

NORSOK STANDARD

MECHANICAL COMPLETION AND COMMISSIONING

Z-007
Rev. 2, Dec. 1999

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CONTENTS

FOREWORD	2
INTRODUCTION	2
1 SCOPE	3
2 NORMATIVE REFERENCES	3
3 DEFINITIONS AND ABBREVIATIONS	3
3.1 Definitions	3
3.2 Abbreviations	5
4 COMPLETION PRINCIPLES	5
4.1 Overall goal	5
4.2 Completion phases	5
4.3 Responsibilities	6
4.4 Common requirements	6
4.5 Documentation	6
4.6 Project Completion System (PCS)	6
4.7 Planning	6
5 MECHANICAL COMPLETION	7
5.1 Introduction	7
5.2 Documentation for a MC Package	7
5.3 Handover at Mechanical completion	7
5.4 Carry Over Work Register (COWR)	7
5.5 Typical Mechanical completion activities	8
6 COMMISSIONING	10
6.1 Introduction	10
6.2 Typical commissioning preparation activities	10
6.3 Commissioning procedure content	11
6.4 Commissioning documentation and handover to operation	11
ANNEX A - MECHANICAL COMPLETION FORMULARS (TYPICAL)	14
ANNEX B - COMMISSIONING FORMULARS (TYPICAL)	15

FOREWORD

NORSOK (The competitive standing of the Norwegian offshore sector) is the industry initiative to add value, reduce cost and lead time and eliminate unnecessary activities in offshore field developments and operations.

The NORSOK standards are developed by the Norwegian petroleum industry as a part of the NORSOK initiative and supported by OLF (The Norwegian Oil Industry Association) and TBL (Federation of Norwegian Manufacturing Industries). NORSOK standards are administered and issued by NTS (Norwegian Technology Standards Institution).

The purpose of NORSOK standards is to contribute to meet the NORSOK goals, e.g. to develop standards that ensure adequate safety, value adding and cost effectiveness for all parties involved and thus are used in existing and future petroleum industry developments

The NORSOK standards make extensive references to international standards. Where relevant, the contents of a NORSOK standard will be used to provide input to the international standardisation process. Subject to implementation into international standards, the NORSOK standard will be withdrawn.

Annex A and B is informative.

INTRODUCTION

This NORSOK standard replaces Z-CR-007 Rev 1, May 1996.
Please note that additional MCCRs to those enclosed in the Annexes to this standard might occur.

1 SCOPE

This standard defines the principles and structures of mechanical completion and commissioning

2 NORMATIVE REFERENCES

Non

3 DEFINITIONS AND ABBREVIATIONS

3.1 Definitions

Can	Verbal form used for statements of possibility and capability, whether material physical, or casual.
Carry Over Work Register (COWR)	A register where incomplete items are documented sufficiently for work preparation and completion. The COWR is based on the punch lists Register and describes punch-listed work to be transferred to the next project executor.
Commissioning (C)	Is the functional verification of equipment and facilities that are grouped together in systems.
Commissioning dossier	Commissioning documentation compiled in Commissioning dossier.
Commissioning Package	A practical scope of work unit within a system or subsystem for commissioning, constituting a functional unit which can be tested by commissioning to confirm its suitability for operation.
Commissioning Preparation Check Record (CPCR)	A Check record for the various equipment to document results from commissioning preparations before energising.
Executor	An organisation, supplier, contractor that performs a predefined scope of work.
Factory Acceptance Test (FAT)	Testing to be performed at supplier's workshop to verify the equipment's performance/functionality.
Informative references	Shall mean informative in the application of NORSOK standards.
May	Verbal form used to indicate a course of action permissible within the limits of the standard.
MC dossier	MC documentation compiled in MC packages.
MC package	A practical unit of the scope of work for one discipline within a commissioning package.
Mechanical Completion Certificate (MCC)	A certificate issued by the Executor to document that his MC scope has been carried out. The MC certificates shall be used per MC package.
Mechanical Completion Check Record (MCCR)	A discipline Check record for the various equipment. These records form the basis of the MC documentation. MCCRs are prepared for one or more items for recording of the results from checking and testing performed during Mechanical completion.

Mechanical Completion (MC)	The checking and testing of equipment and construction to confirm that the installation is in accordance with drawings and specifications and ready for commissioning in a safe manner and in compliance with project requirements.
Mechanical Completion Status Index (MCSI)	This is a listing of all items/tags with associated MCCR status for each MC package. The MCSI should be produced from the EDP based project completion system.
Normative references	Shall mean normative (a requirement) in the application of NORSOK standards.
Preservation	The preventive maintenance carried out on equipment before it is taken into use.
Project Completion System (PCS)	Is a computerised system for electronic documentation of Mechanical completion, commissioning and preservation by system, subsystem, area, commissioning package, MC package and/or individual tag.
Punch List (PL)	A Punch list describes incomplete work or malfunction of equipment or construction.
Punch List Register (PLR)	A punch list register is a listing of all punch list items, prepared at a time when installation, functions or activities should have been completed.
Ready For Commissioning Certificate (RFCC)	Formal document for transfer of a completed commissioning package from MC executor to Commissioning.
Shall	Verbal form used to indicate requirements strictly to be followed in order to conform with the standard and from which no deviation is permitted, unless accepted by all parties.
Should	Verbal form used to indicate that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required.
Status "NA"	This status means that the check is not applicable to the item referenced in the MCCR. The item may however be applicable for subsequent executors.
Status "OK"	This status means that this item is completed and there is no further work associated with this item.
Status "PA"	This means that this check item is not completed, and that remaining work is category 'A', i.e. shall be completed prior to commissioning.
Status "PB"	This means that this check item is not completed and that remaining work is category 'B', i.e. may be completed prior to or after commissioning.
Subsystem	A system broken down into functional subsystems.
System	An operational system or a non-operational system. Operational systems are dynamic process, utility or facility systems such as seawater, diesel, HVAC, telecom., main power and control system. Non-operational systems are systems such as surface protection, insulation, civil, structural steel, markings and signs, cable and tubing trays.

