



Indicative Methodology & Risk Assessment

DDR Fender Replacement Scotstoun
BAE Systems Surface Ships Limited

BAE SYSTEMS



1. Contents

1	PROJECT OVERVIEW	3
1.1	DESCRIPTION OF WORKS	3
1.2	PROJECT WORKSITE & WORK SCOPE OVERVIEW	3
1.2.1	<i>Location of Site.....</i>	<i>3</i>
2	DIVE TEAMS AND ASSOCIATED WORKING PRACTICES	3
2.1	PROJECT ORGANOGRAM.....	3
2.2	KEY PERSONNEL	4
2.2.1	<i>Project Manager / Principal Engineer – Peter Walsh.....</i>	<i>4</i>
2.2.2	<i>Project Engineer – Craig Kidd.....</i>	<i>4</i>
2.2.3	<i>Diving Supervisors – Steven Belcher/Robert Kitchingman</i>	<i>5</i>
2.2.4	<i>Divers</i>	<i>5</i>
2.2.5	<i>Dive Team</i>	<i>6</i>
2.2.6	<i>HSEQ Officer – Gerry McSwegan</i>	<i>6</i>
3	LOCATION OF SITE COMPOUND	6
4	LOADING RESTRICTIONS	7
5	PROPOSED PLANT.....	7
6	PROJECT EXECUTION	9
7	TENDER ASSUMPTIONS	10
8	EXAMPLE METHOD STATEMENT	10
9	EXAMPLE RISK ASSESSMENT	16

1 PROJECT OVERVIEW

1.1 Description of Works

The Works comprise the removal and replacement of three lead in timber fender panels and the timber fender panels to the north and south dock entrance walls all as shown on the drawings.

1.2 Project Worksite & Work Scope Overview

1.2.1 Location of Site

The site is located adjacent to the BAE shipyard facility at Scotstoun Glasgow. The main area for the works is the northern quay wall at the entrance to DD3.

Access to the secure Scotstoun yard for drainage connection works will be through the South Street Dockyard Gate controlled by BAE Systems Surface Ships Limited security, thence via two-way and one-way roadways within the yard.



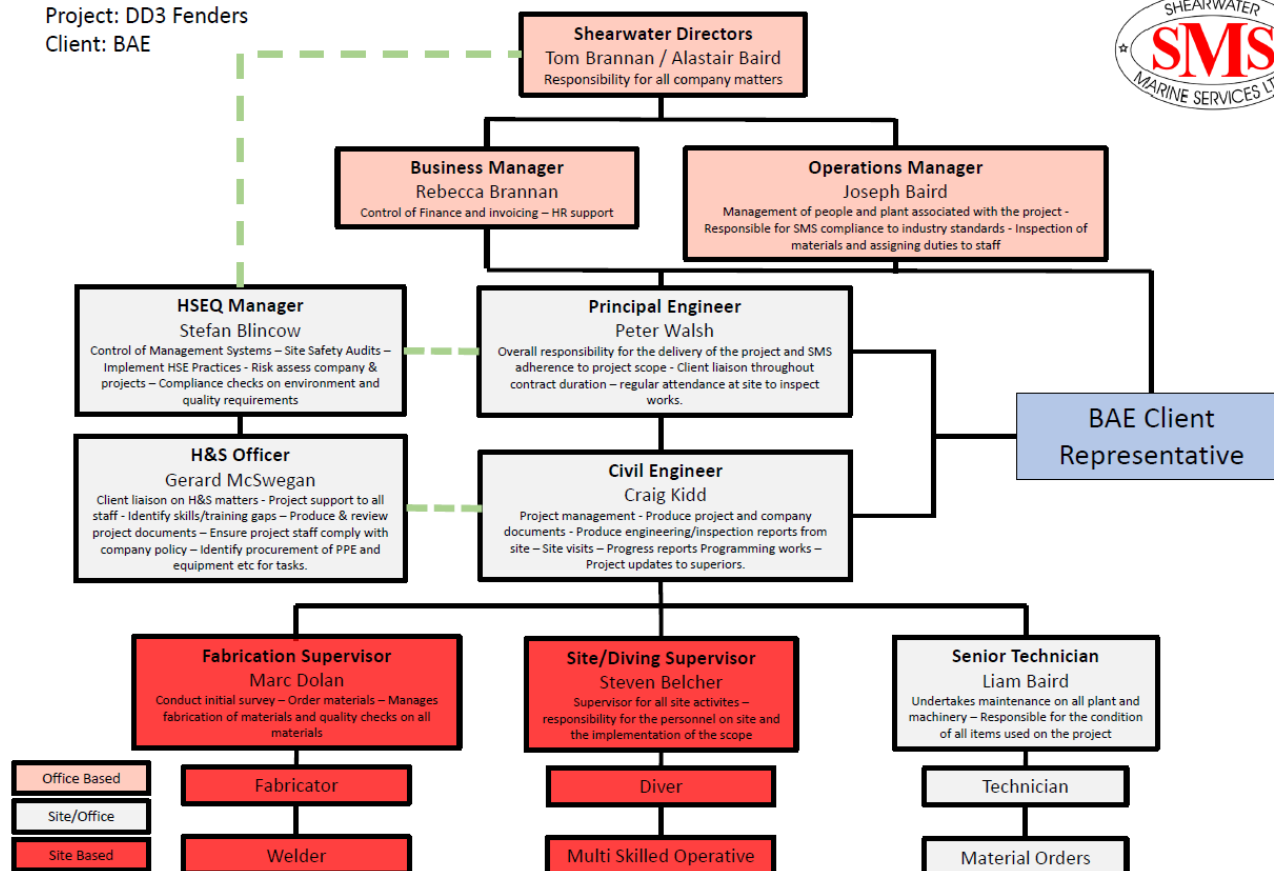
Figure 1 – Approximate Location of Dive Site

2 DIVE TEAMS AND ASSOCIATED WORKING PRACTICES

2.1 Project Organogram

The worksite will be managed as identified in the site-specific matrix included below: -

Project: DD3 Fenders
Client: BAE



2.2 Key Personnel

2.2.1 Project Manager / Principal Engineer – Peter Walsh

The Shearwater Project Manager is responsible for, but not limited to, the following:

- Overall management of the contract
- Act as the main point of contact or BAE
- Review and approve all project documentation
- Carry out initial briefing of site personnel
- Ensure suitable and sufficient Risk Assessments are carried out
- Ensure suitable SHEQ Documentation is prepared
- Ensure quality and timeliness of reporting
- Overall Project HSE Performance
- HSE Performance Review
- Liaison with authorities
- Ensure quality assurance of the work
- Overall responsibility for Project Management of Change.

2.2.2 Civil Engineer – Craig Kidd

The Shearwater Civil Engineer is responsible for, but not limited to, the following:

- Production of Project Procedures, Presentations and Reports
- Engineering associated with the Project
- Assisting with the hazard identification and risk assessment for the Project
- Procurement and Equipment identification associated with the Project
- Preparation of method statements and lift plans
- Quality Assurance on all aspects of the work
- Site liaison with clients and other dockyard users
- Guidance to on site supervisors and personnel
- Production of As-built drawings and Quality documentation

2.2.3 Diving Supervisors – Steven Belcher

The Shearwater Dive Supervisor reports to the Project Manager and has complete authority over, and direct control, of the diving operations during his shift period.

The Dive Supervisor will give a job briefing to the divers and site personnel to ensure the task and the associated hazards are understood. On completion of the task, he will debrief the team to gain any lessons learned and records are to be kept and signed off by all parties.

During all operations the Dive Supervisor is responsible for maintaining communications between Dive Control and the site operatives, keeping an accurate log of events, ensuring that all work is carried out from a safe place of work and to comply with all relevant legislation.

The Diving Supervisor is responsible for all diving operations at the site and shall ensure that the company procedures are implemented and that accurate records of all operations are maintained throughout responsibilities include, but are not necessarily limited to, the following:

- Directly responsible for the Health & Safety of the divers both in the water & on site
- Ensure personnel compliance with mobilisation practices
- Assigns site team to perform specific tasks
- Chair and participate in TBT's
- Manage the safe performance of the work tasks specified
- Adhere to the project plan. Any change in the plan should be reported through the chain of command for approval via the Shearwater Management of Change Procedure
- Directly responsible for the supervision and safety of the Diver(s) and support team
- Ensure the divers have reported as 'Fit to Dive' before being committed to the water
- Ensure quality assurance of the work

2.2.4 Divers

All Divers should be competent, familiar with, and medically fit for the specific tasks they will be asked to perform, they will be responsible for but not limited to the following:

- Ensuring original copies of all their Certificates are on site and available for inspection
- Maintaining an up-to-date Log Book
- Undertake work in a safe and professional manner

- Ensuring the Health and Safety of themselves and others
- Informing the Dive Supervisor as soon as they are unfit to enter the water to work
- Perform such tasks as directed by the Diving Supervisor
- Ensuring their diver worn equipment is properly maintained, complete and ready to use
- Immediately obey all commands or signals to return to the surface
- Act as Standby Diver
- Assist in the training of new personnel
- Follow Safe diving procedures and report any concerns to the Diving Supervisor
- Report all symptoms of DCI immediately and as accurately as possible

2.2.5 Dive Team

The Dive Team identified for the work on this Diving Project is:

No.	Position
1	Dive Supervisor / Site Agent
5	Surface Supplied Divers
6	Total

A sufficient number of the Divers will have in date DMT (Diver Medical Technician) or First Aid at Work certification to ensure that there is always a suitable medic available in an emergency.

2.2.6 HSEQ Officer – Gerry McSwegan

The HSEQ Officer will report directly to the Shearwater HSEQ Manager and BAE Supervisor. Their roles and responsibilities include but are not limited to:

- Health and Safety management of the site
- Ensuring compliance with HSE diving at work regs
- Ensuring compliance with H&S at work act
- Quality control and adherence of the works to the specification
- Visual inspections and site audits
- Implementation of company health and safety rules and practices
- Preparation of project plan and risk assessment

3 LOCATION OF SITE COMPOUND

The site compound will be located in a mutually beneficial location to satisfy the requirements of Shearwater Marine Services and BAE.

