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		(2) Notwithstanding the requirements of sub-clause (1) in the case of the discovery of serious damage or deterioration requiring immediate corrective action, a report shall be made forthwith to an inspector, and a written report as soon as practicable made to the Director.
Records of* petroleum in discharged formation water	655*	A summary of the records referred to in sub-clause 616(4) shall be submitted at 3 monthly intervals in a form acceptable to the Director.

## PART VII - CRANES, WINCHES AND LIFTS\*

### Division 1 - General Requirements

Crane Code*	700*	In this Part, a reference to the "Code" is a reference to the SAA AS 1418, SAA Crane Code.
Crane*	701*	(1) Unless otherwise approved, a crane shall be constructed, installed, tested, operated and maintained in accordance with the Code or such other code as is approved.  (2) Except with prior approval, a crane shall not be used unless a certificate verifying its design suitability for intended use in the marine environment has been issued by a verifying body.
Crane construction, installation, relocation and alteration*	702*	(1) A crane shall not be constructed on a fixed platform unless prior to the commencement of construction notice in or to the effect of Appendix 1 has been lodged with the Director and the intended construction has been approved.  (2) A crane shall not be installed or relocated on a platform unless prior to the commencement of installation or relocation notice in or to the effect of Appendix 2 has been lodged with the Director and the installation or relocation has been approved.

- (3) A crane on a platform shall not, without approval, undergo alterations to components or parts which affect or determine the structural integrity or load bearing capacity of the crane.
- (4) Safety devices which affect the integrity of a crane on a platform shall not be altered without approval.
- Certificate of inspection of manufacture\* 703\* Before a crane is installed in the adjacent area, a certificate of inspection of manufacture issued by a person or body empowered to issue such a certificate by a law of the Commonwealth of Australia or of a State or Territory, or some other approved person or body, shall be lodged with the Director.
- Crane repairs\* 704\* (1) Except in an emergency, where a crane on a platform has suffered serious damage that crane shall not be repaired without approval.
- (2) In this clause "serious damage" shall have the meaning given to that expression by clause 282.
- Commissioning tests\* 705\* A crane -
- (a) that has been installed on a platform or relocated on a platform; or
- (b) that has been repaired or altered and is on a platform -
- shall undergo approved commissioning tests before being used or re-used (as the case may be).
- Special Conditions\* 706\* (1) For the purposes of this clause the load factor conditions(dynamic factor) means the factor by which the capacity of a crane is determined for offshore applications.
- (2) Subject to sub-clause (4), a fixed crane on a platform shall not be used for loading or unloading vessels, for on-platform lifts, or for raising or lowering persons unless -
- (a) the design of the crane complies with the Code or such other code as is approved;
- (b) the crane cannot be lowered in free fall;
- (c) legible load charts, which have been calculated in accordance with the following factors, have been fitted in the crane driver's cabin:
- (i) vessel list factor where applicable;

- (ii) load factor (Dynamic factor) of at least 2.4 for routine loading and unloading vessels; and
  - (iii) load factor (Dynamic factor) of 1.35 or such other load factor as is approved for routine on-platform lifts;
- (d) for lifts, other than routine lifts, which fall outside the constraints of the load charts referred to in paragraph (c), approval has been given;
- (e) for a fixed crane to be used for loading or unloading vessels, the wind conditions are not more than 40 knots and the mean wave height is not more than 3.5 metres;
- (f) for a fixed crane to be used for raising or lowering persons, the crane has -
- (i) a capability of a powered rope speed in single fall of not less than 50 metres per minute;
  - (ii) self-sustaining features of a worm gear reduction or any other design of equivalent safety; and
  - (iii) a "deadman" type fail-safe brake which operates directly on the winding drum or on a drum of approved design geared in an approved manner directly to the winding drum and is applied by approved means; and
- (g) for a fixed crane to be used for on-platform lifts, the wind speed and direction are such that they will not create a hazard.
- (3) Where there is on a platform a fixed crane that does not comply with paragraphs (a), (b), (c) and (f) of sub-clause (2), that crane shall, as soon as is reasonably practicable, be modified or altered so that it does so comply.
- (4) Where there is on a platform a fixed crane that cannot comply with paragraphs (a), (b), (c) and (f) of sub-clause (2), that crane may, subject to approval, be used with such constraints as are determined by the Director.
- (5) A crane on a platform shall not be used to lower loads in free fall without approval.
- Personnel                      707\*      (1) A crane on a platform shall not be used to