3.2 Abbreviations

C	Commissioning
COWR	Carry Over Work Register
CPCR	Commissioning Preparation Check Record
FAT	Factory Acceptance Test
MC	Mechanical Completion
MCC	Mechanical Completion Certificate
MCCR	Mechanical Completion Check Record (MCCR)
MCSI	Mechanical Completion Status Index
MSL	Material Status List
PCS	Project Completion System
PL	Punch List
PLR	Punch List Register
RFCC	Ready for Commissioning Certificate

4 COMPLETION PRINCIPLES

4.1 Overall goal

The overall goal of Mechanical completion and commissioning is to verify and document that the system is designed and built to fulfil its purpose and specified requirements.

Life cycle cost principles and safety should govern all decisions and actions.

Early establishment of commissioning packages is essential for an orderly and effective project completion. The commissioning plan shall have maximum priority to enable reversed planning in all project phases. All fabrication and installation planning shall be system oriented.

Mechanical completion, commissioning, FAT, Preservation and suppliers assistance requirements shall be specified.

Repeating of MC/C checks performed at suppliers and assembly sites should be avoided, wherever possible.

4.2 Completion phases

4.2.1 Definition phase

In this phase the following shall be prepared:

- Completion philosophy.
- Coding structure and system breakdown.
- Completion requirements to suppliers and contractors.

4.2.2 Engineering phase

In this phase the following shall be carried out:

- Commissioning package and MC package definition.
- Define commissioning network.
- Produce commissioning procedures.

4.2.3 Suppliers completion phase

Equipment suppliers shall execute MC, FAT, commissioning and preservation as specified. The completion shall be documented as part of the completion system which leads up to handover to the company/client.

4.2.4 Construction/assembly Phase

Executor shall perform MC/C and preservation as specified. The completion is documented as part of the completion system which leads up to handover to the company.

4.3 Responsibilities

MC execution and registration/documentation, shall be performed by anyone who has a scope of work to be performed, such as equipment suppliers, fabrication contractors, installation contractor and hook-up contractors.

Commissioning registration and documentation shall be performed by anyone who has this responsibility implemented in their scope of work.

4.4 Common requirements

This standard shall be used as a basis for preparing plans, procedures and documentation for Mechanical completion and commissioning. The implementation of this standard requires the use of a coding system for item and system numbering, e.g. NORSOK Z-002, "Coding system".

4.5 Documentation

Mechanical completion documentation shall be completed/executed per item/MC package. Commissioning documentation shall be documented on a commissioning package level.

4.6 Project Completion System (PCS)

An electronic based system for administration of Mechanical completion, commissioning and Punch list register, should be used.

4.7 Planning

All MC activities shall be planned on fully integrated fabrication, Mechanical completion and commissioning schedules on system prioritised basis in order to meet the optimal sequence of completion.

5 MECHANICAL COMPLETION

5.1 Introduction

This chapter forms the basis for the execution and documentation of mechanical completion activities.

Mechanical completion takes place through all phases of a project, up to the commissioning phase.

- Mechanical completion encompasses all disciplines.
- The detailed responsibilities are described in the contract.
- Executor of MC activities is responsible for establishing and compiling the MC dossiers and report status into PCS.

5.2 Documentation for a MC Package

The MC package shall consist of an MCC, an MCSI, MCCRs and a PLR printout as described below.

A Mechanical Completion Certificate (MCC) is a form completed by the Executor after all MC is carried out. The MCC is the cover sheet for each MC package. An MC package shall when signed, be ready for handover to commissioning.

The Check Records (MCCR) are the forms on which the Executors record the results of all checks, inspections and tests carried out for each individual item.

A Punch List (PL) shall be prepared by the Executor along with the MC activity. In each MC package a PL shall be included to document incomplete work.

A Mechanical Completion Status Index (MCSI) listing the status of all MCCRs for the MC package shall be included.

5.3 Handover at Mechanical completion

Handover from Mechanical completion to commissioning shall be at commissioning package level, documented by the ready for commissioning certificate (RFCC).

5.4 Carry Over Work Register (COWR)

The COWR lists all punch items that the Project accepts as cannot be completed during present phase. The register is used for the release of the work from the Executor and will as such be an input to the scheduling and planning of outstanding work to be performed during later phases.

The COWR Item number and cross reference to the Punch list/MCCR shall be given. COWR work shall be marked up on drawings or sketches and be included in the records.

