
081 – Norwegian Oil and Gas recommended guidelines – Remote pipe handling operations

Translated version



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Preface

This guideline is supported by the Norwegian Oil and Gas Drilling Managers Forum, and Norwegian Oil and Gas Operations Committee. Furthermore, this guideline has been approved by the Director General in Norwegian Oil and Gas.

The guidelines have been developed in cooperation with Norwegian Ship-owners Association (NSA) and the Petroleum Safety Authority (PSA).

This Norwegian Oil and Gas guideline has been prepared with the broad-based participation of interested parties in the Norwegian petroleum industry, and they are owned by the Norwegian petroleum industry, represented by Norwegian Oil and Gas. Norwegian Oil and Gas is responsible for administration of these guidelines.

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1 OBJECTIVES

This document describes the guidelines and routines for Norwegian Oil and Gas/NSA members in order to establish a practical implementation of PSAs' requirements for remote pipe handling operations in the Facilities regulations and the Activities Regulations.

The intention of this document is to establish a common understanding of what is realistic to achieve for existing drilling and well intervention units with respect to safe remote pipe handling operations. This document is based on the following documentation:

- Identification of all relevant remote operated sub operations and associated handling routes from original position on deck until it has been secured at the rotary table, ref. definition in facilities regulations.
- Analysis of each sub operation, with indication that operation can be conducted safely with the available remote operated field proven equipment.
- Identified realistic operational status (R=Remote operated, M=Manual operated or NA=Not applicable) for each sub-operation and handling sequence.

Pipe handling related to hydraulic well operations (CT or Snubbing) is not considered in this document.

New drilling unit projects, upgrades and replacement projects should have the objective to reduce the extent of manual pipe handling operations even further than described in this document.

These guidelines are available at the Norwegian Oil and Gas website.

<https://www.norskoljeoggass.no/arbeidsliv/retningslinjer/boring/081-anbefalte-retningslinjer-for-fjernoperert-rorhandtering-/>

2 ABBREVIATIONS

CW	- Catwalk
DMF	- Drilling Managers Forum
HTV	- Horizontal to vertical
PSA	- Petroleum Safety Authority
NSA	- Norwegian Ship-owners Association
OC	- Operations Committee
M	- Manual operation
R	- Remote operation
NA	- Not Applicable

3 HIGHLIGHT CHANGES

The procedure for handling exemptions (previously section 8) is changed to procedure for handling deviations (now section 6).

There are grammatical changes and inclusion of reference documents.

The format in figures in Appendices 2, 3 and 4 has been improved.

The guidelines are restructured in accordance with Norwegian Oil and Gas procedure for establishing, revising and retraction of guidelines.

4 REFERENCES

Norwegian Oil and Gas – Recommended practice for establishing and working in the red zone on the drill floor.

Norwegian Oil and Gas – Handbook for safe handling of wireline equipment on deck

Norwegian Oil and Gas – Handbook for consent applications for well operations from a mobile facility

5 GENERAL REQUIREMENTS

All pipe handling that can be remotely operated shall be handled in this manner as long as this improves the overall safety level. In the event manual handling is chosen, regardless of possible remote handling solutions, a documented risk assessment shall be established. Remote operations shall be performed from a safe position away from exposed area. Each installation shall define the term 'safe distance' and shall establish a red zone on the drill floor.

The following procedures should be implemented for operation of pipe-handling equipment:

- Handling procedures shall be established for all planned manual pipe handling operations marked "M" in the matrix. These procedures must be based on risk analysis (HAZID). HAZID shall be repeated at least every 3 years and in relation to changes that will affect the pipe handling. HAZID shall be stored in a way that makes it available on the Rig. HAZID shall be conducted in accordance to ISO 17776.
- For planned manual operations, the rig specific handling procedures must be examined before the manual operation starts.
- For unplanned manual operation, ref. Equipment failure or other (Attachment 2 and 4), a Safe Job Analysis (SJA) must be carried out before the operation starts. The manufacturer's user manual shall be available and examined before the equipment is used.
- This guideline together with rig specific matrix and manual procedures shall be readily available for the users at all times.
- Any pipe handling operation not covered in this document shall be carried out in accordance with the company's lifting and material handling requirements.
- Existing internal procedures for manual pipe handling operations must be updated in the rig specific matrix on a continuous basis.

Personnel directly involved in pipe handling operations shall have competency in accordance with the company competence requirements. Simulator training is recommended where relevant and possible. Training should include emergency operation of handling equipment.

