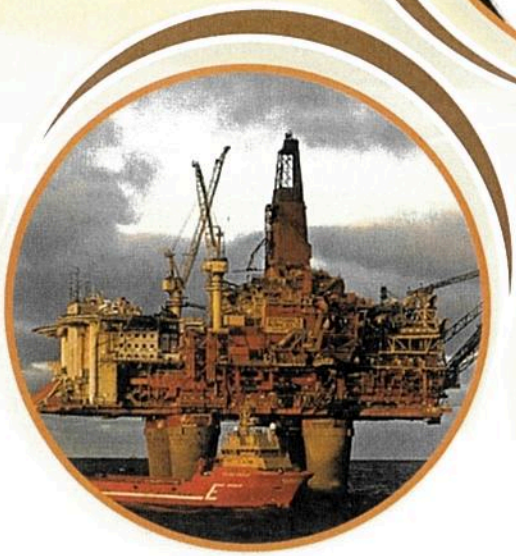
MINE HEALTH & SAFETY INSPECTORATE



GUIDELINE

FOR THE COMPILATION OF A MANDATORY CODE OF PRACTICE FOR OFFSHORE INSTALLATIONS

mineral resources
Department:
Mineral Resources

DEPARTMENT OF MINERAL RESOURCES

MINERAL RESOURCES FOR DEVELOPMENT AND PROSPERITY

MINE HEALTH & SAFETY INSPECTORATE

GUIDELINE FOR THE COMPILATION OF A MANDATORY CODE OF PRACTICE FOR OFFSHORE INSTALLATIONS

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PART A: THE GUIDELINE

1. FOREWORD

1.1 Although no major accidents have occurred in South African waters involving offshore installations, the potential for such an event exists, which could have major consequences. Unlike mining operations on land, exploration and production of petroleum at sea have unique hazards and risks. An offshore installation is stationed at the centre of a 500-metre radius exclusion zone, within which the management of the offshore installation has full control and accountability for activities which impact upon the offshore installation and persons aboard it. Weather plays an important role in the safety of persons on board and therefore offshore installations must be designed and constructed to withstand the meteorological factors to which it may be exposed. Well drilling has many inherent risks. Offshore installations have volatile hydrocarbons taken on board in large volumes, often under extreme pressure. Other vessels and aircraft, which operate in the vicinity to service offshore installations, or operate over pipelines, impose great risk.

1.2 Offshore installations are complex structures, which are contracted throughout the world. Internationally a so called "Safety Case" system has been developed which reflects internationally accepted industry best practice to ensure health and safety at offshore installations. Each installation has inspection and audit programmes in place throughout its life in order to maintain a valid Certificate of Fitness. It is impractical to thoroughly inspect or audit the complete installation on every occasion before use. It is necessary that the inspections and audits have been conducted according to the programmes in place and that standards have not been compromised and the installation is safe to operate. Each installation additionally has its own Safety Management System which addresses health and safety issues unique to that installation. Employers usually hire offshore installations, which are operated by contractors. The operator of the installation implements a Safety Management System to control the risks to which persons may be exposed. The system involves Verifying and Inspections Authorities to ensure continued compliance with safety standards.

1.3 In an initiative to address this matter, a tripartite task group was established under the auspices of the Mining Regulation Advisory Committee (MRAC). The tripartite task group came to the conclusion that this topic would best be regulated by a combination of regulations and a guideline for a mandatory COP.

1.4 The COP requires the operator and duty holder to record factual information about the offshore installation, its environment and activities. The COP involves hazard identification and risk assessment over the whole life of a project and remedial measures to mitigate the risks.

2. LEGAL STATUS OF THE GUIDELINE

In accordance with section 9(2) of the MHSA an employer must prepare and implement a COP on any matter affecting the health or safety of employees and other persons who may be directly

affected by activities at the mines if the Chief Inspector of Mines requires it. These COPs must comply with any relevant guideline issued by the Chief Inspector of Mines (section 9(3). Failure by the employer to prepare or implement a COP in compliance with this guideline is a contravention of the MHSA.

