JOB SAFETY ANALYSIS (JSA) FORM

Rev 1 Feb 24

Unit/Area:	Specific Location:	Work Authorizer (if applicable):	Supervisor / Work Lead:	Date:

Job Description for Tasks with High Potential Consequence (i.e., life-altering injuries or Consequence Level 1 process safety events including HC 1&2 events) (include Equipment Numbers as Practical):

Check LSRA(s) that apply and review Start Work Check(s). Complete Page 2 with any additional task steps with high potential consequence or if there is no applicable LSRA.

Confined Space Entry ☐

Obtain authorization before entering a confined space

1. I confirm energy sources are isolated
2. I confirm the atmosphere has been tested and is monitored
3. I check and use my breathing apparatus when required
4. I confirm there is an attendant standing by
5. I confirm a rescue plan is in place
6. I obtain authorization to enter

Bypassing Safety Controls ☐

Obtain authorization before overriding or disabling safety controls

1. I understand and use safety-critical equipment and procedures which apply to my task
2. I obtain authorization before:
   - Disabling or overriding safety equipment
   - Deviating from procedures
   - Crossing a barrier

Energy Isolation ☐

Verify isolation and zero energy before work begins

1. I have identified all energy sources
2. I confirm that hazardous energy sources have been isolated, locked, and tagged
3. I have checked there is zero energy and tested for residual or stored energy
4. I never remove or tamper with energy control devices without authorization
5. I confirm equipment is back to safe operating condition prior to re-energizing

Excavation ☐

Obtain authorization before digging or entering excavations

1. I obtain authorization prior to performing excavation / trenching / ground disturbance activities
2. I confirm underground utilities and structures are located, de-energized or protected
3. I confirm hazard controls and confined space entry as required
4. I monitor for changing conditions and exit as appropriate

Safe Mechanical Lifting ☐

Plan lifting operations and control the area

1. I confirm that the equipment and load have been inspected and are fit for purpose
2. I only operate equipment that I am qualified to use
3. I establish and obey barriers and exclusions zones
4. I never walk under a suspended load
5. I understand the lift plan prior to starting work and keep hands off load unless authorized
6. I establish and maintain communication with lifting and rigging personnel

Hot Work ☐

Control flammables and ignition sources

1. I identify and control ignition sources
2. Before starting any hot work:
   - I confirm flammable material has been removed or isolated
   - I obtain authorization
3. Before starting hot work in a hazardous area, I confirm:
   - A gas test has been completed
   - Gas will be monitored continually

Working Around Mobile Equipment ☐

See and be seen; maintain a safe distance

1. I plan work to separate workers and mobile equipment
2. I only operate mobile equipment if qualified and use spotters where required
3. I verify safety devices are functional on mobile equipment
4. I establish clear means of communication with equipment operator
5. I stay out of the equipment's exclusion zone while in operation
6. I confirm controls are in place to prevent unintentional movement of mobile equipment and/or loads

Working at Height ☐

Protect yourself against a fall when working at height

1. I inspect my fall protection equipment before use
2. I secure tools and work materials to prevent dropped objects
3. I tie-off 100% to approved anchor points while outside protected area
4. I have validated prompt rescue capability when wearing fall protection
5. I will follow safe work practices when climbing, descending or working from ladders

BreakingContainment/OPE ☐

Manage ignition sources and exposure to energy & hazardous substances

1. I verify opening/break location(s)
2. I confirm energy isolation is complete
3. I manage ignition sources and confirm gas testing is completed when required
4. I use appropriate PPE and defensive behaviors when opening process equipment

Driving ☐

Follow safe driving rules

1. I always wear a seatbelt
2. I do not exceed the speed limit, and reduce my speed for road conditions
3. I do not use phones or operate devices while driving
4. I am fit, rested and fully alert while driving
5. I follow journey management requirements

Work Authorization ☐

Work with a valid permit when required

1. I have confirmed if a permit is required
2. I am authorized to perform the work
3. I understand the permit
4. I have confirmed that hazards are controlled, and it is safe to start
5. I stop and reassess if conditions change

Line of Fire ☐

Keep yourself and others out of the line of fire

1. I position myself to avoid:
   - Moving objects
   - Vehicles
   - Pressure releases
   - Dropped objects
2. I establish and obey barriers and exclusion zones
3. I take action to secure loose objects and report potential dropped objects

Confirm these safeguards are in place and effective prior to starting work using the applicable SWC(s).
During the task, if safeguards are no longer in place or effective, STOP Work.

