



NEDMAG VE-5

Project-Specific Safety & Health Document

(PSSHD)

(Bridging Document)

Rev No.	Details	Date	Author	Checked	Approved
0	V. 1.0	12/01/2024	MN/SH	SH	SH
1	V.1.1	18/01/2024	MN/SH	SH	SH
2	V.1.2	23/01/2024	MN/SH	SH	SH

Holds and Change List

V1.0	Version 1.0 for client approval	MN	12/01/2024
V1.1	Version with client comments	MN	18/01/2024
V1.2	Version with additional client comments	MN	23/01/2024

Authorisation:

Title	Name	Date	Signature
NEDMAG Project Manager	5.1.2.e	26/1/2024	5.1.2.e
WEP Project Manager	5.1.2.e		Approved version 1.2 by email on 24/01/2024
NEDMAG QHSE Manager	5.1.2.e		5.1.2.e Digitaal ondertekend door 5.1.2.e Datum: 2024.01.26 13:16:30 +01'00'
Inwatec Operations Engineer	5.1.2.e	24/01/2024	5.1.2.e

Controlled Copy Holders

Copy	Company	Position
1.	NEDMAG	QHSE-manager (Custodian)
2.	State Supervision of Mines	Inspector General Mines
3.	NEDMAG	Mining Director
4.	NEDMAG	Project Manager
5.	Well Engineering Partners	Project manager
6.	Well Engineering Partners	Well Service Supervisor (Well Site)
7.	Inwatec	Operations Manager
8.	Inwatec	Supervisor
9.		

Contents

1. Summary	4
2. General.....	5
2.1. Objective & field of application.....	5
2.2. Reference documents	5
2.3. Revision and updates.....	6
3. Organisation	6
3.1. Employers	6
3.2. Cooperation between employers	6
3.3. Organization Structure.....	7
3.4. Tasks, Responsibilities and Authorization.....	8
3.5. Individual responsibility	10
3.6. Coordination and implementation of safety measures	11
3.7. Communication.....	12
4. Risk Identification, Assessment and Management.....	12
4.1. Hazard Identification	12
4.2. Risk matrix	13
4.3. Risk elimination, assessment and management	13
4.4. Hazardous substances, products or materials	13
4.5. Personal Protective Equipment (PPE).....	13
4.6. Performance standards.....	13
4.7. Assessment against the performance standards	13
5. Emergency Preparedness and Response.....	14
5.1. Fire Fighting and Rescue Plan.....	14
5.2. Well Emergencies & Blow Out Contingency Plan.....	14
Appendix 1: Reference to Legislation	15
Appendix 2: Abbreviations.....	16
Appendix 3: Responsibility Matrix Guide between NEDMAG, WEP & Inwatec	17
Appendix 4: Contact list.....	19
Appendix 5: Overview data Chemicals workover VE-5.....	22
Appendix 6: Overview of Meetings and Reporting.....	23
Appendix 7: Risk Matrix.....	25
Appendix 8: Risk Assessment	26
Appendix 9: Location layout.....	27

1. SUMMARY

NEDMAG will do a workover on a brine production well (VE-5) from Wellhead Centre 1 (WHC-1) at Borgercompagnie 156A, Borgercompagnie.

The operations will be carried out using Inwatec’s combined mini coil and wireline unit. The execution of the workover operations is supported by and supervised on behalf of NEDMAG by Well Engineering Partners (WEP).

This document describes the HSE Management measures for the specific operations on the VE-5 well with the objective of reducing the HSE risks associated with the activity to a level As Low As Reasonably Practicable (ALARP).

This Project Specific Safety & Health Document (PSSHD) is a supplement to NEDMAG and Inwatec’s standard QHSE systems. This document

- clarifies which organization, rules and procedures will be enforced on the operations, in order to create a seamless process to safely execute the work program
- identifies the project specific risks and defines associated mitigating measures.

This PSSHD should be considered in conjunction with a number of standard NEDMAG and Inwatec documents and a number of other Project Specific Documents (see chapter 2.2).

The main employers of the workover activities are as follows:

Company Name	Activity
NEDMAG B.V.	Operator
Inwatec	Combined wireline and mini coil unit and services
Well Engineering Partners B.V.	Engineering and supervision services

The main contents of this document are:

- An introduction, brief description of the project and overview of related documents
- A description of the project organization, including an overview of tasks, responsibilities, and communication structure
- A description of the assessment of risks, definition of mitigating measures and the permit to work process.

All personnel will have access to this document. A copy is available in the office of the Inwatec Supervisor and the NEDMAG Company Representative (SSV).

Each person is responsible to carry-out the activities in a correct, professional, and safe manner.

‘Safety first’ shall be the deciding factor in all decisions.

2. GENERAL

2.1. OBJECTIVE & FIELD OF APPLICATION

The operations are planned for week 8 of 2024. The main steps in the operation can be summarized as follows:

1. Rig up unit
2. Jet away blockage using mini coil
3. Cut 3 ½" tubing at 2636 m AH using wireline
4. Rig down unit

For more details see the work program.

The mini coil activities will take place continuously (24 hrs, day and night shift), except for mobilization and demobilization. The location is shown on the well-site layout diagram in Appendix 9: Location layout. The details of the operations are described in the Work Program for the well.

The health and safety legislation Arbeidsomstandighedenbesluit 2.42 sub3 dictates that the principal who is 'responsible for work places in the mining industry' is obliged to promote the coordination between all parties involved. NEDMAG as a principal therefore takes overall responsibility for safety and health issues at the location.

All contractors present at the site are independent contractors and as such are responsible for the safety and health of their own employees.

This PSSHD aims to give substance to:

1. art. 2.42f of the Working Conditions Decree (Arbeidsomstandighedenbesluit)
2. art. 3.7 and paragraph 3.10 of the Working Conditions Rule (Arbeidsomstandighedenregeling): obligation to draw up a Safety and Health Document, with prescribed content
3. art. 2.42 of the Working Conditions Decree: Cooperation between different employers in a business or establishment, obligation to draw up a Safety and Health Document with specified content, coordination for health and safety by the employer responsible for the workplace in the mining industries.

Under art. 3.7 first paragraph under a. of the Arbeidsomstandighedenregeling, Inwatec is responsible for the Safety & Health Document for their unit with which the workover is executed. NEDMAG checks if this requirement has been met.

NEDMAG is in the context of this document responsible for:

- Management of this PSSHD
- Ensuring that it fully covers the planned activities
- Keeping the document up to date
- Distribution of the document to all stakeholders, also after actualisation/revision.

2.2. REFERENCE DOCUMENTS

This HSE Document should be considered in conjunction with:

- NEDMAG VE-5 workover work program
- Project specific firefighting and rescue plan, FFRP NEDMAG VE-5
- Besluit Activiteiten Leefomgeving (BAL melding VE-5, 2024)
- NEDMAG Mining Safety & Health Document (M-01)
- NEDMAG Emergency Plan Mining (M-02) & NEDMAG Blow out contingency plan (M-12)
- NEDMAG Self-assessment Safety & Health Approach during the life cycle of NEDMAG wells (august 2010)
- NEDMAG SHE requirements for contractors (P2.10)
- NEDMAG HSE instructions for drilling/well activities on the NEDMAG Mining location WHC-1
- NEDMAG Management system Procedure for specific well activities (M-08).

2.3. REVISION AND UPDATES

NEDMAG is the custodian of this document. This implies that this organisation is ultimately responsible for ensuring the contents of this document is correct, kept up-to-date and distributed in accordance with requirements.

This document remains valid for the time workover operations on well VE-5 are in progress. Should a delay occur, the validity of this document will be extended in line with the delay period.

All well operations will be carried out according to the VE-5 work program. If changes are required, a management of change (MOC), as described in the work program, is applied. In case of change, the risks of the new or changed steps in the work program will be assessed and mitigating measures will be defined, communicated and implemented.

3. ORGANISATION

3.1. EMPLOYERS

There are a number of parties active in the workover operations on VE-5. The main employers are as follows:

Company Name	Contact Person
Operator: Nedmag B.V.	5.1.2.e Project Manager Nedmag B.V.
Mini coil and wireline unit and services Inwatec	5.1.2.e Manager

Subcontractors	Activity
Well Engineering Partners BV	Well engineering services
Mammoet	Crane

3.2. COOPERATION BETWEEN EMPLOYERS

The cooperation between the relevant employers is focused on alignment of the mutual risks and the effectiveness of the management of these risks in order to ensure the safety and health of the workers.

All main parties have collaborated in preparing this Project Specific Safety & Health Document to ensure that:

- all conceivable and relevant potential risks have been reviewed
- mitigation measures are in place
- all residual risks are reduced to As Low As Reasonably Practicable (ALARP).

An Executing the Work on Paper (EWOP) and Risk Assessment meeting has taken place with all major parties involved prior to the operation as a final check that there will be no conflicting operations that would generate an unacceptable risk.

An overview of the identified risks and their mitigations are shown in Appendix 8: Risk Assessment.

3.3. ORGANIZATION STRUCTURE

The figure below illustrates the organogram of the organization of the operations.