Material Status List (MSL) and marked up drawings/instruction shall contain sufficient information for job setting in a later phase.

5.5 Typical Mechanical completion activities

Mechanical completion activities includes checking of fabrication and installation work.

Executor shall complete packages related to listed disciplines and as required by the MCSI.

Executor shall complete the check list items as per the MCCRs. (See Annex A for typical). The activities shall include but not be limited to:

5.5.1 Mechanical

- Visual inspection for complete and correct installation.
- Internal inspection of tanks and vessels.
- Alignment.
- Load testing of lifting equipment.
- Hot oil flushing.
- Bolt tensioning.
- Dimension control.
- Preservation.

5.5.2 Electrical

- Visual inspection for complete and correct installation.
- Insulation and continuity testing of cables.
- Insulation testing of generator, transformers and motors, panels, distribution board etc.
- Earthing checks.
- Static check of switches and control devices.
- Battery preparations.
- Lighting and socket outlet checks.
- Area completion.
- Heat tracing.
- Preservation.

5.5.3 Instrument/Telecommunication

- Calibration and testing of instruments prior to installation.
- Visual inspection for complete and correct installation.
- Insulation and continuity testing of cables.
- Cleaning, flushing, pressure and leak testing of pneumatic and hydraulic tubing.
- Adjustment of control, alarm and shutdown settings.
- Loop testing.
- Function testing of control systems.
- Function testing of field instruments.
- Hot oil flushing of instrument tubing.
- Area completion.
- Preservation.

5.5.4 Piping

- NDE carried out.
- Welding procedures.
- Removal of all items subject to damage during flushing, cleaning and pressure testing.
- Flushing of pipework.
- Chemical cleaning and testing of pipework.
- Drying of tested pipework.
- Preservation of tested pipework.
- Reinstatement of all items after testing.
- Final inspection of pipework.
- Test ISO's and P&ID's showing the extent of each pressure test.
- Pneumatic and hydraulic tubing.
- Hot oil flushing of pipework.
- Bolt tensioning.
- Pipe supports completed.
- Insulation.
- Flow coding.

5.5.5 HVAC

- Visual inspection for complete and correct installation.
- Cleaning of ductwork.
- Leak testing of ductwork.
- Alignment checks.
- Mechanical function checks of equipment.
- Preservation.
- Flow coding.

5.5.6 Safety

- Visual inspection for complete and correct installation.
- Preservation.
- Area completion

5.5.7 Mechanical completion of non-operational systems

Mechanical completion of non-operational systems includes completion status and checks on an area basis. Disciplines included structural, surface protection, insulation, fireproofing and architectural.

5.5.8 Structural

- Visual inspection for complete and correct installation.
- QC documentation.
- NDE carried out.
- Welding.
- Load testing of lifting lugs and monorails.

5.5.9 Surface protection, Insulation and Fire proofing

- Visual inspection for complete and correct application/installation.
- Thickness checks carried out.
- Adhesion checks carried out.
- Preservation.
- Insulation.
- Painting.
- Fire proofing.

5.5.10 Architectural

- Visual inspection for complete and correct installation.
- Preservation.

6 COMMISSIONING

6.1 Introduction

This chapter forms the basis for preparation and execution of commissioning.

Commissioning take place when Mechanical completion is completed for a commissioning package.

Commissioning can be divided into three main activities:

- Commissioning preparation
- Commissioning execution
- Commissioning documentation and handover to operation

Establishment of a commissioning network and definition of commissioning packages early in a Project, shall be carried out, in order to establish fabrication/installation priorities and milestones.

Definition of commissioning packages is essential in order to achieve an early commissioning completion.

6.2 Typical commissioning preparation activities

The preparatory work shall consist of activities such as:

- Development of commissioning organisation
- Development of system breakdown (sub system)
- Commissioning packages definition
- Commissioning network
- Commissioning budget including spare parts for commissioning
- Commissioning preparation check record (ref. Annex "B" for typicals)

6.3 Commissioning procedure content

Commissioning shall be executed by guidance of a detailed commissioning procedure describing:

6.3.1 Objective

Details the operating parameters to be achieved.

6.3.2 Description

Shall contain a brief description of the system/sub systems to be commissioned, including marked up P&ID or other relevant drawings as a basis for all functions to be tested.

6.3.3 Lists of temporary equipment and consumables

Lists all consumables, temporary equipment tools and requirements for supplier's assistance.

6.3.4 Health/Environment/Safety

A list of all toxic and polluting fluids and materials shall be made, describing their handling and disposal. A checklist of all required safety precautions including requirements for work permit shall be made. Prior to energisation of electrical equipment a livening up notice shall be issued in order to inform all involved parties of forthcoming energising.

6.3.5 Preservation

Requirements for removal of existing preservatives/protection shall be made and subsequent new preservation of the system if the system shall be out of operation for a period.

6.3.6 Scope

The scope shall detail the work to be done step by step including the commissioning preparation, check records (ref. Annex "B").

Irregularities and/or faults shall be logged.

Equipment supplier's start-up procedures shall be incorporated.

6.3.7 Planning

Detailed commissioning plans for system/sub system/commissioning package shall be worked out and shall include man-hours per discipline, including supplier assistance man-hours.