Following a site visit during tender stage the area directly to the north of the 3 fender packs has been identified as the most suitable for storage of plant, materials, dive control and welfare. It is the intention of Shearwater to have this area fenced off to other dockyard users and be self sufficient throughout the works.

Only on the 3 Nr. Days when working on the DD3 entrance timbers will works be required out with this site boundary. These works will be deconflicted with other site users and the BAE supervisor.



Figure 2 – Preferred Site Compound Location

4 LOADING RESTRICTIONS

Shearwater Marine Services Ltd have considered the possibility of loading restrictions and as such have planned the operations and plant requirements to keep loads to a minimum around the deck of the dock. It is not envisaged that the proposed plant used for the task would be limited in the locations required.

5 PROPOSED PLANT

The proposed plant to be utilised in this project includes:

Mobile Dive Unit (Towable Dive Support Trailer)

The Dive Support Trailer is equipped with a full dive system and will be positioned to allow easy access to the water and the working diver will be supported by a fully certified diving panel that is supplied upstream by fully independent primary and secondary gas/air supplies. A panel mounted regulator provides operator control over downstream gas/air supplies to the diver and a calibrated pneumofathometer will allow live monitoring of the diver's depth. The standby diver is equipped as per the working diver with a completely independent gas/air as a primary supply. A uniform back-up gas/air source is acceptable and can be used in an emergency.

The working diver will operate with hat mounted camera and light and will be monitored via hardwire two-way communications. Primary electrical systems are backed up by battery UPS and the working and standby divers are covered by audio and visual recording should it be a requirement. The working diver and stand-by diver will be wearing dry suits to maintain a good thermal balance.

Spider Crane x 2

The following is a typical spider crane that the Shearwater Divers are trained and competent to operate on site which will provide suitable material and man-riding capability to complete the works. The image below is from a recent project at Oban Northern Lighthouse Board Jetty where Shearwater were contracted to replace 33 Nr. Timber fender piles. The method utilised allowed for both lifting and diving operations to be carried out simultaneously and provided a safe and efficient means of replace the timber fenders piles and associated waling beams.

Working from the dockside using the cranes as a means of access also negates the constraints of tidal working and allows for unhindered access to the works.



Figure 2 – Oban Timber Pier Spider Cranes

Motorised Pontoon and Safety Boat

Primarily the access to the work location will be provided via the 2 Nr. Cranes and man basket. When it is been advantageous Shearwater will utilise both motorised pontoons and RIB work boat to support the works. The image below notes typical operations carried out from the motorised pontoons.



Figure 3 – Garelochhead Fender Strong Backs Refurbishment

6 PROJECT EXECUTION

Shearwater have vast experience working in the marine environment and particularly on operational infrastructure where works have to be managed and executed with minimal disruption to the daily operations of other users of the facilities. The works at **BAE Scotstoun** will be planned in such a way that they minimise our footprint on the asset, allow the dock to be returned to service at short notice at any time and keeps the programme as short as possible. The sequence of works will be intended as follows:

Mobilisation – Site set up, material delivery, inductions and familiarisation

Timber Removal – Fender Packs timber removal utilising both divers and topside operatives to strip and remove all fixings and bracketry

Preparatory Works – Setting out, Drill and Anchor Fixings, Underwater welding of new brackets

DD3 Entrance – Removal and replacement of all items at D33 entrance utilising spider cranes for access.

Fender Install – Drilling, lifting and installation of all timbers on Fender packs 1-3

Quality Check and Demobilisation – Inspection of works, removal of redundant materials from site, demobilization of all plant equipment and welfare.

7 TENDER ASSUMPTIONS


The following assumptions have been made by Shearwater during the tender process:

- Working Hours – 0700-1900 Monday – Friday
- Delays incurred out with Shearwaters control will constitute a compensation event
- Permit to work system will be provided by BAE for the duration of the project
- No restrictions on site deliveries
- Welfare provision has been costed by Shearwater as per BoQ item.
- No allowance has been made for the ladder replacement as it does not feature in the BoQ
- It is assumed all steel for welding to is of sufficient section for the specified weld - 6mm fillet weld.
- Weather delays in the contract are to include excessive wind and sea-swell. Upper ranges of 6 or higher, on the Beaufort scale, may constitute to a delay of works, within the discretion of the dive supervisor to ensure the safety of our personnel on site this will be treated as a compensation event. Any wind speeds/gusts which prevent lifting as per the approved lift plan will constitute a compensation event.
- No allowance or time has been allowed for operating the dock gate. It is assumed this will be carried out by BAE and not hinder the works.
- For pricing purposes, it is assumed any presence of reinforcement within the structures will not affect the drilling or anchoring of the fender fixings.
- For pricing purposes, it is assumed that there is sufficient steel section on the sheet piles to allow for welding (>6mm).

8 EXAMPLE METHOD STATEMENT

The following is an extract from the Project Plan implemented at the Oban Timber Pier Replacement Works Project recently undertaken by Shearwater Marine Services Ltd for the Northern Lighthouse Board. The Method statement and tasks therein mirror in many ways the activities required at the DD3 project.

A detailed project specific Project Plan will be developed for the project inclusive of: Emergency Response Plan, Task Methodology, Construction Phase Plan, Lift Plan, Risk Assessment and Environmental Management Plan.

TASK METHODOLOGY				
PRE-DIVE PROCEDURES				
Step	Action	Pre-Dive Procedure	Responsible	Tick
1.		Upon arrival at site, the Diving Supervisor will liaise with the 'Authorising Person' to ensure that work control systems on the vessel are in place and that the required permits are present and active. Supervisor to obtain permit from the Harbour Authority	Dive Sup/Auth Persons	



1.		The Diving Supervisor will review and update the onsite HIRA based on any new site information that is relative to project safety. Permits and project RAMS will be located in clear view within Dive Control	Dive Supervisor	
2.		Dive support vessel will be located and secured in a position to enable clear and safe access to the underwater project location	Master/dive team	
3.		LOTO PROCEDURE – Where potentially live vessels are in proximity of the Diving Operation area, the “Lock Out/Tag Out” Procedure must be enforced with any engines shut-down, seawater intakes / outlets isolated and potential rudder movements prevented. The Vessel Master must provide the Dive Supervisor with a tagout confirmation prior to the commencement of any diving operations. Alpha flag to be raised to inform others of divers in the water	Master/ Dive Supervisor	
4.		The Diving Supervisor will conduct a pre-dive safety briefing (toolbox talk) with all relevant parties.	Dive Supervisor	
5.		Access/egress arrangements will be reviewed and discussed – including emergency recovery of an incapacitated diver and shore landing area	Dive Supervisor	
6.		Equipment will be run up and pre-dive checks completed	Dive Supervisor	
7.		Standby Diver will be dressed and pre-dive equipment dress checks completed	Dive Supervisor	
8.		Working Diver will be dressed and pre-dive equipment dress checks completed	Dive Supervisor	
9.		The working diver will enter the water and tenders will carry out leak checks	Diver/Tender	
10.		The Dive Supervisor will start the video system and ensure that playback recording on camera and voice communications is function checked and clear	Dive Supervisor	
11.		Once permitted to do so, the diver will leave surface transit to the project location	Dive Sup/Diver	



| TASK | Underwater Cleaning Operations |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	
2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	
3.		Diver descends down to the point for cleaning and reports to supervisor.	Diver/Dive Supervisor	
4.		Diver begins cleaning the splice plates, fixings and any other elements due for removal methodically to ensure full coverage.	Diver	
5.		Diver continues the cleaning method on each element until he reaches the surface or runs out of dive time.	Diver	
6.		Surface team will ensure any area above the tide point where the diver surfaces, is completed later.	Diver/Topside Team	
7.		The diver may continue to a further area depending on dive time / depth restrictions at this point.	Diver	
8.		On completion and when permitted to do so by the supervisor the diver(s) will return to surface and be recovered to the dive platform.	Diver, Tender, Dive Supervisor	
9.		Throughout the operation diver(s) will be rotated at the discretion of the Diving Supervisor and in accordance with the dive time limitations laid out in the Shearwater Diving Operation Manual REV 4.	Dive Supervisor	



| TASK | Wailing Removal Operations |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	




2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	
3.		Diver swims on surface to the waling identified for removal	Diver	
4.		Diver will leave surface and locate themselves on the waling for removal	Diver	
5.		Supervisor records time diver begins pressurisation in daily dive log	Diver/Dive Supervisor	
6.		Supervisor will instruct Topside team to lower the diver a tool container with the work tools	Diver/Dive Supervisor	
7.		Topside team will connect a chain block and strops to the upper waling and lower the connection points to the diver	Diver/Topside Team	
8.		The diver will attach the connection points and strops to the lower waling	Diver	
9.		Diver will then begin the removal of the fixings on the splice plate by hand	Diver	
10.		If hand tools aren't sufficient the Topside team will deploy a hydraulic grinder to the diver to be used to cut the bolts and the splice plate.	Diver/Topside Team	
11.		Once the diver has removed all of the fixings and splice plate from the waling they will be returned to surface	Diver/Topside Team	
12.		Topside team will connect lifting strops to the Spyder-Crane and lower them to the diver.	Diver/Topside Team	
13.		The diver will connect the strops and the Spyder-Crane will take the weight of the waling beam	Diver/Topside Team	
14.		The diver will then disconnect the strops which are connect to the chain block	Diver	
15.		Surface team will lift and recover the lower waling onto the Pier,	Topside Team	
16.		The process will be repeated until all lower walings have been removed.	Dive Operation	
17.		On completion and when permitted to do so by the supervisor the diver(s) will return to surface and be recovered to the dive platform.	Diver, Tender, Dive Supervisor	
18.		Throughout the operation diver(s) will be rotated at the discretion of the Diving Supervisor and in accordance with the dive time limitations laid out in the Shearwater Diving Operation Manual REV 4.	Dive Supervisor	



| TASK | Waling Beam Installation |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	
2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	
3.		Diver swims on surface to the area where the waling beam has to be installed	Diver	
4.		Surface team connect the waling beam to the Spyder-Crane using strops and lower the beam to the water line	Diver/Topside Team	
5.		Diver moves to agreed "Safe Zone" whilst the beam is being lowered	Diver	