Organogram

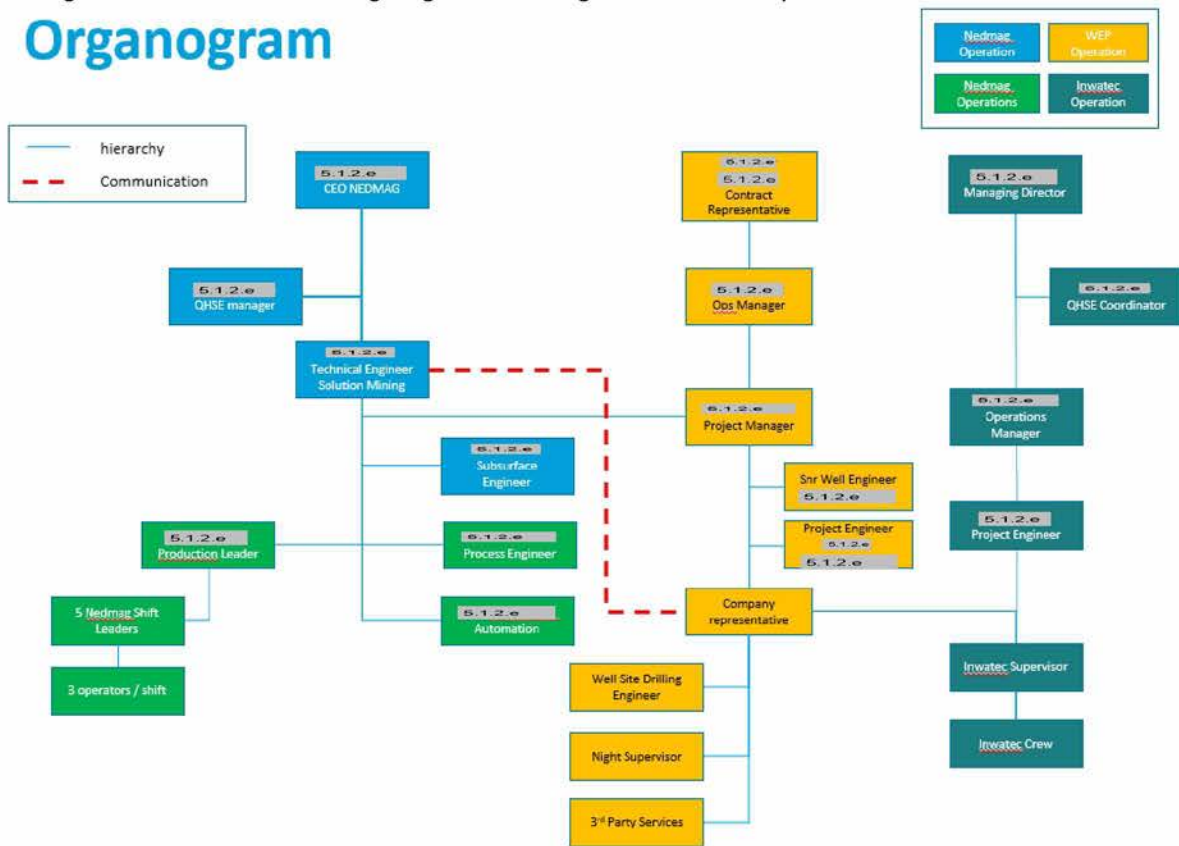


Figure 2: Project Organogram

3.4. TASKS, RESPONSIBILITIES AND AUTHORIZATION

The table below defines the roles and responsibilities of the employers and subcontractors.

Company Name	Role	Responsibilities
NEDMAG	Mining Director	<ul style="list-style-type: none"> Acts as HCO – Head concurrent operations
	Project Manager (PM)	<p>The PM will be on location on WHC-1 or WHC-2 during the day shift (f/Monday t/Friday) and must be on call for the duration of all well intervention activities. The PM has single point responsibility for operational matters and has the authority to suspend any or all operations. Specific responsibilities include the following:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> Has the overall responsibility for the entire project, including QHSE assurance, security, and logistics Monitor compliance with this PSSHD. Non-compliance or exceptions will be discussed with the relevant members of the project organisation Ensure that all personnel on unit & location are informed of the extra preventive measures required as defined by this PSSHD Conduct visual inspection on operations Ensure that new personnel on location are given adequate safety and HSE briefing Ensure that all new personnel are instructed on muster points. <p><u>Authorized to</u></p> <ul style="list-style-type: none"> Suspend any well intervention operations at any time Deviate from this procedure if safety, health or environmental issues require to do so.
WEP	WEP Project Manager (WEPPM)	<p>The WEPPM is responsible to the NEDMAG Project Manager for the safe engineering and execution of the workover. He or she is specifically responsible for the following:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> The writing of the work program and other required documentation Monitor compliance with this PSSHD. Non-compliance or exceptions must be discussed with the SSV Preparation of all necessary HSE submissions Provision of office-based engineering support during work over operations Ensuring all required 'End of Well' reporting is performed, and the well audit files are complete The WEP Project Manager liaises with NEDMAG Project Manager <p><u>Authorized to</u></p> <ul style="list-style-type: none"> The WEPPM has the authority to suspend the operations at any time Deviate from this procedure if safety, health or environmental issues require to do so.
	Company Representative (SSV = Site Supervisor)	<p>The SSV is on duty during the day shift. A night supervisor (NSSV) will take over the duties of the SSV during the night shift when workover operations require 24-hour coverage. Specific responsibilities of the SSV include the following:</p> <p><u>Responsibilities</u></p>

		<ul style="list-style-type: none"> • Has the overall responsibility for the safe implementation of the project in general • Supervision of work over operations on behalf of NEDMAG • QHSE assurance (well site) • Maintenance of persons register personnel & visitors • Introduction new personnel to well site regulations • Communication between field and office • Reporting to SodM • Collecting, compiling and sending out reports • Supervising subcontractors • Provide all work permits on the workover location • Attend toolbox meeting organized with the Inwatec supervisor • Conduct visual inspection on well site • Onsite coordination emergency response, in liaison with the HCO and the Inwatec Supervisor. <p><u>Authorized to</u></p> <ul style="list-style-type: none"> • Suspend the well intervention operation at any time • Act as considered appropriate for well intervention related issues.
Inwatec	Supervisor	<p>First line of well control</p> <p>The Inwatec supervisor is on duty during the day shift. A night supervisor will also be available and will take over the duties of the Inwatec supervisor for the night shift. Specific responsibilities of the Inwatec supervisor include the following:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> • Execute well operations according to work program and daily instructions from SSV • Supervising Inwatec crew and Inwatec subcontractors. Ensure that personnel work in a safe manner • Organize and record toolbox meetings • During well intervention related emergencies, the Inwatec supervisor supports the SSV with the emergency response operation. • Manage well control situation (1st line) <p><u>Authorities</u></p> <ul style="list-style-type: none"> • Suspend the well intervention operation at any time • The Inwatec supervisor has the authority to act as considered appropriate for the issues related to the wireline/mini coil unit and equipment.

3.5. INDIVIDUAL RESPONSIBILITY

The NEDMAG HSE Policy establishes NEDMAG’s commitment to safeguarding the environment and minimizing health and safety risks to their personnel, contractors and the communities in which they do business. NEDMAG believes that, in addition to meeting regulatory expectations, the appropriate range of industry best practices should be used throughout its operations, to reduce HSE-risks to a level ALARP. Therefore, NEDMAG has preferentially selected contractors and services providers to meet these objectives.

In respect to all decisions made, safety first shall be the deciding factor and each person is responsible to carry out the activities in a correct, professional and safe manner.

Prior to the work, it was discussed with the key players at an *Executing Work on Paper (EWOP)* session. Afterwards, a risk assessment for all steps in the work program was conducted. The results of this can be found in Appendix 8: Risk Assessment. The appendix also provides the overview of all defined mitigating measures.

For a number of activities with a relatively high risk, the permit to work process is applicable, see under 3.6.

For all workover activities a Toolbox Talk (TBT) is held. This is used daily before a job starts and when the job changes.

For any work, a LMRA must be carried out. This is to ensure that at all times and even under changed circumstances, work is executed safely. It is each person’s individual responsibility to conduct this LMRA.

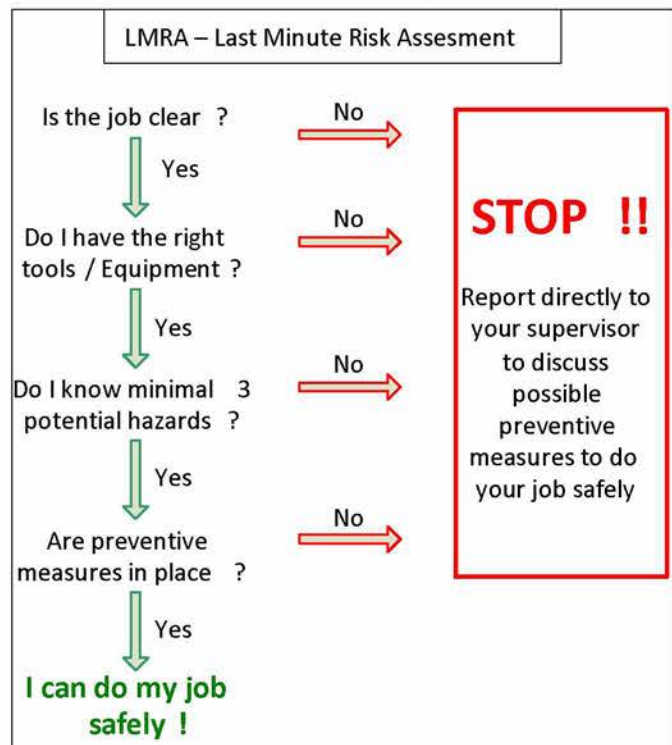


Figure 1: Last Minute Risk Assessment Process

All personnel on site will register themselves in the site register and will attend the site HSE introduction. The site registration list requires each person on site to register their name, company name, date of arrival, time of arrival, time and date of departure and VCA (or equivalent) certification.

All foreign personnel, or any personnel working for a foreign company need to have an A1 certificate, or proof that this has been requested for them.

Visitors to the well site require permission from the Nedmag project manager. Any visitors to site will, if at all possible, provide a 24 hours notification to the SSV, this is to ensure safe execution of visits. Depending on ongoing operations, the SSV has the right to suspend or cancel any visits.

To support HSE awareness, employees visiting the site for the first time, receive the HSE info instructions and have to read and sign their commitment to those instructions.

All persons on-site have a duty to wear clean and suitable personal protective equipment (PPE) for the task being undertaken. Standard PPE includes hard hats, safety boots, safety glasses, coveralls and gloves. All subcontractors provide Safety Data Sheets (SDS) of chemicals planned for use. All SDS are available to provide information of additional specific PPE to be used.

3.6. COORDINATION AND IMPLEMENTATION OF SAFETY MEASURES

The NEDMAG PM will coordinate the HSE issues of all mining activities on WHC-1 and will coordinate the HSE issues of the concurrent operations. The SSV will coordinate HSE issues concerning the workover operations at WHC-1, after the well has been handed over to him. With the handover the well to the SSV, the NEDMAG PM permits the SSV and the rest of the workover organization to execute all activities as defined in the work program, under the following conditions:

- The measures as stated in the Risk Analysis overview are in place during the execution of the work. In case of changes to the work program, through the MOC procedure as described in the work program, the same applies for the measures based on a RA related to the changes in the program
- Each shift starts with a toolbox safety meeting, at which as a minimum the measures from the RA are discussed and from which the minutes are undersigned by the Inwatec supervisor and the SSV
- The SSV issues specific work permits in the following cases:
 - Hot work (any work where sparks and /or heat are generated or released)
 - X-mas tree and wellhead operations
 - Work in confined spaces, including the cellar and tanks
 - Maintenance work on hydraulically or electrically driven equipment
 - Work involving explosives
 - Heavy lifting (> 5ton and/or difficult lifts)
 - Activities outside the work program and any other (non-routine) work where the SSV and/or Inwatec supervisor think that issuing a specific work permit adds value.

