by the liquid penetrant method). Refer to Section 7 for the appropriate examination criteria. The welds for permanent attachments installed above the maximum liquid level of the tank do not require examination by the magnetic particle method.

7.16.3.2-3 Temporary attachments....

REVISION HISTORY

1. Rev 0 – Draft for discussion