

# Detensioning/ Breakout Flange Procedure

January 2023

## 1.0 Purpose

- 1.1 To Detension or breakout flange connection bolts on an isolated, de-pressured and drained system utilizing hydraulic tensioners.

## 2.0 The requirements contained within this procedure are applicable to IPS★ITCS and affiliates.

- 2.1 Equipment and Tools
- 2.2 Appropriate size tensioning equipment tools.
- 2.3 Miscellaneous hand tools.

## 3.0 Customer to Furnish

- 3.1 Scaffolding, platform and/or ladder(s), as needed.
- 3.2 Plant air supply for small tools, as needed.
- 3.3 Plant air supply (Minimum of 100 psig, 100 cfm) for tensioning equipment.
- 3.4 Manpower, crane or rigging for installation and removal of equipment to and from platform if needed.
- 3.5 The support of the piping component from moving once the joint has been broken.
- 3.6 Necessary work permits and authorizations.
- 3.7 Isolation of necessary equipment following appropriate Lockout Tag-out procedures.
- 3.8 Decontamination of equipment.
- 3.9 Radiation Protection and Health-Physics service, as required for nuclear applications.

## 4.0 Pre-Job Review

- 4.1 Review job requirements and perform a job walk down with the customer.
- 4.2 A walk down of the line will be performed with the operator to confirm how the line has been blocked.
- 4.3 Verify with the Customer Contact, conditions are as stated on the Pre-Job Assessment.
- 4.4 Air requirements
  - 4.4.1 100 CFM and 100 psi air connection
  - 4.4.2 How much air hose will be needed to reach the job site
  - 4.4.3 If the air supply is not within a reasonable distance from the job site, an air compressor may be required so that an adequate amount of air is available to power pneumatic tools.
- 4.5 Permits
  - 4.5.1 What types of permit(s) will be required
  - 4.5.2 Is this a first line break
  - 4.5.3 Perform line walk down with the operator
  - 4.5.4 Who approves, signs, and receives the permit(s)
- 4.6 Decontamination of equipment, if applicable.
  - 4.6.1 Does the customer have a means of decontaminating equipment and tools that may come in contact with chemicals or radioactive material?
  - 4.6.2 If hazardous waste is generated, does the plant have areas for disposal?

## 5.0 Verify with Process Operator

- 5.1 The scope of work.
- 5.2 Identify the Joint to be Detensioned.

- 5.3 All pressure valves to the section of piping to be worked on are closed.
- 5.4 All possible branches of the line to be worked on are blinded or disconnected.
  
- 5.5 The line is empty by draining and venting all the media into the proper disposal containers or vacuum truck.
- 5.6 If no vents or drains are existing, have the flanges “air-gaped” at the block valve or tie-in point if possible
- 5.7 The line has been purged, steamed, or water washed to remove existing media that may still be in the line.
- 5.8 Vents and drains are locked or tagged open where possible on existing line.
- 5.9 Tags on all closed valves.
- 5.10 These steps were accomplished and verified by doing a thorough job walk with the permit issuer.

## 6.0 Procedure

- 6.1 Verify with the Customer Contact, conditions are as stated on the Pre-Job Assessment.
- 6.2 Complete and review Job Safety Environmental Analysis (JSEA) with all participating employees.
  - 6.2.1 A plant JSEA is acceptable in lieu of the TEAM JSEA if all points are covered.
- 6.3 Determine the maximum operation pump pressure for the brand make and model of the tensioners being used before continuing.
- 6.4 Inspect & clean all bolts and apply penetrating liquid to all the nuts as needed if allowable by customer.
- 6.5 Ensure there is sufficient stud extended beyond the nut for the tensioner to grip.
  - 6.5.1 At least one times the stud diameter in length should protrude beyond the nut.
- 6.6 Inspect piping and components for movement once the joint has been unsecured.
  - 6.6.1 Measures should be taken to secure or support the piping component from moving once the joint has been broken.
- 6.7 Determine the de-tensioning sequence according to the number of tensioner heads being utilized.
- 6.8 Using an approved marking tool (paint marker, crayon, etc.) begin to letter stud locations on the flange according to the number of sequences in each pass.
- 6.9 Letter A should be located at the top center (or top left of center) on vertical joints; and north (or west of north) on horizontal joints.
- 6.10 If using 50% Tensioner coverage continue to Letter the studs in a clockwise rotational pattern as A, B, A, B until complete.
- 6.11 If using less than 50% Tensioner coverage, continue to Letter the studs in a clockwise rotational pattern as A, B, C, A, B, C or A, B, C, D, A, B, C, D or as needed until complete.
- 6.12 Install hydraulic tensioner heads at equally spaced intervals around the bolt circle beginning with sequence Letter A.
- 6.13 When mounting the hydraulic tensioner head on the stud extension, it is important that the hydraulic piston is fully collapsed into the tensioner body.
  - 6.13.1 Screw puller Bars all the way down to the top of the hydraulic piston then back off the puller bars one complete turn. (This allows the Flange nut to be loosened without jamming against the bottom of the puller bar).
- 6.14 Assemble interconnecting hose harness and connect to pump.