The permits will contain the following information:

- A description of the work to be performed
- The location where the work is to be performed, including clear identification of the specific plant or equipment being worked on
- Hazard identification or risk assessment of both the work and the worksite
- Specification of necessary precautions
- Protective equipment (including PPE, emergency equipment, etc.)
- Identification of the specific competent people who are to conduct the work.

The permit to work system will be provided by NEDMAG and will be used or audited by the SSV, Inwatec supervisor, WEPPM and NEDMAG PM/HCO.

The goal of the work permit system is to minimize safety incidents during the operations at NEDMAG WHC-1 site. Proper use of the system ensures:

- Good communication about work to be done
- Recognition of the relevant associated risks
- Definition and implementation of appropriate mitigating measures.

The Inwatec supervisor carries the immediate coordination for recovery and rescue operations on the workover location. The Inwatec Supervisor will be on site during day shift and can be called up 24 hours a day in case of emergencies. During the night shift, a night supervisor will take over the Inwatec Supervisor's responsibilities. He will take the necessary primary actions in an emergency and will call the Inwatec day Supervisor without delay.

3.7. COMMUNICATION

Effective communication is critical to the success of the operation where different parties interface. The following clearly defines how communication is managed between the interfaces during the following situations.

See also Appendix 6: Overview of Meetings and Reporting for an overview of meetings and reporting.

Pre Operations

All employers will be informed of the objectives and timetable of the operation in advance of the operations starting. A pre-job meeting on site will be held with the employers and subcontractors involved with the operation. The project specific HSE document will be available and presented at this meeting.

HSE Information

Each main party is responsible for ensuring that all relevant HSE information is effectively communicated within their own organisation including alerts, notices, reports etc. The person (within the party specific organisation) with overall responsibility for HSE will ensure that all relevant HSE information is communicated to all persons throughout the onsite operation.

Execution of Operations

All main parties shall ensure that their personnel, including subcontractors, are notified of and are familiar with the on-going activity program and abide by all relevant regulations and standards. The following methods shall be used to establish and maintain effective lines of communication between the main parties and subcontractors:

1. Induction – the SSV is responsible for ensuring that all personnel new to the operation are formally inducted. The induction will take the form of a HSE video and project toolbox.
2. Daily report & meeting – the main parties and subcontractors must provide a combined daily report detailing operational progress and planned programme. This must also be discussed together in a meeting where any actions agreed must be recorded on the report. The SSV will lead the meeting and report this to the SodM.
3. Pre-job meeting/toolbox talk – held at the operational job site by all appropriate personnel. Will incorporate JSA/LMRA. Particular attention given to any programme changes which must be assessed with a review of the appropriate task risk.

Management of Change (Communication of Change)

If changes to the operations are required a management of change (MOC), as described in the work program, is applied. This will include an assessment of the risks associated with the new or changed steps, including a definition of required mitigating measures.

Emergency

Chapter 5 details the emergency response arrangements in place. This will define who will undertake overall control of the emergency situation and from where. In case of an emergency the SSV onsite should act according to the scheme below in order to inform the NEDMAG project manager.

Incident reporting

All personnel have a responsibility to report accidents, incidents and unsafe situations immediately to the SSV. Reporting incidents to the authorities is done by NEDMAG according to the NEDMAG procedure.

4. RISK IDENTIFICATION, ASSESSMENT AND MANAGEMENT

4.1. HAZARD IDENTIFICATION

Inwaterc has their own risk assessment for wireline and mini coil operations, these are listed in Appendix 8: Risk Assessment

4.2. RISK MATRIX

A risk matrix is used to assess risks within the framework of this operation specific Safety & Health Document and can be found in Appendix 7: Risk Matrix.

4.3. RISK ELIMINATION, ASSESSMENT AND MANAGEMENT

All contractors have delivered project specific risk inventories and evaluations. Prior to activities with high risk a special Job Safety Analysis or Last Minute Risk Assessment must be carried out. See Appendix 8: Risk Assessment for the risks, potential consequences and mitigation measures.

4.4. HAZARDOUS SUBSTANCES, PRODUCTS OR MATERIALS

All chemicals present on site must comply to the REACH (Appendix 5: Overview data Chemicals workover VE-). For all chemicals safety data sheets (SDS) shall be available on site.

4.5. PERSONAL PROTECTIVE EQUIPMENT (PPE)

All people on-site have a duty to wear clean and suitable personal protective equipment (PPE) for the task being undertaken. Standard PPE includes hard hats, safety boots, safety glasses, coveralls and gloves. All subcontractors provide Safety Data Sheets (SDS) of chemicals planned for use provide information of additional specific PPE to be used when handling chemicals, such as:

1. Chemical resistant clothing
2. Rubber safety boots
3. Face shields, safety goggles, hearing protection.

4.6. PERFORMANCE STANDARDS

Performance standards are defined as clear and measurable parameters relating to the performance of a process or system component, equipment and management systems, which contribute directly to achieving safety and health objectives.

The risks to workers connected with the workover operations, including the preparation and disposal of equipment are inventoried and evaluated. There is a set of adequate physical facilities and organizational measures in place to eliminate or minimize risks.

Furthermore, the organization assures that all necessary plans, programs and documents are submitted to the State Supervision of Mines on time, and that work will be done in accordance with such plans. This document is audited by a senior QHSE manager.

4.7. ASSESSMENT AGAINST THE PERFORMANCE STANDARDS

- In selecting contractors, the track records in the areas of quality, safety and environment are reviewed
- The Contractors use only certified equipment and materials during the activities, such as Ex-proof according to the ATEX standard, equipment with lifting certification if needed
- Prior to the start of operations, a document (certificates) check will be performed

5. EMERGENCY PREPAREDNESS AND RESPONSE

5.1. FIRE FIGHTING AND RESCUE PLAN

For the VE-5 workover a specific Fire Fighting and Rescue Plan has been prepared supporting the general NEDMAG Mining Fire Fighting and Rescue Plan M-02 (Calamiteitenplan Mining), which is a separate document.

A copy of the Fire Fighting and Rescue Plan and Rescue Plan is available on location.

5.2. WELL EMERGENCIES & BLOW OUT CONTINGENCY PLAN

In case of a blow out, the VE-5 workover specific Fire Fighting and Rescue Plan will be followed.

APPENDIX 1: REFERENCE TO LEGISLATION

WCL = Working Conditions Law = Arbeidsomstandighedenwet
 WCD = Working Conditions Decree = Arbeidsomstandighedenbesluit
 WCR = Working Conditions Regulations = Arbeidsomstandighedenregeling

	Section	Reference to legislation		
		WCL	WCD	WCR
1	Introduction			
1.1	Summary of performers			
2	General aspects			
2.1	Purpose and scope of the H&S document for special operations		2.42e sub 1	37 sub 1b
2.2	Reference documents			3.12 sub 2
2.3	Revision and actualisation		2.42 sub 4	
3	Organisation			
3.1	Employers			
3.2	Cooperation	19 sub 2	2.42 sub 2d 2.42f sub 3	
3.3	Organisation structure			
3.4	Tasks, Responsibilities and Authorization			
3.5	Individual responsibilities			
3.6	Coordination		2.42 sub 3 2.42f sub 3	
3.7	Communication			
4	Risk Identification, Assessment and Management		2.42f sub 1	
4.1	Hazard identification		2.42 sub 2a	3.10 sub 1c
4.2	Risk analyses		2.42f sub 1c	3.10 sub 1b 3.10sub 1c
4.3	Risk elimination and reduction improvement measures		2.42 sub 2b 2.42 sub 2c 2.42f sub 1b	3.10 sub 1c - 1h
4.6	Performance standards			3.10 sub1g
5.0	Emergency Preparedness and Response		2.42g 2.42h	
5.1	Fire Fighting and rescue plan		2,5c 2.42,f sub 1c 2.42h	3.9 sub c 3.10 sub 1a 3.12 sub 3 3.14 3.37n 3.37q - 3.37u 6.4.14 Appendix 1 sub f Appendix II Appendix VIII
5.2	Well Emergencies & Blow Out Contingency Plan		2.42h	3.10 sub 1a 3.10 sub 2 3.12 sub 3 3.14 3.37n 3.37q – 37v Appendix VIII

APPENDIX 2: ABBREVIATIONS

Abbreviation	Description
ATEX	ATmosphères EXplosives
BOP	Blow out preventer
EWOP	Executing Well On Paper
ER	Emergency Response
ESD	Emergency Shut Down
EX-proof	Explosion Proof
HSE	Health, Safety & Environment
JSA	Job Safety Analyses
LMRA	Last Minute Risk Analyses
MEDEVAC	Medical Evacuation
MOC	Management Of Change
MSDS	Material Safety Data Sheet
OM	Operation Manager
POS	Persons On-Site
PPE	Personal Protective Equipment
RA	Risk Assessment
SSM	State Supervision of Mines
SSV	Site supervisor
WSE	Well Site Engineer

APPENDIX 3: RESPONSIBILITY MATRIX GUIDE BETWEEN NEDMAG, WEP & INWATEC

Planning				
R: Responsible		A: Accountable		
C: Consulted		I: Informed		
Item	Activity / Deliverable	NEDMAG	WEP	Inwatec
1.	Contract Requirements	RA	C	RA
2.	Work Over Location: Site Survey	I	C	RA
3.	CT/WL Unit Rig-up/down Procedure(s)	I	C	RA
4.	Work Program(s)	AC	R	C
5.	Hold Pre-workover Meeting(s)	A	R	C
6.	Emergency Response Interface	A	R	C
7.	Equipment Transport Arrangements	A	R	C
8.	Third Party Procurement (NEDMAG Contractors)	A	R	I
9.	Third Party Procurement (Inwatec Contractors)	I	C	RA
10.	Equipment Requirements	A	R	I
11.	Service Requirements	A	R	I
12.	Environmental Reporting (BAL)	A	R	I

