

Hazard Analysis and Risk Control Record										
Doc ref:		Task/Process Assessed:	Welding booth							
Revision:		Location:								
Date:		Assessment Team:								
Operation:		Approved by:								
Activity Steps	HAZARD		INITIAL RISK			CONTROL MEASURES		RESIDUAL RISK		
	Hazard Description and Worst Case Consequences with no Prevention or Mitigation Measures in Place	Loss Category/ Population Affected	L i k e l i h o o d	S e v e r i t y	R i s k L e v e l	List all Current and Planned Control Measures, taking into Account all Contributing and Escalating Factors		L i k e l i h o o d	S e v e r i t y	R i s k L e v e l
						Current and Planned Prevention Measures to reduce Likelihood	Current and Planned Mitigation Measures to reduce Severity			

<p>Load mandrel onto turntable</p>	<p>Injuries to workers a) Pinch points b) Tripping c) Back injuries d) Feet injuries due to fallen object</p>	<p>Assets Personnel</p>	<p>Possible (3)</p>	<p>Major (-3)</p>	<p>Undesirable (-9)</p>	<ul style="list-style-type: none"> • Pre check the overhead hoist & its accessories for validity & ensure that they are in good physical condition prior to use • Operator trained to operate the overhead hoist • Only trained operator can operate the overhead hoist • Safe working load of the overhead hoist prominently displayed at site • Ensure the transported path is free of obstacles and spills • Ground guide to provide direction when visibility is obscured • During the lifting operations no one allowed to be under or near the lifted load • Unauthorised personnel prohibited from entry during the lifting operations • Pre check the mandrel & turntable for signs of pinch points & hidden traps prior to use • Ensure the welding station is free of obstruction prior to welding activity • Operator trained on the correct technique to load the mandrel & applying its locking mechanism • Only qualified welder are allowed to perform welding • Ensure there is no combustible or ignition source nearby the welding station • Operator to adopt SIPP technique during mandrel loading • Hazards identified in the HARC briefed to all operators to increase their awareness 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Signages on hands caught in between moving parts displayed at affected area of the equipment 	<p>Unlikely (2)</p>	<p>Light (-2)</p>	<p>Acceptable (-4)</p>
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Grinding parts on a rotating equipment	<p>Injuries to workers</p> <p>e) Pinch points</p> <p>f) Hands got caught between moving parts</p> <p>g) Rotating equipment fall apart</p> <p>h) Fire hazard</p> <p>i) Worker clothing caught in between the rotating equipment</p> <p>j) Tripping</p> <p>k) Scalded by the heating torque</p> <p>l) Scalded by the freshly grinded area</p> <p>m) Heat stroke due to poor ventilation</p>	Assets Personnel	P o s s i b l e (3)	M a j o r (-3)	U n d e s i r a b l e (-9)	<ul style="list-style-type: none"> • Only trained operator can performed grinding & welding operations • Operator trained on the correct grinding technique • Mandatory Workshop safety level 1 certification for all worker • Only qualified grinder can perform the welding work • Pre check and ensure that there is no combustible material stored near the welding booth • Pre check and ensure that there is no obstruction nor spills at or near the welding station • Pre check & ensure that the ventilation system is in working condition • Watch out for surface pinch or nib point and traps on working equipment , tools and table • Adopt SIPP techniques during the grinding & welding operation • Fire retardant curtain installed at welding booth • Pre check welding & cutting equipment cables & guns & tool for signs of exposed or crushed wiring & also its connections prior to using them • Jewlery, loose clothing & long unkept hair prohibited for operator performing the grinding activity • Never attempt to change tooling insert when the machine is working • Never attempt to handle shavings with bare hands • Ensure the grinding machine is setup in the correct position prior to use • Trained worker to distinguish a good flash back arrestor, non return valve & clips from the malfunctioned ones during pre check stage • Trained worker on the rotating equipment locking wheel mechanism • Housekeeping & 5S prior to starting the welding operation • No entry to authorized personnel. • Designated structure to hold the heating torque thereafter use • Periodical welder rotation • Operators trained on the use of fire extinguisher • Hazards identified in the HARC briefed to all operators to increase their awareness 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Signages on hands caught in between moving parts displayed at affected area of the equipment • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	Un l i k e l y (2)	L i g h t (-2)	A c c e p t a b l e (-4)