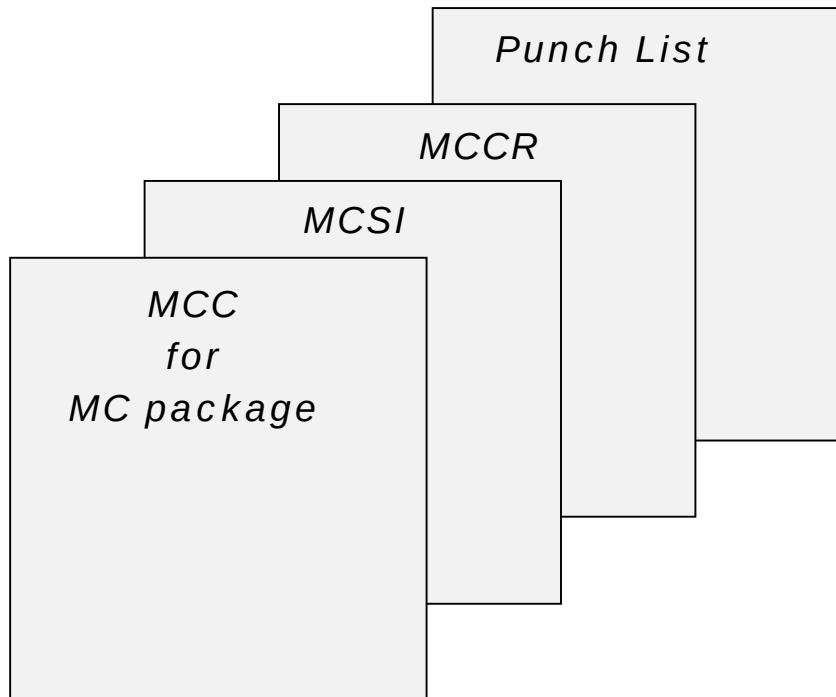
6.3.8 Handover

The handover shall contain a certificate and other documents agreed with operation.

6.4 Commissioning documentation and handover to operation

Handover of systems from Executor to project/operation shall be according to a formal hand over procedure which as a minimum should consist of:

- Completion acceptance certificate (signed by both parties).
- Commissioning P&ID and other relevant drawings showing the extent of the completed system.
- Authority certificates (if any).

Documentation for an MC package:**Mechanical Completion Certificate (MCC):**

- States that all discipline related inspections and tests for a MC package have been carried out according to relevant contract documents.
- MCC shall end up in status OK – PB

Mechanical Completion Status Index (MCSI):

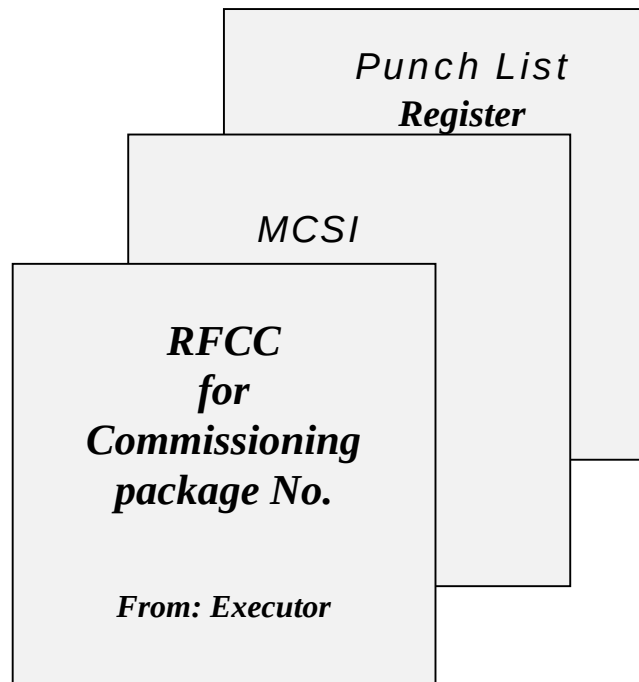
- A computerised listing of all Tag/Cable/Test/MCCRs in an MC package, which gives the MC scope of work and status for a completed package.

Mechanical Completion Check Record (MCCR):

- Discipline checklist for the various equipment. These records form the basis of the MC - documentation.
- MCCR shall end up in status OK - PA – PB

MC Punch List (PL):

- Is the form on which the executor records any outstanding work.

MC Documentation for an Commissioning package:**Ready for Commissioning Certificate (RFCC):**

- Formal document for transfer a Commissioning package from MC Executor to Commissioning.

Mechanical Completion Status Index (MCSI):

- A Computerised listing of all Tag/Cable/Test(MCCR) with status for the completed package.

MC Punch List Register:

- Is the form which describes any incomplete work per MC package.