6.		Once the waling beam is safely lowered the diver swims over and attaches the lifting strops to each end of the beam	Diver	
7.		The diver will then be lowered the lifting bags from the surface team	Diver/Topside Team	
8.		A lifting bag will be attached to each strop	Dive Operation	
9.		The diver will then ask to make pneumo “Hot” to inflate the lifting bag	Diver	
10.		Care must be taken when filling the bag not to over fill equal quantities should be added	Dive Operation	
11.		The crane will then lower the beam until the bags have the full weight of the beam.	Crane Operator/Topside Team/Dive Supervisor/Diver	
12.		The diver can then disconnect the strop and manoeuvre the beam in place	Diver, Tender, Dive Supervisor	
13.		Surface team connect a chain block and strops to the upper waling and lower the connection points to the diver	Diver, Tender, Dive Supervisor	
14.		Diver connects the strops to the waling and takes up the strain using the chain block.	Diver, Tender, Dive Supervisor	
15.		Diver then removes the strops connected to the lifting bag and returns them to surface	Diver, Tender, Dive Supervisor	
16.		Once the diver confirms that the waling is at the correct height they begin installing the splice plate using the fixings and the predrilled holes.	Diver, Tender, Dive Supervisor	
17.		Whenever possible the fixings and splice plates will be installed to reduce the workload for the diver.	Diver, Tender, Dive Supervisor	
18.		The process will be repeated for all waling beams until they are all installed.	Dive Supervisor	

| TASK | Timber Pile Replacement |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	
2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	
3.		Diver swims on surface to the pile identified for replacement	Diver	
4.		Supervisor records time diver begins pressurisation in daily dive log	Diver/Dive Supervisor	
5.		Diver will make their way to the area on the pile where the piling gate is to be installed.	Diver	
6.		The Topside team will lower the diver a tool container with the required work tools.	Diver/Topside Team	
7.		The Topside team will lower to the diver the lower piling gate which has been prepared on the jetty.	Diver/Topside Team	
8.		The diver will install the piling gate as instructed by LB Civils.	LB Civils/Dive Supervisor/Diver	
9.		Diver will then come to surface and be recovered onto the pier so the piling operation can begin.	Diver/Topside Team	



10.		LB Civils will begin the removal of the old pile and installation of the new pile. (Refer to LB Civils Method Statement)	LB Civils	
11.		When it is confirmed that the new pile is in place and secure the diver will enter the water to remove the piling gate.	Diver, Tender, Dive Supervisor	
12.		The piling gate will be recovered to surface and moved to the next location where the diver will install it as per previous method.	Diver/Topside Team	
13.		The process will be repeated until all piles to be replaced are complete	Dive Operation	
14.		On completion and when permitted to do so by the supervisor the diver(s) will return to surface and be recovered to the dive platform.	Diver, Tender, Dive Supervisor	
15.		Throughout the operation diver(s) will be rotated at the discretion of the Diving Supervisor and in accordance with the dive time limitations laid out in the Shearwater Diving Operation Manual REV 4.	Dive Supervisor	



| TASK | D Fender Removal |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	
2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	
3.		On surface the Topside Team will burn the nuts on the back face of the fender piles that join onto the existing D Fender, this will allow the bolt to be 'punched' through.	Diver, Tender, Dive Supervisor	
4.		The Topside Team will then 'punch' the bolts through to the front face of the pile.	Topside Team	
5.		If a bolts is unable to 'punch' completely through the timber and D Fender the head of the bolt will be cut and 'punched' back through the timber allowing the D Fender to be re-moved.	Topside Team	
6.		The Topside Team will repeat this process until all the bolts are free from the D Fenders leaving the top 2 holding in place	Topside Team	
7.		When clear to remove the D Fender the Topside Team will remove the top bolt and attached a shackle in the fixings hole this will then be rigged to the crane. When the crane has the tension we removed the final bolt (2nd from the top) and recovered the D Fender to the surface	Topside Team	
8.		The crane will come up on the load until there is no slack on the rigging.	Crane Opera- tor/Topside Team	
9.		The final fixing can then be removed (2 nd from the top) this will free the D Fender to be brought to surface.	Topside Team	
10.		The D Fender will then be directed to a safe location.	Crane Opera- tor/Topside Team	
11.		This process will be repeated for all D Fenders.	Dive Operation	








| TASK | D Fender Install |

Step	Action	Description of Task	Responsible	Tick
1.		The task will be conducted in accordance with the procedures laid out in the Shearwater Diving Operations Manual REV 4.	Dive Operation	
2.		The diver will enter the water at the agreed access location. The tender will carry out leak checks and report to the supervisor.	Diver, Tender, Dive Supervisor	



3.		On surface, the topside team will have the D Fender ready for lifting	Diver/Topside Team	
4.		The diver will move to the agreed "Safe Zone"	Diver	
5.		The crane operator will lift the D Fender over and into position	Crane Operator/Topside Team	
6.		Once in position, the diver will move in ready for installation	Diver	
7.		The diver will locate the first fixing hole location, he will insert the fixing and secure	Diver	
8.		Repeat step 7 for all remaining UW fixing locations	Dive Operation	
9.		On completion and when permitted to do so by the supervisor the diver(s) will return to surface and be recovered to the dive platform.	Diver, Tender, Dive Supervisor	
10.		Throughout the operation diver(s) will be rotated at the discretion of the Diving Supervisor and in accordance with the dive time limitations laid out in the Shearwater Diving Operation Manual REV 4.	Dive Supervisor	
11.		Topside team will enter the man basket and proceed to install all remaining fixings	Topside Team	
12.		Crane operator will lower the operatives into position	Crane Operator/Operatives	
13.		Topside team will install all fixings and secure	Topside Team	
14.		Once complete the crane operator will lift the man basket back to jetty	Crane Operator/Operatives	

POST DIVE PROCEDURES

Step	Action	Description of Task	Responsible	Tick
1.		Diver(s) will be checked by the Diving Supervisor, to ensure they are fit and well.	Dive Supervisor	
1.		Confirm with the 'Authorising Person', that the task has been carried out to a satisfactory standard, confirming that task is complete.	Dive Supervisor	
2.		After consulting with the 'Authorising Person' to confirm satisfactory completion of the task. Permit to Dive and Tag outs , will be signed off and handed back to Dive Control.	Dive Supervisor	
3.		Dive supervisor will inform vessel master diving operations are complete. Ignition keys should be returned handing control back to the vessel master.	Vessel Master, Dive Supervisor	
4.		The Operational Flags and shapes should be lowered. Vessel lights should be altered to signify a change in the vessel operational status.	Vessel Master	
5.		Diving and ancillary equipment will be disassembled, stored and secured for departure.	Dive Supervisor, All	
6.		Confirm the Dive site has been left as found, all waste products or redundant materials have been removed. All barriers and safety measures have been reinstated.	Dive Supervisor, All	
7.		The Dive Supervisor will confirm that all post task steps have now been completed and the task can now be closed out.	Dive Supervisor	



9 EXAMPLE RISK ASSESSMENT

The following is an extract from the Project Plan implemented at the Garelochhead Timber and Steel Frame Fender Works Project recently undertaken by Shearwater Marine Services Ltd for the Oil and Pipelines Agency. The risks and required mitigations therein mirror in many ways the activities required at the DD3 project.

A detailed project specific Project Plan will be developed for the project inclusive of: Emergency Response Plan, Task Methodology, Construction Phase Plan, Lift Plan, Risk Assessment and Environmental Management Plan.

Task:	Fender Replacement and Reinstatement	Project No:	SMS-CMS-215	Prepared By:	Stefan Blincow
Operation:	Fender Repair Works at OPA Garelochhead	Date:	26/01/2022	Title:	HSEQ Manager
Location:	OPA, Southern Jetty, Garelochhead	Review Date	Ongoing	Signature:	
Persons exposed:	YES				
Direct Employees	YES	Contractors	YES	Approved by and date:	Joe Baird
Young persons	N/A	Public/visitors	YES	Position:	Operations Manager

Hazards with potential for harm

Note: This list is not exhaustive and should not be considered as a full list of hazards

