



## Risk Solutions

# Pressure Points

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## Ask the Engineer

### UG-84(h)(2)

**Question 1:** For Section VIII, Divisions 1 and 2 construction, when qualifying WPS(s) on carbon and low alloy steels (i.e. Table UCS-23 and Table 3-A.1 materials respectfully) for production joints requiring impact testing, are there requirements for the heat treated condition of the PQR test coupon(s) prior to welding that must be taken into consideration?

**Answer 1:** Yes. Section VIII Division 1, paragraph UG-84(h)(2)(-b) and Section VIII, Division 2, paragraph 3.11.8.3(f)(2) state that the PQR test coupon material be in the same heat-treated condition as the material to be used in production.

### UG-84(h)(2)(-b) states:

*(2) When Required.* Welding procedure impact tests shall be made when required by **UCS-67, UHT-82, or UHA-51**. For vessels constructed to the rules of **Part UCS**, the test plate material shall satisfy all of the following requirements relative to the material to be used in production:



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- (-a) be of the same P-Number and Group Number;
- (-b) be in the same heat-treated condition; and
- (-c) meet the minimum notch toughness requirements of (c)(4) for the thickest material of the range of base material qualified by the procedure (see **Figure UG-84.1**).

### 3.11.8.3(f)(2) states:

(f) for materials of **Table 3-A.1** (carbon steel and low alloy steel), the test plate material shall satisfy all of the following requirements relative to the material to be used in production:

- (1) Be of the same P-Number and Group Number;
- (2) Be in the same heat-treated condition;
- (3) Meet the minimum toughness requirements **3.11.2**, **3.11.3**, and **3.11.4**, as applicable for the thickest material of the range of base material qualified by the procedure.

So what do these requirements mean? They mean that the heat treatment condition applied to the PQR test coupon material **before welding** must match the heat treatment condition of the production material at the joint before welding. To be clear, this is in addition to the Section IX essential and supplementary essential variable requirements addressing PWHT.

For example, a production joint exists on SA-516 Gr 70 material (P-No 1, Group No. 2), which requires the welding procedure be qualified with impact testing. The MTR states that this material is in the normalized heat-treated condition. In order to be Code Compliant, the WPS selected to weld the production joint must be qualified with the PQR test coupon in the Normalized heat-treated condition prior to welding the coupon. Using a qualified WPS in this production joint, where the PQR test coupon was in the as-rolled condition, would not be acceptable in meeting the minimum Code requirements. The qualified WPS in the as-rolled heat treatment condition would only be permitted for welding:

- a) production joints not requiring the welding procedure be qualified with impact testing; or
- b) in production joints requiring impact testing where the production material is in the as-rolled condition within the qualification range.

While recording the heat-treated condition of the test coupon on the PQR is not a requirement of Section IX, Section VIII, Divisions 1 and 2 impose more stringent requirements, which the construction Code is permitted to do. This is also consistent with Section IX paragraph QG-100(b).

### QG-100(b) states:

(b) Whenever the referencing Code, standard, or specification imposes requirements different than those given in this Section, the requirements of the referencing Code, standard, or specification shall take precedence over the requirements of this Section.

Section VIII, Divisions 1 and 2 do not state that the heat-treated condition of the test coupon be listed in the certified PQR, although that may be an opportune location for that information. The Code states that the heat-treated condition of the PQR test coupon prior to welding must match the heat-treated condition of the production material at the joint prior to welding. How this information is to be documented should be a matter of agreement between the Certificate Holder and the Authorized Inspector. If the heat treatment status of the test coupon is not recorded on the PQR, then alternate traceable documentation must be available linking the test coupon to its heat treatment condition prior to welding.

So what does Section VIII consider as different heat-treated conditions? There is a partial list stated in Interpretation VIII-1-92-51:

Interpretation: VIII-1-92-51  
Subject: Section VIII, Division 1 (1989 Edition, 1991 Addenda); UG-84(h)(3)(b)  
Date Issued: March 9, 1992  
File: BC88-434 (BC89-465 and BC89-467)

**Question 2:** Does the phrase "Same heat treated condition" in UG-84(h)(3)(b) of Section VIII, Division 1 mean that the following would be considered different heat treated conditions?