Resource management				
R: Responsible		A: Accountable		
C: Consulted		I: Informed		
Item	Activity / Deliverable	NEDMAG	WEP	Inwatec
13.	Control of POS / Crew Change	A	R	I
14.	Site Induction of all Personnel	A	R	I
15.	Control of Third Party Personnel on site	A	R	I
16.	Control of Third Party Equipment On Site	A	R	I
17.	Materials Management	A	R	I
18.	Activities: Relating to the Routine Operation of the CT/WL Unit	I	C	RA
19.	Unit maintenance	I	C	RA
20.	Unit modifications	I	C	RA
21.	Control of Inspection, Measuring and Test Equipment	I	C	RA
22.	Occupational Safety	A	R	R
23.	Occupational Health	A	R	R
24.	Environmental Spill Control	A	R	R
25.	Waste Management	A	R	R
26.	Major Accident Prevention	A	R	R

Execute work program				
R: Responsible		A: Accountable		
C: Consulted		I: Informed		
Item	Activity / Deliverable	NEDMAG	WEP	Inwatec
27.	Execute CT/WL Unit mobilisation/de-mobilisation Procedure	I	C	RA
28.	Prepare for Well Operations	A	R	R
29.	Confirm readiness for operations in all respects at location.	A	R	R
30.	Approval to Rig down at end of operations.	A	R	I
31.	Execute Work Program	A	R	C
32.	Amend Work Program	A	R	C

APPENDIX 4: CONTACT LIST

Contact list					
VE-5 wellsite: Borgercompagnie 156, ^{5.1.2.e} Borgercompagnie					
Call 112 for police, fire brigade or ambulance					
Nedmag					
Name	Job Function	Reception	Office Number	Mobile	E-mail
5.1.2.e	Mining Director			5.1.2.e	5.1.2.e @Nedmag.nl
5.1.2.e	Field Engineer			5.1.2.e	5.1.2.e @nedmag.nl
5.1.2.e	Subsurface Engineer			5.1.2.e	5.1.2.e @Nedmag.nl
5.1.2.e	QHSE Manager			5.1.2.e	5.1.2.e @nedmag.nl
5.1.2.e	Buyer			5.1.2.e	5.1.2.e @Nedmag.nl
Nedmag Control Room WHC-1	Operational control			5.1.2.e	-
Nedmag Control Room WHC-2	Operational control		5.1.2.e		-
Emergency Response			24 / 7		5.1.2.e
5.1.2.e	Duty manager		5.1.2.e		5.1.2.e @we-p.nl
5.1.2.e	Back-up Duty manager		5.1.2.e		5.1.2.e @we-p.nl
5.1.2.e	Ops Manager		5.1.2.e		5.1.2.e @we-p.nl
Well Engineering Partners					
Toldijk 17-19, 7900 AP Hooageveen					
Office team	Job Function	Reception	Office Number	Mobile	E-mail
5.1.2.e	Project Manager	5.1.2.e	5.1.2.e	5.1.2.e	5.1.2.e @we-p.nl
5.1.2.e	Project Engineer	5.1.2.e	5.1.2.e	5.1.2.e	5.1.2.e @we-p.nl
5.1.2.e	Project Engineer	5.1.2.e	5.1.2.e	5.1.2.e	5.1.2.e @we-p.nl
5.1.2.e	Operations Manager	5.1.2.e	5.1.2.e	5.1.2.e	5.1.2.e @we-p.nl

WEP Field Team on Site		Onshift	Offshift
5.1.2.e	Service Supervisor (day)	5.1.2.e	-
5.1.2.e	Service Supervisor (night)	5.1.2.e	5.1.2.e @we-p.nl
			-
			-
SodM (State Supervision of Mines)		Office	
Reporting of accidents or incidents (24/7)		5.1.2.e	-
General		5.1.2.e	sodm@minez.nl
			-
Service companies			
Inwatec - unit		Phileas Foggstraat 120, 7825 AM, Emmen, the Netherlands	
Name	Job Function	Reception	E-mail
5.1.2.e	Sales Manager		5.1.2.e @inwatec-cs.com
5.1.2.e	Operations Manager		5.1.2.e @inwatec-cs.com
Mammoet - cranes		Im Nordfeld 16, 29336, Nienhagen, Germany	
Name	Job Function	Reception	E-mail
Planning	Logistics		5.1.2.e @mammoet.com
5.1.2.e	Technical Sales Officer		5.1.2.e @mammoet.com
5.1.2.e	Accountmanager		5.1.2.e @mammoet.com
			-
			-
Diesel (Oliecentrale)			
Name	Job Function	Reception	E-mail
Planning			5.1.2.e @oliecentrale.nl
Safety.NL			
Name	Job Function	Reception	E-mail
5.1.2.e			5.1.2.e@elsingconsult.nl

Public services	
Local doctors Veendam:	
Veentjer, Lloydsterras 10	0598 612227
De Beijl/Trips Steenstraat 10	0598 612282 / 612005 (spoed 635701)
Local doctors after office hours:	
Huisartsenpraktijk Groningen	0900 9229
University Hospital Groningen (Hanzeplein 1)	050 361 61 61
Martini Hospital (Van Swietenplein 1)	050 5245245
Hospital Stadskanaal (Refaja) (Boerhavestraat 1)	0599 654 654
Ommelander Hospital Scheemda (Pastorieweg 1)	088 0661000
Taxi Midden-Groningen	06-51925292,
Connexion Taxi Services Groningen	0597 454 444
5.1.2.e	
5.1.2.e	5.1.2.e

APPENDIX 5: OVERVIEW DATA CHEMICALS WORKOVER VE-5

DATA PROVIDED BY THE OPERATOR								
LANDLOCATIE	PRODUCT - LEVERANCIER DATA						OPERATOR DATA	
Mijnbouwwerk: landlocatie gebruik	Product handelsnaam (1)	Leveranciernaam (2)	Datum van uitgifte VIB (indien beschikbaar) (3)	CtgB nr. ("toelatings- nummer" of "aanmeldings- nummer") indien biocide (4)	Product etiket: H-zinnen of R- zinnen (5)	REACH Compliance check afgerond (gevaarlijk product) (6)	Geplande maximaal te gebruiken kg (7)	Algemene opmerking (8)
Inwatec - wireline and mini coil services								
Borgercompagnie	Motip Remmenreiniger	Motip Dupli BV	03/09/2019		H222-H229, H315, H336,	ja	2L	
Borgercompagnie	Motip Penetrating oil MoS2	European Aerosols BV	13/06/2022		H222-H229, H412	ja	2L	
Borgercompagnie	Motip PTFEvet	European Aerosols BV	16/06/2022		H222-H229, H336, H411		2L	
Borgercompagnie	Diesel	Gulf Bunkering BV	18/04/2019		H226, H304, H315, H336, H351, H373,	ja	20L	
Borgercompagnie	Dasty Ontvetter	Dasty Italy S.p.A	21/09/2018		H318, H315	ja	5L	
Borgercompagnie	Copper + Plus	Kroon Oil BV	14/07/2023		H412	ja	1L	
Borgercompagnie	Q8 HLVP Hydraulic Oil 46	Kuwait Petroleum Companies	02/07/2021		niet gevaarlijk	ja	20L	
Borgercompagnie	EuroI AFT II D	EuroI BV	03/08/2022		niet gevaarlijk	ja	2L	
Borgercompagnie	Coolant RTU 40	77 Lubricants	04/09/2018		H302, H361, H373	ja	20L	

APPENDIX 6: OVERVIEW OF MEETINGS AND REPORTING

EWOP meeting	
Purpose	Discuss plan for whole well
Chairman	WEPPM
Attendees	All major contractors + NEDMAG
Frequency	Once during drafting work program
Records	Minute of Meeting and update work program
Daily Ops Meeting	
Purpose	Discuss SHEQ items, last & next 24 hours, 6-day lookahead and compliance issues
Chairman	SSV
Attendees	SSV, WSE, Inwatec supervisor, WEPPM + NEDMAG
Frequency	Daily
Records	Minute of Meeting
Pre-job safety meeting (toolbox)	
Purpose	Discuss specific job
Chairman	Inwatec supervisor
Attendees	Involved crew + SSV
Frequency	Ad hoc
Records	Signed TBT sheet
Site Induction	
Purpose	To make everyone aware of operations, risks and emergency procedure before allowed on site
Chairman	Wellsite Supervisor
Attendees	Everyone who has to go on site
Frequency	Before going on site
Records	List of Attendees and identified on Personal Safety Log
Supervisor Shift handover	
Purpose	To handover the work and brief the new shift on the status
Chairman	Leaving Supervisor
Attendees	Leaving and upcoming Supervisor
Frequency	Every shift change of SSV
Records	Shift handover form
Pre Shift Briefing (TBT)	
Purpose	To brief all applicable of the work to be done in the upcoming shift
Chairman	SSV
Attendees	Applicable working crew
Frequency	Beginning of every shift
Records	Pre Shift Report & LMRA Card

Reporting

SodM Daily report	
Purpose	To inform the own organisation and SodM of the Work Over operation status
Responsible	WEP Project Manager / Sent by SSV
Distribution	SodM
Frequency	Daily before 9:00 am
Records	Originals are kept by NEDMAG
Daily report	
Purpose	To inform the own organisation and partners of the Work Over operation status
Responsible	SSV
Distribution	NEDMAG Organisation
Frequency	Daily before 9:00 am
Records	Originals are kept by NEDMAG
Incident report	
Purpose	To report incident or near miss
Responsible	SSV

Distribution	NEDMAG Organisation, SodM via Nedmag
Frequency	Directly after incident
Records	Originals are kept by NEDMAG

APPENDIX 7: RISK MATRIX

Nedmag Risk Matrix							
Severity	(Potential) Effect		Increasing probability				
	People	Environment & Material	A	B	C	D	E
			Has never occurred in other companies	Has occurred in other companies	Has occurred at Nedmag or more than 1 x other companies	Has occurred on the department or more than 1 x a year at Nedmag	Has more than 1 x a year occurred on department
I	No injuries	No damage	AI	BI	CI	DI	EI
II	First Aid injury	Minor damage	AII	BII	CII	DII	EII
III	Medical care and LTI	Limited damage	AIII	BIII	CIII	DIII	EIII
IV	Severe injuries, permanent injury	Major damage	AIV	BIV	CIV	DIV	EIV
V	Death	Ravages	AV	BV	CV	DV	EV
Red	Unacceptable risk						
Yellow	Reduce risk to levels as low as reasonably achievable						
Green	Continuous improvement, acceptable risk						

