



# **Accreditation of Hot Tap Organizations**

## **TSSA Guide for Survey Teams**

**Technical Standards & Safety Authority  
Boiler & Pressure Vessels Safety Division  
3300 Bloor Street West  
14<sup>th</sup> Floor, Centre Tower,  
Etobicoke, Ontario, M8X 2X4  
CANADA**

	Section	Manual Reference	Yes	No	N/A	Comments
--	---------	------------------	-----	----	-----	----------

**Notes:**

1. This checklist is prepared for the use of TSSA Survey Team Leaders and Inspectors and shall be used in conjunction with TSSA Checklist for Accreditation of B &PV Repair or Alteration Organizations, API Recommended Practice 2201 and TSSA Safety Bulletin SB05-02.
2. Scope of this checklist is for
  - a. Hot taps on in-service pressure piping using welded construction [2.1]
  - b. Ferritic & Austenitic materials [2.1]
3. This checklist does not address all situations nor answer all potential questions [API 2201, 1.1]
4. This checklist is not a substitute for specific job planning [1.2]
5. It is the responsibility of the owner to ensure that all of the necessary engineering, installation and safety requirements are addressed for any given hot tap operation [SB05-02]
6. Where more than one organization is involved in the various activities required for the hot tap, the owner shall ensure that all of the organizations to be involved are coordinated and advised of their responsibilities [SB05-02].

Company Name & Address

---



---



---



---

Reviewed By

---

Date:

---

	Section	Manual Reference	Yes	No	N/A	Comments
	<p><b>Scope of Work</b></p> <ul style="list-style-type: none"> <li>- Does the scope of work in the manual describe: [SB05-02] <ul style="list-style-type: none"> <li>▪ The scope of hot tapping that the organization is capable of (ie. Welding the hot tap fitting to the pressure boundary, hot tapping operation, etc.)</li> <li>▪ The type of hot tapping connections (welded, mechanical, etc.)</li> <li>▪ Service Restrictions (flammable or non-flammable fluids, etc)</li> <li>▪ The types of equipment to be worked on (ie. Piping, pressure vessels, tanks, etc)</li> </ul> </li> </ul>					
	<p><b>Drawings, Design &amp; Specifications</b></p> <ul style="list-style-type: none"> <li>- The Owner / User is responsible to submit drawings &amp; design calculations for hot tapping to TSSA for Registration.</li> <li>- Does the drawing provided by the Owner / user include the following information: <ul style="list-style-type: none"> <li>▪ Code of Construction (incl. B31.3 Category when applicable)</li> <li>▪ Pipeline or pressure component Service</li> <li>▪ Design conditions (Pressure, Temperature, etc)</li> <li>▪ Operating conditions of the in-service pipeline (pressure, temperature, flow rate) [API 2201, 6.3]</li> <li>▪ Pressure test of branch</li> </ul> </li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p>connection (method, pressure, temperature)</p> <ul style="list-style-type: none"> <li>▪ Material specifications (pipeline, hot tap fitting, repads, valves, bolting, gaskets, etc)</li> <li>▪ Hot tap fitting attachment weld details (weld joint configuration, weld sizes)</li> <li>▪ Hot tap fitting &amp; valve details (type, material, schedule, thickness, class or rating, etc)</li> <li>▪ Minimum base metal thickness required for the main pipe run</li> <li>▪ NDE requirements (method &amp; extent)</li> <li>▪ PWHT requirements (method &amp; extent)</li> <li>▪ Hardness testing requirements</li> </ul>					
	<p><b>Materials</b></p> <ul style="list-style-type: none"> <li>- The materials used in making repairs or alterations shall be of known weldable quality, shall conform to the Code of Construction and shall be compatible with the original material [API 570-1993, 6.2.4]</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p><b>Hot Tap Welding</b></p> <ul style="list-style-type: none"> <li>- WPS &amp; WPQ for hot tapping shall be qualified in accordance with the Code of Construction</li> <li>- Hot tap welding shall be done in accordance with API Publication 2201 [API 570- 6.2]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has conducted a review of the piping metallurgy and line contents to ensure that hot tapping is appropriate [API 2201, 4.3.1]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has taken into consideration the following risks associated with in-service welding [API 2201, 6.1] <ul style="list-style-type: none"> <li>▪ Weld Burn-through</li> <li>▪ Weld Cracking</li> </ul> </li> <li>- The TSSA Certificate Holder shall verify the Owner / User has evaluated the heat transfer during welding to determine the heat input and related welding variables in order to prevent overheating &amp; burn-through during welding [API 2201, 6.1]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has inspected the pipeline for adequate wall thickness and absence of imperfections in the location of the hot tap [API 2201, 6.1]</li> </ul>					

