Proven Experience. Trusted Results.

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Temporary Pipe Works

- Temporary pipe works is a very large portion of a new employees second week of class
- This week of class is known as B.E.S.T. Class
  - Basic
  - Employee
  - Skills
  - Training
B.E.S.T. Class Training one week long.

• 1) Class + Cudd rules + policies
• 2) Service Line Intro
• 3) Service Line Equip + stimulation Equip Ident.
• 4) BISON Safe Hands
• 5) Fall Protection inspection
• 6) Hands on Using fall Protection (climbing sand hulks)
• 7) JSA’S
• 8) Frac Iron Training
• 9) Pipe works

• 10) SPM Safety Iron and Hammer Hazards video
• 11) Iron Ident.
• 12) Hands on Frac Iron Rig-Up
• 13) Hands on Lock-out tag-out on a Pump Truck
• 14) Hands on Fluid end Rebuild
• 15) HRP process
• 16) Remember Charlie Video
• 17) Friday overview + Test
Purpose For Temporary Pipework Standard

Global Temporary Standard has been developed to rationalize and control the use of both the operator and contractor supplied temporary pipework in order to improve the safety of a wide range of operations that utilize this equipment and associated pipework interfaces.

Temporary pipework is a function description also known as flow control equipment or treating iron. In a large number of applications the connections of this equipment is made with hammer lugs or WECO unions which can be integral, welded or threaded (threaded make-up is not acceptable except in low <285 psi) pressure service to the pipework on which they are formed or joined.

There is NO single standard or organization such as API, NORSOK or IADC, which has set requirements for the design, manufacture and installation of temporary pipework used for operations on wells.

Although the same nominal temporary pipework connections from different suppliers are dimensionally compatible and, can therefore be connected, the design standards of the pipe body on which the unions are forged or welded, can be and often are DIFFERENT.

This standard identifies and reconciles the acceptable design and manufacturing codes.

Additionally, much process instrumentation is hooked up using temporary pipework. The inlets and outlets of this process equipment, including blanked or instrument tapped temporary pipework connections are subject to the requirements of this standard.
What The Standard Requires

- CERT / IERT Completion / Intervention Equipment Review Team
- CID / Connection Interface Diagram Drawing of the layout of temporary pipework
- FIG # implying figure or drawing number designated working pressure of the union
- IERT Intervention Equipment Review Team
- P&ID Piping and Instrumentation Diagram
- Temporary Pipework must be inspected and documented
- Temporary Pipework must meet manufactures designed limits for any operation and can be inspected by CERT/IERT
- Temporary Pipework SHALL meet the requirements of ASME B31.3
- Temporary Pipework SHALL have been “TYPE APPROVED” by an independent Competent Body
- All Temporary Pipework components, restraints, connections SHALL undergo an independent design review by a Competent Body
- Anchor points for temporary pipework restraint system SHALL be suitable for the potential dynamic loading that could be applied to them
- Walking the Line to verify that temporary pipework, including blanked outlets, is installed according to design and is SAFE to test. Requires physical examination of the pipework flow by the operator and contract supervisors
- Hammer Unions wing nuts SHALL be replaced where the lug is too small to strike accurately
- Stricter or More Stringent Requirement’s where local experience or national legislation dictates higher requirements than specified in this standard
- Dispensation from this Requirements of this Standard in the event that the requirements of this standard cannot be complied with, the deviation will be reviewed and controlled via the Location Procedure for Dispensation from the operator.
Items of Temporary Pipework Covered in this Standard

- Pipework runs (straights) pup-joints, elbows.
- T-pieces
- Laterals (Y-pieces)
- Swivel Joints
- Treating Loops
- Crossovers
- High Pressure Hoses
- Flanges, Blinds, Plugs, Tapping's for Sensors, Sample Points

The pipework connections to be controlled in this standard are classified as:

- Hammer Unions
- Hub Connections
- Flange Connections
- Pressure Sealing Threaded (PST) Connections
- Non-Pressure Sealing Thread (NPST) Connection of Hammer Union Subs to the Pipe
- Pipe Body To Pipe Body (Welded Connections)
Training Objectives

• Standard Frac Rig-up
• Frac Iron Maintenance
• Frac Iron Inspection
• Go/ No Go Gage
• Frac Iron Inventory Process
• Hands on Assessment
• Written Assessment
• Feedback
## FRAC-208 Standard

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Clean all connections from dust and debris using a wire brush.</td>
</tr>
<tr>
<td>2</td>
<td>Visually inspect connections for cracks and thread defects. Also inspect segments (&quot;dogs&quot;) at the wing and snap ring. Refer to vendor guidelines below (Flow Iron Visual Inspection). All defective frac iron will be identified with fluorescent orange paint and taken out of service. Note: Inspect iron certification bands and verify that the certification date is not expired.</td>
</tr>
<tr>
<td>3</td>
<td>Perform Go/No-Go testing on all frac iron to be utilized in rig-up. Refer to vendor guidelines below (Go/No-Go Testing Procedure). All defective frac iron will be identified with fluorescent orange paint and taken out of service.</td>
</tr>
<tr>
<td>4</td>
<td>Replace seal inserts on each thread half before connection is made.</td>
</tr>
<tr>
<td>5</td>
<td>Lubricate wing half and thread half before connection is made.</td>
</tr>
<tr>
<td>6</td>
<td>Chiksans should be checked for smooth swivel rotation. If Chiksan shows any stiffness in rotation Chiksan should be properly greased.</td>
</tr>
<tr>
<td>7</td>
<td>Grease wheel valves and plug valves on daily basis.</td>
</tr>
</tbody>
</table>
Frac Iron Inventory Process