transfer*	transfer persons between a platform and a vessel unless those persons are wearing approved bouyancy vests and are transferred on approved personnel transfer nets, and the crane complies with paragraph 706(2)(f).
(2)	No more than 4 persons shall be transferred simultaneously on a personnel transfer net.
Load and boom angle indicators*	<p data-bbox="395 479 464 508">708*</p> <p data-bbox="600 479 1254 508">A crane on a platform shall be equipped with -</p> <p data-bbox="612 548 1318 616">(a) one (and not more than one) automatic load indicator -</p> <ul style="list-style-type: none"> <li data-bbox="687 656 1406 797">(i) which is so constructed and marked as to enable a person operating the crane readily to determine the safe working load for any working position;</li> <li data-bbox="687 837 1406 1043">(ii) which gives an alarm warning when the load has reached 95% of the safe working load for the corresponding radius and an audible warning when the load has exceeded 110% of the safe working load for the corresponding radius;</li> <li data-bbox="687 1084 1366 1256">(iii) which may also be fitted with a means to stop the hoisting and luffing-out motions automatically when the load has reached 110% of the safe working load for the corresponding radius;</li> <li data-bbox="687 1296 1270 1326">(iv) which is maintained in good order;</li> <li data-bbox="687 1366 1334 1433">(v) which is checked monthly to ensure its accuracy; and</li> <li data-bbox="687 1473 1414 1541">(vi) in respect of which a log is maintained of the monthly checks.</li> </ul> <p data-bbox="612 1581 1342 1682">(b) a positive boom angle indicator and, where applicable, a boom extension indicator clearly visible to the crane driver.</p>
Maintenance and operating manuals*	<p data-bbox="395 1722 464 1751">709*</p> <p data-bbox="528 1722 1270 1823">(1) A maintenance and operating manual shall be submitted to the Director for approval in respect of each crane installed on a platform.</p> <p data-bbox="528 1863 1414 1964">(2) A copy of the approval maintenance and operating manual shall be kept on the platform and be available to the crane driver at all times.</p>

- (3) A crane on a platform shall be maintained and operated in accordance with the procedures set out in the approved maintenance and operating manual.
- (4) An approved maintenance and operating manual shall not be altered without approval and, where the Director so requires, shall be altered in the manner required.
- (5) The Director may require that any crane on a platform shall not be used if a maintenance and operating manual has not been submitted for his approval in accordance with this clause, or if the manual submitted has not been approved.
- Crane communication\* 710\*
- (1) When a crane is being operated, communication between dogman or crane chaser and crane driver shall be in accordance with the Code, except that voice communication by telephone or radio between those persons is permitted.
- (2) Where voice communication by telephone or radio between dogman or crane chaser and crane driver is installed it shall, where practicable, be used instead of other types of communication.
- Crane driver competence\* 711\*
- (1) A crane shall not be driven except by a person holding a certificate of competence issued by an approved authority.
- (2) The Director may require further and continuing evidence of competence of a crane driver for offshore crane operation.
- Dogman or crane chaser competence\* 712\*
- (1) A person shall not act as a dogman or crane chaser unless he holds a certificate of competence issued by an approved authority.
- (2) The Director may require further and continuing evidence of the competence of a dogman or crane chaser for offshore crane operation.
- Sheave blocks\* 713\*
- (1) Sheave blocks shall comply with SAA AS 2089, Sheave Blocks or such other code as is approved.
- (2) All sheaves and pins in sheave blocks shall be designed to withstand both the static and the dynamic loads likely to be encountered in operation.
- (3) All diverting sheaves located in working areas and subjected to dynamic loads shall be protected in such a fashion that in the event of a failure of the sheave the wire rope shall not be capable of displacement by a

distance greater than 1.5 times the diameter of the sheave.