ANNEX A - MECHANICAL COMPLETION FORMULARS (TYPICAL)**MCCR Multidiscipline (Z)**

MCC-Z-01	Rev.2	MC certificateRev.2, 02.04.98.
RFCC-Z-01	Rev.2	Ready for commissioing certificate
PL-Z-01	Rev.2	Punch list

MCCR Architect (C)

MCCR-C-01	Rev. 1	LQ cabins and bathroomRev.1
MCCR-C-02	Rev.1	Room area completion
MCCR-C-03	Rev.1	Stairs
MCCR-C-04	Rev.1	Sanitary equipment except for LQ cabins
MCCR-C-05	Rev.1	Doors and personnel hatches
MCCR-C-06	Rev.1	Windows
MCCR-C-07	Rev.1	Dry fix insulation, technical linings and penetrations
MCCR-C-08	Rev.1	Partitions and ceiling system
MCCR-C-09	Rev.1	Flooring
MCCR-C-10	Rev.1	Kitchen, catering and laundry equipment, provision stores
MCCR-C-11	Rev.1	Equipment and funiture
MCCR-C-12	Rev.1	Prefab. walls, wind shield cladding and heat shield panels
MCCR-C-13	Rev.1	External cladding
MCCR-C-14	Rev.1	Safety and information signs

MCCR Electrical (E)

MCCR-E-01	Rev.2	Electrical motors
MCCR-E-02	Rev.1	Eletrical installation by area

MCCR Instrument (I)

MCCR-I-01	Rev.1	Instrument installation/inspection
MCCR-I-02	Rev.1	Part loop
MCCR-I-03	Rev.1	Completed loop
MCCR-I-04	Rev.1	Instrument calibration check
MCCR-I-05	Rev.1	Safety / relif valves
MCCR-I-06	Rev.1	Safety / relif valves (supplier)
MCCR-I-07	Rev.1	Instrument and telecommunication installation by area

MCCR Mechanical (R)

MCCR-R-01	Rev.1	Initial machinery alignment
MCCR-R-02	Rev.2	Centrifugal, screwpump, compressor or hydr. motor
MCCR-R-03	Rev.1	Chemical cleaning
MCCR-R-04	Rev.1	Hot oil flushing
MCCR-R-05	Rev.1	Bolt tensioning / torque

MCCR Piping (L)

MCCR-L-01	Rev.2	Piping completion status
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MCCR Structural (N)

MCCR-N-01	Rev.1	Liftinglugs/scaff.lugs/monorails
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ANNEX B - COMMISSIONING FORMULARS (TYPICAL)**CPCR Electrical (E)**

CPCR-E-01	Rev.2	Electrical equipment
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CPCR Safety (S)

CPCR-S-01	Rev.2	Water mist system
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CPCR HVAC (H)

CPCR-H-01	Rev.2	Field check (HVAC)
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CPCR Mechanical (R)

CPCR-R-01	Rev.2	Diesel engine
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CPCR Multidiscipline (Z)

CPCR-Z-01	Rev.2	Field P&ID Check
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 MCC-Z-01, rev.2	MC CERTIFICATE MCC	<Project>	
MCC Description : MCC Area : MCC Site : System : Sub System :		MC Package No. Comm. Package No.	
SCOPE OF ACCEPTANCE			
Discipline code: _____ Mechanical Complete as per attached MCSI MCC status: _____ Date: _____ It is hereby certified that the plant/equipment referenced has been inspected, tested and accepted in accordance with the attached MC check Records and other documents, but with the exception of outstanding word according to attached Punch List register.			
COMMENTS:			
VERIFIED	SUPPLIER	FABRICATION	HOOK-UP
Name Sign Date	Executor 	Executor 	Executor
Name Sign Date	Comp. 	Comp. 	Comp.

Page 17 of 54

Page 18 of 54

 MCCR-C-01, rev.1		MC CHECK RECORD LQ CABINS AND BATHROOM		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Area : System : Subsystem :	
				Comm. Package no.	
				MC Package no.	
INSPECTION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
01	Items cleared from prototype preview checklist, (Ref. NORSOK C-004)				
02	Bathroom installed complete and undamaged				
03	Fixing of bathroom to deck accepted				
04	Hook-up of bathroom complete				
05	Sharp edges are avoided in outfitting details				
06	Voids and service shaft are cleaned				
07	Cabin complete and undamaged				
08	Fixing of cabin to deck accepted				
09	No gaps between components and walls/ceilings				
10	Access hatch locations provide required access				
11	Floor finish/skirtings completed				
12	Furniture drawers and doors adjusted for function				
13	Locking system installed				
14	Void below bed is cleaned and sealed				
15	Cabin and bathroom is cleaned and ready for use				
COMMENTS:					
VERIFIED		SUPPLIER		FABRICATION	
HOOKUP					
Name	Executor		Executor		Executor
Sign					
Date					
Name	Comp.		Comp.		Comp.
Sign					
Date					