- as rolled
- annealed
- normalized
- normalized and tempered
- quenched and tempered

**Answer 2:** Yes.

In summary, when welding production joints requiring impact testing on Section VIII Division 1, Table UCS-23 and Section VIII Division 2, Table 3-A.1 materials, it is required that the PQR test coupon(s) justifying the WPS(s) be in the same heat-treated condition prior to production welding. Otherwise, different qualified WPS(s) meeting this requirement must be selected.

With this information in mind, it is advisable that Certificate Holders check existing PQR(s) qualified with impact testing to ensure that the heat treatment condition prior to welding was known at the time of qualification and documented.

## Notified Bodies – Pre and Post Brexit Update

Hartford Steam Boiler (HSB) committed that it would provide updates as more information became available on the decision that the United Kingdom would leave the European Union. HSB recognizes the potential implications of Brexit on the Notified Bodies, including the Pressure Equipment Directive 2014/68/EU for the manufacturing sector.

It was recently announced that an agreement between the European Union and British negotiators was reached allowing the UK to continue trading as a Member State until the end of 2020 under a new transition agreement. This increased transition period agreement is applicable for both Notified Bodies and Manufacturers. This legal agreement will be published in October 2018 pursuant to continued negotiations. It is important to reiterate that there are ongoing negotiations between the UK and the EU on the process and outcome of Brexit with regard to the Notified Bodies.

This means that U.K. Notified Body services will remain unchanged through December 31, 2020.

We would like to take this opportunity to assure our clients that Hartford Steam Boiler will seamlessly provide support through any changes to the Notified Body structure throughout the Brexit transition process.

We will continue to provide updates on this topic as we learn more details.

## Hartford Steam Boiler's Bob Wielgoszinski Honored by ASME

Bob Wielgoszinski, principal code consultant, HSB, was honored on May 9 by The American Society of Mechanical Engineers (ASME). He was named as the first recipient of the Wilfred C. LaRochelle Conformity Assessment Award, an award created in 2017 in memory of a former HSB employee.

He was recognized for his contributions to the Society's standards and quality assurance programs, as well as his efforts to help HSB clients stay in compliance with ASME standards for safety and reliability in boilers and pressure vessels. He is also a recipient of the Society's Dedicated Service Award and the National Board Safety Medal.

Bob has chaired ASME's Standards Committee on Qualifications for Authorized Inspection and Subcommittee on Accreditation and has served on committees of the National Board of Boiler and Pressure Vessel Inspectors.

"Bob is part of a long tradition of HSB supporting ASME and National Board standards development over the last 100+ years," said Tom Pastor, Vice President - Codes & Standards, HSB. "Bob sets the standard for what it means to be a committee volunteer. He has been a significant contributor on ASME Boiler and Pressure Vessel code committees since 1988 in the areas of Section I Power Boilers, Section IV Heating Boilers, and Conformity Assessment. In the area of Conformity Assessment, he has served on no less than seven different committees, several of which he served terms as Chairman."

## ASME Three-Day Seminar

Introduction to ASME Section VIII, Division 1 and NBIC Repairs and Alterations. The seminar will cover the following:

Material	Design	Fabrication	NBIC Repairs and Alterations
Requirements	Basic Design Philosophy	Overview	General Requirements
Recertification	Design Equations for Common Shapes	Material Control	Quality Management
Documentation	Openings and Reinforcements	Joint Preparation	PWHT / Alternative Welding Methods
Indentification	Toughness	Postweld Heat Treatment	Welding Performance Qualifications
	Pressure Testing, Manufacturer's Data Report and More		Forms

Location	Dates
Charlotte, NC	September 18 - 20, 2018

To Register: <https://bookstore.hsbct.com> or call 860-722-5061.

NBIC Repairs and Alterations and ASME Section IX. The seminar will cover the following:

<u>NBIC Reparis and Alterations</u>	<u>Welding</u>
<u>General Requirements</u>	<u>General Requirements</u>
<u>Quality Management</u>	<u>Welding Procedure Qualifications</u>
<u>PWHT / Alternative Welding Methods</u>	<u>Welding Processes</u>
<u>Welding Performance Qualifications</u>	<u>Welding Performance Qualifications</u>
<u>Forms</u>	

<u>Location</u>	<u>Dates</u>
<u>Houston, Texas</u>	<u>October 16 - 18, 2018</u>
<u>St. Louis, Missouri</u>	<u>November 6 - 8, 2018</u>

To Register: <https://bookstore.hsbct.com> or call 860-722-5061.

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August 2018

*Pressure Points* is published by

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Hartford, CT 01141-0299

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