Illumination of areas of operation*	714*		When operations involving the use of cranes or winches are carried out between the hours of sunset and sunrise, the load, the area under the load, and any likely obstructions shall be adequately illuminated.
Winches*	715*	(1)	Winches including air driven winches shall, unless otherwise approved, comply with the Code.
		(2)	Unless otherwise approved, winches used for raising or lowering persons shall be so designed as to have a safety factor of 10 and shall comply with sub-paragraphs 706(2)(f)(ii) & (iii).
		(3)	Where there is a risk to personnel, winches shall be used with rope spooling devices.
Lifting tackle and gear*	716*		Unless otherwise approved, lifting tackle and gear complying with the Code shall be used on a crane on a platform.
Ropes and slings*	717*		Unless otherwise approved-
		(1)	steel wire ropes shall comply with SAA AS 1656, Steel Ropes (other than for Mining Purposes);
		(2)	lifting slings made of wire rope shall comply with SAA AS 1666, Wire Rope Slings;
		(3)	lifting slings made of natural or synthetic fibre shall comply with SAA AS 1380, Fibre Rope Slings;
		(4)	all wire rope slings shall be marked with identification and safe working load information as detailed in Section 9 of SAA AS 1666, Wire Rope Slings;
		(5)	all steel wire ropes and slings shall be regularly inspected and maintained in accordance with SAA AS MB1, Steel Wire Rope Manual and an approved maintenance and inspection programme, and shall be used in accordance with SAA AS 1666, Wire Rope Slings and SAA AS MB1, Steel Wire Rope Manual; and

- (6) slings and wire ropes under dynamic loading shall have approved end fittings complying with SAA AS MB1, Steel Wire Rope Manual. Bull dog and fist grips are not to be used as a sole means of fastening in this application.
- Cargo gear testing and handling\* 718\* (1) Cargo gear that includes a sheave block, chain, ring, hook, shackle, or swivel or cargo tray, personnel transfer net, work basket or other cargo container, shall not be used in lifting, loading or unloading operations unless -
- (a) that cargo gear has been tested using a proof load at least equal to that applicable to it and shown in a table in Appendix 3 and found after the test to be undamaged and free from cracks, flaws or other defects;
  - (b) where that cargo gear is a sheave block, chain, ring, hook, shackle or swivel, the safe working load for which it has been tested pursuant to paragraph (a) -
    - (i) is clearly marked on it or on a tablet or ring of durable material attached to it; or
    - (ii) is set out in a notice of a kind and in a position that may be read easily by a person using it;
  - (c) where that cargo gear is a cargo tray, personnel transfer net, work basket or other cargo container, it has the weight of the contents for which it has been tested pursuant to paragraph (a) clearly marked on it;
  - (d) that cargo gear has a certificate recording the results of the test pursuant to paragraph (a) and issued by the person who carried out the test; and
  - (e) that cargo gear is regularly inspected and maintained in accordance with an approved inspection and maintenance programme.
- (2) Cargo gear which is a sheave block, chain, ring, hook, shackle or swivel and which shows damage, permanent deformation, cracks, flaws or other defects after testing in accordance with paragraph (1)(a) shall be discarded.

- (3) Cargo gear which is a cargo tray, personnel transfer net, work basket or other cargo container and which shows damage, permanent deformation, cracks, flaws or other defects after testing in accordance with paragraph (1)(a) shall not be used until repairs have been carried out and has been successfully retested.
- (4) A package or an article of one tonne or more in weight shall not be lifted unless a statement of its gross weight has been prominently marked in legible and durable characters not less than 5cm in height on it or on a label securely attached to it.

Chain blocks \*

719\*

Manual and power chain blocks shall comply with the Code or such other code as is approved.

Safety requirements for all cranes\*

720\*

- (1) Unless otherwise approved, a crane on a platform shall have -
- (a) a hoisting limit device which when actuated stops the hoisting motion and applies the brake on the hoisting winch automatically;
  - (b) luffing limit devices which when actuated stop the luffing motion and apply the brake on the luffing winch automatically, and which are so arranged as to prevent the by-passing of these devices in the normal operation of the crane;
  - (c) engine stop systems which operate in a manner such that the engine comes to rest with minimum delay;
  - (d) (notwithstanding sub-clause 327(8)) a readily accessible shutdown device in the air intake of the internal combustion engine;
  - (e) a facility for emergency lowering of loads;
  - (f) temperature sensing devices (which may be of the audio-visual type) or equivalent safeguards to give adequate protection to prime mover and associated equipment;
  - (g) an emergency stop with manual re-set capability;
  - (h) subject to sub-clause (2), motion control levers which return with a minimum delay to neutral upon release;
  - (i) fire extinguishers of an approved type at the machinery deck;
  - (j) a wind speed indicator of an approved type;