Access/Egress	<input checked="" type="checkbox"/>	Current (Tide)	<input checked="" type="checkbox"/>	Failure	<input checked="" type="checkbox"/>	Noise	<input checked="" type="checkbox"/>	Pressure	<input checked="" type="checkbox"/>	Stored Energy	<input type="checkbox"/>
Adequate Equipment	<input checked="" type="checkbox"/>	Depth	<input type="checkbox"/>	Fire	<input checked="" type="checkbox"/>	Obstructed Vision	<input type="checkbox"/>	Reciprocating	<input checked="" type="checkbox"/>	Substances	<input type="checkbox"/>
Blow-On / Blow-Off	<input type="checkbox"/>	Discharge	<input type="checkbox"/>	Flare / Heat Radiation	<input checked="" type="checkbox"/>	Other Operations	<input type="checkbox"/>	Recovery	<input checked="" type="checkbox"/>	Surge / Sway / Yaw	<input type="checkbox"/>
Body Positioning	<input type="checkbox"/>	Disintegration	<input type="checkbox"/>	Fumes / Vapour	<input checked="" type="checkbox"/>	Overflow	<input type="checkbox"/>	Redundancy	<input type="checkbox"/>	Swell / Waves	<input checked="" type="checkbox"/>
Break / Fracture	<input checked="" type="checkbox"/>	Drive	<input type="checkbox"/>	Heat / Hot Surface	<input checked="" type="checkbox"/>	Overload	<input type="checkbox"/>	Release	<input type="checkbox"/>	Temperature	<input type="checkbox"/>
Caught Between	<input checked="" type="checkbox"/>	Dropped	<input checked="" type="checkbox"/>	Heavy	<input checked="" type="checkbox"/>	Overpressure	<input type="checkbox"/>	Rotation	<input type="checkbox"/>	Tension	<input type="checkbox"/>
Certification	<input type="checkbox"/>	Ejection	<input type="checkbox"/>	Height	<input checked="" type="checkbox"/>	Particles	<input type="checkbox"/>	Rupture	<input type="checkbox"/>	Unauthorised	<input type="checkbox"/>
Circulation	<input type="checkbox"/>	Electrical Equipment	<input checked="" type="checkbox"/>	Impact	<input checked="" type="checkbox"/>	Pinch Point	<input type="checkbox"/>	Sharp Edges	<input checked="" type="checkbox"/>	Unfamiliar	<input type="checkbox"/>
Collision	<input type="checkbox"/>	Electricity Supply	<input type="checkbox"/>	Injury	<input checked="" type="checkbox"/>	Pitch / Roll / Heave	<input type="checkbox"/>	SIMOPS	<input type="checkbox"/>	Unguarded	<input type="checkbox"/>
Communication	<input checked="" type="checkbox"/>	Entanglement	<input type="checkbox"/>	Intake / Discharge	<input type="checkbox"/>	Pollution	<input checked="" type="checkbox"/>	Slip, Trip & Fall	<input checked="" type="checkbox"/>	Vehicles / Traffic	<input checked="" type="checkbox"/>
Confined Space	<input type="checkbox"/>	Environmental	<input checked="" type="checkbox"/>	Loss of Position	<input type="checkbox"/>	Visibility / Lighting	<input type="checkbox"/>	Smoke	<input type="checkbox"/>	Vibration	<input checked="" type="checkbox"/>
Coordination	<input type="checkbox"/>	Explosion	<input type="checkbox"/>	Loss of Power	<input checked="" type="checkbox"/>	Power Isolation	<input type="checkbox"/>	Spillage	<input checked="" type="checkbox"/>	Weather	<input checked="" type="checkbox"/>

Risk Matrix

5					
4					
3					
2					
1					
	1	2	3	4	5

Severity

Risk = Likelihood x Severity

Low 1-5

Moderate 6 - 14

High 15 - 25

High Risk - Task Must Stop until risk is lowered

General Site Tasks

Tasks No.	Tasks	Who might be harmed? Hazard / Consequence	S	P	IRR	Control Measures	S	P	RRR	
1.	Arriving on site	Struck by moving vehicles	5	4	20	All operatives are to park in designated areas. Site rules and authorised routes, provided by the OPA, are to be followed. All operatives are to wear hi-visibility jackets, Overalls, Safety Boots, Glasses etc when leaving a vehicle. All operatives are to sign in onsite. All operatives are to receive a site induction. Operative to assist driver when vehicles are reversing.	5	2	10	All operatives
2.	Leaving or entering site	Struck by moving vehicles	5	4	20	All operatives and site visitors are to ensure they sign in when entering. Inductions are to be provided to all operatives and visitors before entering the worksite, individuals will be notified of the designated vehicle and pedestrian routes and site rules. All operatives and site visitors are to ensure they sign out when exiting the site.	5	2	10	All operatives



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

40 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
						Operative and visitors are to watch out for other contractors leaving the area at the same time.				
3.	Working around or causing construction dust	Lung cancer, silicosis, chronic obstructive pulmonary disorder (COPD) or asthma caused by inhaling construction dust	5	3	15	Appropriate materials to be used so that minimal cutting is required. A FFP3 dust mask that is face-fit tested, tight goggles or a face mask is to be worn at all times. Operatives are to maintain a high level of housekeeping, using filter vacuums for debris, bagging and removing waste according to local regulations and the site management plan.	5	1	5	All operatives, site visitors
4.	Working in a noisy environment or operating noisy plant	Gradual or sudden noise exposure causing permanent hearing damage	5	3	15	All operatives are to be provided with information, instruction and training around working in noisy environments or operating noisy plant. The correct ear protection, such as ear plugs or defenders, is to be used in conjunction with any noisy plant or when operating near noisy areas.	5	1	5	All operatives, site visitors
5.	Working in a noisy environment or operating noisy plant	Risk of injury or death due to interference with communications reducing people’s awareness of their surroundings	5	3	15	Where warning sounds are used to avoid or alert to dangerous situations, the client shall make sounds clearly audible in the noisy environment. Any systems of work where safety relies on verbal communications are to be avoided where the levels of noise or the wearing hearing protection could lead to misunderstandings. When working around mobile machinery or traffic, operatives are to be extra careful of their surroundings and not select hearing protection devices that are totally isolating in nature	5	1	5	All operatives, site visitors
6.	Preventing slips, trips and falls	Severe strains, sprains and breaks	4	4	16	All operatives are to be shown the correct area for safe storage of materials onsite before works begin. Operatives are not to carry items that will hinder the carrier’s clear view. All rubbish is to be removed from the site at scheduled times, organised by the site supervisor and in line with the site waste management plan.	4	1	4	All operatives, site visitors
7.	Lowering tool to diver	Open water environment Tender falling into deep water/ Personal injury, hypothermia, drowning	5	4	20	Tender to wear Correct PPE at all times including certified lifejackets, boots, gloves, floatation suit	5	2	10	All Personnel
8.	Lowering/recovering tool to/from diver	Dropped tool Personal injury diver, damaged assets	4	4	16	Lower tool on suitable job line, job-line checked fit for purpose before use, good communications between diver/dive supervisor/tender	4	2	8	Dive Supervisor / Dive Tenders
9.	Safe use of hand tools	Hand Tools Personal injury, Cuts	4	3	12	All Tools subject to pre-use checks prior to being used , Divers trained in the safe use of tools	4	1	4	All Personnel
10.	Transportation and setting up of hydraulic power pack	Heavy lift. Slips trips & falls, load movement Personal injury/ Damage to as-sets	4	4	16	Suitable PPE worn. Safe lifting procedures adhered to. Equipment correctly stowed prior to transit to/from site	4	1	4	Dive Supervisor / Dive Tenders
11.	Setting up hydraulic power pack	Fuelling, topping up hydrau-lic/engine oil Spillages, spontaneous fire/ Personal injury, environmental damage	4	3	12	No fuelling or oil filling with unit running. Spill kit in close proximity	4	1	4	Dive Supervisor / Dive Tenders



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

41 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
12.	Starting up and running power pack	Hydraulic hose failure Oil spillage/ Personal injury, contamination	4	3	12	Safety goggles worn whilst unit running. Spill kit in closed proximity	4	1	4	Dive Supervisor / Dive Tenders
13.		Moving machinery. Snagging hazard - Clothing entrapment/ Personal injury	4	3	12	Correct PPE worn at all times, no loose clothing	4	1	4	Dive Supervisor / Dive Tenders
14.		Running machinery, high decibel levels Damage to hearing	4	5	20	Correct PPE worn at all times (ear defenders) Yearly hearing checks during medica, noise barriers in place if required	4	1	4	Dive Supervisor / Dive Tenders
15.	Positioning Tools and Equipment on Jetty	Diver in Water, Operative on Multicat vessel Tools or Equipment falling from Jetty / Severe impact injury to head or body, potential of life changing injury	5	3	15	Where possible, generators and other heavy equipment should remain onboard the Multicat Vessel or Dive Support Vessel to prevent the potential of equipment falling from jetty. Equipment and tools should be secured where possible. All tools and equipment to be kept back from the edge of the jetty. Must be behind yellow stop block and faded yellow marker on platform. Positioning of tools and equipment to be agreed during Pre-Dive Toolbox talk. All operatives to wear hard hat and steel toe-capped workboats while working below jetty on vessels. Diver is required to wear hard shelled dive helmets to protect from falling objects.	5	1	5	Principle Contractor, Supervisor and Operatives
16.	Dropped object while lowering to diver	Diver in Water Tools dropped while tender lowering to Diver / Impact to head or body of diver, potential damage to diving equipment or dive suit, injury to diver	4	4	16	Working area to be visually assessed by diving supervisor prior to works commencing. Where possible, tools and equipment are lowered to the diver prior to the diver being positioned in the required area. Nothing to be lifted or lowered to the diver that is out with the manual handling capability of the tender. Large or heavy equipment or tools to be lowered down by mechanical means. All tenders / divers trained to manage tools and materials including how to lower into the water from height on the jetty. Communication between Diver, Supervisor and Tender to ensure tools are safely lowered and received in both directions. Verbal confirmation required by all parties. Loose tools must be stored within an adequate container and rope / sling checked by a diving supervisor (SQEP) prior to use. Diver is required to wear hard shelled dive helmets to protect from falling objects.	4	2	8	Principle Contractor, Supervisor and Operatives
17.	Tender managing umbilical from surface	Tender, Diver in Water Tender falls into water while managing umbilical / Accidental immersion in the water, either partial or total, causing hypothermia, drowning or health risks	5	4	20	All tenders to be suitably trained and experienced to carry out the role. Where possible tenders should stand behind collective fall protection to prevent a fall. “Lazy Loop” technique to be used by all operatives to prevent the umbilical, if tugged to throw the tender into the water. All staff are to be trained in rescue techniques and have knowledge of emergency procedures. Standby diver to be available at all times Rescue equipment is to be located where it is quick/easy to reach and use. Spare warm and dry clothing or blankets are to be available, especially in cold weather. Working alone is not permitted on any Shearwater Marine Services Ltd site. All Operatives to be briefed on emergency procedures during initial toolbox talk. A first aider (not the person at risk) is to be present at all times. Lifejacket must be worn by all operatives in close proximity to the water’s edge. Appropriate boots to be worn by all operatives on site.	5	1	5	Principle Contractor, Supervisor and Operatives