Page 20 of 54

Page 21 of 54

Page 22 of 54

 MCCR-C-05, rev.1		MC CHECK RECORD DOORS AND PERSONELL HATCHES		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Area : System : Subsystem : Comm. Package no. MC Package no.	
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
GENERAL					
01	Installation complete, undamaged and in compliance with drawings				
02	Bulkhead plate buckling within specified limits				
03	Mounting frame installed, frame plumb and square				
04	Frame sealing installed in accordance with drawings				
05	Operation has minimum accident potential, vision panels installed as required				
06	Threshold heights / local ramps within door schedule limits				
07	All gaskets installed with gasket type suitable for application				
08	Full perimeter gasket contact achieved				
09	Door operates freely and fire / smoke doors are self closing / latching				
10	Partition door latches without slamming (cabin doors)				
11	Maximum opening pressure verified within limit in door schedule				
12	External door prevent ingress of water				
13	Adjustments to door leaf and frame assemblies completed				
HARDWARE AND ACCESSORIES COMPLETED					
14	Identification name / tagplate installed with correct information				
15	Hardware inclusive bumpstops correctly installed, completed and lubricated				
16	Doorpump correct type, installed and are adjusted for applicable operation				
17	Automatic opening devices complete and adjusted for applicable operation				
18	Finishes are specified and undamaged and clean				
19	Temporary / permanent locking system and hardware installed				
20	Locking system and hardware installed				
21	Preservation carried out				
COMMENTS:					
VERIFIED		SUPPLIER		FABRICATION	
HOOKUP					
Name	Executor		Executor		Executor
Sign					
Date					
Name	Comp.		Comp.		Comp.
Sign					
Date					

Page 24 of 54

 MCCR-C-07, rev.1		MC CHECK RECORD DRY FIX INSULATION, TECHNICAL LININGS AND PENETRATIONS		Sheet no.	<Project>																																																																																																																																																																																										
Tag no. : Description : PO no. : Manufacturer :				Area : System : Subsystem : Comm. Package no. MC Package no.																																																																																																																																																																																											
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Page 26 of 54

 MCCR-C-09, rev.1		MC CHECK RECORD FLOORING		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Area : System : Subsystem :	
				Comm. Package no.	
				MC Package no.	
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
FLOOR SCREED					
01	Levelled / filled / sanded down as required				
02	Local "ramps" provided as required at door thresholds				
03	No "troughs" at bulkheads with potential condensation				
FLOATING FLOOR					
04	Reinforced where necessary for point loads equipment fixing				
05	Sealed at perimeter and interfaces against moisture ingress				
RAISED ACCESS FLOOR					
06	Check void has been cleaned				
07	Check floor level height difference between panels				
08	Check that individual panels do not rock or creak				
09	All openings closed in accordance with specifications				
10	Ensure stairs and railings comply with requirements				
11	Earthing and isolation verified				
12	Check panel lifting tools are installed as specified				
FLOOR FINISHES					
13	Check interface detailing is watertight (carpets excepted)				
14	All skirtings installed				
15	Check finish is impregnated, waxed, polished as required				
16	Antistatic properties verification spot-check performed				
17	Ensure finish cleaned and preserved				
DRAINAGE					
18	Check deck / floor drains dissipate water				
19	Efficient access to water trap / strainer cup maintained				
COMMENTS:					
VERIFIED		SUPPLIER		FABRICATION	
HOOKUP					
Name	Executor		Executor		Executor
Sign					
Date					
Name	Comp.		Comp.		Comp.
Sign					
Date					

 MCCR-C-10, rev.1		MC CHECK RECORD KITCHEN, CATERING AND LAUNDRY EQUIPMENT, PROVISION STORES		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Comm. Package no. MC Package no.	
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
KITCHEN, CATERING AND LAUNDRY					
01	Installation complete and in compliance with drawings and specification				
02	Check mounting height, fixings, foundations and reinforcements				
03	Tag / nameplate installed with required information				
04	Ensure maintenance access is maintained (include JB`s)				
05	Hygienic requirements maintained at all interfaces				
06	Check stop valves are installed where applicable				
07	Equipment / shelves allow for installation movement (storm raise)				
08	Soap dispensing systems installed and adjusted				
09	Area and components cleaned and preserved as required				
10	All initial installation adjustments performed				
PROVISION STORES					
11	Access to store rooms for pallet trolley allowed for				
12	Parking positions for storage room doors				
13	Bumper protection in trolley transport areas				
14	Provisions for washing down and drainage				
15	Check no exposed cabling and pipework				
16	Heat tracing and detail finishes allow efficient cleaning				
17	Cleaning and maintenance access to evaporators is acceptable				
18	Check evaporator condensation discharge drain				
COMMENTS:					
VERIFIED	SUPPLIER		FABRICATION		HOOKUP
Name	Executor	_____	Executor	_____	Executor
Sign		_____		_____	
Date		_____		_____	
Name	Comp.	_____	Comp.	_____	Comp.
Sign		_____		_____	
Date		_____		_____	

 MCCR-C-11, rev.1		MC CHECK RECORD EQUIPMENT AND FURNITURE		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Comm. Package no. MC Package no.	
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
GENERAL					
01	Installation complete and in compliance with drawings and specification				
02	Check mounting height, fixings, foundations and reinforcements				
03	Tag / nameplate installed with required information				
04	Ensure maintenance access is maintained (include JB`s)				
05	Hygienic requirements maintained at all interfaces				
06	Check stop valves are installed where applicable				
07	Equipment / shelves allow for installation movement (storm rails)				
08	Area and components cleaned and preserved as required				
09	All initial installation adjustments performed				
COMMENTS:					
VERIFIED		SUPPLIER		FABRICATION	
Name	Executor		Executor		Executor
Sign					
Date					
Name	Comp.		Comp.		Comp.
Sign					
Date					