APPENDIX 8: RISK ASSESSMENT

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
General												
G-1	General work activities	NEDMAG	Uncontrolled activities Unauthorized / uninformed people on site	(Severe) injury to people, damage to environment & equipment	E	IV	EIV	Safety instructions and rules of Operator apply on site. All employees receive and sign safety instructions on forehand of project Adequate supervision on site Work with increased risk will be done with a permit to work Toolbox meeting to be held prior of every job, in conjunction with a LMRA PPE requirements to be followed Controlled entrance to location via gate Place signs at workover site entry with reporting requirements For any concurrent operational activity around the well (and surrounding wells), SSV will be informed prior to entrance into hardstand / working area. Daily communication / coordination between location security and SSV for workover-related logistics All contractors to register visits online in advance	E	II	EII	
			Noise emission	Complaints from the neighbors, local authorities, damage to hearing	D	III	DIII	Communication to the neighbors in advance of upcoming operations. Continuous sound measurement. Machinery according to acceptance criteria BARMM (to be defined) Keep noise level within limits unless absolutely required for HSE reasons. Stop operations if noise level too high. Additional sound reduction measures like electric powered pumps Ear plugs available on location. Instruction to personnel to reduce noise, also in smoking area	C	II	CII	
			Domestic waste disposal	Littering Environmental waste	C	II	CII	Dedicated special places for domestic waste (Small bins to be provided by contractor) HSE policies and instructions for environment protection to be followed Good housekeeping	C	I	CI	
			Oil contaminated waste	Spill ,Fire, Environmental contamination Serious injury to personnel life and company reputation	C	IV	CIV	HSE policies and instructions for environment protection to be followed Contractor to supply dedicated bins (labeled) for disposal Adequate supervision Proper disposal by certified third party Rags and spill kits available Separate oil contaminated fluid waste Good housekeeping Fluid-tight floor, tanks and gutters	C	II	CII	

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
			Improper use of PPE Lack of PPE	Injuries, illness, occupational diseases to personnel if PPE's are not used properly. Consequently, illness, infections, etc. while wearing	E	III	EIII	Discipline and adequate supervision Sufficient and clean PPE's (contractor's PPE requirement to be followed) Personnel & PPE competency Location layout arranged in such a way to minimize possibility of walking on work area without PPE, place signs with PPE requirements at workover site entrance (BPC) TBT Safety induction	E	I	EI	
			Release of CO gas	Death	E	IV	EIV	PTW when working in confined spaces Entry to Cellar only with gastester (Nedmag)	E	I	EI	
			Slips, trips and falls	Injury to people	D	III	DIII	Good housekeeping Reduce areas with tripping hazards, place scaffolding in required areas. Build walkways / cable cellars when required Adequate supervision Proper use of PPE	D	I	DI	
			High winds	High winds can jeopardize the stability and cause the Unit / Crane to tumble over with potential to cause multiple fatalities Falling heavy equipment could cause serious material damage to surrounding equipment, wells, and/or injury to people.	B	V	BV	Weather forecasts shall be monitored regularly and work will be planned based on forecast. Equipment design and limitations --> Stay within equipment limits Install and secure all equipment properly. All equipment fall within design criteria. R/U Procedures to be followed Crane equipped with gauges to determine wind speed Weather forecast to be mentioned during Toolbox meetings when relevant	B	II	BII	http://buienradar.nl/ http://windfinder.com/ Crane: acc crane driver

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
G-2	Weather conditions	NEDMAG		Detachment of equipment, Loose cables, hoses, pipe, slamming container doors etc. can start to fly around and can cause material damage or injury personnel	C	IV	CIV	Stop operations at the first signs of detached equipment, cables, hoses, etc. Maintain good housekeeping All operational staff have the authority to stop work when unsafe Perform preventive inspections prior to expected high winds / storms Keep all doors closed/tied off	C	II	CII	
			Lightning	Lightning strike can cause severe injuries and major damage to the installation	C	IV	CIV	Proper earth connection of the unit with the well (checked during commissioning) When installing new equipment, check earthing Weather forecasting and livetracking if there are storms in the area Stop operations, R/D crane, close in well and evacuate workover area when lightning is the vicinity	C	I	CI	http://goo.gl/anFdix Check lightning forecast prior to wireline operations
			Warm weather	Lack of concentration, dehydration, sun burn, unconsciousness	D	II	DII	Availability of adequate PPE's, Increase ventilation (bug blowers), Provide sufficient drinking water - Reduce exposure (more breaks)	D	I	DI	
			Cold weather (freezing)	Freezing lines	D	II	DII	Use brine for testing etc. or drain fresh water after use	C	II	CII	
				Cold stress	C	III	CIII	Proper clothing, dry/warm	C	II	CII	
	Slippery surface	D	II	DII	De-ice ground and equipment; salt available on location	E	I	EI				

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
			Heavy Rain - flooding of location	Spillage of waste fluids (mud, waste water, etc.) will mix with incoming fresh water and uncontrolled flow will cause a spill outside the location. Slips / trips / falls Electrocution	E	II	EII	<p>Check weather forecast regularly</p> <p>In time emptying of cellars, gutter systems, pits, etc. will reduce the risk of mixing up (drilling) fluids and waste water with rain water coming onto the location.</p> <p>Dedicated chemical storage areas</p> <p>Ensure no electrical cable sockets are placed on the ground</p>	E	I	EI	http://buienradar.nl/
G-3	Traffic to location	NEDMAG	Accidents/disturbance due to increase in traffic	Complaints from the neighbours, local authorities Accidents, injury / damage to equipment	C	II	CII	<p>Dedicated traffic routes (traffic plan available)</p> <p>Supply truck drivers with a timetable</p> <p>Plan transport during office hours when possible</p>	C	I	CI	
				Collision of moving vehicles which may trap and hit people on site resulting in severe injury								

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
G-4	Traffic on location	NEDMAG	Collision / struck / crash	Collision of moving vehicles with wells and pressurized piping may result in an uncontrolled high pressure brine leakage which may cause serious injuries and environmental spills	B	IV	BIV	Driving routes and direction will be shown in the traffic plan No uncontrolled driving on location Hard barriers are placed around the present wells on location Speed limit enforced Parking allowed only in designated areas Driving on workover site allowed only under supervision	B	II	BII	
G-5	Lifting	NEDMAG	Overloading of Lifting	Personnel at fatal risk: -	B	V	BV	PtW system to be used for heavy / complex lifting Crane lifting capacity to be identified on the crane and certification	B	III	BIII	Heavy lift >5mT
		NEDMAG	Collision with equipment on location Collision with personnel	Damage to equipment & wells, severe injury to personnel	B	IV	BIV	Allow adequate clearances to avoid conflict with other plant or structures in the lift vicinity Use tag lines to help control the load if needed Use of banksman with radio communication with crane operator Wellhead protection placed on surrounding wells Lifting plan available for complex lifts during operations No personnel allowed under suspended load Do not use the crane to pull load free, only pull weight of load	B	II	BII	On TR-9 ops 2021 experienced stored energy on lifting causing to jump the load (removal dilution spool from WH)
G-6	Working with pressure vessels / piping	NEDMAG	Bursting of hoses, pipes and fittings Release of projectiles Release of powerful jet of fluid	Injury to people Environmental spill Damage to equipment	B	IV	BIV	Follow workprogram, PJSM Proper supervision Certified & pressure tested equipment, barriers (tape-off zone) Tie down lines Limit entry to zone to authorized personnel Keep clear of all lines for the duration of the test Pressure setting of (test) pump limited to lowest pressure rating of equipment All personnel have the authority to stop work when unsafe Only authorized personnel to operate swab and master valves	B	III	BIII	

Risk assessment_VE-5 P&A v1.0.xlsx

Schedule Risk Register - Abandonment VE-5												
Task ID	Description of Operation	Stakeholders/ Party Responsible	Risks	Potential Consequences	Probability	Severity	Initial Risk rating	Action to mitigate or create contingency plan	Probability	Severity	Residual Risk	Remarks
G-7	Working with chemicals	NEDMAG	Exposure to chemicals	Permanent injury to people Environmental spill	B	IV	BIV	Follow SDS procedures; take adequate measures as stated in SDS (Correct PPE use) SDS available on location (chemical storage area & supervisors' offices) Dedicated storage location Drip pans where possible Use mud bucket at all times when handling pipe with brine / mud inside Additional PPE (face masks / shields) when handling pipe on basket level	B	II	BII	
G-8	Working on Wellhead (TR-2/6/8/9, VE-2/4)	Robke, BPC, Nedmag	Exposure to Chrom-6	Permanent injury to people (carcinogenic)	C	IV	CIV	Use correct PPE, as per Nedmag matrix Wear gloves when handling light green/red painted WH items Wash hands after job, throwaway gloves	E	I	EI	Q:181 NEDMAG\0 General\9 Safety



Risk Assessment Worksheet

Number: ICS-CT-RA-001
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Arrive on location & spot equipment (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-001

Rev No: 2.0

1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-001
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Arrive on location	Unfamiliar with location / Unfamiliar with escape routes / Unaware of simultaneous operations. (Simops) <i>Injury to personnel due to slips, trips and falls / wrong decisions in emergency situations / Hazardous situations due to Simops.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	3	2	6	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Platform / location Induction; Pre Job safety meeting; Toolbox Talk; Work area barriered off. 	2	2	4
2	Unload Truck / Boat and spot equipment	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Certified lifting gear; Assigned banksman; Toolbox Talk; Weather assessment; Use of Tag Line. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-001
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2.e [Redacted Signature]
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2.e [Redacted Signature]



Risk Assessment Worksheet

Number: ICS-CT-RA-002
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Rig Up & Pressure Testing (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-002

Rev No: 2.0

1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Install BOP onto riser, Xmas tree or test stand.	Crane Activities / Heavy Loads / Manual guiding. <i>Fingers trapped while stabbing / Hit by BOP.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	3	3	9	<ul style="list-style-type: none"> Clear communication; Use of Tag Line; Appropriate PPE; Handling Training; Supervision. 	2	3	6
2	Connecting fluid treatment line.	Use of (heavy) hand tools / manual lifting / frequently bending over. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards .</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	3	2	6	<ul style="list-style-type: none"> Appropriate PPE; Handling Training; Use crane if possible; Two persons required to rig up; Assess the work area. 	2	2	4
3	Function test of BOP.	Hydraulic Oil Spill. <i>Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Harm to environment; Job delays. 	3	1	3	<ul style="list-style-type: none"> Appropriate PPE; Spill kits / Oil absorbent materials; Check connections. 	2	1	2