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

42 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
18.	Diver Access / Egress to water	Diver in Water Fall from access ladder / entanglement in umbilical, disorientation.	4	4	16	Access and egress points, will have been planned by the SMS Project management team taking into considerations environmental conditions, equipment to be worn, ease of use, proximity of hazards, etc. Tenders will be in close proximity to the diver to assist access/egress as well as monitor umbilical.	4	1	4	Principle Contractor, Supervisor and Operatives
19.	Operative working on Jetty / above where multicat is docked	Operative, Site Visitor Fall from jetty onto or around area where multicat is docked / Severe impact injuries from fall, landing on deck or entrapment between vessel and dock wall.	5	5	25	Multicat positioned on the jetty where no work is taking place, no requirement for operative to be positioned near the jetties edge where vessel is docked. Yellow marker and Stop Block in place and visible on Jetty. No access permitted beyond the marked lines where vessel is docked. All operatives briefed on access requirements during daily Pre-Dive toolbox talk. Diving supervisor to monitor and liaise with SMS Project Team where required. Suitable PPE including life jackets to be worn at all times.	5	2	10	Principle Contractor, Supervisor and Operatives
20.	Operative working on Jetty / above water	Operative, Site Visitor Fall from jetty into water / Severe impact injuries from fall, hitting dock wall. immersion in the water, either partial or total, causing hypothermia, drowning or health risks	5	5	25	Yellow marker and Stop Block in place and visible on Jetty. No access permitted beyond the marked lines unless lowering materials or tools to diver where appropriate techniques are used by SQEP Tender / Operative. All operatives briefed on access requirements during daily Pre-Dive toolbox talk. Diving supervisor to monitor and liaise with SMS Project Team where required. All staff are to be trained in rescue techniques and have knowledge of emergency procedures. Standby diver to be available at all times Rescue equipment is to be located where it is quick/easy to reach and use. Spare warm and dry clothing or blankets are to be available, especially in cold weather. Working alone is not permitted on any Shearwater Marine Services Ltd site. Suitable PPE including life jackets to be worn at all times while on site.	5	2	10	Principle Contractor, Supervisor and Operatives

DIVING OPERATIONS

21.	Site Emergency Evacuation	Personnel unaware of site procedures Confusion / panic / poor response to emergency situation	3	5	15	Site induction carried out by all personnel, project familiarisation meeting carried out, Project Bridging & ERP document onsite, site escape plan clearly identified, diver emergency recovery exercise conducted prior to works starting. Stand-by diver at a constant state of readiness whilst dive ops are ongoing. SMS vehicle permanently stationed at the jetty entrance. Certified recovery davit on board vessel. Tender craft used transfer casualty to boat steps to be evacuated to transport.	3	1	3	Site Agent / Dive Supervisor
22.	Permit to Work System	Unfamiliar procedure, other site activities No permit in place / incorrect permit / uncoordinated activities / unsafe condition	4	4	16	Tag-Out systems discussed pre-mobilisation / project familiarisation / site induction / bridging document to clarify PTW systems / PTW to be raised and checked prior to works commencing	4	1	4	Site Agent / Dive Supervisor



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

43 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
23.	Loading and offloading equipment	Lifting and lowering tools for diver Dropped load/equipment misuse or failure/damage to assets/personal injury	4	3	12	All personnel suitably briefed during toolbox talk, PPE worn, tag-lines used, divers move to "safe zone" during lifting and lowering	4	1	4	Dive Supervisor/diver tenders/divers
24.	Diving operations from diving support craft	Wave/ground swell/moving dive platform Slips trips & falls/personal injury	4	3	12	Good housekeeping, deck kept clear, vigilance maintained on environmental conditions, personal awareness, lifejackets worn, experienced personnel onboard at all times.	4	1	4	All project personnel
25.		Deep water environment Man overboard/personal injury	5	3	15	Man-overboard drill understood and carried out regularly, PPE worn including certified life jackets/personal awareness, hand thrown recovery lanyards present	5	1	5	Dive Supervisor
26.		Lifting and lowering tools for diver Dropped load/equipment misuse or failure/damage to assets/personal injury	4	3	12	All personnel suitably briefed during toolbox talk, PPE worn at all times, tag-lines used, divers move to "safe zone" during lifting and lowering	4	1	4	Dive Supervisor
27.		Poor light conditions Slips trips & falls/personal injury/damaged or lost assets	4	3	12	DSV External lights will be utilised during low light conditions	4	1	4	All project personnel
28.		Vessel Propulsion Unit Unintentional start-up/personal injury	5	3	15	Engine stopped, start keys removed from console and kept with Diving Supervisor during diving operations. Vessel will not start without key	5	1	5	Coxswain/ Dive Supervisor
29.	Diving operations from diving support craft	Loss of Mooring Vessel drift-off/diver dragged/entanglement/unintentional upwards excursion/personal injury	5	3	15	Vessel will be secured using good quality nylon or dyneema mooring rope with secondary back-up line attached/environmental conditions monitored, all operatives trained in marine knot tying skills	5	2	10	All Personnel
30.	Diving Below Vessel	Wave/groundswell/vessel or buoy movement Diver impacting hard surface/personal injury / damaged assets	5	3	15	Divers will wear hard shelled diving helmets / care taken when descending and ascending directly beneath the vessel or mooring can	5	2	10	Dive Supervisor/divers
31.	Use of All Type of Air Diving Equipment inc. LP Breathing Air Compressor	Equipment used outside operating parameters / Mixing / use of uncertified equipment Physical Injury personnel/Third party Personnel. Damage/Down time of equipment.	5	3	15	Use trained competent personnel / Operate within Shearwater Operating procedures / Check all equipment for certification / Secure/dispose of all non-certified equipment	5	1	5	Dive Supervisor
32.	Maintenance & Use of LP Compressor Systems	Pressurised Air Serious injury to, Compressor and servicing personnel. Physical Damage to Equipment	4	3	12	Isolate all power supplies / Support/restrain equipment to prevent movement / Before dismantling ensure all residual pressure in all parts of equipment, on the panels of air supply, in hoses are released / Trained Personnel / Certified Equipment	4	1	4	Dive Supervisor / Dive Techs
33.	HP Charging	Fuels and lubricants Spontaneous combustion/personal injury/damage to assets	5	3	15	All charging will be done off-site for petrol/diesel compressor prime mover, all plant in service, vigilance and site operational procedures followed	5	1	5	All project personnel



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

44 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
34.		Exhaust fumes Contaminated air supplies/personal injury	4	3	12	Ensure exhaust positioned in well ventilated area downwind of diving compressor intakes, intake pipe as possible, continue to monitor wind direction for any sudden changes	4	1	4	All project personnel
35.		High pressure air supplies HP burst /personal injury	4	4	16	PPE worn (safety glasses,) when changing over air supplies, whip arrestors in place and to be used at all times.	4	1	4	All project personnel
36.	Diving Operations	Access and egress arrangements Unconscious, immobile diver	5	3	15	Tested recovery system in place, standby diver present, safety briefing, immobile diver egress point established during planning stage, egress point free from obstructions at all times, ERP in place and kept in Dive Control at all times, emergency recovery drill conducted and logged.	5	1	5	Dive Supervisor
37.		Unknown discarded underwater materials Entanglement, entrapment	5	3	15	Surface supplied diving techniques, diver carries knife, voice communications, standby diver dressed and ready at all times	5	1	5	Dive Supervisor/diver tenders/divers
38.		Unknown discarded underwater materials Entanglement, entrapment	5	3	15	Diver Knife risk assessed for use, only cut away from yourself, good umbilical management whilst knife is out of Sheath.	5	1	5	Dive Supervisor/diver tenders/divers
39.		Environmental conditions Wind, wave and tide/ sudden impact, loss or damaged equipment/ personal injury	5	3	15	Sheltered location, monitor conditions, abort diving if any doubt re safety of the diver, max wave height 1.2m h/max, max current 0.8knts , standby diver dressed and ready, sheltered location	5	1	5	Dive Supervisor/diver tenders/divers
40.		Environmental conditions Hypothermia/Hyperthermia/pers onal injury	5	4	20	Divers wearing neoprene dry suit and under-layers, tenders wearing suitable PPE, standby diver sheltered from excesses in temperature, good communications and rest breaks as required.	5	1	5	Dive Supervisor
41.		Equipment malfunction Loss or restriction of main air, rapid ascent DCI/personal injury	5	3	15	Equipment fully maintained and part of company PMS system, pre-dive function checks carried out, emergency air supply available through back up and bailout cylinders	5	1	5	Dive Supervisor
42.		Compressing/decompressing diving personnel Barotrauma, DCI/ personal injury	5	3	15	All diving personnel have valid in date yearly medical certification, ERP in place and kept in Dive Control at all times, RCC available with DMT in attendance (Directions within ERP)	5	1	5	Dive Supervisor
43.		Environmental/marine life Stings, scratches, bites/personal injury	4	4	16	1 st aid kit onsite and available to all personnel, Tenders to wear appropriate work gloves at all times, divers wear appropriate gloves at all times	4	1	4	Dive tenders/divers
44.		Sharing diving helmet Contamination Infection, disease/ personal injury	4	4	16	Helmets decontaminated pre/post dives and flushed with water, divers wear own hat liners, if possible,	4	1	4	Dive tenders/divers
45.	Diving Operations	Sharp edges areas dry-suit tear Water ingress, chilling, hypothermia/personal injury	5	4	20	Tender Carries out Leak checks prior to Diver leaving surface, abort Dive if Leaks in system or Suit present. Care whilst moving around and entering or exiting water.	5	1	5	Dive Supervisor/diver tenders/divers
46.		Loss of Weights Uncontrolled ascent, embolism/personal injury	5	4	20	Harness worn in place of weight belt, Harness part of PMS System and check as per manufacturer instructions divers trained not drop weights at depth,	5	1	5	Dive Supervisor/divers
47.		Poor Visibility Disorientation / difficulty returning to down-line / deployment device	4	4	16	Competent experienced divers, umbilical's marked, excursion lengths known on surface, voice communications, Hat Light and UW Video, Diving Supervisor monitoring Divers breathing at all times	4	2	8	Dive Supervisor/divers



