Figure PW-19.4(b)
Unacceptable Types of Diagonal Braces for Installation by Welding

PW-28  WELDING QUALIFICATION AND WELD RECORDS

PW-28.1.1  The Welding Procedure Specifications, the welders, and the welding operators used in welding pressure parts and in joining load-carrying nonpressure parts, such as all permanent or temporary clips and lugs, to pressure parts shall be qualified in accordance with Section IX.

PW-28.1.2  Except as provided in (a) and (b), the Welding Procedure Specification, the welders and the welding operators used in welding nonpressure-bearing attachments which have essentially no load-carrying function (such as extended heat transfer surfaces, insulation supports, and the like) to pressure parts shall be qualified in accordance with Section IX.

(a) When the welding process is automatic, welding procedure and performance qualifications testing is not required.

(b) When the material used for the nonpressure part makes the mechanical test requirements for procedure qualification and performance qualifications impracticable, a weld test coupon may be evaluated using the macro-examination method for both groove and fillet welds in accordance with Section IX, QW-470. The test coupon may be of production configuration and shall be of sufficient length to contain a specimen for macro-examination. When heat treatment is a requirement of the WPS, it shall be
considered a nonessential variable. All other Section IX variables remain. The weldable quality of the nonpressure part materials shall be verified by the macro-examination of a single cross-section of either the groove or fillet weld as in the production configuration. A groove weld may qualify a fillet weld. Visual examination of the weld metal and heat-affected zone of both the pressure part and nonpressure part material shall show complete fusion and freedom from cracks.

**PW-28.1.3** Welding of all test coupons shall be conducted by the Manufacturer. Testing of all test coupons shall be the responsibility of the Manufacturer. Qualification of a welding procedure, a welder, or a welding operator by one Manufacturer shall not qualified that procedure, welder, or the welding operator for any other Manufacturer except as provided in Section IX, QG-106.1(c) and QG-106.2(g).

**PW-28.2** No production work shall be undertaken until the procedures, the welders, and the welding operators have been qualified, except that performance qualification by volumetric NDE, in conformance with Section IX, QW-304 for welders or QW-305 for welding operators, may be performed within the first 3 ft (1 m) of the first production weld.

**PW-28.4** The Manufacturer shall maintain qualification records of the welding procedures, welders, and welding operators employed, showing the date, results of the tests, and the identification mark assigned to each welder. These records shall be certified by the Manufacturer by signature or some other method of control in accordance with the Manufacturer’s Quality Control System and be accessible to the Authorized Inspector. Continuity records showing that the qualifications of welders and welding operators have been maintained need not be retained for more than 5 yr.

**PW-28.4.1** The Manufacturer shall also establish a procedure whereby all welded joints, except as permitted in PW-28.4.2 and PW-28.4.3, can be identified as to the welder or welding operator who made them. This procedure shall use one or more of the following methods and be acceptable to the Authorized Inspector. The welder or welding operator may stamp his identification mark on or adjacent to all welded joints made by him, or he may stamp on or adjacent to a continuous weld or a series of similar joints made by him at intervals of not greater than 3 ft (1 m), or, in lieu of stamping, the Manufacturer may keep a record of welded joints and the welders or welding operators used in making the joints.

**PW-28.4.2** When making multiple load-carrying or nonload-carrying structural attachment welds on pressure parts, the Manufacturer need not identify the welder or welding operator that welded each individual joint, provided

(a) the Manufacturer’s Quality Control System includes a procedure whereby the identity of the welders or welding operators that made such welds on each pressure part will be maintained so that the Inspector can verify that the welders or welding operators were all properly qualified

(b) the welds are all the same type and configuration and are welded with the same welding procedure specification

**PW-28.6** Identification of welders or welding operators making tack welds that become part of a final pressure-retaining weld or structural attachment weld is not required provided the Quality Control System of the Manufacturer includes a procedure to permit the Inspector to verify that such tack welds were made by qualified welders or welding operators.

**PW-28.7** If tube butt welds are made using the flash welding process, production testing shall be performed in accordance with Section IX, QW-199.1.3 as follows:

(a) one sample shall be tested at the start of production

(b) one sample shall be tested at the beginning, midpoint, and end of each work shift

(c) when production shifts are consecutive, a test at the end of the shift may serve as the test for the beginning of the next shift

(d) when a welding operator is replaced during production

(e) if any machine settings are changed

When any production run weld fails to pass the required tests, the welding parameters shall be adjusted until two consecutive welds pass the bend test. In addition, all welds that were made subsequent to the previous successful test shall be either cut out and rewelded or cut out and tested in reverse sequence of welding until two successive welds pass the tests.

**PW-29** **BASE METAL PREPARATION**

**PW-29.1** The preparation of joints prior to welding may involve any of the conventional methods in use such as machining, thermal cutting, chipping, grinding, or combinations of these.

**PW-29.2** Where thermal cutting is used, the effect on the mechanical and metallurgical properties of the base metal shall be taken into consideration.
B. Record Description

<table>
<thead>
<tr>
<th>Subject *</th>
<th>Edition/Addenda *</th>
<th>Paragraph/Fig./Table No. *</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPV Section I</td>
<td>2017</td>
<td>PW-28.1.2</td>
</tr>
</tbody>
</table>

Subject Description *
PW-28.1.2 - subcontracting welding to a non-Certificate Holder

2. Proposed Question(s) and Reply(ies) *

Question: Is it the intent of Section I that a boiler Manufacturer may subcontract, to a non ASME Certificate Holder, the welding of non load carrying parts to pressure parts, such as fins to tubes, by an automatic welding process, such as automatic high-frequency resistance welding?

Reply: Yes. Possession of a Certificate of Authorization by an organization performing such welding is neither required nor prohibited.

3. Explanation *

In PW-28.1.2, qualification to ASME BPV Code Section IX is not required for automatic welding processes. However, this clause does not specify whether or not the automatic weld may be performed by an organization not holding an ASME Certificate. This inquiry clarifies that it is neither required nor prohibited to possess an ASME Certificate of Authorization to perform such welding.