3. OBJECTIVES

The objectives of this guideline are to guide the employer through the process of compiling a mandatory COP for offshore installations used for exploration and production of petroleum in South African waters which, if properly implemented and complied with, will address all the significant risks relating to such offshore exploration and production.

4. DEFINITIONS AND ACRONYMS

Unless the context otherwise indicates, words and expressions contained in this guideline, or any amendment thereof, bear the meaning attributed to them in the MHSA, or as set out below:

'Certificate of Fitness' means a certificate issued by an Inspection Authority certifying that the installation is fit for installation or establishment in the said waters. This certificate is required by the international maritime authorities for all vessels.

'Certified equipment' means equipment certified as fit for its intended purpose by an accredited Certifying Authority;

'Certifying Authority' means a person or organisation accredited by the Government endorsed national accreditation body, for auditing and inspecting offshore installations against relevant standards and which upon verification of compliance with such standards issues a Certificate of Fitness;

'COP' means a Code of Practice;

'DMR' means Department of Minerals Resources;

'Life-saving appliance' means any equipment used for preservation of life in an emergency situation and includes: life buoy, life-jacket, survival craft, life raft or similar equipment, any smoke-hood and self rescue breathing apparatus;

'MHSA' means the Mine Health and Safety Act, 1996 (Act 29 of 1996);

'Temporary Safe Refuge' (TSR) means an area of refuge, protected from fire and toxic gas, which is easily reachable from all areas of the offshore installation and is located near to protected escape routes from the offshore installation.

5. MEMBERSHIP OF TASK GROUP

5.1 This document was prepared by the Mining Regulation Advisory Committee Task Group on Prospecting and Mining of Petroleum.

5.2 The members of the Task Group were the following:

Messrs:

R S McLoughlin (Chairperson)	State
JP Engelbrecht (Chairperson)	State (Deceased)
F G Wilmans	State (Deceased)
HJOP Smith	State
L Polley	State
J Mittan	Employers
H Schoeman	Employers
P Gilbertson	Employers
J Snyman	Employers
T E Askeland	Verifying Authorities

PART B: AUTHOR'S GUIDE

1. The COP must, where possible, follow the sequence laid out in Part C of this guideline Format and Content of the COP The pages as well as the chapters and sections must be numbered to facilitate cross-referencing. Wording must be unambiguous and concise.

2. It should be indicated in the COP and on each annex to it whether -

   (a) the annex forms part of the COP and must be complied with or incorporated in the COP or whether aspects thereof must be complied with or incorporated in the COP or

   (b) the annex is merely attached as information for consideration in the preparation of the COP (i.e. compliance is discretionary).

3. When annexures are used the letter allocated to that particular annexure should precede the numbering and the numbering should start at one (1) again. (e.g. 1, 2, 3, ... A1, A2, A3,).

4. Wherever possible illustrations, tables, graphs and the like, should be used to avoid long descriptions and/or explanations.

5. When reference has been made in the text to publications or reports, references to these sources must be included in the text as footnotes or side notes as well as in a separate bibliography.

PART C: FORMAT AND CONTENT OF THE CODE OF PRACTICE

1. TITLE PAGE

The title page must include the following:

1.1 the name of the offshore installation;

1.2 the heading of the COP (for example, mandatory code of practice for Offshore Installations);

1.3 a statement to the effect that the COP was drawn up in accordance with DMR guidelines.

1.4 the mine reference number for the COP;

1.5 the effective date; and

1.6 revision dates.

2. TABLE OF CONTENTS

The code of practice must include a comprehensive table of contents.