- (k) where the crane is used in conjunction with diving operations, an audio-visual device indicating that there is minimum of three turns of wire rope left on hoisting drums;
  - (l) the hoisting rope of the winch used for boat lifts attached to the drum in such a manner that the attachment withstands 100%, and not more, of the safe working load of the rope;
  - (m) pneumatic, hydraulic and electric connections clearly marked corresponding to the markings on the crane circuit drawings; and
  - (n) an emergency escape route for personnel.
- (2) Paragraph (1)(h) does not apply to an engine throttle lever.
- (3) Unless otherwise approved, where there is a rope luffing crane on a platform -
- (a) the luffing hoist wire rope shall be so arranged as to ensure that if the crane boom should pass through its maximum operating radius, the boom shall not suffer damage;
  - (b) the luffing rope which drum shall have fitted a rope attachment device, which shall withstand at least twice the safe working load of the wire rope with no rope turns left on the drum and a holding brake acting directly on the drum; and
  - (c) the rope end entry on the winch drum shall be so arranged as to prevent damage to the wire rope under any condition.
- (4) Unless otherwise approved, the settings of a hoist brake on a crane on a platform shall be so secured that unauthorised adjustment is prevented.
- (5) Safety latches which automatically close shall be fitted on integral crane hooks.

Safety requirements for hydraulic\*

721\*

Unless otherwise approved, a hydraulic powered crane on a platform shall be fitted with -

- (a) a luffing speed limiting device which actuates prior to approaching the upper luffing limit;
- (b) an upper ultimate type limit device which shuts down the motive power to hoisting and luffing;

- (c) an automatic sensing device which prevents operation of the crane upon loss of pressure in the hydraulic power system;
- (d) primary filters in the hydraulic circuits which incorporate an electrical device which initiates a warning in the crane driver's cabin when a filter becomes blocked and the flow of oil drops below a minimum rate as determined by the manufacturer of the crane;
- (e) secondary filters in the hydraulic circuits which incorporate an electrical device which shuts down the motive power when the filter becomes blocked and the flow of oil drops below a minimum rate as
- (f) a means to show the crane driver which hoist speed has been selected;
- (g) a warning device to ensure that the crane is not in motion when changing hoist speeds; and
- (h) dual anti-cavitation devices installed in series in the hoisting and luffing hydraulic circuits.

Electrical requirements*	722*		Unless otherwise approved, electrical wiring and fittings of cranes shall comply with AS 3000, SAA Wiring Rules, or other approved code.
Riding booms*	723*		Unless otherwise approved, a person, other than a qualified rigger engaged in the erection or dismantling of a crane, shall not climb or ride a boom or ancillary equipment of a crane.
Crane inspection*	724*	(1)	A lattice type crane boom shall be fitted with a walkway and safety line internal to the boom, or other approved facilities, to ensure safety of personnel during boom inspections.
		(2)	Crane boom sections and slew ring bolts shall be regularly inspected and tested in accordance with an approved inspection and testing programme.
		(3)	A person when inspecting crane booms shall wear an approved harness connected to the boom.
Pawls, washers and limits*	725*	(1)	Where pawls are fitted to crane drums there shall be an approved form of indication that the pawls are engaged when the engine is shut down.
		(2)	Hardened washers shall be used with high tensile bolts and nuts in conformity with SAA AS 1511, SAA High-

strength Structural Bolting Code or such other code as is approved.

- (3) Crane limit devices and associated equipment shall be such that unauthorised interference is prevented.

Multiple lifts*	726*	Cranes on platforms shall not be used for multiple or common lift operations without approval.
Log book*	727*	A crane shall have a log book in which the crane driver records the daily checks and comments relating to the crane's operation.
Lifts*	728*	Unless otherwise approved, lifts shall comply with the rules of the classification society under which the facility is classified.
Taglines*	729*	Taglines for controlling loads shall be used at all times.
Mobile cranes*	730*	A mobile crane as defined in the Code shall not be required to comply with the provisions of any clause in this Part provided that - <ol style="list-style-type: none"> <li>(1) a mobile self-propelled crane of the crawler track type as defined in the Code shall comply with the following -             <ol style="list-style-type: none"> <li>(a) for all on-platform lifts on a fixed platform, the normal operating conditions as given in the Code; and</li> <li>(b) for all lifts from a fixed platform, and on or from a mobile platform, a stability factor of 67% as required by the Code provided that -                 <ol style="list-style-type: none"> <li>(i) an automatic load weighing indicator is fitted; and</li> <li>(ii) the mean wave height does not exceed 2 metres while loading and unloading vessels.</li> </ol> </li> </ol> </li> <li>(2) a mobile crane other than a mobile crane referred to in sub-clause (1) shall not be used without approval.</li> </ol>
Riding loads*	731*	No person shall be supported by a crane except in an approved work basket or personnel transfer net.
Bridge crane*	732*	Unless otherwise approved, a bridge crane shall be designed, constructed, installed, tested, operated and maintained in accordance with the Code or such other code as is approved.
Diving and crane	733*	Where diving operations are being carried out from a platform, the crane or other equipment not

