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Document: Hot Tap & Vacuum Line Policy

Execution

- A. This section must be reviewed to determine if this Hot Tap procedure is practical for your specific situation. Hot Taps can be performed only when:
1. Continuity of service is essential.
 2. Shutdown of the system is impractical.
 3. Documented procedures are followed (if necessary an SSOP must be developed).
 4. Special equipment is used which will provide effective protection for employees. To include, UL or ASME rated/approved equipment (this includes tapping tools – homemade taps cannot be used). Follow the manufacturer’s specifications manual(s) for tapping equipment.
 5. An engineering evaluation has to be done before welding or hot tapping on vacuum lines, please see Vacuum Lines and Vessels section below. An engineering evaluation must also be done when hot tapping upstream of rotating equipment and control valves without filters or strainers in place between the hot tap and equipment.
 6. If a full size hot tap is being done, (2 inch on 2 inch for example) a split tee fitting shall be used.
 7. Hot taps shall NOT be done on pipelines carrying these fluids:
 - a. Vapor/air mixtures, vapor/oxygen mixtures, compressed air (oil and carbon deposits in these systems are explosive), hydrogen.
 - b. Chlorine, Caustic, Peroxide, Acids, Amines (these contents react when exposed to high heat and may also cause hydrogen embrittlement of material during welding).
 8. Hot tapping will not be conducted on pipes or vessels that are lined.
 9. Hot tapping on the decks of floating tank roofs is prohibited.
 10. If hot tapping in a confined space (an excavated ditch), compliance with Escanaba Mill Confined Space Policy will be required, it will be required to obtain a permit and have continuous air monitoring at a minimum. Please review the mill’s Confined Space Policy.
 11. Before any work is to begin a pre-job huddle must be conducted with all involved employees to review all safety aspects of the job, including problems that may arise and communications with the front gate.
- B. Hot Tapping Procedure:
1. Identify material to be tapped (carbon, SS, etc.), and use compatible fitting.
 2. The location of the tap in the pipeline has to have UT thickness readings taken. These readings must confirm that the pipeline thickness is greater than the minimum thickness required by ASME B31.1 for the pressure, temperature, and material of the pipe in service. See Maintenance Trainer for ASME B31.1 on Power Piping.

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3. To prevent burn-through no hot taps shall be installed on piping with thickness less than an 1/8 inch. 3/32 inch electrodes will be used on parent material less than ¼ inch thick. Subsequent passes can be applied using 1/8 inch electrodes. If parent material is ½ inch thick and above, larger diameter electrodes can be used for entire weld.
- C. Temperature control during welding:
1. Flow should be maintained in the tapped line to carry heat away without causing weld to cool at such a rate that cracking becomes a problem. If heat is being removed at too fast a rate, heat should be applied to weld area to allow slow cooling, if flow cannot be slowed.
 2. If the tapped line is below dew point (pipe is sweating), preheat should be used to eliminate moisture.
 3. If connection is being made to a tank or vessel, liquid level must remain at least 3 feet above weld area. Controls should also be in place to monitor this level as welding progresses.
 4. Hot taps cannot be performed on closed systems where thermal expansion created by welding will increase pressure in the system.
- D. When the weld is complete, pressure test the seat of a fully ported valve, to at least the operating pressure that the valve will be used in, but do not exceed the rated pressure of the valve. Install this valve with special attention given internal alignment for hot tap equipment.
- E. Install the hot tap machine, and check for clearances. Also measure drill or hole saw travel required to complete tap.
- F. Pressure test the fitting and hot tap assembly. This should be pressurized to at least the pressure in the tapped line, not exceeding 1.1 times that pressure.
- G. Complete the tap, retract the cutting assembly, close the valve, and bleed off pressure before removing the hot tap machine.

II. Vacuum Lines and Vessels for Grinding, Patching and Banding Live Lines

A vacuum within lines and vessels are considered energy sources and a potential for hazards exists; therefore, they must be considered for lockout as would any other energy source under our policy. The policy applies to any vessels, and lines greater than two inches in diameter. The following must be addressed before work is assigned on any vacuum line or tank:

- A. The integrity of the line must be assessed (including external fixtures, such as brackets), by the work group involved (pre-job huddle) if invasive work such as grinding, patching or banding is to begin on the “live” line or vessel, the following must be reviewed:
1. Is the work to be conducted covered under the Hot Tapping Procedure? If not, continue...
 2. Is the line visually distorted or collapsed in any way.



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3. Area Reliability Engineer must get involved to determine if work can be conducted in or on the line or vessel (particularly if the line is to be worked on and not locked out. Ultrasonic Testing (UT) or equivalent may be required to be performed on a “live” line or vessel before work can begin. See ASME – Section VIII, Pressure Vessels, Thickness of Shells and Tubes Under External Pressure – section on vacuum systems. See Maintenance Trainer for ASME B31.1 on Power Piping.
4. Is the work necessary or can the work be put off until the system is down, or can work be altered to reduce hazard (reduce load or valve out).



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HOT TAP CHECK LIST

Location _____

Date _____

Description _____

Prepared
By _____

Before Starting the Hot Tap

1. Section A (safety considerations) of the Hot Tap Procedure has been reviewed.
2. Does the hot tapping machine have adequate temperature and pressure ratings, cutter travel, and corrosion resistance for the particular job?
3. Have the contents of the line been considered and does the procedure take into account the hazards?
4. Are all of the materials compatible and do they meet the code specifications of the line that is going to be tapped?
5. Has the location of the tap been identified and inspected? Type of material, UT readings, and clearance from weld seams-flanges-threaded connections. Can it structurally support the hot tapping machine?
6. Is there sufficient external as well as internal clearance for the hot tap machine?
7. Has a flow been established in the line or has it been determined that the liquid level is above the area to be hot tapped in a tank or vessel?
8. Is the pressure testing equipment available and has the pressure to be tested at been established?
9. Perform Pre-Job Huddle

Before Welding

1. Are the welders and the procedure qualified for the specific job?
2. Have Preheat and Postheat been taken into consideration?
3. Does the welder have the proper PPE available in case of a failure?
4. Has Hot Work Permit been called in to front gate?

Before Cutting

1. Is all the pressure testing complete?
2. Are all the bolts tight on the hot tap machine?
3. Has cutting depth been established to avoid cutting the opposite side of the pipe?

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4. Has a dry run been completed to check for clearances?
5. Has Hot Work Permit been called in to front gate?

Before removing the hot tapping machine.

1. Retract hot tap machine and close valve.
2. Bleed off the pressure.
3. Make provisions to catch spilled contents if necessary.

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NewPage – Escanaba Michigan Operations

Subject: Hot Tapping & Vacuum Line Procedure		Number: PC-02	
Effective Date: May 2006		Pages: 05	
Revision Date: November 2007		Approved By: Safety Leadership Committee	
Revision History			
REVISION	PAGE(S) AFFECTED	DATE	DESCRIPTION OF CHANGE
01	Added Pages 2, 3 and 4	11/13/07	<ol style="list-style-type: none"> 1. Section added - Vacuum Lines and Vessels for Grinding, Patching and Banding Line Lines. 2. Checklist added.
02	All	1/25/2022	<ol style="list-style-type: none"> 1. Reference changes for ASME B31.1. 2. Hot Work Permit questions. 3. Name change, Newpage to Escanaba Mill