3. STATUS OF COP

Under this heading the guideline must require the COP to contain statements to the effect that:

3.1 The mandatory COP was drawn up in accordance with DMR guidelines, issued by the Chief Inspector of Mines.

3.2 This is a mandatory COP in terms of section 9(2) and (3) of the MHSA.

3.3 The COP may be used in an accident investigation/inquiry to ascertain compliance and also to establish whether the COP is effective and fit for purpose.

3.4 The COP supersedes all previous relevant COPs.

3.5 All managerial instructions or recommended procedures (voluntary COPs) and standards on the relevant topics must comply with the COP and must be reviewed to ensure compliance.

4. MEMBERS OF DRAFTING COMMITTEE

4.1 In terms of section 9(4) of the MHSA the employer must consult with the health and safety committee on the preparation, implementation or revision of any COP.

4.2 It is recommended that the employer should, after consultation with the employees in terms of their MHSA, appoint a committee responsible for drafting the COP.

4.3 The members of the drafting committee assisting the employer in drafting the COP should be listed giving the full names, designations, affiliations and experience. This

committee should include competent persons sufficient in number effectively to draft the COP. The employer must ensure that the COP is drawn up by persons who are experts in the fields of design, construction, plant maintenance, plant operation and safety management involving offshore installations.

5. GENERAL INFORMATION

The guideline should require the COP to set out certain relevant information regarding the mine under this heading. This should include:

5.1 A brief description of the offshore installation and its location or intended locations;

5.2 The commodities to be explored or produced;

5.3 The methods of mineral/petroleum extraction processes and distribution;

5.4 A description of the exploration and production systems in use at the installation; and

5.5 Other relevant COPs.

6. TERMS AND DEFINITIONS

Any word, phrase or term of which the meaning is not absolutely clear or which will have a specific meaning assigned to it in the COP must be clearly defined. Existing and/or known definitions should be used as far as possible. The drafting committee should avoid jargon and abbreviations that are not in common use or that have not been defined. The definitions section should also include acronyms and technical terms used.

7. RISK MANAGEMENT

7.1 Section 11 of the MHSA requires the employer to identify hazards, assess the health and safety risks to which employees may be exposed while they are at work, and to record the significant hazards identified and risks assessed. The COP must address how the significant risks identified in the risk assessment process must be dealt with, having regard to the requirements of section 11(2) and (3) of the MHSA to the effect that, as far as reasonably practicable, attempts should first be made to eliminate the risk, thereafter to control the risk at source, then to minimize the risk and finally, insofar as the risk remains, to provide personal protective equipment and to institute a programme to monitor the risk.

7.2 To assist the employer with risk assessment, all possible relevant information such as accident statistics, ergonomic studies, research reports, manufacturers specifications, approvals, design criteria and performance figures for all similar types of offshore installations should be obtained and considered. A list of relevant references is attached as ANNEX 1, merely for information purposes.

7.3 In addition to the periodic review required by section 11(4) of the MHSA, the COP should be reviewed and updated after every serious incident /accident at the offshore

installation, or if significant changes are introduced to procedures, operational methods, plant or equipment and material.

7.4 The hazards and hazardous operations that could have significant risks associated with them should set out how these should be addressed. The COP should also set out which early warning/detection systems should be installed, where appropriate, and procedures to ensure regular monitoring of such systems.

Such hazards and hazardous operations include, but are not limited to: -

(i) Well perforation;

(ii) Reservoir blowouts;

(iii) Hazardous areas (explosive atmospheres);

(iv) Hydrocarbon gas in the mud system;

(v) Hydrocarbons during well testing;

(vi) Hydrogen sulphide;

(vii) Hazardous substances

(viii) Conventional explosive material;

(ix) Handling of heavy overhead objects;

(x) Failing of objects under tension;

(xi) Helicopter transportation;

(xii) Support vessel operations;

(xiii) Loss of sub-sea equipment/pipelines;

(xiv) Marine traffic;

(xv) Foreign sub-sea objects;

(xvi) Extreme weather conditions;

(xvii) Loss of offshore installation stability;

(xviii) flammable and toxic gas;

(xix) fires and explosions; and

(xx) Radioactive radiation

8. ASPECTS TO BE ADDRESSED IN THE COP

The COP, must set out how the significant risks identified in terms of the risk assessment process referred in paragraph 7.1 above, will be addressed. The COP must address at least the aspects set out below unless there is no significant risk associated with that aspect.