Are there any <u>additional</u> high potential consequence hazards present?

Electrical Energy	Moving Objects	Lighting & Visibility	Simultaneous Operations (SIMOPS) or Stacked Work
Stored Energy	Hazardous Substances	Noise & Vibration	
Thermal Energy	Radiation		

High Potential Consequence Task Steps (Description)	Check off to indicate Hold Point	POTENTIAL HAZARDS & CONSEQUENCES Include applicable Error Prone Situations and Triggers	SAFEGUARDS (Actions & Physical Safeguards) Eliminate or Mitigate the hazards
	Hold Point ☐		
	Hold Point ☐		
	Hold Point ☐		
	Hold Point ☐		
	Hold Point ☐		

Confirm these safeguards are in place and effective prior to starting work using this JSA.
During the task, if safeguards are no longer in place or effective, STOP Work.

Lessons Learned (as needed): What improvements should be made for future work? Discussion leader to provide feedback to update planning package.

LAI HAZARD ANALYSIS												
Project Number:		**Project Task:** Hot Work					**Location:**					
Prepared By:			**Date:**				**Reviewed By:**				**Date:**	
Ref. Number	**High Potential Consequence Task Steps**	**POTENTIAL HAZARDS & CONSEQUENCES Include applicable Error Prone Situations and Triggers**	**Target** Check off to indicate Hold Point	**Preliminary Risk Assessment**			**Control Type**	**SAFEGUARDS (Actions & Physical Safeguards) Eliminate or Mitigate the hazards**	**Final Risk Assessment**		
				H	**M**	**L**			**H**	**M**	**L**
1	Hot work (burning, welding, grinding, etc.) within and around the GOLD project	Open flame and/or sparks around combustible materials within and around the project resulting in a fire, personnel injury (burns including flash burns) and or damage to the facility.	P/F/E ☐	X			D/E /S/ W/A A A A	Prior to starting a task, Evaluate the Lifesaving Rules and actions (LSRA) start work Checks (SWC) that may apply to that task review START/STOP work expectations and implement, Verify & Validate (V&V) the appropriate behaviors and or control Safeguards per the ExxonMobil PSMS and site HSE Procedures during the pre-task brief Ensure JSA for specific LAI tasks address proper hazard control methods Utilize work permit process to control work activities. Ensure personnel are trained in the use of fire extinguishers and in the emergency response to fires.			X

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							A/S	Keep combustible materials at least 35 feet away from hot work (housekeeping).			
							A/S	Keep flammable materials at least 50 feet away from hot work.			
							A/S	Personnel performing shall wear appropriate protective clothing and gloves to be defined in the JHA.			
							A	Only trained and authorized personnel shall be permitted to perform hot work.			
							A/D	A fire watch will be in place with requires gas monitoring equipment and will remain a minimum of 30 min after hot work has stopped.			
							A	Complete a Last Minute Risk Assessment (LMRA) prior to beginning each task.			

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2	Exothermic Welding (Cadweld)	Skin/ bodily Burns, temperatures in excess of 2500 degrees Fahrenheit, Fire, Exposition, Flash burns, inhalation of smoke/fumes	P/F ☐		X		D/E /S/ W/A A A/D	Prior to starting a task, Evaluate the Lifesaving Rules and actions (LSRA) start work Checks (SWC) that may apply to that task review START/STOP work expectations and implement, Verify & Validate (V&V) the appropriate behaviors and or control Safeguards per the ExxonMobil PSMS and site HSE Procedures during the pre-task brief Ensure JSA for specific LAI tasks address proper hazard control methods **GENERAL AND SAFETY INSTRUCTIONS:** A. Only ERICO manufactured equipment and materials should be used to make CADWELD® connections. B. Do not connect items except as detailed in instruction sheets. Failure to comply with these instructions.			**X**

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								may result in improper and unsafe connections, damage to items being connected, bodily injury and property damage. C. Do not use worn or broken equipment which could cause leakage. D. Do not alter equipment or material without ERICO authorization. E. When using CADWELD® do not use welding material package if damaged or not fully intact. When using CADWELD® PLUS, do not tamper with or disassemble the welding material unit. F. Make connections in conformance with CADWELD instructions and all governing codes.			