• Identify iron piece per zone
• Record serial number and zone for the frac iron database

All information for each piece of iron must be readily available upon customer request.
Inspection Tag
Manufacture Tag on Valves

VA0375 STD 0206
A342060 15000 PR 1"
PU AA 1

Valves-Fittings-Manifolds-Pumps
Assembly P/N
Date
Serial #
Working Pressure
Size
Temp Class
Ret Fluid
www.diwmsi.com

Division of Dixie Iron Works, LTD
300 West Main • Alice, Texas 78332
800-242-0059

CUDD ENERGY SERVICES
Cudd Energy Services
Mis-Match Hammer Unions

- Hammer Unions
- 2”, 3”, 4” Iron Pipe Connections For Oilfield Work
- Properly Identify Markings
- Pressure Ratings
- Periodic Inspections
- Taking Proper Actions When Discrepancies Arise
- Your Right and Obligation to Stop Work Authority
Forbidden Hammer Unions & Pipework In The Standard

1. 2” FIG 602 Hammer Unions
2. 2” FIG 1002 Hammer Unions
3. NOTE: The Industry has redesigned the 2” 602 & 2” 1002 female subs preventing their thread to engage in the 2” 1502 wing nut. However the position remains that both the “OLD STYLE” and “NEW STYLE” are BANNED from use.
4. EXCEPTIONS: 2” 602/ 607 hammer unions manufactured with Left Hand Threads
5. Hammer Unions flowing produced, energized fluids from the well at pressures greater than 10,000 psig.
6. Pipework where the pipe body has a lower pressure rating than either of its end connections.
7. The Pressure De-rating of pipework from its original working pressure specifications because of reduction in its wall thickness below the minimum prescribed by the manufactures to retain its original wall thickness
8. Back welded threaded connections or fittings
9. Non-pressure Sealing Thread (NPST) pipework without external hammer union sub.

1. NOTE: It is preferred that temporary pipework equipment be supplied as one-piece (integral) forged items, but fabrication from pipe with butt-welded unions is acceptable.
2. Threaded unions of any description are not acceptable except under the conditions stated in this standard
The First Hazard

A 2” 1502 Wing Nut will make up to a 2” 602 or 1002 thread half but will fail ... explosively.

<table>
<thead>
<tr>
<th>Series (Figure)</th>
<th>Standard Working Pressure</th>
<th>Nominal Pipe Sizes (dia - inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>1,000</td>
<td>2, 2½, 3, 4, 6, 8</td>
</tr>
<tr>
<td>200</td>
<td>2,000</td>
<td>1, 1¼, 1½, 2, 2½, 3, 4</td>
</tr>
<tr>
<td>206</td>
<td>2,000</td>
<td>1, 1¼, 1½, 2, 2½, 3, 4, 6, 8, 10</td>
</tr>
<tr>
<td>207</td>
<td>2,000</td>
<td>3, 4, 6, 8, 10</td>
</tr>
<tr>
<td>211</td>
<td>2,000</td>
<td>1, 1¼, 1½, 2, 2½, 3, 4</td>
</tr>
<tr>
<td>400</td>
<td>2,500</td>
<td>5, 6, 8, 10, 12</td>
</tr>
<tr>
<td>400</td>
<td>4,000</td>
<td>2, 2½, 3, 4</td>
</tr>
<tr>
<td>600</td>
<td>6,000</td>
<td>1, 1½, 2, 2½, 3, 4</td>
</tr>
</tbody>
</table>

- **Potentially Fatal Combinations**

<table>
<thead>
<tr>
<th>Series (Figure)</th>
<th>Standard Working Pressure</th>
<th>Nominal Pipe Sizes (dia - inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>602</td>
<td>6,000</td>
<td>1, 1¼, 1½, 2, 2½, 3, 4</td>
</tr>
<tr>
<td>1002</td>
<td>10,000</td>
<td>1, 1¼, 1½, 2, 2½, 3, 4, 5, 6</td>
</tr>
<tr>
<td>1003</td>
<td>10,000</td>
<td>2, 3, 4, 5</td>
</tr>
<tr>
<td>1502</td>
<td>15,000</td>
<td>1, 1½, 2, 2½, 3, 4</td>
</tr>
<tr>
<td>2002</td>
<td>20,000</td>
<td>2, 3</td>
</tr>
<tr>
<td>2202</td>
<td>15,000</td>
<td>2, 2½, 3</td>
</tr>
</tbody>
</table>
Pressure Testing Of Temporary Pipework

1. Walking The Line
2. Checking against the CID and the P&ID
3. Checking Restraints
4. Supervisors verifying gauges, instruments, plugs which have a physical presence to be read are mounted in an area as far as to a point in a direction where they would not harm personnel if discharged
5. TOOL BOX TALK shall be held to cover the stages in the pressure testing, the dangers from a pressure release, exclusion of personnel not directly involved with pressure test, the responsibilities of those directly involved in the pressure test
6. These test SHALL be recorded
7. The test pressure applied SHALL be at least 10% higher than the maximum operation design or expected pressure of the line section and, SHALL respect the maximum working pressure of the equipment and any safety devices and relief valves
8. Pressure testing SHALL be conducted with water, other acceptable liquids or gaseous N2
9. The pressure test SHALL start with a low-pressure stability hold period prior to the pressure being raised to the TEST pressure
10. The Test pressure SHALL be brought up in stages and held for 1 minute at each stage until final test pressure is reached
11. Retest SHALL apply to the same procedure