Activity Description & Location:	Permanent Gauge Installation Onshore, Australia	**Assessment No:**	GN010	**Rev:**	1.0
		Date:	27-Mar-2019		
References used: *(Inc. Legal obligations)*	• Permanent Gauge Installation-HSE-LP-SOP (RM01) • Wellsite Permit to Work System • FROMM Pneumatic Combination Tool A480 (parts & troubleshooting) • Gauge Specific Installation Instructions • Wellhead Outlet Installation Instructions	**Assessment Team:**	G. Humphreys, J. Hollingworth, K. Rowbotham		
		Company / Dept.:	Huracan / Reservoir Monitoring		
		Frequency of Activity:	Regular		
		Persons Affected:	Huracan Crew, Rig Crew		

OPERATION / EVENT	HAZARD	RISK	Initial Risk			CONTROLS			Residual Risk		
Steps	***Energy source to cause harm / damage***	***Consequence of hazard – harm / damage to occur***	**Pr**	**Co**	**RS**	***Detail***	***Person to implement***	***Person to monitor***	**Pr**	**Co**	**RS**
Arrival to site, Spotting Unit & Rigging Up	• Interaction mobile plant & infrastructure (impact with) • Unsuitable / Restricted worksite • Lifting (equipment) • Overhead loads • Moving equipment • Manual handling	• Equipment damage – Huracan &/or Client (impact, dropped object) • Injury - Permanent disability (Slipping & Tripping, crush, dropped object • Environmental impact – spill to ground • NPT – manoeuvring worksite	Possible	Major	**Med C4**	• Rig Induction • Check personnel and equipment certification • Spotter for all interaction between mobile plant infrastructure • Exclusion zone / barrier may also be required • Competent personnel (driver & spotter) • Communication confirmed • Visual inspection / hazard hunt of worksite • To set-up unit for spooling operations, park truck, ensure immobile & turned off.	Huracan Crew, Spotter	Supervisor	Remote	Major	**Low E4**
Install Gauge Carrier	• Lifting operations • Moving / rotating equipment • Manual Handling	• Injury - Permanent disability (Slipping & Tripping, crush, dropped object • Equipment damage – Huracan &/or Client (impact, dropped object)	Possible	Major	**Med C3**	• Pre-Job Safety Meeting, Review Resource Docs (JSA / SOP) Permit + confirm communication method & any other isolations / controls reqd. for job	Huracan Crew, Rig Crew	Driller	Remote	Major	**Low D3**

						• Competent personnel operating rig tong, pick up gauge carrier and install on completion string and torque • Ensure personnel clear during torque procedure					
Installing gauge and cable and suspending TEC cable through sheave and suspending above rig floor	• Lifting operations • Moving / rotating equipment • Manual handling • Interaction with other operating plant	• Injury, dropped object • Damage to plant & equipment, dropped object) • NPT - Delays to job	Possible	Major	**Med C4**	• Gloves for manual handling • Install gauge into gauge carrier and tighten • Connect TEC cable and cable head to gauge and mark and toque to 1-1/4 turns as per manufacturer's instructions • Experienced competent personnel / supervision • Ensure lifting equipment certified and current • NEVER work under a suspended load • Good communication between driller, spool operator & man on floor. • Controlled speed to help keep tubing away from potential snags	Huracan Crew, Rig Crew	All personnel	Remote	Major	**Low E4**
Running In Hole with tubing and Gauge Cable	• Moving / rotating equipment • Manual handling • Interaction with other operating plant	• Damage to TEC cable from Injury (Slipping & Tripping, crush, dropped object) • Damage to plant & equipment (dropped object)	Possible	Major	**MED C4**	• Ensure no back tension on TEC cable while running in hole for first 4 joints • Slowly increase back tension on TEC cable as per SOP • Ensure cable will not be crushed by rig slips • Driller to have smooth operation on the brake while running in and out of hole • Gloves for manual handling • Experienced competent personnel / supervision	Huracan Crew, Rig Crew	Huracan Gauge Installation Supervisor	Unlikely	Major	**Med D4**

						• Lifting equipment certified and current • NEVER work under a suspended load • Good communication between driller, spool operator & man on floor. • Controlled speed to help keep tubing away from potential snags					
Installing Cross Coupling Protectors	• Moving / rotating equipment • Manual handling Interaction with other operating plant	• Personnel injury from crushed fingers in cross coupling protectors • Damage to TEC cable • Dropped Objects in well	Likely	Major	**High B4**	• Hold meeting with rig personnel and discus pre-job • Use correct hand tool for specific cross coupling installation • Ensure mat is placed around tubing and slips so no objects are dropped in the hole • Ensure TEC cable is pulled against tubing using open palms and open hands With manual operations for • Cannon protector installation tool correctly adjusted prior to starting	Huracan Crew, Rig Crew	Huracan Installation Supervisor	Unlikely	Major	**Med D4**
Pass TEC cable through tubing hanger and landing of hanger, engaging torque anchor, termination of TEC cable	• High pressure • Manual Handling • Crushed from rotating equipment	• Equipment Damage (Kinking TEC cable, TEC cable doesn't pass through hanger assembly,) • Negative impact on reputation (Cannot seal from hanger to capillary tubing, Failure to inject)	Possible	Minor	**Low C2**	• Use landing joint on tubing hanger • Once tubing hanger installed in elevators and brought to a suitable height, perform gauge reading, • Switch of surface monitoring equipment, • Tape cable spool clear area and cut TEC cable ensuring both ends are held during cutting. • Lower sheave • Strip encapsulation from TEC cable	Huracan Crew, Rig Crew	Huracan Installation Supervisor	Remote	Minor	**Neg E2**