In order to maintain experience with manual operations, traceable and documented training of personnel shall be performed on a regular basis. Each facility should define the need for training. The training shall be based on possible failures in existing remote operated pipe handling equipment on installation. A minimum frequency for training should be once per offshore period (14 days). The training should be intensified based on changes in personnel / crew composition, the competence of the crew and introduction of new equipment. Manual operations as a result of equipment failure can be regarded as training, reference are made to attachment 2. A failure of the anti-collision system shall be treated in accordance with attachment 4. Equipment being used shall at all times have updated operating instructions and documentation according to the applicable regulations.

6 PROCEDURE FOR HANDLING DEVIATIONS

Companies shall ensure that changes in the requirements in the Activity Regulations and the Facility Regulation relevant to pipe handling are implemented as soon as possible, reference to the Framework HSE regulation regarding "continuous improvement" and risk reduction principles.

- The responsible party shall verify the rig status in connection with every rig operation and identify all non-conformances related to the requirements established in this document.
- Each company should adapt the guidelines in Attachment 2, 3 and 4 to own organisation and own management system.
- Deviations from this guideline shall be handled in accordance with the company procedure on deviations.

7 MARKING OF EQUIPMENT

Marking shall be performed in such a way that there will be no conflict or confusion with other relevant marking.

Marking is to prevent mismatch of handling equipment and tubulars. However, each individual is responsible for ensuring that equipment has the correct labelling/tagging or markings required, and according to corresponding documentation, before equipment is put in operation. The equipment shall be marked properly and be easy to identify and correspond with the documentation.

Examples of equipment to be marked

- Elevators
- Inserts for multi-range elevators
- Slips
- Inserts for multirange slips
- Lifting subs

Equipment delivered by service companies/rental companies shall be documented and marked (labelled) in a format recognizable to the user. Equipment which is not marked shall not be used.

8 GUIDELINES FOR FILLING IN THE MATRIX

8.1 Heading

Norwegian Oil and Gas - 081 recommended guidelines for remote pipe handling operations

Rig: Rig name Performed date: dd.mm.yyyy

8.2 Table

No	Equipment		Pipe deck to CW	CW to drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensated measures in addition to general requirements, see section 6. Compensating measures:
1	Bit	Req.= Requirement	M	M	NA	M	NA	NA	M	Drill bits shall preferably be put together onshore, before arrival at the rig. This to reduce the number of manual operations offshore.
		Rig								Procedures;

Level that realistically can be achieved (for available equipment)).

M = manual operation

NA= Not applicable

R = remote operated

R¹ = R¹ reference

Sequence in an operation, e.g. from pipe deck to cat walk (CW)

The rig specific level regarding own equipment

Report the rig specific procedures here. Rig specific procedures are required for manual pipe handling operations. If in compliance with remote operation requirement, there will be no need for rig specific manual procedures according to this document (risk analysis - HAZID).

Rig specific conditions are also listed in this column.

8.3 Footer

Document no and name

Revision no: x Rev. date: xx.xx.xx Page: x of xx x

Fill in revision no. Fill in revision date Page no.