8.1 Organisation of work and management structure

The COP should set out a summary of the organisation of work, as contemplated in

section 8(1)(a) of the MHSA, as far as it relates to the offshore installation. The COP should further set out an organogram describing the management hierarchy from the employer down, including at the offshore installation; and the relationships between the various accountable persons, specifically identifying the different persons accountable for the different activities to be undertaken on the offshore installation

8.2 Safety Management System

In order to prevent persons from being exposed to significant risks due to inadequate safety management systems, the employer must ensure that the COP addresses the safety management system by including at least the following:

8.2.1 a summary of the key elements and structure of the Safety Management System and the link between such systems applicable to the structure of the platform and the equipment thereon, to the operational activities on the platform and to the rest of the mine.

8.2.2 the preparation and implementation of an operations manual, which must be readily available on board the offshore installation at all times, for securing:

(a) the health and safety of persons on board the offshore installation; and,

(b) the safety and integrity of an offshore installation whilst operating and during simultaneous operations with other offshore installations or vessels.

8.2.3 Selection criteria, in terms of physical and mental health, for employment on an offshore installation.

8.3 Environmental and Geological Conditions

In order to prevent persons from harm from hazards due to severe environmental and geological conditions causing disastrous consequences for the installation and the persons aboard it, the COP should set out how the factors mentioned below should be accommodated in the design, location and stationing of the offshore installation;

- Wind;
- Sea currents;
- Temperatures;
- Seasonal variations;
- Waves;
- Seabed;
- Sub-soil conditions;
- Foundations and Pile data and anchoring data, where applicable;
- Geological information and details of the reservoir and the wells including well descriptions and well compositions;

8.4 Emergencies

In order to prevent person from injury or harm during emergencies, the COP should set out measures that will ensure that emergency situations can be dealt with properly and evacuations are not hampered. The measures must be regularly reviewed and revised with reference to any deficiencies identified or improvements required. Such measures should include the following:

8.4.1 particulars of the equipment available and arrangements made onshore for offshore emergencies, setting out the procedure to be followed and recorded, so as to ensure that these procedures are at all times adequate to deal with such emergencies.

8.4.2 measures to ensure that all persons aboard the offshore installation are aware of the location of the temporary safe refuge (TSR's) and that all TSR's are adequately designed, constructed and equipped;

8.4.3 emergency escape arrangements;

8.4.4 emergency systems to alert persons when there is an emergency at the offshore installation and to initiate predetermined safeguarding action;

8.4.5 procedures for shutting down or isolating, in the event of an emergency, each pipeline connected to the offshore installation, so as to stop any flow through the pipeline, which must include –

(a) effective means of controlling and operating all relevant emergency valves (shut down valves) and well kill equipment for the pipeline;

(b) a fail-safe system of isolating a pipeline in the event of failure of other safety devices for the pipeline;

(c) adequate means of mitigating, the risks associated with each pipeline connected to the offshore installation; and

8.4.6 measures to be taken to prevent injury from pipelines, sub-sea equipment and, where applicable, control buoys, which have the potential to cause or aggravate major accidents - including the fluid which such pipelines and sub-sea equipment convey;

8.4.7 measures to control of the operation of a well, the pressure in a well and to prevent the uncontrolled release of hazardous substances.

8.4.8 manning levels and the organisational structure on board in case of an emergency, including specific duties and competency requirements of persons. Training programmes to ensure competence of persons as contemplated in section 10(2)(d) of the Act, including survival training, first aid training, evacuation, abandonment, rescue and fire drills;

8.4.9 measures to ensure that any gas flare system cannot pass solid matter or liquids into the gas system;

8.4.10 procedures to monitor the status of all safety critical equipment, including frequency and recording of periodic inspections and testing of pipes and pipeline emergency shutdown valves, and sub-sea equipment, to ensure that they will operate correctly in an emergency.

