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Procedure
for
Performing Hot Taps

REVISION

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2	DCN1441	Updated link to SUNY Poly Contractor's Forms Internet Page	8-25-17	B. Borden	P. O'Dea

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1 PURPOSE AND SCOPE

To define procedure for performing 'Hot Taps' at the Colleges of Nanoscale Science and Engineering (CNSE) at SUNY Polytechnic Institute (SUNY Poly) and Kiernan Plaza. The procedure is to protect the integrity of the system being tapped.

This procedure applies to welding or cutting on unlined metal piping, tanks, and vessels or other operating equipment (herein specified as "equipment") without emptying, purging, and blinding steps to prepare the repair area.

2 DEFINITIONS

- 2.1 **Hot Tapping** - The technique of attaching a welded branch fitting to piping or equipment as it remains in service, and then creating an opening in that piping or equipment by drilling or cutting a portion of the piping or equipment within the attached fitting. Hot Tapping by definition involves Hot Work on equipment "in service".
- 2.2 **Hot Work** - Includes all potential ignition sources such as welding, burning torches, abrasive blasting, portable grinders, or any other heat or spark producing equipment.

3 RESPONSIBILITIES

Compliance with this procedure is the responsibility of the CNSE employee responsible for the work activity.

4 ASSOCIATED DOCUMENTS

- 4.1 **CFM-00004** - Obtaining Work Authorization Permits
- 4.2 **CFM-00004-F1** - Work Authorization Permit
- 4.3 **CFM-00005** - Obtaining Fire Protection System Daily Permits Instructions
- 4.4 **CFM-00005-F1** - Fire Protection System Daily Permit
- 4.5 **EHS-00029** - Hot Work Procedure
- 4.6 **EHS-00029-F1** - Hot Work Permit

5 SAFETY

Reference to the EHS Safety website:

<https://sunypoly.edu/research/albany-nanotech-complex/contractor-forms-training.html>

6 PROCEDURE

6.1 General

6.1.1 Criteria which must be met to satisfy the Lockout / Tagout exemption for performing Hot Taps are:

- 1) Continuity of service is essential;
- 2) Shutdown of the system is impractical;
- 3) Documented procedures are followed;
- 4) Special equipment is used which will provide proven effective protection for personnel performing the Hot Tap.

6.1.2 If all four criteria cannot be met, then the Hot Tap should NOT be performed and the Lockout / Tagout Procedure should be followed for performing the work.

6.1.3 This Hot Tap Procedure is applicable to piping and equipment manufactured from ferrous (iron) and austenitic steel. Other materials – cast iron (Mondi pipe), aluminum, copper, etc. – are NOT covered in this procedure and may be unsuitable for Hot Tapping or may require special procedures.

6.2 Approval Process

6.2.1 Any job requiring a Hot Tap shall have a detailed, written, job-specific procedure approved prior to submitting the applicable work permits (Work Authorization Permits, Hot Work Permit, Daily Fire Protection Permits, etc.). If more than one Hot Tap is to be performed, then each will have a separate documented Hot Tap Procedure and associated job-specific work permits. See paragraph 6.5

6.2.2 Manager of Facility Operations or System Owner shall review and approve the written job-specific Hot Tap procedure prior to submission of permits to perform of the work.

6.3 Hot Tap are NOT Permitted:

- 1) If by inspection and calculation the wall thickness is less than minimum wall thickness for that alloy, schedule, and service. If below the minimum wall thickness the system should be shut down for repairs immediately.
- 2) If the alloy, service, or metal thickness requires stress relieving of welds.
- 3) In hydrogen and hydrogen rich (30% or greater) services because of tendency to leak through packing glands and potential hydrogen embrittlement of the metal.
- 4) On flammable material lines containing air or oxygen because of potential detonation.
- 5) On compressed air lines or air receivers because of the possibility of residue lubricating oil or carbonaceous material, which may ignite.
- 6) On hydrocarbon systems operating under a vacuum because of potential detonation.
- 7) On any vessel under vacuum.
- 8) On systems containing acid, caustic, amine, or elemental sulfur because these materials can cause a metallurgical change in the metal and may require stress relieving, unless a variance is given by appropriate supervision.
- 9) On cold service lines or equipment where a minimum metal temperature of 50°F cannot be maintained throughout the process (cooling water is an exception).
- 10) On thin wall pipelines where fluid temperature is so high that there would be a risk that the heat of welding / cutting would not be dissipated, unless a variance is given by appropriate supervision.

6.4 Hot Tapping Guidelines

- 6.4.1 Hot Tapping equipment shall utilize a multi-rail alignment systems, packing housings with multiple o-rings seals rated for a minimum of 150% of the system being tapped (temp & press), heavy-duty variable speed drive motors with clutch assemblies, etc. Provide information on equipment for review.

6.4.2 A Facilities Operations Group (FOG) or System Owner representative shall be present during the actual drilling operation of the Hot Tap work.

6.4.3 A continuous flow of product must be maintained through the pipe being Hot Tapped, welded, or cut during the entire operation to carry off heat.

6.4.4 When performing Hot Work on the outside surface of a pipe, precautions should be in place to protect against overpressure resulting from thermal expansion of the contents.

6.5 Written Job-Specific Hot Tap Plans

6.5.1 Prior to commencing the work associated with the Hot Tap, a job-specific written plan will be developed and approved. The plan will include at the minimum:

- 1) Connection location;
- 2) Connection design, including the specification of gaskets, valves and bolts;
- 3) Thickness determination of the vessel or pipeline to be Hot Tapped;
- 4) Detailed written welding procedure;
- 5) Inspection and pressure testing of the attachment weld after completion of the welding and prior to attaching the Hot Tap machine;
- 6) Hot Tap procedure;
- 7) Plan to control and monitor process variables while Hot Tapping is being performed;
- 8) Work Authorization Permit, Hot Work Permit and Daily Fire Protection Permit;
- 9) Signs and barriers to isolate the job site;
- 10) Health, safety, fire protection, emergency response and other procedures and instructions;
- 11) Names and experience of personnel performing the welding and Hot Tap procedures.

- 12) Should a problem arise with the tapping procedure, include a specific plan to seal off the tap and isolate it in a manner which maintains the integrity of the system being tapped. The materials and methods shall be similar to the tapped system and shall be designed for the life of the system.
- 13) Provide an emergency shutoff procedure for the piping system being tapped. Identify valves, provide access to valves and assign responsibility of turning off valves

7 RECORDS

Related permits (Work Authorization Permits, Hot Work Permit, Daily Fire Protection Permits and Hot Tap Plans) shall be kept on file (electronically) by the Facilities Department for at least three years.