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Pressure testing fluid treatment line.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Toolbox Talk; Work area barriered off; Secure treatment line; PRV installed and calibrated; Harmless test fluid; Calibrated gauges. 	2	4	8
5	Pressure testing BOP.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing / Test Bar/CT ejected.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Toolbox Talk; Work area barriered off; Secure treatment line; PRV installed and calibrated; Harmless test fluid; Calibrated gauges; Secure test bar / CT. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
6	Bleeding down pressure from pressure test.	Noise / Exposure to pressure / Sudden movement of treatment line. <i>Hearing damage.</i>	<ul style="list-style-type: none"> Harm to people; Job delays. 	3	2	6	<ul style="list-style-type: none"> Appropriate PPE; Bleed off properly in appropriate drains. 	2	-2	-4
7	Checking position / Operating gate valves on the Xmas tree or flow block.	Confined space / Working at height / Hydrates. <i>Unfavorable working posture / Difficult Escaping / Valves unable to be operated.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	2	4	8	<ul style="list-style-type: none"> Knowledge of Escape Routes; Appropriate PPE; Use fall arrestor; Competent personnel. 	2	3	6
8	Removal of Xmas tree cap.	Working at height / Trapped pressure / Release of Hydrocarbons into the atmosphere / Crane activities. <i>Trapped / Nipped Fingers or Falling Loads / Hazardous substances exposed to environment / Injury to personnel due exposure to pressure.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays; Harm to environment. 	3	4	12	<ul style="list-style-type: none"> Clear communication; Controlled venting; Appropriate PPE; Competent personnel; Supervision; Valve status document. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
9	Lifting Injector.	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	3	9	<ul style="list-style-type: none"> • Appropriate PPE; • Clear communication; • Supervision; • Certified lifting gear; • Assigned banksman; • Toolbox Talk; • Weather assessment; • Use of Tag Line. 	2	3	6
10	Prepare CT and making up connector.	Crane activities / Heavy Loads. <i>Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage. 	3	3	9	<ul style="list-style-type: none"> • Appropriate PPE; • Clear communication; • Supervision; • Use Injector legs; • Minimize time of exposure; • Use correct hand tools. 	2	3	6
11	Pull testing CT connector.	High tension / Equipment failure during test. <i>Connector can come off.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage. 	2	3	6	<ul style="list-style-type: none"> • Only essential personnel permitted in workspace; • Competent personnel; • Clear communication; • Use pull test plate; • Work area barriered off; • Do not pull over 60% of the max. yield. 	2	2	-4



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
12	Making up required BHA.	Working underneath Injector / Manual Handling. <i>Trapped / Nipped Fingers or Falling Loads.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage. 	3	3	9	<ul style="list-style-type: none"> Supervision; Appropriate PPE; Clear communication; Use Injector legs; Minimize time of exposure; Only essential personnel permitted in workspace; Use correct hand tools. 	2	3	6
13	Function Test BHA / Nozzle	Fluid spill Unexpected Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; 	3	3	9	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Work area barriered off; Harmless test fluid; 	2	3	6



Risk Assessment Worksheet

Number: ICS-CT-RA-002

Rev No: 2.0

1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
14	Pressure testing stack.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposure to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Toolbox Talk; Work area barriered off; PRV installed and calibrated; Harmless test fluid; Calibrated gauges. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-002
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2.e [Redacted Signature]
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2.e [Redacted Signature]



Risk Assessment Worksheet

Number: ICS-CT-RA-003
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation RIH & POOH (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-003

Rev No: 2.0

1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-003
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Equalizing pressure in stack to WHP.	Exposure to pressure / Equipment failure due to pressure. <i>Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Harm to environment. 	2	4	8	<ul style="list-style-type: none"> • Supervision; • Selecting competent personnel to carry out the Job; • Toolbox Talk; • Appropriate PPE; • Handling Training; • Use of certified and tested equipment only; 	1	4	4
2	Opening Xmas tree valves.	Unexpected exposure to pressure. <i>Injury to personnel due exposal to pressure.</i>	<ul style="list-style-type: none"> • Harm to people; • Harm to environment. 	4	4	16	<ul style="list-style-type: none"> • Selecting competent personnel to carry out the Job; • Appropriate PPE; • Clear communication; • Equalized pressure; • Permit to work; • Counting turns. 	2	4	8
3	Commence running in hole (RIH).	Unexpected equipment failure / Unexpected weight loss / Surface leak. <i>Maintenance on equipment while CT is in hole / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> • Property / Equipment damage; • Harm to environment. 	4	4	16	<ul style="list-style-type: none"> • Supervision; • Selecting competent personnel to carry out the Job; • Monitor all operating and well parameters; • Well drawing available; • Awareness of emergency procedures. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-003
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Performing pull tests.	CT failure under tension / Unexpected equipment failure. <i>Broken CT / Maintenance on equipment while CT is in hole / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Property / Equipment damage; Harm to environment. 	4	4	16	<ul style="list-style-type: none"> Supervision; Selecting competent personnel to carry out the Job; Monitor all operating and well parameters; Well drawing available; Awareness of emergency procedures; Awareness of max. pull allowed; Simulations available. 	2	4	8
5	Pull out of hole (POOH).	Unexpected equipment failure / Unexpected high tension / Surface leak. <i>Maintenance on equipment while CT is in hole / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Property / Equipment damage; Harm to environment. 	4	4	16	<ul style="list-style-type: none"> Supervision; Selecting competent personnel to carry out the Job; Monitor all operating and well parameters; Well drawing available; Awareness of emergency procedures. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-003
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
6	Tagging stripper with connector.	Tagging with too much force. <i>Connector parts from CT / CT pulls out of stripper / Hydrocarbons escape into the atmosphere.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays; • Harm to environment. 	4	4	16	<ul style="list-style-type: none"> • Supervision; • Selecting competent personnel to carry out the Job; • Awareness of emergency procedures; • Compare depth counter readings. 	2	4	8
7	Closing Xmas tree valves.	Closing while CT/Tools are across valves. <i>Damage on valves / Unable to close off well.</i>	<ul style="list-style-type: none"> • Property / Equipment damage. 	4	4	16	<ul style="list-style-type: none"> • Selecting competent personnel to carry out the Job; • Appropriate PPE; • Clear communication; • Confirm BHA tagged stripper; • Counting turns. 	2	4	8
8	Bleed off pressure in stack / CT and Xmas tree.	Blocked lines / Trapped pressure / Hydrocarbon release. <i>Injury to personnel due exposal to pressure / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> • Harm to people; • Harm to environment. 	4	4	16	<ul style="list-style-type: none"> • Appropriate PPE; • Bleed off to closed tank or separator; • Verify pressure on back-up gauges; • Check using manual vent point. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-003
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2e [Redacted Signature]
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2e [Redacted Signature]



Risk Assessment Worksheet

Number: ICS-CT-RA-004
Rev No: 2.0
1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Rig down Injector from Well, Change out BHA (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-004
Rev No: 2.0
1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-004
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Bleed of pressure in Stack / CT and Xmas tree.	Blocked lines / Trapped pressure / Hydrocarbon release. <i>Injury to personnel due exposure to pressure / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Harm to people; Harm to environment. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Bleed off to closed tank or separator; Verify pressure on back-up gauges; Check using manual vent point. 	2	4	8
2	Lift Injector with / without lubricator off BOP or QTS	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	3	3	9	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Certified lifting gear; Assigned banksman; Toolbox Talk; Weather assessment; Use of Tag Line. 	2	3	6
3	Change out required BHA	Working underneath Injector / Manual Handling. <i>Trapped / Nipped Fingers or Falling Loads.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage. 	3	3	9	<ul style="list-style-type: none"> Supervision; Appropriate PPE; Clear communication; Use Injector legs; Minimize time of exposure; Only essential personnel permitted in workspace; Use correct hand tools. 	2	3	6



Risk Assessment Worksheet

Number: ICS-CT-RA-004
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Function Test BHA / Nozzle	Fluid spill Unexpected Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due to exposure to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; 	3	3	9	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Work area barriered off; Harmless test fluid; 	2	3	6
5	Lift Injector with / without lubricator back onto BOP or QTS	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	3	3	9	<ul style="list-style-type: none"> Supervision; Appropriate PPE; Clear communication; Use Injector legs; Minimize time of exposure; Only essential personnel permitted in workspace; Use correct hand tools. 	2	3	6



Risk Assessment Worksheet

Number: ICS-CT-RA-004
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2.e
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2.e



Risk Assessment Worksheet

Number: ICS-CT-RA-005
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Rig Down Equipment
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-005
Rev No: 2.0
1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-005
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Bleed off pressure in stack / CT and Xmas tree.	Blocked lines / Trapped pressure / Hydrocarbon release. <i>Injury to personnel due exposal to pressure / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Harm to people; Harm to environment. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Bleed off to closed tank or separator; Verify pressure on back-up gauges; Check using manual vent point. 	2	4	8
2	Lifting Injector.	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	3	3	9	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Certified lifting gear; Assigned banksman; Toolbox Talk; Weather assessment; Use of Tag Line. 	2	3	6
3	Remove BHA	Working underneath Injector / Manual Handling. <i>Trapped / Nipped Fingers or Falling Loads.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage. 	3	3	9	<ul style="list-style-type: none"> Supervision; Appropriate PPE; Clear communication; Use Injector legs; Minimize time of exposure; Only essential personnel permitted in workspace; Use correct hand tools. 	2	3	6



Risk Assessment Worksheet

Number: ICS-CT-RA-005
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Unstab Coiled Tubing and spool back onto reel	Mechanical movement / Manual Handling <i>Trapped / Nipped Fingers / Equipment damage due to movement</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage. 	3	3	9	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Only essential personnel permitted in workspace; Use correct hand tools. 	2	3	6
5	Disconnect Hydraulic hoses	Hydraulic Oil spill / Unexpected exposure to pressure <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure</i>	<ul style="list-style-type: none"> Harm to people; Harm to environment. Property / Equipment damage. 	3	1	3	<ul style="list-style-type: none"> Appropriate PPE; Competent personnel; Bleed off properly. 	2	1	2



