



Decks, stairways, gangways and their associated handrails

Prepared by **Bomel Ltd**
for the Health and Safety Executive

OFFSHORE TECHNOLOGY REPORT
2001/069



Decks, stairways, gangways and their associated handrails

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FOREWORD

This document provides technical information previously contained in the Fourth Edition of the Health and Safety Executive's '*Offshore Installations: Guidance on Design, Construction and Certification*' (1990 edition plus amendments)⁽¹⁾. The 'Guidance' was originally published in support of the certification regime under SI289, the Offshore Installations (Construction and Survey) Regulations 1974⁽²⁾. However, SI289 was revoked by the Offshore Installations (Design and Construction, etc) Regulations, 1996, which also introduced the verification provisions into the Offshore Installations (Safety Case) Regulations, 1992. The 'Guidance' was formally withdrawn in its entirety on 30 June 1998 (see HSE OSD Operations Notice 27⁽³⁾).

The withdrawal of the 'Guidance' was not a reflection of the soundness (or otherwise) of the technical information it contained; some sections (or part of sections) of the 'Guidance' are currently referred to by the offshore industry. For this reason, after consultation with industry, relevant sections are now published as separate documents in the HSE Offshore Technology (OT) Report series.

It should be noted that the technical content of the 'Guidance' has not been updated as part of the re-formatting for OTO publication, although prescriptive requirements and reference to the former regulatory regime have been removed. **The user of this document must therefore assess the appropriateness and currency of the technical information for any specific application.**

The following table lists the technical sections in the original 'Guidance' and their present publication status.

Former 'Guidance'		Status	OT Number
Section No *	Subject		
10	Installation Layout	Lapsed	N/A
11	Environmental Considerations	OT Report	OTO 2001 010
12	Corrosion Protection	OT Report	OTO 2001 011
13	Fire Protection	Lapsed	N/A
14	Site Investigations	OT Report	OTO 2001 012
15	Loads	OT Report	OTO 2001 013
20	Foundations	OT Report	OTO 2001 014
21	Steel	OT Report	OTO 2001 015
22	Pile / Sleeve Connections	OT Report	OTO 2001 016
23	Concrete	OT Report	OTO 2001 046
24	Materials other than Steel or Concrete	OT Report	OTO 2001 017
30	Floating Installations	OT Report	OTO 2001 048
31	Stability, Watertight Integrity and Ballasting	OT Report	OTO 2001 049
32	Station Keeping	OT Report	OTO 2001 050
33	Self-elevating Installations (Jack-up Units)	OT Report	OTO 2001 051
40	Electrical Equipment and Systems	Lapsed	N/A
41	Instrumentation	Lapsed	N/A
42	Mechanical Equipment	OT Report	OTO 2001 065
43	Well Control Equipment	Lapsed	N/A
44	Gas Flares and Cold Vents	Lapsed	N/A
45	Gas and Liquid Containment	Lapsed	N/A
46	Lifting and Handling Appliances	Lapsed	N/A

Former 'Guidance'		Status	OT Number
Section No *	Subject		
47	Heating, Ventilation and Air Conditioning (HVAC)	OT Report	OTO 2001 066
50	Living Accommodation	OT Report	OTO 2001 067
52	Noise and Vibration	OT Report	OTO 2001 068
53	Illumination	Lapsed	N/A
54	Decks, Stairways etc.	OT Report	OTO 2001 069
55	Helicopter Landing Area	OT Report	OTO 2001 070
60	Structural Repairs and Modifications	Lapsed	N/A
90	Emergency Facilities	Lapsed	N/A
91	Emergency Shutdown Systems	Lapsed	N/A

* NOTE: Section numbering within the 'Guidance' was not sequential.

1. INTRODUCTION AND SCOPE

This Offshore Technology (OT) Report provides information on standards for decks, stairways, gangways and their associated handrails.

The information is based on guidance previously contained in Section 54 of the Fourth Edition of the Health and Safety Executive's 'Offshore Installations: Guidance on Design, Construction and Certification'⁽¹⁾ which was withdrawn in 1998. As discussed in the Foreword, whilst the text has been re-formatted for Offshore Technology publication, the technical content has not been updated. The appropriateness and currency of the information contained in this document must therefore be assessed by the user for any specific application.

2. CONSTRUCTION OF DECKS, ETC

Decks should be strong enough to withstand the local design loading without permanent deformation. Dimensions and methods of construction of corridors, walkways, stairways and ladders would need to be of at least the standard required on sea-going cargo ships.

Gratings should be properly supported and fixed so that they are incapable of being accidentally displaced, either by normal work activities or by environmental forces. Where it is necessary to secure gratings, with clips and clamps, these should be compatible with the type of grating used and be so designed that they cannot be readily dislodged or broken, even when subjected to exceptionally rough treatment.

3. SURFACES AND SURFACE DRAINAGE

Deck surfaces should have non-slip finishes, where practicable. They should be laid to fall, or be cambered where necessary so as not to retain surface water.