operations\*

associated with the diving operations shall not be operated or any activity carried out if diving personnel or diving equipment engaged in or being used for the diving operations could be struck by any material moving or falling as a result of the use of the crane or other equipment or the carrying out of the activity.

Division 2 - Reporting and Data Submission

Periodic  
inspection\*

750\*

Not later than one month after each periodic inspection of a crane on a platform, there shall be submitted to the Director a report which includes a description of work carried out, items inspected, findings as a result of the inspection, and any intended further action considered necessary as a result of the inspection.

## APPENDIX 1 Clause 702\*

## Notice of Intention to Construct a Crane

I hereby give notice that it is intended to construct a crane as described hereunder, and your approval for the intended construction is requested.

1. Address at which work is to be done.
2. Type of crane (eg overhead travelling crane, derrick crane, mobile crane, monorail, conveyor, hoist, etc).
3. Intended use of crane.
4. Classification of crane under the Code.
5. Power to be used to drive crane.
6. Safe working load/s.
7. If jib crane, state jib length.
8. If travelling crane, state span.
9. Name and address of maker.
10. Date when construction is to commence.
11. Name and address of verifying body.

I forward herewith general arrangements drawings and specifications describing the crane, together with a certificate referred to in clause 701 including a statement of the highest dynamic factor expected to be applied when using a crane in the adjacent area.

(Signature of person notifying)

Full postal address

Telephone number

Date

Note: In this notice a reference to a clause is a reference to a clause in that Part of the Schedule of which the form of this notice is an appendix.

## APPENDIX 2 Clause 702\*

## Notice of Intention to Install or Relocate a Crane

I hereby give notice that it is intended to install/relocate on the platform indicated a crane as described hereunder and your approval for the intended installation/relocation is requested.

- 1 Platform at which crane is to be installed or relocated.
- 2 Exact location of crane on that platform.
- 3 Type of crane.
- 4 Intended use of crane.
- 5 Power to be used to drive crane.
- 6 Safe working load/s.
- 7 If jib crane, state jib length.
- 8 If travelling crane, state span.
- 9 Name and address of maker.
- 10 Date when installation is required to commence.
- 11 Name and address of verifying body.
- 12 The certificate referred to in clause 701 is attached/has previously been forwarded and, where applicable, the certificate referred to in clause 703 will be forwarded on completion of installation/relocation.

(Signature of person notifying)

Full postal address

Telephone number

Date

Note:- In this notice a reference to a clause is a reference to a clause in that Part of the Schedule of which the form of this notice is an appendix.

## APPENDIX 3 Clause 718\*

## PROOF LOADS FOR CARGO GEAR

## A SHEAVE BLOCK, CHAIN, RING, HOOK, SHACKLE OR SWIVEL

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 Article Proof Load
 

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Chain, ring, hook, shackle or swivel	Twice the safe working load
Single sheave block*	Four times the safe working load
Multiple sheave block with safe working load not exceeding 20 tonnes	Twice the safe working load
Multiple sheave block with safe working load exceeding 20 tonnes but not exceeding 40 tonnes	20 tonnes in excess of the safe working load
Multiple sheave block with safe working load exceeding 40 tonnes	One and a half times the safe working load

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\* The proof load for a single sheave block is the load imposed on the pin or eye of the block and the safe working load is the maximum load which may be applied to a chain or rope passing around the sheave of the block.