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<p>Weld mandrel</p>	<p>Injuries to workers n) Pinch points o) Scalded by the heating torque p) Scalded by the freshly grinded area q) Eyes injuries due to arc flash</p> <p>Damaged to property - Fire</p>	<p>Assets Personnel</p>	<p>Possible (3)</p>	<p>Major (-3)</p>	<p>Undesirable (-9)</p>	<ul style="list-style-type: none"> • Pre check the welding equipment & its accessories for proper connections and ensure that there is no exposed or crushed wiring. • Ensure no obstruction nor spill at the welding station • Pre check that the ventilation system is in good working condition • Ensure the welding rod barrel is free of trash • Ensure the electrode holder is not in contact with the ground clamp • Ensure there is no flammable nor ignition source nearby the welding station • Ensure there is a fire extinguisher nearby the welding station • Pre check the welding equipment & its accessories for signs of pinch points & hidden traps prior to using them • Ensure ground clamp is firmly attached to the welded unit • Check and ensure tank restraint chains are in placed on the torch cart and torch body valves are shut off • Ensure acetylene & oxygen pressure gauge are set at 5 & 25 PSI respectively • Use soapy water to check for connection leakage • Operator to adopt SIPP technique & ensure working in his green zone during welding • Safety signage displayed at site to warn operator not to lean against unit to be welded • Safety signage displayed at site to warn operator to use only dry leather glove for welding purposes • Only qualified welder can do the welding job • Ensure the fire retardant curtain is available at the welding booth • Pre check and ensure the welding torque is in good physical condition and its connection is intact prior to use • Unauthorised personnel prohibited from entering the welding station once welding activity commenced • Operator trained on the correct technique to weld • Operator shall tucked in working clothing during the process of welding • Designated place to store welding torque with available signage beside the heated torque indicating "hot surface" • Ensure welding equipment is switched off upon job completion 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Signages on hands caught in between moving parts displayed at affected area of the equipment • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	<p>Unlikely (2)</p>	<p>Light (-2)</p>	<p>Acceptable (-4)</p>
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					<ul style="list-style-type: none"> Hazards identified in the HARC briefed to all operators to increase their awareness Mandatory fire watch of 1 hr & 3 hr upon job completion 					
<p>Operating the torch</p> <p>a)Position torch tip b)Turn on tanks c)Oxygen & acetylene gas pressures</p>	<p>Injuries to workers</p> <p>r) Pinch points s) Scalded by the heating torque</p> <p>Damaged to property - Fire</p>	<p>Assets Personnel</p>	<p>P o s i b l e (3)</p>	<p>M a j o r (- 3)</p>	<p>U n d e s i r a b l e (-9)</p>	<ul style="list-style-type: none"> Pre check the gas tanks, torch tip & its accessories for signs of pinch points & hidden traps prior to use Always face torch tip away from body and tank assembly when torch is lighted Always turn on the acetylene tank 1st followed by the oxygen tank Purge oxygen & acetylene gas pressure individually before lighting the torch Turn on acetylene first and then the oxygen knob on torch handle before lighting the torch Operator trained on the emergency evacuation procedures Operator trained on the use of fire extinguisher 	<ul style="list-style-type: none"> First aid kit available & readily accessible on site Fire extinguisher available & readily accessible MSDS easily available & readily accessible on site Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall Workers familiar with the site emergency EXIT Workers familiar with the location of the fire extinguisher 	<p>Un l i k e l y (2)</p>	<p>L i g h t (-2)</p>	<p>A c c e p t a b l e (-4)</p>
<p>Turning off the torch</p>	<p>Injuries to workers</p> <p>t) Scalded by the heating torque</p> <p>Damaged to property - Fire</p>	<p>Assets Personnel</p>	<p>P o s i b l e (3)</p>	<p>M a j o r (- 3)</p>	<p>U n d e s i r a b l e (-9)</p>	<ul style="list-style-type: none"> Always face the torch tip away from body and away from acetylene & oxygen tank when turning off torch Turn torch body valves off, acetylene first then turn tank valves off, again acetylene first Coil hoses neatly around cart handle Designated location to store the heated torch with signages indicating caution hot surface Operator trained on emergency evacuation procedure Operator trained on the use of fire extinguisher 	<ul style="list-style-type: none"> First aid kit available & readily accessible on site Fire extinguisher available & readily accessible MSDS easily available & readily accessible on site Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall Workers familiar with the site emergency EXIT Workers familiar with the location of the fire extinguisher 	<p>Un l i k e l y (2)</p>	<p>L i g h t (-2)</p>	<p>A c c e p t a b l e (-4)</p>