8.4.11 search and rescue procedures to follow in the event of any persons falling overboard.

8.4.12 procedures to be followed in the event of helicopter emergencies;

8.5 Permit to work

In order to prevent persons from being injured when working on equipment that may pose a risk or hazard by the release of any electrical, mechanical, hydraulic, chemical or other sources of energy procedures be developed and implemented that is a documented permit to work system. This system must identify the potential health and safety hazards when this work is to be performed and defines precautions to be taken to mitigate the potential risks posed by such hazards.

The permit to work system procedure must include, but is not limited to, measures to prevent-

(a) fires and explosions as a result of welding and other hot work;

(b) uncontrolled releases of petroleum as a result of cold work, including physical isolation and barricades;

(c) fires, explosions and electric shock as a result of electrical work, including electrical isolation;

(d) fires, explosions and asphyxiation as a result of entry into, and working in, a confined space;

(e) persons or equipment falling from elevated working positions; and

(f) persons drowning or suffering diving sickness as a result of diving work.

PART D: IMPLEMENTATION

A registered trade union with members at the **offshore installation** or where there is no such union, a health and safety representative at the **offshore installation,** or if there is no health and safety representative, an employee representing the employees at the **offshore installation,** must be provided with a copy on written request to the manager. A register must be kept of such persons or institutions with copies to facilitate updating of such copies.

The employer must ensure that all employees are fully conversant with those sections of the COP relevant to their respective areas of responsibilities.

1. IMPLEMENTATION PLAN

1.1 The employer must ensure that the duty holder prepares an implementation plan for the COP that makes provision for issues such as organisational structures, responsibilities of functionaries and programmes and schedules that will enable its proper implementation. A summary of, and a reference to, a comprehensive implementation plan may be included.

1.2 Information may be graphically represented to facilitate easy interpretation of the data and to highlight trends for the purpose of risk assessment.

2. COMPLIANCE WITH THE COP

The employer must institute measures for monitoring and ensuring compliance with the COP.

3. ACCESS TO THE COP AND RELATED DOCUMENTS

3.1 The employer must ensure that the COP and related documents are:

(i) kept readily available on the offshore installation,

(ii) kept at any emergency response centre, if applicable,

(iii) kept at the registered office of the employer, for examination by any affected person, and,

(iv) lodged with the relevant Principal Inspector of Mines.

3.2 The employer must ensure that all employees are fully conversant with those sections of the COP relevant to their respective areas of responsibility.

3.3 All training records must be kept up to date and readily available for audit and inspection.

1.4 OTHER REFERENCES

1. The Public Inquiry into the Piper Alpha Disaster. Cm 1310 HMSO 1990 ISBN 0 10 113102X (2 volumes) (The Cullen Report);

2. Petroleum (Submerged Lands) (Management of Safety on Offshore Facilities) Regulations 1996 - Statutory Rules 1996 No. 298 as promulgated in terms of the Petroleum (Submerged Lands) Act 1967: Australia;

3. Article: UK Offshore Legislation by PS Tindall;

4. Lecture for Offshore training course: "Verification Scheme"; Lloyd's Register Lowestrof. Prepared by AC Mather;

5. Guidelines for Management of Safety Critical Elements; A joint industry guide, UKOOA, 1996;

6. Classification Society Rules for MODUs, MOPUs, FPSOs and Fixed Installations.

7. International Standard IEC 61892-7:

   Mobile and fixed offshore units –

   Electrical Installations – Part 7: Hazardous Areas

8. United Kingdom Offshore Operators Association (UKOOA) Standard CP015: Medical Aspects of Fitness for Offshore Work – A Guide For Examining Physicians