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

45 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures	Residual	
48.		Loss Communications Supervisor unable to communicate with diver / extended bottom time / DCI / personal injury	5 3 15	Comms subject to PMS servicing, checks carried out prior to diver entering water, replacement unit present and in full working order, revert to line signals if required, flash hat light to signal diver to abort dive immediately	5 1 5	Dive Supervisor / tenders
49.	Access to Dive-Site	Third parties encroaching topside working areas Plant and equipment running / unsafe condition / personal injury / damaged assets	5 3 15	Use of fencing / barriers / signage to prevent and warn unauthorised persons from encroaching working areas / vigilance / verbal instruction	5 1 5	All project personnel
50.		Pleasure craft Vessels encroaching divers safe working area / vessel impacting diver or umbilical / personal injury / damaged assets	5 3 15	RIGID Flag Alpha flown during diving operations / VHF radio within Dive Control / notice to mariners issued/QHM / vigilance / diver removed from water if encroachment by any vessel	5 2 10	All project personnel
51.	Working in close proximity of Vessels	Vessel propulsion unit moving Personal injury/Damaged assets	5 3 15	Good Communications between vessel master and Diving supervisor at all times, Diver moved to “safe zone” during any vessel movements, good tendering practices at all times.	5 2 10	Diver/Dive Supervisor
52.	Adverse Weather	Wet slippery surfaces Slips trips and falls / impact injury / man overboard / fractures / drowning	5 3 15	Suitable footwear, good housekeeping, no running on site, lifejackets worn for edge working, hard hats worn at all times	5 2 10	All project personnel
53.		Thermal balance Hot/cold/wet / poor concentration / personal injury	4 3 12	Appropriate clothing, shelter, minimise time out side, rotate personnel	4 1 4	All project personnel

PLANT & EQUIPMENT

54.	Working near or over water with electrical equipment User	Fatal or serious injuries sustained from using electrical equipment over or near water	5 3 15	Operatives are to choose equipment that is suitable for the working environment. Electrical risks are to be eliminated by using air, hydraulic or hand-powered tools. When battery powered portable tools cannot be used, portable tools designed to run from a 110-volt centre-tapped-to-earth supply are to be used A 110v portable transformer is to have RCBO protection.	5 1 5	All
55.	Use of Mobile Generator	Positioning mobile generator Injuries sustained from slips, trips and falls or manual handling of mobile generator	5 3 15	Exhaust to be checked at intervals and correctly sited to ensure good ventilation Generators will only be used in well ventilated areas, with adequate airflow, internal use will be avoided All operatives included will receive information and instruction regarding the location and correct use of the spill kit Suitable firefighting equipment will be located at the refuelling point. Ensure to turn off generator before re-fuelling, and use funnel Ensure fuel for equipment is carried in an explosion proof and appropriate metal container which is secured in the transport vehicle Machine is to be fuelled away from the vehicle, visitors and members of the public Smoking is not permitted during refuelling and operation of this equipment Ensure fuel tank and cap is secure at all times Caution shall be exercised to prevent overfilling and spillage; all spillages will be cleaned up immediately	5 1 5	All site operatives

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures	Residual	
56.	Operating mobile generator	Electrical shock whilst operating mobile generator	5 3 15	Ensure equipment is maintained and inspected before use Equipment to be operated by a competent person Ensure all cables leading from generator are safe, electrically tested and tagged	5 1 5	All site operatives
57.	Using portable hand and power tools	Injuries to hands sustained from incorrect use of portable hand tools	2 4 8	All operatives to be trained in the safe use of hand tools before starting works and have necessary experience to use each hand tool Tools used shall have inherent safety features where possible Keep cutting tools sharp, so that they cut true without needing to be forced Tools should be checked regularly for damage and any item to be found damaged or defective taken out of use immediately Guards to be used where available and never removed or adjusted from the intended position All portable hand tools are to be used as per the manufacturer's instruction	2 1 2	User
58.		Using portable power tools Electrocution causing serious or fatal injuries whilst using portable power tools	5 3 15	Only 110v or battery-operated equipment to be used Electric equipment to be kept dry and stored in toolbox to protect from damp and damage Visual inspection prior to use, plugs, leads, power supply (transformer), insulation, switches, RCD (if used), signs of burns, casing, loose parts Damaged or defective equipment including leads to be replaced immediately or fixed by competent person Electrical equipment must not to be tampered with, anything showing evidence of tampering must not be used until tested by a competent person	5 1 5	User
59.	Using portable hand and power tools	Using portable power tools Hearing loss to site operatives working near noisy power tools	2 3 6	Suitable hearing protectors should be provided for operatives and any surrounding workers Use low-noise tooling where possible Operatives and the supervisors are to co-ordinate with other workers in the area to ensure that works taking place do not impact one another's safety, where unavoidable operatives working nearby noisy works will be provided with suitable hearing protection.	2 1 2	All site operatives
60.		Using portable power tools Serious cuts, injuries or amputations to body parts from the incorrect use of cutting tools	5 3 15	Ensure any portable tools that are set up, are in a designated safe area avoiding thoroughfare of other workers or vehicles All cutting tools to have safety guards incorporated, fastened securely and regularly checked and maintained Ensure no loose clothing is worn in the vicinity of cutting, and gloves are worn at all times	5 1 5	User
61.	HAVS	Using vibrating machinery Serious injuries like hand-arm vibration syndrome caused by the extended use of vibrating machinery	4 5 20	Where possible, try eliminate or reduce exposure to the lowest reasonably practicable level Consult supervisor and employees for extent of use with vibrating machinery All workers should have sufficient training and competency in using vibrating machinery Ensure employees are not exposed above the ELV If they are, take immediate action to prevent recurrence Where exposure still remains above EAV implement health surveillance and make available job rotation to limit excessive exposure	4 1 4	User
HIGH PRESSURE EQUIPMENT						
62.	Setting up HP Cleaning Equipment – operational function checks	High pressure pumps, hoses and lances Equipment misuse, malfunction, catastrophic failure/Personal injury damaged assets	5 4 20	Competent person checks all equipment and associated couplings daily prior to operational function checks	5 2 10	Dive Supervisor



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

47 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
63.		High pressure pumps, hoses and lances Catastrophic failure/Personal injury damaged assets	5	4	20	Equipment belonging to SMS will be subject to full and thorough examination six monthly by competent person. Equipment on hire will have a certificate of fitness for use valid for 6 months minimum	5	1	5	Dive Supervisor
64.		Fuels and lubricants Spills and leakages/Personal injury environmental damage	4	4	16	No refuelling pump units whilst running, PPE worn for pump unit operational checks (eye protection, gloves) spill trays utilised and spill kits present	4	1	4	All Personnel
65.	Deploying and recovering guns and lances to/from underwater worksites	Lifting and lowering equipment items to/from diver Dropped object/Personal injury damaged life support equipment	5	3	15	No overboarding equipment items until diver clear from overhead objects, good communications, standby diver in attendance, job-lines	5	1	5	All Personnel
66.	Operating High pressure water jetting equipment	Dump safety valve type jetting gun Severe jolt when trigger is released, personal injury	4	5	20	Ensure choke system is fitted to reduce effect – consult manufacturers operations manual before use	4	2	8	Dive Supervisor
67.		Dry shut off type jetting gun Pressure maintained in supply line – inadvertent use whilst pump cold – personal injury	4	4	16	Consult manufacturers operations manual before use ensure all personnel familiar with potential for inadvertent cold start-up, vigilance	4	2	8	All Personnel
68.	Operating High pressure water jetting equipment	Opposite reaction force Unbalanced unmanageable equipment/Personal injury	4	5	20	All HP water guns fitted with retro jet with nozzle type designed to provide reaction force equal to lance to give equal balanced gun	4	1	4	Dive Supervisor / Dive Tender's
69.		Retro jet	4	4	16	Retro jet must be guarded by venturi type diffuser locked onto gun.	4	1	4	Dive Supervisor / Dive Tender's
70.		High pressure water, bodily contact/Personal injury	4	4	16	Ensure positively locked onto gun prior to every use, or if removed releases retro nozzle to avoid self-injury to diver	4	1	4	Dive Supervisor / Dive Tender's
71.		High pressure spray/grit Inadvertent bodily contact/Personal injury	4	4	16	Ensure that lance length sufficient to reduce chance of self injury – longer better – ensure all users trained in use prior to underwater operation	4	3	12	Dive Supervisor / Dive Tender's
72.			4	4	16	Ensure dangers of water embolism understood by all persons. Contact with HP water must be treated as a true medical "emergency" requiring "immediate" hospital attendance no matter how insignificant the wound	4	3	12	Dive Supervisor / Dive Tender's / Divers
73.		Equipment malfunction, failure, loss pressure In-water checking of hose, couplings, etc. whilst pump running, inadvertent bodily contact/Personal injury	4	3	12	Any loss of pressure should always be treated as a system leak!! Make tool "cold" and remove all pressure by depressing trigger and return to topside for inspection. Under no circumstances inspect for leakages in-water	4	1	4	Dive Supervisor / Diver
74.	Long term usage of equipment	Corrosion and deterioration of joints and couplings Increased risk of equipment failure/Personal injury	4	5	20	Flush through with fresh water prior to nightly storage, inspect and store in secure manner to avoid breakages. If any lose or damaged fittings are found mark as "defective" and report to dive supervisor	4	3	12	All Personnel
WELDING / BURNING OPERATIONS										
75.	Underwater Welding	Electrical Current Electric shock/Personal injury	5	4	20	Circuit Breaker used. Diver working outside of circuit. All cables and Stinger double insulated. Earth clamp clamped to work piece. Refer to IMCA D 045, R 015 (Safe use of Electricity underwater) for important info.	5	2	10	Dive Supervisor / Diver