<p>Changing tank on cart a)Tanks b)Regulator c)Check connection after changing</p>	<p>Injuries to workers -hand injuries Damaged to property - Fire</p>	<p>Assets Personnel</p>	<p>Possible (3)</p>	<p>Major (-3)</p>	<p>Undesirable (-9)</p>	<ul style="list-style-type: none"> • Change tanks when working pressure begins to fall • Tank valve cap must be in placed on tanks before releasing the restraining chains • Replacement tanks must be chained to torch cart • Blow out cylinder valves using low pressure before attaching regulator to cylinder valve • Release adjusting screws on the regulator before opening the cylinder valve • Purge oxygen & acetylene gas pressures individually • Do not stand facing the valve when opening fresh oxygen tank for the 1st time • Use soapy water to check regulator tank connection • Pre check tank valve cap, regulator & its accessories for signs of pinch points & hidden traps • Adopt SIPP technique during the tank changeover 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	<p>Unlikely (2)</p>	<p>Light (-2)</p>	<p>Acceptable (-4)</p>
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<p>Moving cart out of designated place</p>	<p>Injuries to workers -hand injuries Damaged to property - Fire</p>	<p>Assets Personnel</p>	<p>Possible (3)</p>	<p>Major (-3)</p>	<p>Undesirable (-9)</p>	<ul style="list-style-type: none"> • Pre check regulators, tank caps and cart for signs of pinch points and hidden traps • Adopt SIPP technique during cart transport • Always remove the regulators and install caps on the bottles before moving the cart out of the shop floor • Ensure that the bottle restraints are in place prior to moving them • Operators trained on the correct technique to transport the bottles • Operator trained on the use of fire extinguisher • Operators trained on the emergency evacuation procedure 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	<p>Unlikely (2)</p>	<p>Light (-2)</p>	<p>Acceptable (-4)</p>
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<p>Grind / buff with powered wire brush</p> <p>(This process take place at each weld pass & thereafter the final weld pass)</p>	<p>Injuries to workers</p> <p>u) Pinch points</p> <p>v) Scalded by the powered wire brush</p> <p>w) Eyes injuries due to flying fragment</p> <p>Damaged to property</p> <p>- Fire</p>	<p>Assets</p> <p>Personnel</p>	<p>Possible (3)</p>	<p>Major (-3)</p>	<p>Undesirable (-9)</p>	<ul style="list-style-type: none"> • Pre check the grinding equipment & its accessories for proper connections and ensure that there is no exposed or crushed wiring. • Ensure no obstruction nor spill at the grinding station • Pre check the powered wire brush equipment & its accessories and ensure proper connection & that there is no exposed or crushed wiring • Pre check the grinding equipment & its accessories for signs of pinch points & hidden traps prior to using them • Operator to adopt SIPP technique & ensure working in his green zone during welding • Only trained operator can perform the grinding job • Unauthorised personnel prohibited from entering the grinding station • Operator trained on the correct technique to grind & buff • Operator shall tucked in working clothing during the process of welding • Designated place to store the powered wire brush with available signage beside the heated brush indicating "hot surface" • Hazards identified in the HARC briefed to all operators to increase their awareness • Mandatory training on workshop safety level 1 for all operators 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Signages on hands caught in between moving parts displayed at affected area of the equipment • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	<p>Unlikely (2)</p>	<p>Light (-2)</p>	<p>Acceptable (-4)</p>
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Remove mandrel from turntable	Injuries to workers x) Pinch points y) Feet injuries due to fallen objects	Personnel	Possible (3)	Major (-3)	Undesirable (-9)	<ul style="list-style-type: none"> • Pre check the turntable locking mechanism is in working order prior to removal • Pre check the mandrel & the turn table for signs of pinch points and hidden traps • Operators to adopt SIPP technique and ensure working in his green zone during mandrel removal • Pre check the mandrel unloading equipment wheels & locking mechanism is in good working condition prior to use • Operator trained on the correct technique to remove mandrel from turntable using the unloading equipment • Mandatory training on workshop safety level 1 for all operators • Hazards identified in the HARC briefed to all operators to increase their awareness 	<ul style="list-style-type: none"> • First aid kit available & readily accessible on site • Fire extinguisher available & readily accessible • MSDS easily available & readily accessible on site • Mandatory PPE such as hard helmet, safety shoes, safety glasses, face shield, leather gloves & fire retardant coverall • Signages on hands caught in between moving parts displayed at affected area of the equipment • Workers familiar with the site emergency EXIT • Workers familiar with the location of the fire extinguisher 	Unlikely (2)	Light (-2)	Acceptable (-4)
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