 MCCR-C-12, rev.1		MC CHECK RECORD PREFAB. WALLS, WIND SHIELD CLADDING AND HEAT SHIELD PANELS		Sheet no.	<Project>	
Tag no. : Description : PO no. : Manufacturer :				Comm. Package no. MC Package no.		
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.	
GENERAL						
01	Installation complete and in compliance with drawings and specification					
02	Check fire, acoustic and ventilation interface requirements					
03	Check that dissimilar metals isolation from each other					
04	Check that percentage of louver and release panels within specification					
05	Check that openings of release panels are unobstructed					
06	Check that specified drainage requirements maintained					
07	Check that panel finish with regard to weld splatter / blast grit					
08	Check that orientation of explosion / water jet release panels are correct					
09	Preservation carried out					
PREFABRICATED WALLS						
10	Check interface details at vapour barriers and skirting					
11	Penetration sacrificial plates maintain minimum sleeve clearances					
12	Check that detailing allows for hosing down					
COMMENTS:						
VERIFIED	SUPPLIER		FABRICATION		HOOKUP	
Name	Exec 		Exec 		Exec 	
Sign						
Date						
Name	Comp. 		Comp. 		Comp. 	
Sign						
Date						

Page 31 of 54

 MCCR-C-14, rev.1		MC CHECK RECORD SAFETY AND INFORMATION SIGNS		Sheet no.	<Project>
Tag no. : Description : PO no. : Manufacturer :				Area : System : Subsystem :	
				Comm. Package no.	
				MC Package no.	
INSTALLATION CHECK		SUPPL.	FABR.	HOOKUP	Punchlist item no.
	GENERAL				
01	Installation complete and in compliance with drawings and specifications				
02	Sequence and installation method is uniform throughout the installation				
03	Location and arr. allows unobstructed vision at applicable scenario				
04	Backplates and supports installed as required at correct heights				
05	Installation does not obstruct accessways				
06	Arrangement of lighting for installation Id. signs and Operator logo allows safe maintenance access				
COMMENTS:					
VERIFIED		SUPPLIER		FABRICATION	
Name		Executor	Name		Executor
Sign			Sign		
Date			Date		
Name		Comp.	Name		Comp.
Sign			Sign		
Date			Date		
Name		Hookup	Name		Hookup
Sign			Sign		
Date			Date		

Page 33 of 54

Page 34 of 54

Page 35 of 54

Page 36 of 54

Page 37 of 54

 MCCR-I-04, rev.1		MC CHECK RECORD INSTRUMENT CALIBRATION CHECK				Sheet no.		<Project>							
Tag no. : Description : PO no. : Manufacturer :						Area : System : Subsystem :						Comm. Package no. MC Package no.			
SER.NO.: CALIBRATION CHECK Calibration procedure No.												Instrument shall only be recalibrated if not properly documented by manufacturer.			
CALIBRATION FIGURES															
CALIBRATION POINTS		RISING				FALLING				UNITS					
Actual Input A															
Actual Input B															
Actual Input C															
Actual Output															
SWITCH POINTS															
SWITCH POINTS		RISING				FALLING				UNITS					
Operates @ input A															
Operates @ input B															
Record serial number and type of test equipment used:															
Comments															
VERIFIED		SUPPLIER				FABRICATION				HOOKUP					
Name		Executor				Executor				Executor					
Sign															
Date															
Name		Comp.				Comp.				Comp.					
Sign															
Date															

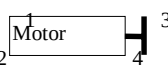
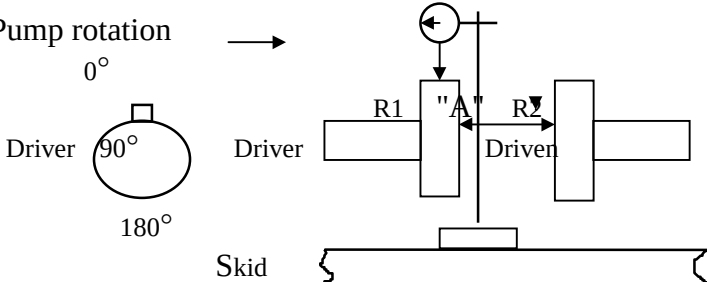
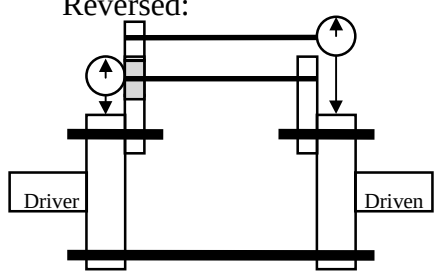
Page 39 of 54