- 6.15 Communicate at all times.
- 6.16 Begin tensioning sequence Letter A by gradually pressurizing the tensioning system until the nuts will break loose from the face of the flange using the tommy bar. Caution shall be taken not to exceed the maximum allowable pressure as predetermined by the tensioner manufacture for that brand make and model tensioner.
- 6.17 Slowly release the oil pressure until the gauge reads zero.
- 6.18 At this point the tensioner pistons will be partially extended and must be pressed back into the tensioner bodies prior to beginning the next tensioning sequence.

**This is done by inserting the tommy bar into each threaded insert and tightening onto the stud until each piston is fully collapsed.**

- 6.19 Re-position the tensioner heads over the next sequence to be de- tensioned.
- 6.20 Repeat steps 6.16 thru 6.19; and continue until all sequences have been de-tensioned.
- 6.21 Once all bolts have been loosened remove the studs leaving a sufficient number of studs with nuts in place, to guard against falling components, pipe spring or other unanticipated movement.
- 6.22 Record all information on Flange Make-Up Data Sheet
- 6.23 Ensure work area is left in a clean and safe condition and all permits and LO/TO has been signed off.



# Competency Assessment

No.	Questionnaire	C/NYC
Q1		
A1		
Q2		
A2		
Q3		
A3		
Q4		
A4		
Q5		
A5		

Enclosed Attachments	
Risk Assessment	<input checked="" type="checkbox"/>
Environmental Aspect and Impact	<input checked="" type="checkbox"/>
Training and Competency	<input checked="" type="checkbox"/>
Measure and Evaluation Tools	<input checked="" type="checkbox"/>

# Competency Checklist

To be filled out by Trainer and signed by Employee, Assessor and Supervisor before being returned to the HSEQT Manager for recording purposes.

Procedure	Competency	Date	Competent YES / NO	Employee Signature

(Please tick appropriate box)

This employee is competent in performing the job.


This employee has not attained the competency level.

\*

\* *If the employee has not attained all competency levels, the General Manager must assess the action to be taken, provide an extension of training or alternative action as listed below.*

Alternate action to be taken: \_\_\_\_\_

Signed By	Employee:	_____	Date:	_____
	Trainer:	_____	Date:	_____
	Assessor:	_____	Date:	_____
	Regional Manager:	_____	Date:	_____

# Environmental Aspects and Impacts

## Identified Environmental Aspects and Impacts

The following table is a summary of the likely environmental aspects and impacts that may be identified during site inspections. The significance of each impact needs to be assessed using the Risk Assessment Model.

Activity	Aspect	Impact
<b>Purchasing &amp; Administrative Work</b>	Consumption of goods	Conservation of natural resources
	Consumption of energy (eg. Electrical equipment and facilities)	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of waste (eg. Paper)	Consumption of space for waste disposal; Habitat loss
<b>Climate Control</b>	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Habitat loss
	Generation of noise	Disturbance to community; Habitat loss
<b>Cleaning of – offices / vehicles</b>	Storage, use and release of chemicals	Contamination of air, water or soil; Risk to human health
<b>Transport (Fleet vehicles / staff travel)</b>	Consumption of energy	Release of greenhouse gases and atmospheric pollution; Consumption of natural resources; Loss of habitat at all stages of generation; Light pollution
	Consumption of goods (eg. Oil)	Consumption of natural resources; Generation of waste; Habitat loss; Biodiversity impacts
	Generation of waste (eg. Oil)	Consumption of space for waste disposal; Potential contamination of water or soil; Habitat loss
	Exhaust emission	Release of greenhouse gases and atmospheric pollution
	Use of dangerous goods (eg. Batteries)	Potential contamination of air, water or soil; Risk to human health
	Generation of noise	Disturbance to community; Habitat degradation
<b>Operations</b>		

Sample only.  
To be filled in

# Risk Assessment

Risk Assessment // insert name here					
Step No: Logical sequence	Sequence of Basic Job Steps documented in the Procedure, Work Instruction and project plans. Break down Job into steps.  Each step should be logical and accomplish a major task.	Potential Safety & Environmental Hazards/Impacts at the site of the Job  Identify the actual and potential health and safety hazards and the environmental impacts associated with each step of the job.	Risk Rating  Refer to the risk matrix or HSEQT.PRO. Risk Mgt	Recommended Corrective Action or Procedure  <i>Determine the corrective actions necessary to reduce the risk to as low as reasonably practical (ALARP) refer to HSEQ.PRO.Risk Mgt. The risk must be reduced or controlled to ALARP before work commences.</i>  Document who is responsible for implementing the controls to manage each hazard identified.	Risk Rating refer to the risk matrix or HSEQT.PRO.Risk Mgt
1.					
2.					
3.					
4.					
5.					

# Audit



<b>Process:</b> insert// <b>Procedure:</b> Insert //		Date:	Audited by:	
		Location of Audit:	Area Mgr/Supervisor:	
Item	Question	Evidence Sited	Comments	Conformance Score 0,3,5
1.				
2.				
3.				
4.				
5.				
6.				
7.				
AUDITOR'S SIGNATURE:		CONFORMANCE SCORE:     / 25		0 – Non-Conformance 3 – Continuous Improvement Opportunity 5 – Total Conformance
SAFETY REP'S SIGNATURE:		CONFORMANCE %:		