ATTACHMENTS

ATTACHMENT 1: Deviation Matrix

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
1	Drill Bit	Req.	M	M	NA	M	NA	NA	M	Drill bits shall preferably be installed onshore, before arrival the rig, in order to reduce manual operations offshore.
		Rig								Procedure no.
2	DC	Req.	R	R	R ¹	R ¹	R ¹	R	R	R ¹ Operation can be performed manually when the DC have a total length of less than 300 m (does not apply for modified Drill Collars). DC with recess for elevator and slips to be used during remote operation, otherwise a slips type elevator shall be used.
		Rig								Procedure no.
3	Lifting Sub for DC and BHA	Req.	NA	NA	M	NA	NA	M	R ¹	R ¹ Manual operation when lift subs are installed on DC joint on Cat Walk. Lift sub length adjusted to the rigs equipment shall preferably be installed and prepared onshore.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
4	JAR	Req.	R	R	R	R	M	R	R	Norwegian Oil and Gas/NSA members should influence suppliers to deliver JAR with recess for elevator. If this is not possible, the Jar shall, if possible, be delivered with lifting sub with length fitted to rig equipment.
		Rig								Procedure no.
5	Dog-collar	Req.	NA	NA	NA	NA	M ¹	NA	NA	M ¹ Use of Manuel Dog-collar clamp shall be limited. Remote operated Dog-collar shall be used when longer lengths of the same dimensions are run.
		Rig								Procedure no.
6	X/O	Req.	M	M	M	M	M	M	R ¹	R ¹ Every rig must ensure that proper length of X/O's suitable for remote operation is being used. New X/O's shall have a design that makes it possible for remote operation during make/break. X/O adjusted to the equipment shall preferably be prepared and assembled onshore.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	<p>Description of non conformances and compensating measures in addition to general requirements.</p> <p>M = manual operation, NA = Not Applicable, R = Remote Operation,</p> <p>Compensating Measures:</p>
7	Stabilizers / Hole opener	Req.	M	M	M	M	M	M	R ¹	<p>R¹ On new builds, upgrading or replacement of Iron Roughneck, a system that handles stabilizers / hole openers remotely shall preferably be chosen.</p> <p>Stabilizers shall be designed in a way that makes it possible to part/split them with the Iron Roughneck.</p> <p>Stabilizers with removable rings must be avoided.</p>
		Rig								<p>Procedure no.</p>
8	DP, HWDP	Req.	R	R	R	R	R ¹	R	R ²	<p>R¹ Manual operation is allowed if string weight is less then recommendation from the equipment supplier,</p> <p>R² All types of pipe, DP - DC etc. which has been exposed for "over torque" and cannot be broken with remote operated equipment, can be broken manually, see Attachment 3.</p> <p>Thin walled pipes can be made up manually (TLC, thin walled tubes etc.)</p> <p>All standard operations shall be remote operated.</p>
		Rig								<p>Procedure no.</p>

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	<p>Description of non conformances and compensating measures in addition to general requirements.</p> <p>M = manual operation, NA = Not Applicable, R = Remote Operation,</p> <p>Compensating Measures:</p>
9	Non Magnetic DC	Req.	R ¹	R	R ²	R ²	R ²	R	R	<p>R¹ Manual operation is permitted where a magnet is still in use. On new builds, upgrading or replacement of pipe deck cranes, a system that handles non-magnetic pipes, shall be selected.</p> <p>R² Operation can be performed manually when the DC have a total length of less than 300 m (does not apply for modified Drill Collars). DC with recess for elevator and slips to be used during remote operation, otherwise a slips type elevator shall be used.</p>
		Rig								<p>Procedure no.</p>
10	DP < 3 ½"	Req.	R	R	M	R ¹	R ²	R ³	R	<p>R¹ Manual operation is allowed if no inserts are available in the market for pipes < 3 ½".</p> <p>R² Manual operation is allowed if string weight is less than recommendation from equipment supplier.</p> <p>R³ Manual stabbing/guiding/centring can only be accepted in special cases; if the remote operated equipment cannot be adjusted to the correct dimension. On new build, upgrading or replacement of remote operated equipment, solutions that make remote operations possible shall be selected.</p>