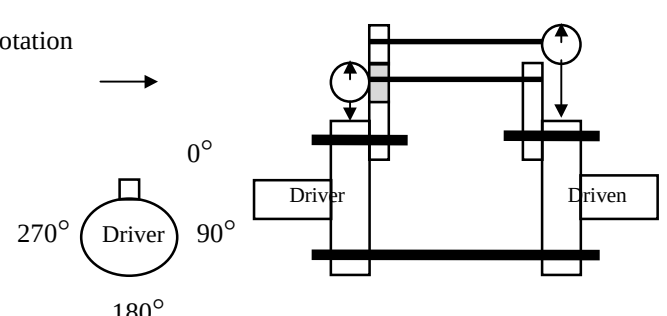
Page 40 of 54

Page 41 of 54

 MCCR-L-01, rev.2		PIPING COMPLETION STATUS PIPING COMPLETION STATUS					Sheet No.	<Project>		
DESIGN PRESS. (bar)	TEST PRESS. (bar)	System			Tag No.		MC Package No.			
		Subsystem					Comm. Package No.			
1	2	3	4	5	6	7	8	9	10	
NDE CLEARED	PIPES SUPPORTED	EARTHING GRP.PIPES	FLUSHED	PRESSURE TESTED	CHEMICAL CLEANED	PRESERVED	VIDEO INSPECTION	HOT OIL FLUSHED	RE- INSTALLED	
ISO No.		Spool No.	Area	Line No.		P&ID No.		Remarks		
It is hereby certified that the plant/equipment referenced has been inspected, tested and accepted in accordance with the attached acceptable records and other documents, but with the exception of the outstanding work according to attached punch list register.										
VERIFIED		SUPPLIER			FABRICATION			HOOK-UP		
Name	Executor				Executor				Executor	
Sign										
Date										
Name	Comp.				Comp.				Comp.	
Sign										
Date										

Page 43 of 54

 MCCR-R-01, rev.1		MC CHECK RECORD		Sheet no.	<Project>
		INITIAL MACHINERY ALIGNMENT (SUPPLIER)		1 of 2	
Tag no. :		Area :		Comm. Package no.	
Description :		System :		MC Package no.	
PO no. :		Subsystem :			
Manufacturer :					
Coupling halves fitted as per instruction:		Required:	Reading:		
Shaft end spacing :					
Coupling halves face spacing "A" :					
Check Motor for "Soft feet" against Skid:					
With slack found. bolts Max. 0.05mm feeler gauge allowed.				Results:	1 3 2 4
Coupling Hubs run out:					
Max allowed		mm			
Driver:		Driven:			
Key Position: Rim R1.		Rim R2			
0° Up		270°			
90°					
180°					
270°					
					
Coupling alignment on "Skid" using Laser or Reversed alignment:					
Reversed alignment final readings:		Allowed: mm			
Key Position: Driver:		Driven:			
0° Up					
90°					
180°					
270°					
					
For laser alignment use printout as attachment:					Result:
If space does not allow normal alignm. methods, a "straight edge" shall be held against the coupling rims, which shall be parallel:					Result:
Finally recheck Coupling halves face spacing "A":					Result:
Comments:					
VERIFIED		SUPPLIER			
Name	Executor		Executor		Executor
Sign					
Date					
Name	Comp.		Comp.		Comp.
Sign					
Date					

	MC CHECK RECORD MACHINERY ALIGNMENT, PIPES ATTACHED	Sheet no. 2 OF 2	<Project>															
Tag no. : Description : PO no. : Manufacturer :		Area : System : Subsystem :																
		Comm. Package no. MC Package no.																
Check Motor for "Soft feet" against Skid:																		
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1	3																	
2	4																	
Alignment check with pipes/HVAC channels disconnected:																		
Reversed alignment: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Key Position:</th> <th>Driver:</th> <th>Driven:</th> </tr> </thead> <tbody> <tr><td>0° Up</td><td></td><td></td></tr> <tr><td>90°</td><td></td><td></td></tr> <tr><td>180°</td><td></td><td></td></tr> <tr><td>270°</td><td></td><td></td></tr> </tbody> </table> Pump rotation → 				Key Position:	Driver:	Driven:	0° Up			90°			180°			270°		
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Comments:																		
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Name	Executor		Executor															
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Sign																		
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HOOKUP																		
Name	Executor		Executor															
Sign																		
Date																		
Name	Comp.		Comp.															
Sign																		
Date																		

Page 46 of 54

Page 47 of 54

Page 48 of 54

Page 49 of 54

Page 50 of 54

Page 51 of 54

Page 52 of 54

 CPCR-R-01, rev.2		COMM. PREPARATION CHECK RECORD DIESEL ENGINE		Check Record No.:	<Project>
System :		Site Code :		Area:	
Subsystem :		Comm.Package No. :			
Tag No :		Description :			
P.O. No. :		Supplier :			
Chkp. No.	Check Description	Status			
		Supplier	Onshore	Offshore	
01	Mechanical Completion status.				
02	Maintenance access.				
03	Operational access.				
04	Dustblinds removed.				
05	Safety valves installed.				
06	Blinds correct status.				
07	Preservation removed.				
08	Externally clean.				
09	Check all filters.				
10	Lubricants filled.				
11	Aux. Lubricant Oil pump run.				
12	Engine hand cranked 2 turns.				
13	Alignment checked. Use MC Check Record.				
14	Coupling filled.				
15	Radiator checked.				
16	Coolant filled.				
17	Aspirating system checked.				
18	Exhaust system checked.				
19	Start system checked.				
20	Crank case vent checked.				
21	Fuel supply system checked/filled.				
22	Remote shut down ready.				
Executor	Name	Date:	Verified by:	Date:	
Supplier:					
Onshore:					
Offshore:					

Page 54 of 54