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							D/E

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				H	**M**	**L**			**H**	**M**	**L**
								8. Review the SDS for the product and comply with all required PPE and controls 9. Do not smoke when handling starting material. 10. Avoid direct eye contact with "flash" of light from ignition of starting material. Welding material is an exothermic mixture and reacts to produce hot molten material with temperatures in excess of 1400°C (2500°F) and a localized release of smoke. These materials are not explosive. Ignition temperatures are in excess of 900°C (1650°F) for welding material.			
							A/S /W				
							D	Make sure there is proper mold fit and assembly of equipment.			

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				H	**M**	**L**			**H**	**M**	**L**
							D/A D/E	Avoid moisture and contaminants in mold and materials being welded. Contact between hot molten metal and moisture or contaminants may result in spewing of hot material. Base material thickness must be sufficient for the size and type of connection being made to prevent melt-through and leakage of hot molten metal.			

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3	Use of Powder actuated Tools	Personnel exposure to high velocity projectiles or debris resulting in injury. Damage to Equipment or process	P/F ☐		X		S/W /A A	Follow requirements in accordance with Worley Hand and Power Tool Safety Standard MS-HS-STD-0054 Personnel shall receive training and have certification of training prior to using powder activated tools. Approval shall be obtained from project Management prior to the use of an explosive powered tool. Warning signs shall be posted to ensure personnel are aware that an explosive powered tool is being used. The sign shall read: "POWDER-ACTIVATED TOOL IN USE IN THIS AREA". **Additional Required PPE** • High impact face shield. • Double Hearing protection commensurate with high impact noise.			X

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				H	**M**	**L**			**H**	**M**	**L**
								Explosive powered tools shall not be used in the vicinity of other personnel unless specific safety precautions are identified within the JSA, documented, and implemented. Explosive powered tools are not to be used in situations where flammable or explosive gas, liquid or dust is present. Use the tool at least 100mm away from edges of concrete. Ensure the surface used is not hard or brittle. Do not use in existing holes. Do not use on soft or brittle substances/materials which allows the projectiles to pass through.			

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								Storage Tools and cartridges shall not be stored or used in explosive or flammable atmospheres. No explosive powered tool shall be stored in a loaded condition. Cartridges shall be stored in suitable metal containers which shall be kept locked. Charges and nails shall not be stored in the same container unless a proper divider/compartment is provided to separate the charges. Charges shall not be carrier loose in the operators' pocket.			
4	Use of propane fueled "weed Burner" torch, "rosebud" and/or Oxy-Fuel torch for preheating of welds.	Fire, gas leaks, thermal burns, explosion, hazardous/ toxic fumes, oxygen deficiency	P/F ☐		X		D/E /S/ W/A	Prior to starting a task, Evaluate the Lifesaving Rules and actions (LSRA) start work Checks (SWC) that may apply to that task review START/STOP work expectations and implement, Verify & Validate (V&V) the appropriate behaviors and or			X

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				H	**M**	**L**			**H**	**M**	**L**
								control Safeguards per the ExxonMobil PSMS and site HSE Procedures during the pre-task brief			
							A	Ensure JSA for specific LAI tasks address proper hazard control methods			
							A	Only trained and authorized employees will operate propane fueled "weed Burner" torch, "rosebud" and/or Oxy-Fuel torch for preheating of welds.			
							A	Read and understand owner/ operator manual and SDS for equipment/fuel being used.			
							A	Ensure proper permit(s)are in place.			
							A	Ensure all Hot work controls as required by MS-HS-STD-0083 Hot Work Standard, and MS-HS-STD-0057 Welding and Gas Cutting			

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				H	**M**	**L**			**H**	**M**	**L**
							A	Health and Safety Standard are in place prior to starting work.			
							A	Complete pre use checklist/ evaluation verified by Worley HSE representative prior to starting task.			
							A	Inspect the work location and ensure that hazards associated with SIMOPS have been mitigated.			
							A/W	Advise nearby personnel of torch operations in the area.			
							W/S	Ensure there is no fueling activities or other potential gas within 50ft of the torch activity.			
							A	Properly barricade the area with Danger Tape/Barricade			
							A	Inspect all tools, parts, and components prior to each use.			