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
		Rig								Procedure no.
11	Casing	Req.	R ²	R ²	R	R	R ¹	R	R ²	R ¹ Manual equipment can be used when the weight of the string is less then the recommendation from the supplier of the remote operated equipment. R ² Manuel handling of casing > 20" The casing shall be filled from a suitable arrangement through the topdrive, such that work in red zone is avoided. Ref. attachment 3, deformed or impaired pipes.
		Rig								Procedure no.
12	Non Magnetic Casing	Req.	R ¹	R	R	R	R ²	R	R	R ¹ Manual operation is permitted only where magnets still are being used. R ² Manual equipment can be used when the weight of the string is less then the recommendation from the supplier of the remote operated equipment. On new builds, upgrading or replacement of equipment, a system that makes remote operation possible shall be selected. Ref. attachment 3, deformed or impaired pipes.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
13	Slick Casing / Liners	Req.	R	R	R ¹	NA	R	R ²	R	R ¹ Applies only for make / break of lift subs, otherwise a manual slips type elevator shall be used. R ² Manual installation of Stabbing Guide can be accepted where it can lead to damage to seal area /threads.
		Rig								Procedure no.
14	Centralizers	Req.	NA	NA	NA	NA	NA	NA	R ¹	R ¹ Centralizers shall preferably be installed onshore. Manual handling can be done if no other type of centralizer will work with the pipe handling equipment. On new builds, upgrading or replacement of equipment, a system that makes remote operation possible shall be selected.
		Rig								Procedure no.
15	WO Riser <20"	Req.	R	R	R	R	R	R	M	Short pipes and XO's can be handled manually.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
16	Marin Risers and Slip Joint > 20"	Req.	M	M	M	R	M	M	NA	
		Rig								Procedure no.
17	BOP Test Tool	Req.	M	M	NA	M	M	M	R	
		Rig								Procedure no.
18	Perforating Guns	Req.	R ¹	R	R	NA	R	R	R	R ¹ Perforating guns <u>shall not</u> be handled with magnet cranes. Perforating guns built for remote operation shall be used, unless specific requirements to function is not available in the market.
		Rig								Procedure no.
19	Fishing Equipment	Req.	M	M	M	M	M	M	M	With reference to XO, current manual handling of fishing equipment can be accepted. This is not a standard operation. A Safe Job Analyses (SJA) shall be performed before releasing the fish on deck.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
20	Protectors	Req.	NA	NA	R ¹	NA	NA	NA	NA	R ¹ On new builds, upgrading or replacement of equipment; A system that enables remote operation of tubulars (without protectors), shall be selected.
		Rig								Procedure no.
21	Mud Bucket	Req.	NA	NA	NA	F	NA	NA	NA	
		Rig								Procedure no.
22	Dope	Req.	NA	NA	NA	R ¹	NA	NA	NA	R ¹ On new builds, upgrading or replacement of equipment, a system that makes remote operation possible, shall be selected. Casing and tubing shall be doped onshore prior to shipping offshore.
		Rig								Procedure no.
23	DP Pup Joints	Req.	M	M	M	M	F	M	R	Every rig has to research and find the proper length for Pup Joints suitable for remote operation or Pup Joints must be replaced to fit rig equipment. This must be documented.
		Rig								Procedure no.

