

## NRR-PMDAPEm Resource

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**From:** Beltz, Terry  
**Sent:** Sunday, August 23, 2015 7:41 PM  
**To:** 'Michael K Scarpello'; hlkish@aep.com  
**Cc:** Alley, David; Tsao, John; Pelton, David  
**Subject:** Donald C. Cook Nuclear Plant, Unit 2 - Proposed Alternative to the ASME Code, Section XI, Repair Requirements  
**Attachments:** Socket weld.docx

Michael and Helen,

The NRC staff has requires additional clarification related to your August 23, 2015, request associated with the Indiana Michigan Power Company (I&M) proposed alternative to the American Society of Mechanical Engineers (ASME) Code, Section XI, repair requirements to apply a weld overlay, with a deviation from ASME Code Case N-666, to a defect in the boric acid makeup system piping. Please refer to the attached document regarding socket welds.

Item C-1 (two drawings on left) are slip-on flanges. Item C-2 (single drawing on right) is flange socket weld. Item C-3 is another socket weld. The August 23, 2015, application indicates the affected component is socket weld FW-17. However, based on the attached drawings, the drawing supplied in Section 7 of your application does not clearly represent a socket weld. This, at the very least, indicates that the I&M may require two alternatives from the code case: 1) a mechanism other than fatigue, and 2) apply socket weld code case to a weld that is not a socket weld.

Therefore, the NRC staff requires a better drawing of the subject component to clearly indicate if it is a slip-on flange or a socket weld flange. In other words, if this is a socket weld then a better drawing is requested. If it is not a socket weld, then you need to revise your request to reflect that the weld in question is not a socket weld and provide further discussion regarding that alternative to the code case.

Please let me know if you have any additional questions.

Sincerely,

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## NC-3660 DESIGN OF WELDS

### NC-3661 Welded Joints

NC-3661.1 General Requirements. Welded joints shall be made in accordance with NC-4200.

#### NC-3661.2 Socket Welds<sup>28</sup>

(a) Socket welded piping joints shall be limited to pipe sizes of NPS 2 (DN 50) and less.

(b) Socket welds shall comply with the requirements of NC-4427.

(c) Drains and bypasses may be attached to a valve or a fitting using socket welded joints up to a maximum of NPS 4 (DN 100).

### **NC-3661.3 Fillet Welds and Partial Penetration Welds for Branch Connections<sup>29</sup>**

(a) Fillet welds and partial penetration welds may be used within the limitations of NC-3643.1(c).

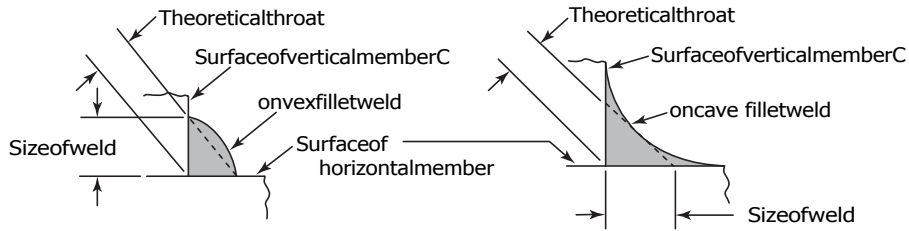
(b) For fillet welds, the size of the weld shall be specified on the design drawings.

(c) For partial penetration welds, the size of the weld, the depth of the weld groove, and the groove angle shall be specified on the design drawings.

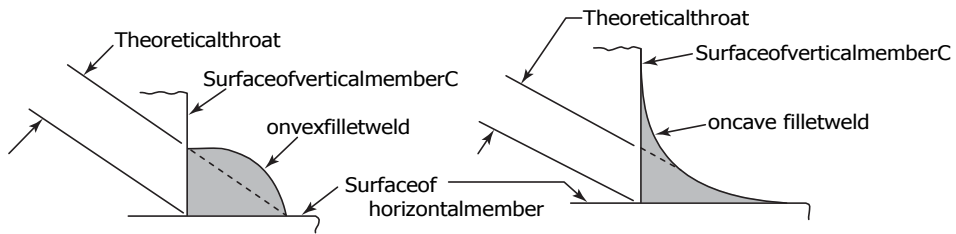
<sup>28</sup> Socket welds should not be used where the existence of crevices could accelerate corrosion.

<sup>29</sup> Fillet and partial penetration welds should not be used where severe vibration is expected.

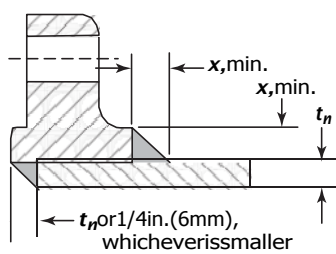
**FIG.NC-4427-1 FILLETANDSOCKETWELDDDETAILSANDDIMENSIONS**



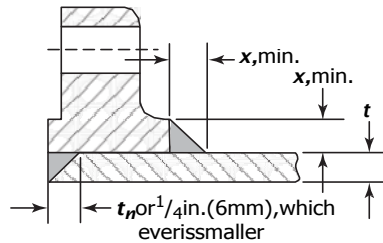
**(a) Equal Leg Fillet Weld [Note(1)]**



**(b) Unequal Leg Fillet Weld [Note(2)]**

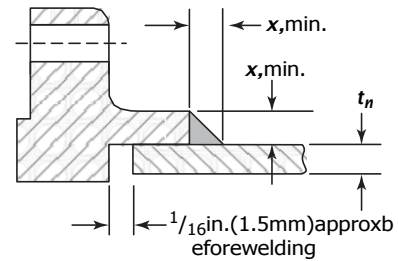


Front and back weld

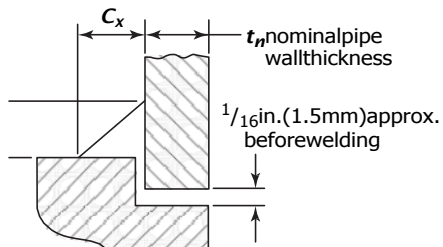


Face and back weld

**(c-1) Slip-On Flange [Note(3)]**



**(c-2) Socket Welding Flange [Note(3)]**



**(c-3) Socket Welding Fittings [Note(4)]**

**NOTES:**

- (1) The size of an equal leg fillet weld is the leg length of the largest inscribed right isosceles triangle. Theoretical throat =  $0.7 \times \text{size of weld}$
- (2) The size of an unequal leg fillet weld is the shorter leg length of the largest right triangle that can be inscribed within the fillet weld cross-section.
- (3)  $x, \text{min.} = 1.4 t_n$  or the thickness of the hub, whichever is smaller, but not less than  $1/8 \text{ in. (3mm)}$ , where  $t_n$  = nominal pipe wall thickness
- (4)  $C_x, \text{min.} = 1.09 t_n$  where  $t_n$  = nominal pipe wall thickness