						• Check TEC cable fitting in hanger and fit onto TEC cable. • Pass TEC cable through hanger and fit lower hanger seal then install upper seal. • Fill void between hanger seals and required and tighten upper seal • Pressure test seal as per client procedure • Land hanger and rotate to engage toque anchor					
Tree Installation and Wellhead Outlet Installation and Pressure Test	• High pressure • Manual Handling • Crushed from rotating equipment	• Equipment Damage (Kinking tubing, Capillary tubing doesn't pass through hanger assembly,) • Negative impact on reputation (Cannot seal from Rod Lock to capillary tubing or from ½" fitting to cast iron rod-lock body, Failure to inject)	Possible	Major	**Med C4**	• Confirm prior to starting job that gauge cable will pass through tree and you have the correct fittings • As soon as the rod lock / tree install has been completed, check gauge is still operational • Connect lower section of the Wellhead Outlet and fill void between rod lock / tree • Tighten furrel and pressure test as per client instructions	Huracan Crew, Rig Crew	Huracan Installation Supervisor	Remote	Major	**Low E4**
Rigging down	• Lifting • Overhead loads • Moving equipment • Manual handling	• Injury, whipping TEC cable • Damage to plant & equipment (snagging tubing, blockage of cut end of tubing, dropped object)	Likely	Moderate	**Med B3**	• Two people to help when cutting the capillary tubing • Follow operational procedures • Experienced competent supervision • Ensure permit is closed out • Worksite is cleaned up, isolations removed (as reqd.)	Huracan Crew	Supervisor	Remote	Major	**Low E4**

Approved By: R. Douglas	Signature: *R. Douglas*	Date: 24-Mar-2017

NOTE: Using the Risk Matrix below, identify the Consequence & Probability of each risk occurring and enter the risk score in the Inherent column. Review the consequence, probability and risk score after appropriate controls have been agreed upon. Remember, the consequence does not change unless you eliminate the hazard (only the probability may change!

		Consequence				
	HEALTH AND SAFETY	First Aid Injury (FAI)	Medical Treatment (MTI)	Lost time Injury (LTI)	Permanent Disability / Fatality	Fatalities (multiple)
	FINANCIAL IMPACT	< $20K	$20K - $200K	$200K - $2M	$2M - $20M	$20M+
	REPUTATION	Minimal impact on business reputation, land holder only	Some impact on business reputation, local community exposure	Moderate impact on business reputation, local media exposure	Significant impact on business reputation, national media exposure	Critical impact on reputation, international media exposure
	ENVIRO.	Incident. No breach of regulations / EA. Minimal and short term impact to any local environment.	Minor breach of regulations / EA resulting in notification to regulator. Localised, short term, recoverable minor impact on flora and fauna	Serious breach of regulations / EA resulting in reporting to regulator, investigation, environment notice or fines. Significant localised but short term environmental impact	Major breach of legislation resulting in prosecution or litigation and regulatory intervention. Serious and long term ecological impact and environmental harm. Emergency Management activated.	Significant compliance breach resulting in prosecution / class action or loss of licence. Severe environmental harm with widespread or permanent Impact Crisis Management activated.
		1. Insignificant	**2. Minor**	**3. Moderate**	**4. Major**	**5. Catastrophic**
Likelihood	A common event that is likely to occur in the industry many times per year	**A. Highly Likely**	**Medium (A1)**	**Medium (A2)**	**High (A3)**	**Extreme (A4)**	**Extreme (A5)**
	An event likely to occur more than once a year in the industry	**B. Likely**	**Low (B1)**	**Medium (B2)**	**Medium (B3)**	**High (B4)**	**Extreme (B5)**
	An event that may occur in the industry over 10 years	**C. Possible**	**Low (C1)**	**Low (C2)**	**Medium (C3)**	**Medium (C4)**	**High (C5)**
	An event not likely to occur in the industry over 10 years	**D. Unlikely**	**Negligible (D1)**	**Low (D2)**	**Low (D3)**	**Medium (D4)**	**Medium (D5)**
	An event that has not previously been experienced in the industry but may occur in exceptional circumstances	**E. Remote**	**Negligible (E1)**	**Negligible (E2)**	**Low (E3)**	**Low (E4)**	**Medium (E5)**

Hierarchy of Controls	**Level 1 – Eliminate the Hazard**	**Level 2 – Substitute, Isolate & Engineer**	**Level 3 - Admin & PPE Controls**
Reporting Requirements	**Report Only – All Negligible Classifications**	**Investigate – All Low to Medium**	**TapRoot – High or above, or any Hi-Po**