

	JOB SAFETY ANALYSIS (JSA) TANK REPAIR WORK	
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JSA Number:			JSA Title:			TANK REPAIR WORK					
Area:			Activity:			Erection and repair work of Tanks		Date			
Task Description		Repair work of existing tanks, bolting, unbolting, removal / erection of shell bottom & roof plates , including removal of existing structure and pipes spools / nozzles , stair and NDT Radiography work									
			Uncontrolled Risk						Residual Risk		
Step	Activity	Hazard	H	M	L	Control Measures			H	M	L
1.	Site preparation	<p>Poor communication between work parties.</p> <p>Inexperienced persons / lack of safety awareness</p> <p>Heat stress</p> <p>Noise</p>		M		<ul style="list-style-type: none">DESCON employees shall have mandatory training.Work permit from the client, with all concurring parties signatures approval must be obtained prior to start of work and display work permit at siteSafety requirements stated on the work permit must be available on site and strictly followedToolbox talk shall be conducted to all personnel on site & documented before start of work.Appropriate PPE shall be worn by all personnel at site.Assigned trained dedicated Banks-man for job with reflective jacket.No water no work policy shall be followed.Work Schedule according to heat IndexEar protection shall be worn where required.Noise meter will be made available at site.Maintenance of equipment on regular basis.Use of well trained licensed drivers.Vehicle movements on site shall be controlled by banks man and speed limits are to be followed.Appropriate signage to be provided.					L

		Vehicles Movement								
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JOB SAFETY ANALYSIS (JSA)
TANK MODIFICATION AND REPAIR WORK

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2.	Transportation of Shell plate & Misc Tanks materials from yard / store ware house to Work location By Using Crane ,Trailer, Boom Truck Pickup etc	<ul style="list-style-type: none"> ● Failure of equipment /crane /Trailer/ Pickup/ Truck etc ● Road traffic accident during transportation of Tanks shell plates and other material. ● Body part injury during loading and unloading operation 		M		<ul style="list-style-type: none"> ● Conduct toolbox talk and LMRA prior to start of work at the specific location. ● Ensure satisfactory condition of equipment, properly inspected, sticker Placed and for appropriate color code. ● All rigging gear shall be certified. ● Synthetic belt or nylon sling shall be used instead of steel wire rope for holding of material. ● Ensure crane operators and riggers fully understand all work tasks and hazards. ● Load shall be secured on the trailer bed to prevent accidental fall. ● Crane operator shall have the third party, certified and applicable license. ● Use proper tag line during loading /off loading material. ● Access route shall be surveyed before transporting the Shell Plates ,pipes & support material etc. ● Barricade with appropriate sign board on the effective area. Riggers shall be experienced and third party certified. 					L

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		<ul style="list-style-type: none"> Pinch point. Vehicle hit the existing facility 				<ul style="list-style-type: none"> Use leather gloves for hand protection. Keep away body parts (hand, feet, head, etc) from the line of fire (LOF). Suitable length of trailer shall be arranged according to length of Shell Plates, pipe spools, supports etc. Red flag at the back end of long pipe spool shall be provided. Site specific traffic rules shall be followed. All vehicle movements will be controlled by a certified banks man. Banks man shall be provided for reversing vehicle. 					

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3.	(A) Bolting ,Unbolting, removal of tank man hole cover and bolts etc. 									

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		<ul style="list-style-type: none">Over tensioningFalling of materials and usage of damaged /non-standard tools	H			<p>be done.</p> <ul style="list-style-type: none">Ensure tested and certified chain blocks and slings are used.Obtain box up clearance from process, inspection, operation and maintenanceFollow stamicarbon tensioning procedure.Use correct size spanners and keep the bolts/nuts in a bag and tie the other end of spanners/tools with a nylon rope to a support to avoid falling while in use.					L
4.	Confined space entry.	<ul style="list-style-type: none">Lake of CommunicationVentilation.Damage materialOxygen deficiency	H			<ul style="list-style-type: none">All personnel working in confined space must have confined space training.PRL confined space procedure shall be followed.Hole watcher is attentive all the time during confined space activity. Lighting provided in CSE to be 24V.Easy communication between hole watcher and supervisor is established all the time.Ensure that passage and transport rout is clear during confined space activities. Proper access/agrees should be					L

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		<div>accumulation of toxic gases</div> <div><div></div>Physical hazards</div> <div><div></div>Improper stacking of material</div>				<div>maintained.</div> <div>Gas test to be done by AGT prior to entering into the confined space.</div> <div>A trained and qualified individual should outside the tank with the responsibility of ensuring the safety of authorized entrants (Fabricator, Fitter, Welder e.tc) through the performance pre-entry briefing, checking and inspecting PPE, equipment and tools and performing regular monitoring in ensuring person working inside pipe remains safe for entry and occupation.</div> <div>A written rescue plan that has provision for conducting a timely rescue of individuals working inside the pipe (Confined Space) should be kept on site. Raising the alarm in the event of an emergency using the radio/mobile phones provided to them.</div> <div>Ensure effective communication systems for the entry are tested.</div> <div>Proper light should be provided less than 25v.</div> <div>All material stack proper and category wise.</div>					