4. HANDRAILS AND GUARDRAILS

Regulation 14 of the Offshore Installations (Operational Safety, Health and Welfare) Regulations 1976⁽⁴⁾ (SI 1976/1019) requires that the edge of every floor, gangway, stairway and opening down which a person could fall more than two metres, or into the sea, should, where practicable, be provided with a toe board not less than 150mm high and suitable guard rails of adequate strength. These guard rails would need to comprise at least three courses so arranged that the lowest rail is not more than 150mm above the toe board and the highest rail is not less than one metre above the floor, gangway or stairway and the openings between the rails are not more than 400mm. Wire or wire mesh of sufficient strength may be substituted for guard rails below the top rail.

5. LADDERS

All ladders over six metres in height (including those incorporated in equipment) and not intended for use solely in cases of emergency, would need to be protected either by safety cages or, if this is not possible, by efficient safety harness devices. Where provided, safety cages would need to extend from 2.5 metres above the bottom of the ladder. Where practicable, rest platforms would need to be provided at not more than nine metre intervals.

6. ACCESS GANGWAYS BETWEEN FIXED AND MOBILE INSTALLATIONS

If the mobile unit is a jack-up, it is possible that some of the suggestions relating to relative movement could be relaxed.

6.1 CONSTRUCTION AND ARRANGEMENT

Walkways should be fitted with handrails and toe boards as suggested in Section 4 of this document. The surface of the walkway should have a non-slip finish.

It is suggested that a system of visual and audible alarms should be fitted signalling to a manned control point if gangway movements are approaching operational limits.

6.2 DESIGN LOADS

It is suggested that the design of the gangway should satisfy the following loading criteria, in addition to the effects of dead load:

a) Gangway supported on another Installation

- Maximum gangway operating wind load plus a live loading of 2.5kN/m^2 applied to the walkway area.
- Local loading of not less than 5.0kN/m^2 .
- Maximum ice loading as defined in OT Report OTO 2001 010 with appropriate wind loading.

b) Gangway in stowed or standby position as applicable

- 50 year storm wind.
- Maximum ice loading as defined in OT Report OTO 2001 010 with appropriate wind loading.

c) Loss of gangway support at outer end

With the loading described in the first bullet point of Section 6.2 a) and maximum gangway operating sea state from any direction, any one of the mobile Installation's moorings should be assumed to have failed resulting in loss of support for the gangway end. The gangway and its support / rigging would need to be designed for any resulting dynamic loading which would be imposed due to the loss of this support. Under this condition, the gangway would need to remain in an attitude that is adequate for the safety of any persons using it.

The above loading condition need not be considered if it can be adequately demonstrated by calculation that, subsequent to the loss of any one mooring line, the horizontal motion of the mobile Installation would not permit the gangway to lose its support.

6.3 ALLOWABLE STRESSES

Basic allowable stresses as defined in BS 449⁽⁵⁾, BS 5950⁽⁶⁾ or other recognised standard may be used for the loading described in Section 6.2 a).

An increase of 1/3 in the basic allowable stresses may be used for the loading in Sections 6.2 b) and c).

It is suggested that a minimum safety factor of five should be used for any rigging wire rope when subjected to the maximum load given by loading conditions in Section 6.2 a). This safety factor may be reduced to 3.75 for the loading described in Sections 6.2 b) and c).

7. SURVEYS (DECKS, STAIRWAYS, ETC.)

It is suggested that a gangway should be surveyed and tested prior to first use.

8. REFERENCES

1. Department of Energy. Offshore Installations: Guidance on Design, Construction and Certification, 4th Edition. HMSO, Consolidated Edition, 1993 (plus Amendment No. 3, 1995). [Withdrawn 1998 by Operations Notice 27].
2. SI 1974 / 289 – The Offshore Installations (Construction and Survey) Regulations 1974, HMSO, 1974. [Revoked and has been replaced by SI 1996 / 913 – The Offshore Installations and Wells (Design and Construction etc.) Regulations, 1996 – ISBN: 0 110 54451 X].
3. Health and Safety Executive. Status of Technical Guidance on Design, Construction and Certification. Operations Notice 27. Revised and Reissued, August 1998.
4. SI 1976 / 1019 – The Offshore Installations (Operational Safety, Health and Welfare) Regulations, 1976. [Revised by SI 1998 / 2307 – The Lifting Operations and Lifting Equipment Regulations, 1998.]
5. British Standards Institution. BS 449 – Specification for the use of Structural Steel in Building. Part 2 – Metric Units. 1969.
6. British Standards Institution. BS 5950 - Structural use of Steelwork in Buildings. Part 1 – Code of Practice for the Design in Simple and Continuous Construction: Hot Rolled Sections. 2000.



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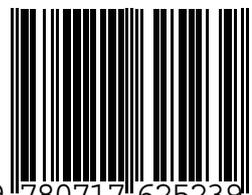
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