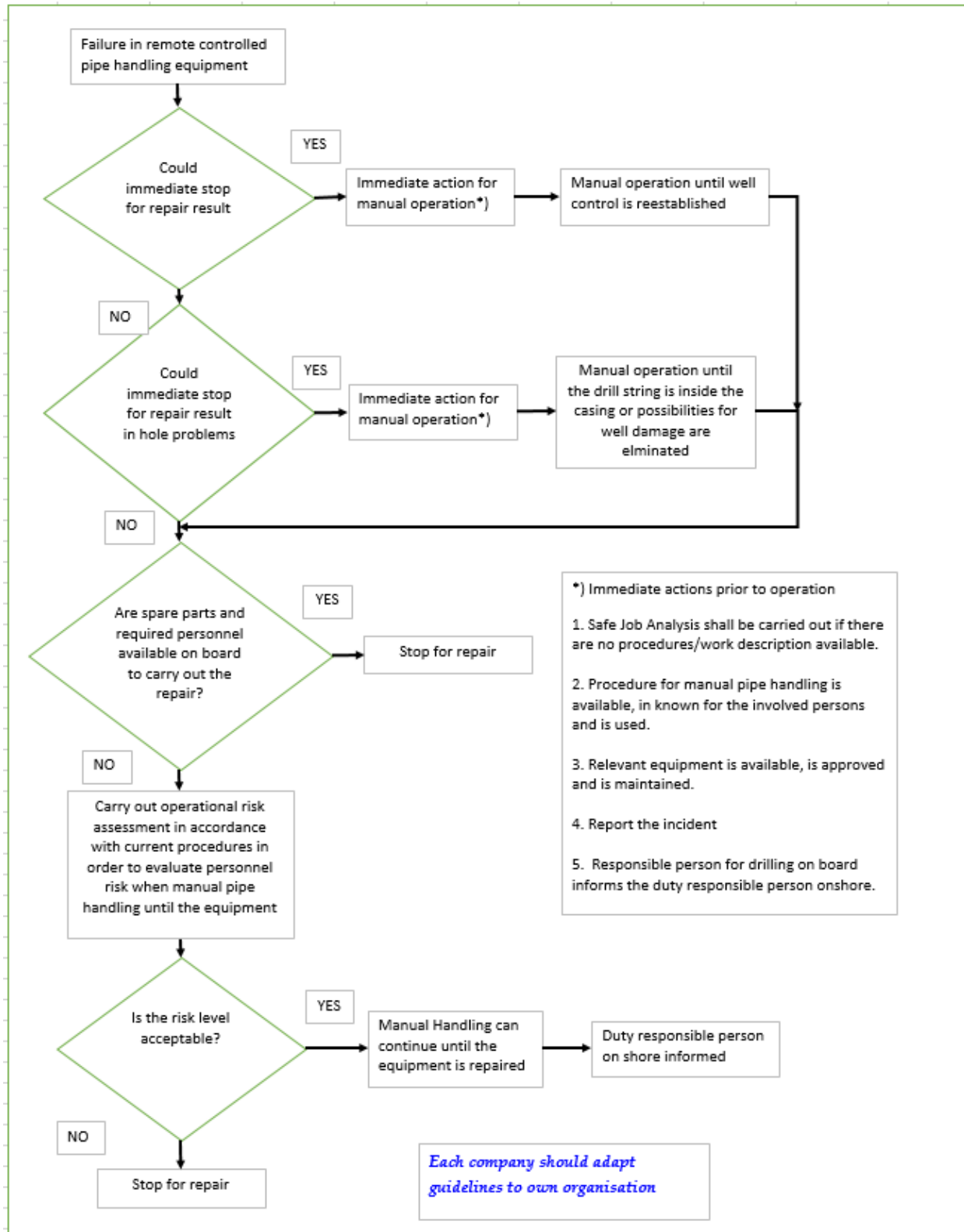
No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
24	Casing/Tubing and Pup Joints	Req.	R	R	R	R	R ¹	R	R	R1 Manual equipment can be used when the weight of the string is less then the recommendation from the supplier of the remote operated equipment.
		Rig								Procedure no.
25	Non magnetic Casing/Tubing and Pup Joints	Req.	R ¹	R	R	R	R ²	R	R	R ¹ Assemblies that are too long for remote operated handling, can be handled manually. Manual operation is allowed where magnets are still in use. R ² Manual equipment can be used when the weight of the string is less then the recommendation from the supplier of the remote operated equipment.
		Rig								Procedure no.
26	Screens	Req.	M	R	R	R	R	M	M	Sensitive completion components which can be damaged of remote operated equipment can be operated manually. In that case, a HAZID shall be performed. SJA shall be performed before the operation starts.
		Rig								Procedure no.
27	Inner string	Req.	R	R	M	M	M	M	M	2 7/8" and 3 1/2" string shall be standardized to fit remote operated rig equipment. If the joint cannot be racked in the derrick in a safe way, the joints must be laid down (remote operated).
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
28	Lateral Well Equipment	Req.	M	M	M	M	M	M	M	Operations which can be remotely operated shall be remotely operated.
		Rig								Procedure no.
29	Completion Equipment	Req.	M	M	M	M	M	R ¹	M	R ¹ For equipment which can be made up for remote operation, operation shall be remotely operated.
		Rig								Procedure no.
30	Double Production Tubing	Req.	M	R	M	R	R	M	M	Equipment and components which can be damaged by using remote operated equipment can be manually handled. A HAZID shall be prepared and a SJA executed prior to start of operation.
		Rig								Procedure no.
31	MWD / Mud Motors	Req.	R	R	R	R	M	M	M	Equipment and components which can be damaged by using remote operated equipment can be manually handled. Equipment should be fit for remote operation and lifting sub should be avoided. For lifting sub, see item #3.
		Rig								Procedure no.

No	Equipment		Pipe deck to CW	CW to Drill floor	HTV	Setback/Rotary	Slips	Stabbing/guiding	Make/Break	Description of non conformances and compensating measures in addition to general requirements. M = manual operation, NA = Not Applicable, R = Remote Operation, Compensating Measures:
32	Coil Tubing BHA's	Req.	M	M	M	M	M	M	M	BHA's shall if possible be prepared and made up onshore. Operations that can be remotely operated shall be remotely operated.
		Rig								Procedure no.
33	False Rotary Table	Req.	NA	NA	NA	R	R	R	R	Pipe that normally shall be remotely operated shall also be operated remotely by use of false rotary table.
		Rig								Procedure no.
34	Drilling with Pup Joint / Drilling Stand	Req.	NA	NA	NA	R	R	R	R ¹	R ¹ If the iron roughneck is not designed to function as a “back up” tong, a manually rig tong can be used. Procedure(s) shall be worked out. On new builds, upgrading or replacement of equipment, a system that makes remote operation possible shall be selected.
		Rig								Procedure no.
35	Casing/Liner Drilling	Req.	R	R	R	R	R ¹	R	R	R ¹ If the weight of the string is less then recommended from the equipment supplier, manual operation is allowed. For retrievable BHA, manual operation is allowed.
		Rig								Procedure no.