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

48 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
76.		Welding gases produced (hydrogen) Underwater Explosion/Personal injury damaged assets	5	3	15	Ensure gases are not allowed to gather in underwater pockets above diver, where possible a ventilation hole should be made in material being welded in accordance with underwater welding procedures.	5	1	5	Dive Supervisor / Diver
77.		Live electrode/glare Unintentional start-up/ Personal injury	4	4	16	Electrode made cold during position adjustment or changing rod – good communications procedures, correctly fitted welding visor	4	1	4	Dive Supervisor / Diver
78.	Using blow lamp or similar	Serious injuries sustained from fire or explosions whilst using a blow lamp or similar for brazing/bronze welding (oxy-acetylene & oxy-propane)	5	4	20	A hot work permit system should be implemented onsite by the principal contractor or client Site operatives must comply with safe procedures and manufacturer’s instructions whilst undertaking hot works User must ensure all combustible materials are removed, with flammable liquids and gas cylinders beyond the range of the blowtorch When using a blowtorch on metal surfaces, combustible material in contact with the metal behind or adjacent to the work area should be removed before work commences Keep a watch whilst work is in progress for signs of fire or smouldering in the immediate vicinity Ensure a portable fire extinguisher is readily available wherever and whenever hot works are in progress Always extinguish a blowtorch when not in use and never leave it burning unattended Ensure adequate ventilation where gas burning appliances are in use Ensure area is checked thoroughly at the end of the work period and signed off on hot works permit as being safe by site supervisor and user	5	1	5	All site operatives
79.		Flashbacks causing equipment to fail or explosion of cylinders	3	3	9	Use the correct lighting-up procedure, purging hoses before lighting the torch Remove any potentially explosive gas mixtures use a spark igniter and light the gas quickly after turning it on Make sure the blowpipe is fitted with spring-loaded non-return valves Use the correct gas pressures and nozzle size for the job Equipment to be maintained regularly and kept in good condition Fuel canisters to be secured at all times	3	1	3	User
80.		Contact burns to operative	3	5	15	Work in a safe location away from other people User to wear protective clothing, boots, gauntlets and eye protection Shut off the torch when not in use. Do not leave a lighted torch on a bench or the floor as the force of the flame may cause it to move Always clamp the workpiece, avoid holding it by hand	3	1	3	All site operatives
81.	Operating or transporting oxy/fuel gas equipment	Fire or explosion caused by gas leaks	5	3	15	When job is finished, turn gas supply off at cylinder or before the cylinders are moved or transported Isolate and purge or remove hoses and equipment from enclosed or poorly ventilated spaces when there is a break in work Keep hoses away from sharp edges and abrasive surfaces or where vehicles can run over them Do not allow hot metal or spatter to fall on hoses All equipment will be maintained by a trained operative and all connections and equipment checked for faults and leaks weekly when in heavy use	5	1	5	User

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
						Any leak detection will be undertaken by a trained operative, using proprietary leak detecting spray or solution suitable for use with oxy/fuel systems and make immediate repairs as necessary				
82.	Flame cutting	Fumes created during flame cutting	3	4	12	Any flame cutting on clean and unpainted metal outdoors will typically not require operative to wear RPE Any exterior work shall be undertaken where possible in a position where the wind blows the fume cloud away from the user and other people near by Working on materials coated with lead or chromate paints, galvanised or cadmium plated or metal contaminated with oil, grease etc will require fume control such as extraction and/or RPE	3	1	3	All site operatives
83.	Storing and transporting cylinders	Fire or explosion caused when storing and transporting cylinders	5	3	15	Close the cylinder valves when the equipment is not in use Store gas cylinders outside whenever possible, or in a well-ventilated place Equipment during storage should close the cylinder valves with the protective caps in place Outside storage, place on a fireproof surface and enclose in a tamper-proof enclosure	5	1	5	User
84.		Crushing or impact injury when handling and transporting cylinders	3	4	12	Cylinders will be secured in transport so they don't come loose in an accident Cylinders will be prevented from falling or being knocked over by securing them with a stout chain or strap Avoid moving a cylinder by tilting it on its base and rolling it, always use a trolley to transport	3	1	3	User
85.	Oxythermic Cutting/Divers	Changing cutting rod Electric shock/personal injury	5	3	15	Electrical current isolated via knife switch during rod changeovers	5	1	5	Dive Sup
86.		Residual waist gases produced (hydrogen, oxygen, methane) Trapped explosive gases, spontaneous combustion/personal injury damaged assets	5	4	20	Ensure gases are not allowed to gather in underwater pockets above diver – cold cut ventilation ducts in enclosed compartments - flush with fresh air using pneumo hose frequently during hot cutting – diver using “drag method” at all times (rod @ arm’s length) diver keeps face and chest clear of cut. Refer to IOGP 471 guidance	5	2	10	Dive Sup
87.		Live electrode, Unintentional start up/personal injury	4	4	16	Cutting Rod made cold during position adjustment or changing rod – good communications procedures, correctly fitted welding visor	4	1	4	Dive Sup
88.		Cutting into void spaces and low pressure areas	5	3	15	Ensure void spaces are flooded prior to cut.	5	1	5	Dive Sup
89.		Mechanical tension Load shift - personal injury, damaged equipment, entrapment	5	3	15	Assess dynamic loading and angles of tension. Diver and equipment positioned in safe location restraining wires used as safeguard with mechanical tension applied	5	1	5	Dive Sue
90.	Oxythermic Cutting /All personnel	High pressure oxygen containers Equipment malfunction, regulator hose failure, gas blow off, explosion personal injury	5	3	15	Ensure all cylinders and associated support equipment is in test and has been visually inspected before and after use – whip restraints	5	1	5	Dive Sup
91.		Gas handling Dropped or impacted storage containers/damaged assets / explosion - personal injury	5	3	15	Care when handling compressed gases – safe by positioning procedure followed – signage	5	1	5	Dive Sup
92.		Contaminated gas venting to topside working areas Inhalation of noxious and toxic gases/personal injury	4	3	12	Ensure surface area sufficient to freely disperse vented gases	4	1	4	Dive Sup



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

50 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures	Residual	
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UNDERWATER GRINDING

93.	Underwater Grinding / Cutting Operations	Fast spinning, sharp/abrasive disc Disc shattering/damaged assets/personal injury	5	3	15	Check disc condition prior to deploying to worksite, ensure discs are never re-used after immersion/no grinding discs used for cutting/store discs upright in safe dry location	5	1	5	All Personnel
94.	Underwater Grinding / Cutting Operations	Fast spinning, sharp/abrasive disc Contact with equipment and or body parts/damage assets/personal injury	4	4	16	Ensure guards are affixed and in good working order/ensure no trailing equipment such as lanyards - straps - umbilicals	4	2	8	Dive Supervisor / Dive Tenders / Divers
95.	Underwater Grinding / Cutting Operations	Unstable work position, fast spinning, sharp/abrasive disc Sudden loss of working position/contact with equipment and or body parts/damage assets/personal injury	5	3	15	Establish solid work position prior to starting work/consider use of magnets for mid-water working/tool isolated during repositioning	5	2	10	Dive Supervisor / Diver
96.	Underwater Grinding / Cutting Operations	Mid-water working/negatively buoyant tool Unscheduled decent/no deco bottom time overrun/delayed ascent/in-water deco/chilling	5	3	15	Tool clipped and lowered on job-line/floating hydraulic hoses used to limit weight/consider wearing BCD's for mid-water work	5	1	5	Dive Supervisor / Dive Tenders
97.	Underwater Grinding / Cutting Operations	Pressurised hydraulic fluid Hose or connectors failure/release of hydraulic fluid/environmental impact	4	3	12	Pre-dive checks should ensure hoses and connectors are in good condition/post dive checks for damage or wear/safe storage overnight	4	1	4	Dive Supervisor / Dive Tenders

CHAINSAW (TOPSIDE & UNDERWATER)

98.	Lifting/supporting chainsaw during operation.	Chainsaw User. The chainsaw (weight ~ 6kg) is held away from the body and causes musculoskeletal injuries.	4	4	16	The Chainsaw User (Stefan Toremar) is trained in manual handling. Safety hard hat, visor and ear-defenders, gloves, trousers and boots, all high visibility and specific for chainsaw use. Only fuel the chainsaw to half-tank level to reduce its weight. Consider the use of a support harness to carry the chainsaw weight on shoulders.	4	1	4	Chainsaw Operator, Supervisor
99.	Chainsaw operation during cutting	Chainsaw User. Slip/trips during operation causes chain blade to hit body and cause severe lacerations.	5	4	20	Automatic power cut-out via Deadman's Handle system on the machine. Chainsaw use is restricted to one member of staff on site only (Stefan Toremar) who is trained in the use and maintenance of the machine which have been proved to the OPA Chainsaw is locked-up when not in use (key held by the Trained User). Chainsaw is used in good weather only, and not during wet conditions. Chainsaw is used with the user at ground level only, and not above shoulder level.	5	1	5	Chainsaw Operator, Supervisor
100.	Blade kick-back or jamming during cutting	Chainsaw User. Moving blade comes into contact with user and causes severe lacerations.	5	4	20	Machine maintained as per manufacturer guidelines by trained user (Stefan Toremar) so that chain blade is always sharp and is properly tensioned. Safety hard hat, visor and ear-defenders, gloves, trousers and boots, all high visibility and specific for chainsaw use.	5	1	5	Chainsaw Operator, Supervisor
101.	Fuelling chainsaw	Chainsaw User and Maintainer. Spillage then accidental ignition of petrol causing burns.	4	4	16	Only done by the trained user (Stefan Toremar) according to the manufacturer's instructions, on the dive vessel only with no ignition sources nearby, and with clean-up equipment near to hand. Gloves to be worn.	4	1	4	Chainsaw Operator, Supervisor