	<b>Section</b>	<b>Manual Reference</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
	<ul style="list-style-type: none"> <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined that the existing pipe metal thickness is adequate for the pressure and temperature involved so that the weight of the hot tapping machine, equipment and personnel can be safely supported and operated [API 2201, 6.1]</li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined the metal chemistry of the equipment to be welded or hot tapped [API 2201, 6.1]</li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined that the metallurgy of the weld materials, the hot tap fitting and the welding electrode are compatible with the metallurgy of the equipment to be welded or hot tapped [API 2201, 6.1]</li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined if the use of low hydrogen process and electrodes are required to minimize weld cracking problems [API 2201, 6.1]</li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined if the use of special welding procedures for high tensile strength steels is required to avoid weld cracking and the need for PWHT [API 2201, 6.1]</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<ul style="list-style-type: none"> <li>- In order to avoid overheating during welding, has the WPS been based on: [ 6.1] <ul style="list-style-type: none"> <li>▪ Experience in performing welding operations on similar piping and / or</li> <li>▪ based on heat transfer analysis</li> </ul> </li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has specified the method and extent of the preheat required prior to welding [6.7]</li>   <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined if it is necessary to purge or flood the line (with steam, inert gas, or hydrocarbon gas) to prevent the formation of flammable mixtures during in-service welding [6.3]</li> </ul>					
	<p><b>PWHT</b></p> <ul style="list-style-type: none"> <li>- The TSSA Certificate Holder shall verify that the Owner / User has determined the method &amp; extent of PWHT required for the weldments which attach the hot tap fitting to the pressure boundary [API 2201, 6.6]</li>   <li>- If PWHT is required, the TSSA Certificate Holder shall verify that the Owner / User has identified any potential ignition sources and to provide the PWHT procedure to be used [6.6]</li> </ul>					

	<b>Section</b>	<b>Manual Reference</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
	<p><b>NDE</b></p> <ul style="list-style-type: none"> <li>- The TSSA Certificate Holder shall verify that the Owner / User has specified the method &amp; extent of NDE required for the weldments which attach the hot tap fitting to the pressure boundary</li> <li>-</li> <li>-</li> </ul>					
	<p><b>TSSA Inspector</b></p> <ul style="list-style-type: none"> <li>- The TSSA Inspector shall have free access to all areas involving hot tapping</li> <li>- All documentation related to hot tapping &amp; line stopping shall be made available to the TSSA Inspector</li> </ul>					
	<p><b>Hot Tapping Procedure</b></p> <ul style="list-style-type: none"> <li>- The Owner or User shall convene a site safety meeting to ensure that all personnel involved in the hot tap are familiar with their responsibilities and the applicable safety procedures. [SB05-02]</li> <li>- The Owner or User is responsible to ensure that all of the necessary engineering, installation and safety requirements are addressed for any given hot tap [SB05-02]</li> <li>- Where more than one organization is involved in the various activities required for the hot tap, the Owner / User shall be responsible to ensure that all of the organizations involved are coordinated and advised of their</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p>responsibilities. [SB05-02]</p> <ul style="list-style-type: none"> <li>- The Owner or User shall invite the TSSA Inspector to the Site Safety Meeting</li> <li>- Is there provision to describe the experience, skills and knowledge necessary for the following categories of personnel: [API 2201, 1.5.1, 1.5.2] <ul style="list-style-type: none"> <li>▪ Competent personnel</li> <li>▪ Qualified personnel</li> </ul> </li> <li>- Is there provision for the employer to designate these person(s) [API 2201, 1.5]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has performed a hot tapping Job analysis which should include the following: [4.1] <ul style="list-style-type: none"> <li>▪ What needs to be accomplished</li> <li>▪ How the work is to be done</li> <li>▪ Whether or not hot tapping is appropriate</li> <li>▪ Do alternatives to hot tapping exist within reasonable engineering and economic bounds</li> </ul> </li> <li>- The Owner / User is responsible to conduct a job specific hot tapping review prior to work authorization: [4.3]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has ensured that the existing piping base</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p>metal thickness will provide adequate support for the new construction and the hot tapping machine, or</p> <ul style="list-style-type: none"> <li>- Alternatively, the Owner / User may specify the use of reinforcement pads or other means of support for the hot tapping machine. [6.4]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has ensured that the base metal is free of laminations, hydrogen attack or stress corrosion cracking: [6.4]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has evaluated imperfections which might prevent a sound weld from being made. [6.4]</li> <li>- The TSSA Certificate Holder shall verify that the Owner / User has specified the minimum base material thickness requirements in the written documentation for the job [6.4]</li> <li>- The Owner / User is responsible to select the proper hot tap fitting for the specific application (ie. Welded outlet, weld ends, split tees, saddles or nozzles) [6.5]</li> <li>- The Owner / User is responsible to provide a written, job specific hot tap procedure / checklist prior to starting each job to ensure that appropriate measures are addressed? [API 2201, 1.2]</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<ul style="list-style-type: none"> <li>- Each TSSA Certificate Holder is responsible to develop a checklist for the scope of work to be done by their organization</li> <li>- The TSSA Certificate Holder shall present the checklist to both the Owner / User and to the TSSA Inspector for review and insertion of inspection points.</li> <li>- The Owner / User is responsible to coordinate all TSSA Certificate Holder checklists</li> </ul>					
	<p><b>Hot Tapping Machine (HTM) Operation</b></p> <ul style="list-style-type: none"> <li>- Has TSSA Certificate Holder determined that the HTM been designed &amp; constructed to withstand the pressure &amp; temperature and mechanical stress, which may be imposed during operation? [7.1]</li> <li>- Has TSSA Certificate Holder determined that the HTM cutter and pilot bit have been carefully inspected to ensure that they are in satisfactory condition prior to use? [7.2]</li> <li>- Has TSSA Certificate Holder determined that the HTM is capable of being left in service in the event of mechanical problems or valve leakage? [7.2]</li> <li>- Has TSSA Certificate Holder determined that the P-T ratings of the HTM been checked and verified</li> </ul>					