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		<ul style="list-style-type: none">Unauthorized entrant				<ul style="list-style-type: none">Rescue arrangement shall be made while working more than five meter inside large bore size.PRL SHE&S Procedure shall be followed.Close supervision required while working inside.Execute the work under close supervision and presence of hole watcher.Proper air supply to be provided or air mover will be provided.Proper ventilation shall be there.Working crew shell be trained for confined space working.				
5.	Lifting/ installation / of Shell , roof and bottom plates, Pipe spools , supports etc by Using lifting equipments crane, trailer, boom truck, chain block, sling shackles)	<ul style="list-style-type: none">Failure of equipment.Fall of objects/ Swinging.		M		<ul style="list-style-type: none">Certified and color coded lifting gears to be used.Equipment shall be inspected prior to use by competent person.Competent and certified operator and rigger & Hi-Vis jacket for the Rigger.Barricade the lifting area/ swing radius and place safety caution boards.Ensure that the load is adequately secured and fixed to the				L

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		<ul style="list-style-type: none"> Overloading. Falling from the lifting beam. Breakage of slings Unplanned lift Improper lifting techniques 				hook. <ul style="list-style-type: none"> The safety latch on the hook must be correctly closed. Lift within SWL (Safe working load). Use tag lines to control the lifting load. Supports to which lifting gears are attached shall be strong enough to withstand the lifting load. And certified by 3rd party. Do not leave the load suspended. Never stand/walk on/under lifting load. Approved lifting plan to be followed. Experienced hoist /crane operator shall be assigned. Use proper lifting techniques. Secure all tools / objects. Use appropriate hand gloves. All personnel working in confined space must have confined space training. Obtain confined space entry permit. PRL Confined space procedure shall be followed. Hole watcher is attentive at all the time and establish good 					

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		<ul style="list-style-type: none">Physical and atmospheric hazards.Confined space Hazards (Inside Tanks).Oxygen deficiency				<p>communication during confined space activity. Lighting provided in CSE to be 24V.</p> <ul style="list-style-type: none">Adequate ventilation to be provided.Easy communication between hole watcher and supervisor is established all the time.Ensure that passage and transport rout is clear during confined space activities. Proper access/agrees shall be maintained.Notified to the ERT (Emergency Response team) prior to start the activity.Work to be executed under close supervision at all times.Gas test to be done by AGT prior to entering into the confined space.					
6.	Hot Work Activity <ul style="list-style-type: none">Welding, Cutting grinding,	<ul style="list-style-type: none">Sparks/fire, Electric shock, burn and explosion inside confined space while	H			<ul style="list-style-type: none">Welding habitat shall be provided at each welding/ grinding location. Fire blanket to be certified/ approved.All internal combustible engines shall have valid inspection sticker.					L

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	Usage of Power brush for internal cleaning, electrical Grinding, drill machine, Cutting set etc, <ul style="list-style-type: none">Usage of gas cylinder for preheating.Repair work of existing tanks, Removal / Erection ,shell bottom & roof plates , including removal of existing structure and pipes spools / nozzles and stair etc	fitting, tacking, grindingetc. <ul style="list-style-type: none">Contact with electricity.Mechanical Hazards of Grinder etcEye injuryFire hazardsElectrical Shock /Hazards				<ul style="list-style-type: none">Keep fire extinguisher standby.Barricade work area and place the proper signboards.All personnel working in confined space must have confined space training.PRL confined space procedure shall be followed.Provide proper respiratory personnel protective equipment.Proper earthling shall be provided for the electrical equipment.Grinding and cutting disc to be as per RPM ratio with machine. And make sure the dates of cutting/Grinding disc are not expired and no damage.Grinding/Cutting machine with dead man switch.Face shield must be used for cutting/grinding activity.Area shall be free from combustible/flammable material.Fire watcher shall be placed for overhead working.All Electrical equipment shall be inspected and color coded. (I.e. Cords, Plugs etc).				

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	<ul style="list-style-type: none">Cylinder storage.	<ul style="list-style-type: none">Falling of gas cylindersDamaged hose cause of gas leakage				<ul style="list-style-type: none">All portable electrical equipments/cables shall be approved declared safe to use. All electrical equipment to be grounded properly.Ensure electrical cables are protected from water / spilled liquidUse correct PPE’s (Leather gloves, Safety Glasses for the task).Ensure all cylinders are secured and capped with metal chain in appropriate trolleys.Protective cover shall be in place while cylinders not in use.Gas cylinders to be secured correctly during transportation.Gas cylinders secured vertically and protected from direct sunlight/heat, grease and any oily items.Always use trolley to shift the cylinders.Cylinder key shall be kept with Cylinders and valve cap place after use.Ensure that cylinder hoses do not come in contact with hot surface / grease oily substance.					