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				H	**M**	**L**			**H**	**M**	**L**
							D A S/A	Inspect fuel tank(s) for and cracking, rust, signs of wear such as bulges / dents, separation of welds. Check the hoses for cracks, cuts, thin areas, where the hose connects to the head and to the fittings to the valve and regulator. Check the torch head/ handle for any damage. Snoop all fitting to ensure there is no leakage. All proper PPE including safety glasses, Face shield or welding hood, Welding gloves, and FRC clothing shall be worn at all times. Secure cylinders in a level, upright position. Do not invert or lay cylinders on their sides. Do not apply flame to cylinders to check for leaks or to increase gas pressure.			

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				H	**M**	**L**			**H**	**M**	**L**
								Keep torches, open flame, and sources of ignition away from cylinders, regulators, and hose. Do not operate torches or any equipment if the odor of LP-Gas is evident. Immediately shut off all valves and, using soapy water, check all equipment again for leaks. Cylinder valves must be protected. Do not hoist a cylinder by the valve. Do not leave the torch unattended while in operation. Maintain a fire watch for 30 minutes after the completion of hot work. Do not stand or prop the torch on the burner end while in operation.			

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				H	**M**	**L**			**H**	**M**	**L**
								Equipment is for outdoor use only with adequate ventilation. Have a 20lb type ABC fire extinguisher at the use location, easily accessible to the person. operating the torch. Never direct torch flame toward any person, animal, flammable surface, or material. Do not use torch to remove paint. Oxy-Fuel Torches Torches must be lit with a friction lighter or other approved device and not by matches, cigarette lighters, or from hot work. As a minimum, suitable flashback arrestor which prevents flame flashbacks to be fitted at the pressure regulator outlet of each gas cylinder and manifold which supplies air, oxygen, or fuel gas to cutting torch, in accordance			

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								with the manufacturer's instructions. A suitable check valve, non-return valve or any similar device which prevents the backflow of the gas into the hose, should be fitted between each gas torch inlet and gas hose, in accordance with the manufacturers' instruction Should a flashback occur, immediately turn off the oxygen and fuel gas valve at the torch and at the cylinders. Purge hose lines individually every time before lighting the torch. This will ensure that no oxy-fuel gas mixture is present in the hoses, which could cause an explosion.			

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								Keep oxygen cylinders and fittings away from oil or grease. Oil or grease may ignite violently in presence of oxygen under pressure. Keep oily or greasy substances away from cylinders, cylinder valves, couplings, regulators, hose, and apparatus. Do not handle oxygen cylinders or related apparatus with oily hands or gloves. Oxygen cylinders should not be handled on the same platform with oil or be placed in a position were oil or grease from overhead cranes or belts may fall upon them.			

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								Regulators shall be removed, and valve protection caps shall be put in place hand tight when cylinders are not in use or when they are being transported. Acetylene must never be operated at pressures greater than 15 psig. Do not allow an oxygen cylinder's pressure to fall below 50 psig. If the oxygen cylinder becomes empty, it will lose its positive pressure, and fuel gas may enter the oxygen equipment, which has the potential to produce an explosion. For non-fuel gas cylinders, e. g., oxygen, the cylinder valve should be opened fully. Failure to open the valve completely may cause leaks around the valve packing because of the design of the valve.			

Target: **P**=Personnel, **F**=Facilities and equipment, **E**=Environment

Control Type: **D**=Design hazard out or minimize, **E**=Engineering control, **S**=Safety device, **W**=Warning device, **A**=Administrative control

LAI HAZARD ANALYSIS												
Project Number:		**Project Task:** Hot Work					**Location:**					
Prepared By:			**Date:**				**Reviewed By:**				**Date:**	
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				H	**M**	**L**			**H**	**M**	**L**
								For fuel gas cylinders (example: acetylene, MAPP Gas, Propane) open the valve approximately ¾ turn. Under no circumstances may the valve be opened more than 1 ½ turns. This is to allow for rapid closing should an emergency situation occur.			

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