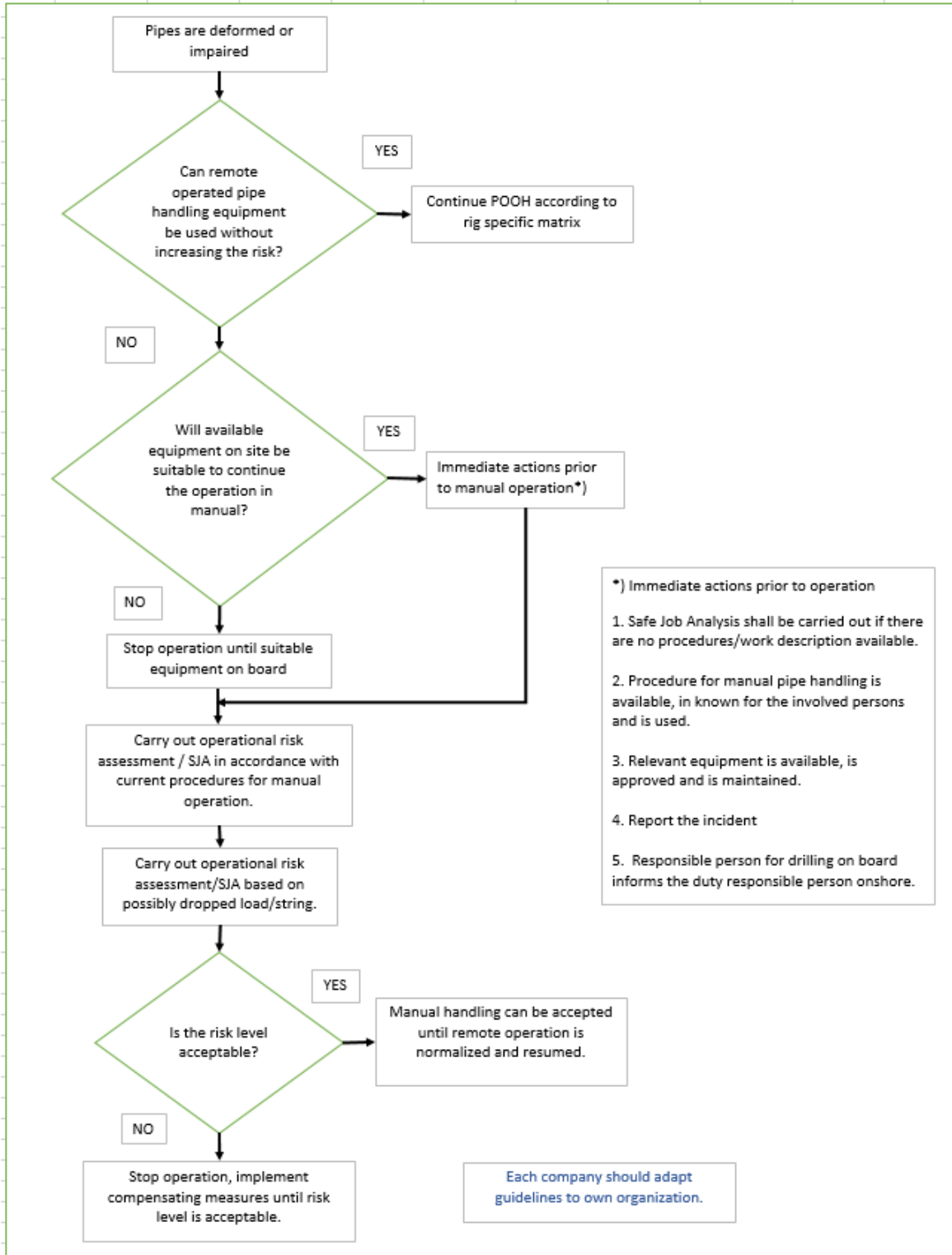
ATTACHMENT 2: Remote Operated Equipment Failures

Guideline for Temporary Failure of Remote Operated Pipe Handling Equipment.



ATTACHMENT 3: Pulling Deformed or Impaired Pipes

Guidelines while pulling Deformed or Impaired Pipes out of the hole.



ATTACHMENT 4: Failure in anti-collision system

Guidelines for Temporary Failure of Anti-collision System, Crown Saver and Floor Saver.