Risk Assessment Worksheet

Number: ICS-CT-RA-005
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
6	Rig Down fluid treatment line.	Use of (heavy) hand tools / manual lifting / frequently bending over. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards .</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Handling Training; • Use crane if possible; • Two persons required to rig up; • Assess the work area. 	2	2	4
7	Rig Down BOP from riser or Xmas tree	Crane Activities / Heavy Loads / Manual guiding. <i>Fingers trapped while guiding / Hit by BOP.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	3	9	<ul style="list-style-type: none"> • Clear communication; • Use of Tag Line; • Appropriate PPE; • Handling Training; • Supervision. 	2	3	6
8	Lift equipment onto trailer / into transport basket	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement / Crushed by Injector.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	4	4	16	<ul style="list-style-type: none"> • Clear communication; • Appropriate PPE; • Supervision; • Certified lifting gear; • Assigned banksman; • Toolbox Talk; • Weather assessment; • Use of Tag Line. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-005
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2e 5.1.2e
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2e 5.1.2e



Risk Assessment Worksheet

Number: ICS-CT-RA-006
Rev No: 2.0
1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Backload equipment (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-006

Rev No: 2.0

1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-006
Rev No: 2.0
1st Issue: 13-01-2021



Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Backload equipment to truck or boat.	Crane activities / Heavy Loads. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Falling Loads / Equipment damage due to movement.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage. 	4	4	16	<ul style="list-style-type: none"> • Appropriate PPE; • Clear communication; • Supervision; • Certified lifting gear; • Assigned banksman; • Toolbox Talk; • Weather assessment; • Use of Tag Line. • Fill in Backload Checklist form. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-006
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	



Risk Assessment Worksheet

Number: ICS-CT-RA-007
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation BOP Pressure Testing (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Install BOP onto riser, Xmas tree or test stand.	Crane Activities / Heavy Loads / Manual guiding. <i>Fingers trapped while stabbing / Hit by BOP.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	3	9	<ul style="list-style-type: none"> • Clear communication; • Use of Tag Line; • Appropriate PPE; • Handling Training; • Supervision. 	2	3	6
2	Connecting fluid test line.	Use of (heavy) hand tools / manual lifting / frequently bending over. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards .</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Handling Training; • Use crane if possible; • Two persons required to rig up; • Assess the work area. 	2	2	4
3	Function test of BOP.	Hydraulic Oil Spill. <i>Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> • Harm to environment; • Job delays. 	3	1	3	<ul style="list-style-type: none"> • Appropriate PPE; • Spill kits / Oil absorbent materials; • Check connections. 	2	1	2



Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Pressure testing Blind or Shear / Seal rams and body.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	4	4	16	<ul style="list-style-type: none"> • Appropriate PPE; • Clear communication; • Supervision; • Selecting competent personnel to carry out the Job; • Toolbox Talk; • Work area barriered off; • Secure treatment line; • PRV installed and calibrated; • Harmless test fluid; • Calibrated gauges. • Install pressure cap with bleed port open. 	2	4	8
5	Bleeding down pressure from pressure test.	Noise / Exposure to pressure / Sudden movement of treatment line. <i>Hearing damage.</i>	<ul style="list-style-type: none"> • Harm to people; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Bleed off properly in appropriate drains. 	2	2	4



Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
6	Install Test bar for testing Pipe rams.	Working at height / Manual handling. <i>Falling from height / Trapped / Nipped Fingers Damage to rams.</i>	<ul style="list-style-type: none"> Harm to people; Equipment; Job delays. 	3	2	6	<ul style="list-style-type: none"> Clear communication; Appropriate PPE; Use fall arrestor; Competent personnel; Centralize test bar while closing rams; 	2	2	4
7	Pressure testing Pipe rams and body.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Toolbox Talk; Work area barriered off; Secure treatment line; PRV installed and calibrated; Harmless test fluid; Calibrated gauges. Install pressure cap with bleed port open. 	2	4	8



InWaTec combined B.V.

Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and <i>Worst-case Consequence</i>	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
8	Bleeding down pressure from pressure test.	Noise / Exposure to pressure / Sudden movement of treatment line. <i>Hearing damage.</i> <i>Trapped / Nipped Fingers or Falling Loads / Hazardous substances exposed to environment / Injury to personnel due exposure to pressure.</i>	<ul style="list-style-type: none"> • Harm to people; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Bleed off properly in appropriate drains. 	2	2	4
10	Remove Test bar out of BOP.	Working at height / Lifting pressure cap / Manual handling. <i>Falling from height / Trapped / Nipped Fingers / Falling load.</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Clear communication; • Appropriate PPE; • Use fall arrestor; • Competent personnel; • Certified lifting gear. 	2	2	4



Risk Assessment Worksheet

Number: ICS-CT-RA-007
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2e 5.1.2e
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2e 5.1.2e



Risk Assessment Worksheet

Number: ICS-CT-RA-009
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Coiled Tubing Operation Fluid / Chemical Mixing & Pumping (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	•On lease spill (<2m ³); •Minimal localized soil contamination.	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	•Release >2m ³ and <30m ³ ; •any off-release; •>50m ³ contaminated soil.	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	•Release >30m ³ and <100m ³ ; •any release into potable water supply; •>100m ³ contaminated soil.	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	•Release ≤100m ³ off lease •Release ≤ 5m ³ into potable water supply.	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Rig up Fluid pump / mix Tank(s).	Use of (heavy) hand tools <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards .</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Handling Training; • Use crane if possible; • Two persons required to rig up; • Assess the work area. 	2	2	4
2	Connecting treatment line / hose.	Use of (heavy) hand tools / manual lifting / frequently bending over. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards .</i>	<ul style="list-style-type: none"> • Harm to people; • Property / Equipment damage; • Job delays. 	3	2	6	<ul style="list-style-type: none"> • Appropriate PPE; • Handling Training; • Use crane if possible; • Two persons required to rig up; • Assess the work area. 	2	2	4
3	Pressure testing treatment line / hose.	Fluid spill / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during testing / Equipment not lined up properly. <i>Hazardous substances exposed to environment / Injury to personnel due exposal to pressure / Equipment bursting/failing.</i>	<ul style="list-style-type: none"> • Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; • Job delays. 	4	4	16	<ul style="list-style-type: none"> • Appropriate PPE; • Clear communication; • Supervision; • Selecting competent personnel to carry out the Job; • Toolbox Talk; • Work area barriered off; • Secure treatment line; • PRV installed and calibrated; • Harmless test fluid; • Calibrated gauges. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Bleeding down pressure from pressure test.	Noise / Exposure to pressure / Sudden movement of treatment line. <i>Hearing damage.</i>	<ul style="list-style-type: none"> Harm to people; Job delays. 	3	2	6	<ul style="list-style-type: none"> Appropriate PPE; Bleed off properly in appropriate drains. 	2	2	4
5	Mix Fluid / Chemicals.	Leaking connections / Toxic fumes / Corrosive substances / Manual lifting / Flammable substances. <i>Chemical burns / Suffocation / Articular or muscular injuries / Fire.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Toolbox Talk; Work area barriered off; Use of drip trays; Create leak tight area; Use of drip trays; Fire extinguisher present. 	3	3	9



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
7	Pumping Fluid / Chemicals.	Leaking connections / Unexpected exposure to pressure / Incorrect pressure reading / Equipment failure during pumping / Equipment not lined up properly. <i>(Chemical) Fluid spill / Suffocation / Injury to personnel or equipment due exposure to pressure or chemicals.</i>	<ul style="list-style-type: none"> Harm to people; Property / Equipment damage; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Clear communication; Supervision; Selecting competent personnel to carry out the Job; Toolbox Talk; Work area barriered off; Secure treatment line; PRV installed and calibrated; Calibrated gauges; Use of drip trays; Create leak tight area. 	2	4	8
7	Bleeding down pressure after pumping.	Blocked lines / Trapped pressure / Release of Chemicals / Hydrocarbon release. <i>Injury to personnel due exposure to pressure / Hazardous substances exposed to environment.</i>	<ul style="list-style-type: none"> Harm to people; Equipment damage; Job delays. 	4	4	16	<ul style="list-style-type: none"> Appropriate PPE; Bleed off to closed tank or separator; Verify pressure on back-up gauges; Check using manual vent point. 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
8	Rig down equipment	Use of (heavy) hand tools / manual lifting / frequently bending over / Exposure to chemicals. <i>Articular or muscular injuries, Trapped / Nipped Fingers or Slip/Trip Hazards / / Injury to personnel or equipment due exposal to chemicals.</i>	<ul style="list-style-type: none"> Depending of the severity of the damage, this may lead to harm to people, environment or damage to equipment and property; Job delays. 	3	2	6	<ul style="list-style-type: none"> Appropriate PPE; Handling Training; Use crane if possible; Two persons required to rig down; Assess the work area; Flush / Neutralize lines before rig down. 	2	2	4



Risk Assessment Worksheet

Number: ICS-CT-RA-009
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	[Redacted Signature]
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	[Redacted Signature]



Risk Assessment Worksheet

Number: ICS-CT-RA-010
 Rev No: 2.0
 1st Issue: 13-01-2021

General

Department:	Operations / Coiled Tubing
Location:	Customer Controlled Site
Process Assessed:	Major Well Control Risks and Hazards (Generic Risk Assessment)
Risk Assessment Team:	5.1.2.e _____ and 5.1.2.e _____
Reassessment Date:	09-06-2023

Risk Estimator		Very Low	Low	Medium	High	Very High
		1	2	3	4	5
		Likelihood				
Light	1	1	2	3	4	5
Serious	2	2	4	6	8	10
Major	3	3	6	9	12	15
Catastrophic	4	4	8	12	16	20

Risk Category		Residual Risk Approval Required
10 ≥ & > 20	High	No Approval Permitted.
5 ≥ & > 9	Medium	Department Manager.
2 ≥ & > 4	Low	No approval required.
1	Insignificant	No approval required.

Risk Category = Severity x Likelihood

Likelihood (with what frequency is the Hazard likely to arise?)	
Very Low	Events known to be practically impossible (1 to 3 occurrences in 100 years).
Low	Events known to be not likely to occur (1 to 3 occurrences in 30 years).
Medium	Events known to occur sometimes (1 to 3 occurrences in 10 years).
High	Events known to occur isolated (1 to 3 occurrences in 3 years).
Very High	Events known to occur repeated (Annual occurrence or more).



Risk Assessment Worksheet

Number: ICS-CT-RA-010

Rev No: 2.0

1st Issue: 13-01-2021

Risk Assessment user instructions

To assess the risk value of hazards, two parameters are to be defined:

- The **likelihood** (or probability) of an event to occur from the hazard.
- The **severity** of the consequences (impact) of such events (in terms of the worst possible case).

The severity of the consequences of an event is found by answering the question:

- What rating does apply to worst case possible consequence when a hazard results in an accidental event?