	<b>Section</b>	<b>Manual Reference</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>	<b>Comments</b>
	<p>against the drawing? [7.2]</p> <ul style="list-style-type: none"> <li>- Has TSSA Certificate Holder given consideration to the possibility of operational upsets during operation of the HTM? [7.2]</li> <li>- Has TSSA Certificate Holder determined that the HTM operator been qualified? [8.3]</li> <li>- Has TSSA Certificate Holder determined that the HTM was assembled and installed by competent personnel? [8.3]</li> <li>- Has TSSA Certificate Holder determined that the skills of the personnel have been achieved by on-the-job training or by formal training provided by the manufacturer of the HTM? [8.3]</li> <li>- The TSSA Certificate Holder shall ensure that a competent person shall be present during the hot tap operation [10.1]</li> <li>- Has TSSA Certificate Holder shall verify that the Owner / User has physically marked the location of the hot tap? [10.1(b)]</li> <li>- Has TSSA Certificate Holder shall verify that the Owner / User has evaluated the pipe wall thickness within the past 28 days? [10.1(c)]</li> <li>- The TSSA Certificate Holder shall verify that there is a documented hot</li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p>tap plan in place [10.1(d)]</p> <ul style="list-style-type: none"> <li>- The TSSA Certificate Holder shall verify that there is a documented contingency plan in place [10.1(e)]</li> <li>- <b>The TSSA Certificate Holder is responsible to check the following items prior to operation of the hot tap machine (HTM):</b> <ul style="list-style-type: none"> <li>▪ Has the visual weld inspection of the hot tap fitting attachment welds been completed? [10.3]</li> <li>▪ Has the pressure test of the hot tap fitting been completed? [10.3]</li> <li>▪ Has the mfg instructions been followed when installing the HTM? [10.4]</li> <li>▪ Has the hot tap valve been tested for seat leakage prior to installation? [10.4(a)]</li> <li>▪ Has it been confirmed that the HTM bleed off valve will hold pressure and is not plugged? [10.4(e)]</li> <li>▪ Has the HTM bolts &amp; packing been checked for tightness? [10.5(a)]</li> <li>▪ Has the hot tap fitting, valve and HTM been pressure tested? [10.5(a)]</li> <li>▪ Once cutting has started, it should proceed without interruption until the hot tap has been completed and the valve closed [10.6]</li> <li>▪ Will the HTM mfg instructions</li> </ul> </li> </ul>					

	Section	Manual Reference	Yes	No	N/A	Comments
	<p>be followed when retracting the bore and closing the valve [10.6(b)]</p> <ul style="list-style-type: none"> <li>▪ Is there a contingency plan in case that the coupon is lost [10.6(b)]</li> <li>▪ Have provisions been made to ensure that adequate containment is available to control liquids and vapors trapped within the HTM? [10.6(c)]</li> </ul>					
	<p><b>Does the TSSA Certificate Holder have the following Reference Materials available?</b></p> <ul style="list-style-type: none"> <li>- Code of Construction (ie. ASME B31.1, B31.3, B31.5, etc)</li> <li>- ASME Section IX</li> <li>- Material specifications (ASME and / or ASTM as applicable)</li> <li>- API 2201 Safe Hot Tapping Practices in the Petroleum and Petrochemical Industries</li> <li>- Hot tap machine manufacturer installation and / or operating instructions (as applicable)</li> </ul>					