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		<ul style="list-style-type: none">Back fire /fire explosion				<ul style="list-style-type: none">Do no tie the hoses with GI tie wire.Ensure hoses are in good condition and well guarded against any possible run over by vehicles or possible material transferAll gas blowing hoses/welding torches shall be provided with flash back arrester and (NRV) non returnable valve.Pressure gauges shall be in working condition and no damage.Gas cylinder shall be stored separately. Oxygen and acetylene separately.All personnel working in confined space must have confined space training.PRL confined space procedure shall be followed.					
	<ul style="list-style-type: none">Manual handling / Shifting of material during job.	<ul style="list-style-type: none">Pinch points.Hand injury		M		<ul style="list-style-type: none">Tool box talk will be conducted by Supervisor.Supervisor will be responsible to complete safe activity pre-Checklist sheet daily before start of work.Use appropriate PPE’S as per job requirement.Maintain good housekeeping to avoid injuries.					L

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		<ul style="list-style-type: none"> Drop of material. Keeping load away from body Muscular skeletal disease, Back pain Lifting by bending back Lifting unmanageable load 				<ul style="list-style-type: none"> Plan before manual lifting Use manual handling / lifting Aids like trolley etc. Ensure no obstruction at job point, access/egress When long period of manual handling is required, give appropriate breaks. Keep the load as close to body as possible. Move feet rather than twisting back during manual handling. Avoid wearing tight clothing which may restrict body movement Ensure strong gripping during manual handling Bend your knees and not back during manual handling / lifting Use legs as the pivot point to raise or lower body with the back straightened when lifting or lowering load Shoulders should be kept level. Look ahead, not down at the load, once it has been held 					

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		<ul style="list-style-type: none">Exhaustion/Fatigue				<p>securely.</p> <ul style="list-style-type: none">Material handling tools or equipment, such as barrows and trolleys, should have handle heights that are between the shoulder and waist.Such tools or equipment should be well maintained, with wheels that run smoothly.Assistance should be provided to handlers negotiating a slope or ramp.Loads should travel over a smooth & even surface.				
7.	Inspections (NDT) PWHT, Radiography	<ul style="list-style-type: none">Inexperience personRadiationChemical hazard		M		<ul style="list-style-type: none">Only trained and certified personnel to be allowed to performing of NDT activities.Personal dosy meter for all involved in Radiography activity.Certified, Calibrated and properly tagged equipments to be used for NDT. Color coding to be verified.No other person allowed to entering in NDT testing area.Area to be barricaded with sign board. Exclusive zone as per procedure.Supervisor to confirm that test performer is in fully				L

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	PWHT/ Preheating By using direct flame/ Electric heating	<ul style="list-style-type: none">Personnel injury.FireElectrical shock				<p>protected clothing and equipped with all necessary PPE, follow all requirement of NDT as per project specification.</p> <ul style="list-style-type: none">Proper PPE shall be used.Fire extinguisher shall be provided at site.Electric board shall be inspected by qualified electrician prior to use.When electric maintenance or repair work is required assigned a trained electrician for the job.Color coded electric tools shall be used.				
8.	Minor maintenance work, Connection /Disconnection and Operation of Diesel Generator set / Welding machines /ovens / Distribution boards/grinder for power supply purpose including repair work.	<ul style="list-style-type: none">Fire / ExplosionSparks.Spillage of fuel/OilElectric Shock		M		<ul style="list-style-type: none">Obtain all necessary approvals prior to start the job.Standby fire extinguisher/Fire watcher.Barricade the area.SWITCH OFF DG (Diesel generator) if any emergency alarm is sounded. Switch off the engine while fueling.Fueling will be done in day time.Ensure no conflicting jobs in vicinity before start of job.DG must have PRL inspection sticker.				L

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						Ensure all lights are intrinsically safe and are pre-inspected. Close supervision during activity. Only competent electrician to perform the job. Proper earthing shall be provided.				
9	Working during extended hour/night	<ul style="list-style-type: none">Inadequate lighting in and around work areas, causing shadows or poorly lit work areas that could result in unsafe acts and injuries taking place		M		<ul style="list-style-type: none">Adequate lighting at work area and Access/Egress area. Emergency route to muster point to be clearly illuminated.Proper cable managementUse clear safety glass for night work for good visibility.Warning Lights and sign boards.Trained Flag man for equipment movement provided with signal torch.Close supervision required while working in night shift.				L
10	Emergency Procedure / Response	<ul style="list-style-type: none">Poor Communication		M		<ul style="list-style-type: none">Educate the workforce about Emergency Procedure.All safety sign board shall be displayed properly at site.In case of any Emergency all work will be stopped, Shut down all running equipment & Machineries and reported to Muster Point				L

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		<ul style="list-style-type: none"> Improper Access/ Egress 				<ul style="list-style-type: none"> Proper Access & Egress shall be available. All Workforces shall know the Muster Point location. PRL Emergency Procedure to be followed. Emergency # 00000000 PRL Medical # 00000000 				
11.	House keeping	<ul style="list-style-type: none"> Trips and fall Sharp Objects Equipment damage 		M		<ul style="list-style-type: none"> All waste generated shall be contained and disposed off in designated waste skips. Do not store materials/equipments inside the plant area. Use Proper Personal protective equipment for handling of waste. All materials shall be removed from the site to a safe storage location immediately after the work. 				L

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Approved

Signature

Print

Date

Performing Party

Signature

Print

Date