For answering this question a selection may be taken from the following predetermined categories:

Severity				
	Quality	Health & Safety	Environment	
			On-shore	Off-shore
Light	Costs: <€20K	Maximum injury: Medical treatment case	<ul style="list-style-type: none"> •On lease spill (<2m³); •Minimal localized soil contamination. 	•Release (<2m ³) contained on-platform
Serious	Costs: ≥€20K	Maximum injury: Lost time incident	<ul style="list-style-type: none"> •Release >2m³ and <30m³; •any off-release; •>50m³ contaminated soil. 	•Release (≥2m ³) contained on-platform
Major	Costs :≥€1M	Maximum injury: Fatality or permanent disability	<ul style="list-style-type: none"> •Release >30m³ and <100m³; •any release into potable water supply; •>100m³ contaminated soil. 	•Unlicensed release from an offshore or lake platform
Catastrophic	Costs: ≥€10M	Multiple fatalities	<ul style="list-style-type: none"> •Release ≤100m³ off lease •Release ≤ 5m³ into potable water supply. 	•Unlicensed release ≥20m ³ from an offshore or lake platform



Risk Assessment Worksheet

Number: ICS-CT-RA-010

Rev No: 2.0

1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
1	Risk of loss of primary well control Leaking stripper	Escape of hydrocarbons Noise Fire / explosion Escape of H2S Spill (wellbore Fluids)	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. Explosion, Electrocutation, Slips / Trips / Falls, Suffocation, Property / Equipment Damage, NPT, etc. 	4	4	16	<ul style="list-style-type: none"> Pressure testing Planned maintenance CT operating Guidelines Certified equipment Toolbox talk Function and pressure Test primary well Control Certified and pressure Tested secondary well Control in place (BOP) Record ESD system Operating prior to Start operations (tertiary) Competent personnel 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and <i>Worst-case Consequence</i>	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
2	Risk of loss of primary well control Leaking quick union seals from PCE above BOP	Escape of hydrocarbons Noise Fire / explosion Escape of H2S Spills (wellbore fluid)	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. Explosion, Suffocation, Property / Equipment Damage, NPT, etc. 	4	4	16	<ul style="list-style-type: none"> Pressure testing Planned maintenance CT operating Guidelines Certified equipment Toolbox talk Function and pressure Test primary well Control Certified and pressure Tested secondary well Control in place (BOP) Record ESD system Operating prior to Start operations (tertiary) Competent personnel 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and <i>Worst-case Consequence</i>	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
3	Risk of loss of primary well control Failure of BOP	Escape of hydrocarbons Noise Fire / explosion Escape of H2S Spills (wellbore fluid)	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. Explosion, Suffocation, Property / Equipment Damage, NPT, etc. 	4	4	16	<ul style="list-style-type: none"> Pressure testing Planned maintenance CT operating Guidelines Certified equipment Toolbox talk Function and pressure Test primary well Control Certified and pressure Tested secondary well Control in place (BOP) Record ESD system Operating prior to Start operations (tertiary) Competent personnel 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010

Rev No: 2.0

1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and <i>Worst-case Consequence</i>	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
4	Risk of loss of primary well control Leaking ring joint seals from PCE below BOP	Escape of hydrocarbons Noise Fire / explosion Escape of H2S Spills (wellbore fluid)	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. Explosion, Suffocation, Property / Equipment Damage, NPT, etc. 	4	4	16	<ul style="list-style-type: none"> Pressure testing Planned maintenance CT operating Guidelines Certified equipment Toolbox talk Certified and pressure Tested secondary well Control in place (BOP) Record ESD system Operating prior to Start operations (tertiary) Competent personnel 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
5	Mechanical lifting	Crane failure Dropped objects from crane Failure of lifting equipment	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. Explosion, Slips / Trips / Falls, Suffocation, Property / Equipment Damage, NPT, etc. 	4	4	16	<ul style="list-style-type: none"> Don't walk under suspended load. Banksman Certified crane operator Barrier of work area Visually inspect lifting Equipment prior to Use Lifting equipment Certified for task Good communication Obey operational limit 	2	4	8
6	Risk of dropped objects on the wellhead	Damage of wellhead and platform Personal injury		3	4	12	<ul style="list-style-type: none"> Leave cover hatch as long as possible in place Barrier of work area After riser is installed Cover remaining gap Between riser and Deck Change tools above Main deck Minimize tool handling Above hatch (wellhead) 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
7	BHA stuck in front of wellhead barriers during normal operations (loss of well integrity)	Damage to well and wellhead components <i>Loss of Well Control</i>	<ul style="list-style-type: none"> Depending on the present hazards, this may lead to various type of events, for e.g. damage to property / equipment, health, environment and NPT. 	4	4	16	<ul style="list-style-type: none"> CT operating Guidelines Proper selection of PCE / BHA / Tools specification in Relation of wellhead And well specifications (ID & OD) Prepare sufficient Lubricator length for All planned and Expected BHA lengths above BOP Planned fishing Operations require Dedicated risk assessment 	2	4	8



Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Process Activity Sequence		Hazard		Initial Risk			Control Measures	Residual Risk		
No.	Description	Hazard Description and Worst-case Consequence	Potential Service / Product / HSE Event	Likelihood	Severity	Risk	List all current and planned measures. Both prevention and mitigations measures	Likelihood	Severity	Risk
8	Failure of CT	Spill Personnel injury Damage to equipment Release of wellbore fluids and gasses. Release of pump medium	<ul style="list-style-type: none"> • Harm to environment • Harm to people • Property / equipment Damage • NPT. 	4	4	16	<ul style="list-style-type: none"> • CT operating Guidelines • Certified equipment • Planned maintenance • Barrier of working Area • Stay within operating Limits / simulation Of CT • When above operating Limits / simulations Suspend operations And consult ICS Office • Proper selection of CT suited for well bore content (CO2/H2S/Brine/Acid) 	2	4	8
9	Failure of CT unit	Loss of hydraulic supply to BOP	<ul style="list-style-type: none"> • Harm to environment • Harm to people • Property / equipment Damage • NPT. 	4	4	16	<ul style="list-style-type: none"> • Accumulator • Hand pump • Manual override on BOP • Certified and Maintained equipment 	2	4	8



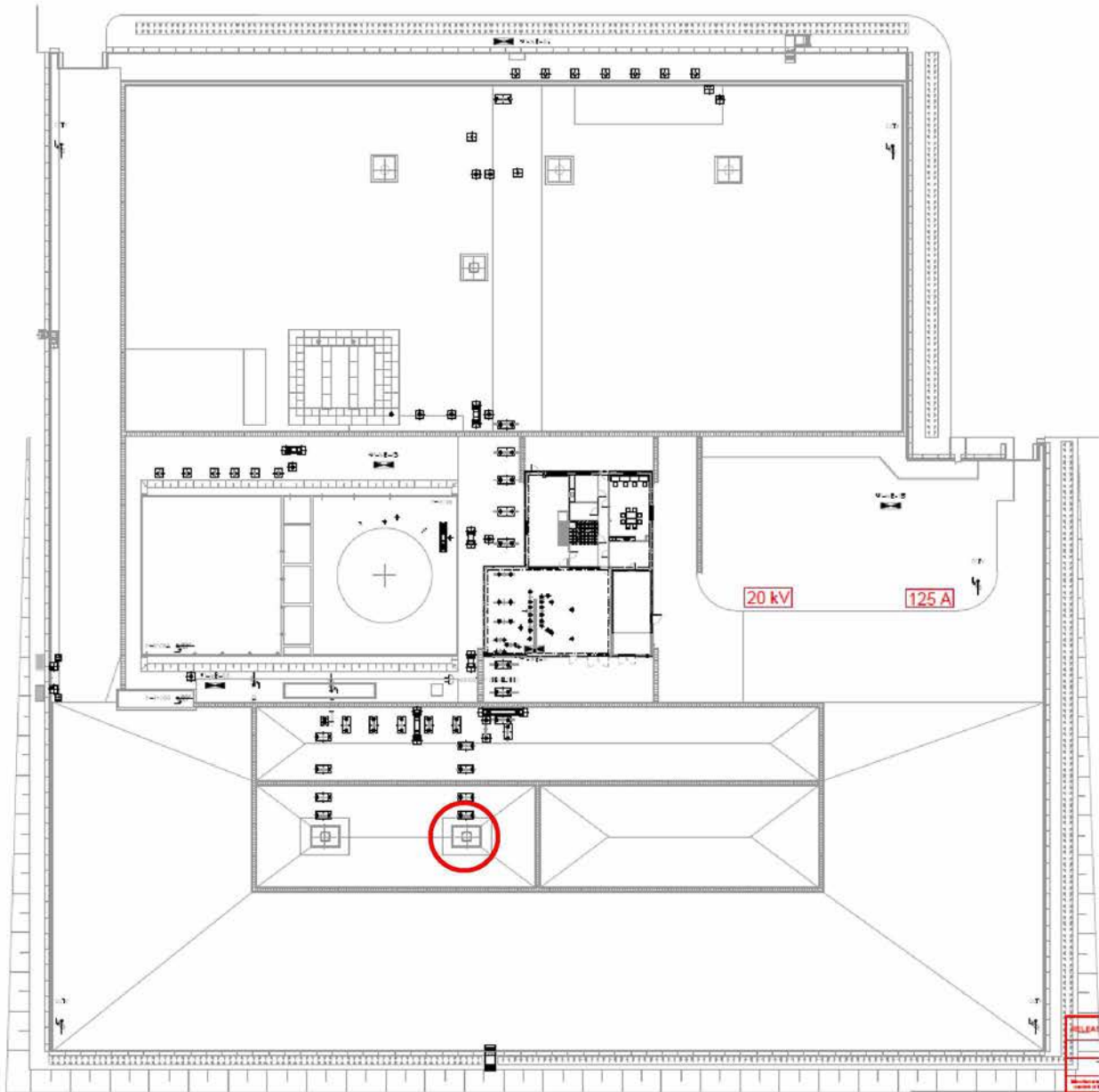
Risk Assessment Worksheet

Number: ICS-CT-RA-010
Rev No: 2.0
1st Issue: 13-01-2021

Revision History and Assessment Approval:

Revision	Date	Description of Status and Changes	Name & Approval Signature (Department / General Manager)
1.0	13-01-2021	First Issue.	5.1.2e 5.1.2e
2.0	27-01-2021	Changes in Severity Matrix, risks reassessed.	5.1.2e 5.1.2e

APPENDIX 9: LOCATION LAYOUT



VE-5 marked in red