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

51 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial			Control Measures	Residual			
102.	Noise from chainsaw during operation	Chainsaw User. Long exposure causes hearing impairment and deafness.	4	4	16	Chainsaw use limited to <1 hour per day. Ear defenders to be worn during operation by user and surrounding operatives	4	1	4	Chainsaw Operator, Supervisor
103.	Vibration from chainsaw during operation	Chainsaw User. Long exposure causes finger/hand numbness and 'white finger' injury.	4	4	16	Chainsaw use limited to <1 hour per day. Gloves to be worn during operation by user, regular breaks to be taken and report to supervisor immediately where tingling on loss of feeling in hands occur.	4	1	4	Chainsaw Operator, Supervisor
104.	Flying debris produced during chainsaw operation.	Chainsaw User and 3rd party staff/visitors in the vicinity. Chainsaw operation causes debris to fly out and cause sharp object impact injuries	5	5	20	Chainsaw is not used if there are people <5m from the job in progress. PPE (for chainsaw operator): Safety hard hat, visor and ear-defenders, gloves, trousers and boots, all high visibility and specific for chainsaw use.	5	1	5	Chainsaw Operator, Supervisor
105.	Chainsaw maintenance activities	Chainsaw Maintainer. Injuries caused to hands/ fingers when covers and guards removed to allow maintenance, esp. from the chain blades.	4	4	16	Chainsaw designed for safe maintenance and equipment certified as per the Shearwater Planned Maintenance System Consider outsourcing the sharpening of the chain to a local specialist.	4	1	4	Chainsaw Operator, Supervisor
106.	Chainsaw Operations	Sharp running blade Severed umbilical, loss main air/ personal injury, drowning	5	3	15	Proper umbilical management, good communications, standby diver present	5	2	10	Dive Supervisor / Dive Tenders
107.	Chainsaw Operations	Unstable seabed Slip trips falls/severed umbilical/severed hydraulic hose/oil contamination/loss gas	5	3	15	Hose management, good communications, hydraulic pack shutdown operator in position. No running tool in unstable stance, or whilst relocating to other job location	5	1	5	Dive Supervisor / Dive Tenders
108.	Chainsaw Operations	Poor visibility Severed umbilical, loss main air/ Personal injury, drowning	5	3	15	Proper umbilical management, good communications, standby diver present, Hose management, good communications, hydraulic pack shutdown operator in position	5	1	5	Dive Supervisor / Dive Tenders
109.	Chainsaw Operations	Jammed blade Involuntary start-up of tool whilst un-jamming / Personal injury, damaged assets	5	3	15	Ensure tool is made cold before attempting to clear from jamming site	5	1	5	Dive Supervisor / Dive Tenders / Diver
110.	Chainsaw Operations	Blunt blade Excessive down force applied, tool slipping, jamming / Personal injury	5	3	15	Do not attempt to cut with blunted or damaged blade	5	1	5	Dive Supervisor / Dive Tenders
111.	Chainsaw Operations	Tensioned cut area Unexpected and rapid work piece movement/ Diver entrapment, crush, personal injury, damaged assets	5	4	20	Survey work area prior to cutting, secure job piece with appropriate rigging/lifting equipment/carnage as required	5	1	5	Dive Supervisor / Dive Tenders
112.	Sharpening blade	Live tool Unintentional start-up/ Personal injury	4	4	16	Hydraulic pack made cold during sharpening or changing blades	4	1	4	Dive Supervisor / Dive Tenders
113.	Drilling/All personnel	tool jamming Unintentional start-up/ Personal injury	4	4	16	Ensure tool is made cold before attempting to clear from jamming location	4	1	4	Dive Sup



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

52 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures	Residual	
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ABRASIVE WHEELS

114.	Use of abrasive wheels	Serious injuries sustained to eyes or body from contact with flying objects or cutting wheels		3	15	Prior to use, all operatives will receive suitable information, instruction and training on the equipment used Equipment will have a declaration of conformity and a CE mark Equipment to be used as is set out within the manufacturer's instructions Equipment is to be periodically checked, maintained and tested and visually inspected before use Only operatives with training and authorised to use abrasive wheel tools should undertake work Correct PPE to be worn at all times when using abrasive wheels and or angle grinders, including safety goggles and gloves Guard on abrasive wheel to be correctly adjusted to suit work position	1	3	3	User
115.		Damage to lungs through the inhalation of dust	4	3	12	Where possible, dust extraction to be used or abrasive wheel work to be undertaken in a well-ventilated area All operatives in the area to wear correct PPE, masks may be required depending on the application	1	3	3	User
116.		Injuries sustained from the use of noisy equipment		3	15	Designated area for abrasive wheel cutting/grinding to be used where possible When cutting in situ, area to be cleared of personnel or provided with hearing protection Hearing protection to be worn by operative at all times	1	3	3	All site operatives
117.		Injuries sustained from equipment vibration	4	3	12	Gloves to be worn at all times by operatives Working in short stints with breaks in-between to be applied All operatives are to receive a briefing on the exposure action values and limit values for the equipment used Tools and equipment will be selected for use, with reduction of hand arm vibration and whole-body vibration in mind	1	3	3	User
118.		Possible fire from sparks emanating from abrasive cutting tools	4	3	12	Site supervisor will ensure operation of abrasive wheels will be isolated from flammable materials. Suitable fire extinguisher for type of flammable materials to be supplied Ensure any petrol operated machines do not leak Switch off petrol operated machines before refuelling	1	3	3	All site operatives
119.		Entanglement of clothing or hair whilst using abrasive wheel		3	15	User not to wear loose clothing or jewellery If operative has long hair, ensure hair is tied back	1	3	3	User
120.	Replacing abrasive wheels	Possible injuries sustained from replacing wheels44	4	2	8	Only operative's trained in the safe use of abrasive wheels are to change or operate abrasive wheels Abrasive wheels should be changed as per the manufacturer's instructions Only suitable blades as detailed within the manufacturer's instructions should be used	1	2	2	User



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

53 | Page

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures					Residual	
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TASK SPECIFIC DIVING ACTIVITIES

1.	General Diving operations	Access and egress arrangements	Slips trips & falls/personal injury/drowning	5	3	15	Access and egress via Dive ladders, close tending procedure during access/egress excursions, check Tender to check umbilical for snags prior to access/egress	5	2	10	Dive Supervisor
2.	Adverse Weather	Wet slippery surfaces	Slips trips and falls / impact injury / man overboard / fractures / drowning	5	3	15	Suitable footwear, good housekeeping, no running on site, lifejackets worn for edge working, hard hats worn at all times	5	2	10	All project personnel
3.	Adverse Weather	Thermal balance	Hot/cold/wet / poor concentration / personal injury	4	3	12	Appropriate clothing, shelter, minimise time out side, rotate personnel	4	1	4	All project personnel
4.	Lowering tool to diver	Open water environment	Tender falling into deep water/ Personal injury, hypothermia, drowning	5	4	20	Tender to wear Correct PPE at all times including certified lifejackets, boots, gloves, floatation suit	5	2	10	All Personnel
5.	Lowering/recovering tool to/from diver	Dropped tool	Personal injury diver, damaged assets	4	4	16	Lower tool on suitable job line, job-line checked fit for purpose before use, good communications between diver/diver supervisor/tender	4	2	8	Dive Supervisor / Dive Tenders
6.	Lowering tool to diver	Dropped tool	Personal injury diver, damaged assets, contamination of environment	4	3	12	diver moves to a "safe zone" prior to any tools being lowered/lifted, good communications between diver and topside at all times, all tools checked and cleaned prior to entering the water	4	1	4	Dive Supervisor / Dive Tenders
7.	Operating mechanical rigging equipment	Nips, pinches, trapped fingers, suit material	Personal injury – damaged assets	4	5	20	All Operatives topside trained in Correct equipment set up and its safe usage prior to diving operations	4	2	8	Dive Supervisor
8.	Operating mechanical rigging equipment	Equipment failure dropped Load	Trapped diver/umbilical personal injury, damaged assets,	5	3	15	Equipment "certified for lifting" and subject to statutory inspection ,visual inspection carried out by competent person before each use, topside training, good communications, safe umbilical tending, diver consider his positioning during each manoeuvre	5	1	5	Dive Supervisor / Diver
9.	Crane lifting operations	Equipment failure dropped Load	Trapped diver/umbilical personal injury, damaged assets,	5	3	15	Equipment "certified for lifting" and subject to statutory inspection , Lift plan in place, good communications, safe umbilical tending Diver not underneath any load at any time, Diver withdrawn from water where possible.	5	1	5	All personnel
10.	Operating mechanical rigging equipment	Nips, pinches, trapped fingers, suit material	Personal injury – damaged assets	3	5	15	Correct training in all equipment and its safe usage prior to diving operations	3	2	6	Diver
11.	Operating mechanical rigging equipment	Equipment failure dropped Load	Trapped diver/umbilical personal injury, damaged assets,	5	3	15	Equipment "certified for lifting" and subject to statutory inspection , topside training good communications, safe umbilical tending, diver positioning,	5	1	5	All personnel
12.	Diving Operations	Diving using a Dive ladder/access/egress	Slips trips & falls/ personal injury, loss equipment, drowning	5	3	15	Ensure dive ladder is fit for purpose, must be sufficient strength and firmly fixed, slip resistant treads, safety chain for when not in use. Hand rails for easy access/egress	5	1	5	All Personnel
13.	Safe use of hand tools	Hand Tools	Personal injury, Cuts	4	3	12	All Tools subject to pre-use checks prior to being used , Divers trained in the safe use of tools	4	1	4	All Personnel
14.											
15.											



HAZARD IDENTIFICATION & RISK ASSESSMENT

Project ACOP: L104 – Inland / Inshore

Task No.	Task	Who might be harmed? Hazard / Consequence	Initial	Control Measures	Residual	
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