 B CARGO TRAYS, PERSONNEL TRANSFER NETS, WORK BASKETS AND OTHER  
 CARGO CONTAINERS
 

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Weight of Contents	Proof Load
Not exceeding 3 tonnes	Twice the net weight
Exceeding 3 tonnes but not exceeding 12 tonnes	3 tonnes in excess of the net weight
Exceeding 12 tonnes but not exceeding 20 tonnes	One and a quarter times the net weight
Exceeding 20 tonnes	5 tonnes in excess of the net weight
Personnel transfer net and work basket	800 kg

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## PART VIII - DIVING

## Division 1 - General Requirements

General

- |                            |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tests*                     | 801* | <p>(1) Any test required under this Part shall be carried out in such a manner as will enable the results to be recorded and certified</p> <p>(a) in an endorsed test document within the meaning of the By-Laws of the National Association of Testing Authorities, Australia; or</p> <p>(b) where the test is not a test in respect of which an endorsed test document of the kind referred to in paragraph (a) can be given, to the satisfaction of the Director; or</p> <p>(c) where the test is a test in respect of which an endorsed test document of the kind referred to in paragraph (a) can be given but for practical reasons acceptable to the Director the requirement of such endorsement has been waived, to the satisfaction of the Director.</p>                                                                                                          |
| Exemption*<br>certificates | 802* | <p>(1) Subject to sub-clause (2), the Director may, by a certificate in writing, exempt any person or class of persons, any diving operation or class of diving operations and any plant and equipment or class of plant and equipment from any requirement or prohibition imposed by any provision of this Part and any such exemption may be granted subject to conditions and to a limit of time, and may be revoked at any time.</p> <p>(2) The Director shall not grant any such exemption unless, having regard to</p> <p>(a) the conditions which the Director proposes to attach to the exemption; and</p> <p>(b) any other requirements imposed by or under any enactment which apply to the case -</p> <p>it is established that the health and safety of persons who are likely to be affected by the exemption will not be prejudiced in consequence of it.</p> |

Qualifications and Experience

Diver\*  
and diver's  
attendant

- 803\* (1) A person shall not be a diver unless that person -
- (a) has been accredited as having met the terminal objectives outlined in the relevant parts of Australian Standard AS2815, consistent with the work which that person is called upon to perform during a diving operation; and
  - (b) has been certified as medically fit to dive in compliance with clause 816; and
  - (c) is at least 18 years of age.
- (2) A person shall not be a diver's attendant unless that person has sufficient knowledge of -
- (a) underwater work;
  - (b) the signals and communication devices used in diving operations;
  - (c) decompression procedures;
  - (d) first-aid; and
  - (e) equipment used in diving operations.

Systems\*  
maintenance,  
life support  
and diver  
medical  
technicians

- 804\* (1) Where required under the provisions of clause 813, there shall be provided an experienced maintenance technician who shall personally, under the supervision of a diving supervisor, undertake and be responsible for the repair, maintenance and safe functioning of equipment used in diving operations.
- (2) A person shall not perform the functions referred to in sub-clause (1) unless that person has such knowledge and experience as approved necessary to perform those duties.
- (3) Where required under the provisions of clause 813, there shall be provided an experienced life support technician who shall, under the supervision of the diving supervisor, control and monitor all the systems functions which relate to the "life support", safety and health of any person inside a surface compression chamber.

- (4) A person shall not perform the functions referred to in sub-clause (3) unless that person has such knowledge and experience as approved necessary to perform those duties.
- (5) Where required under the provisions of clause 813, there shall be provided a diver medical technician who shall, where required, render advanced first-aid treatment.
- (6) A person shall not perform the functions referred to in sub-clause (5) unless that person complies with the provisions of sub-clause 808(3).
- Diving\* supervisor 805\* (1) A person shall not be a diving supervisor unless that person -
- (a) has been trained and experienced in diving, as outlined in clause 803(1)(a) and (c);
- (i) is or has been a competent diver with adequate knowledge and experience of the diving techniques to be used; and
- (ii) has been appointed in writing by that person's employer to supervise diving operations; and
- (b) during that persons dive, another person satisfying the requirements of clause 805 has been appointed in writing by their employer to supervise in the Supervisor's absence.
- Diving\* superintendent 806\* Where the nature or size of a diving operation requires a diving superintendent, a person shall not be a diving superintendent in a diving operation unless that person has been appointed in writing, is able to supervise diving operations competently and complies with the requirements of clause 805.
- Medical\* practitioner 807\* A medical practitioner referred to in this Part is a medical practitioner who is qualified under the requirements of the United Kingdom Health and Safety Executive or an approved similar body, and whose experience in underwater medicine is acceptable to the Director.
- First aid\* qualifications 808\* (1) A person shall not commence employment as a diver, diver's attendant or life support technician unless that person can demonstrate competence in general and hyperbaric first-aid treatment as is acceptable to the Director.

- (2) A person shall not be a diving supervisor unless -
- (a) that person has an approved level of competence in general and hyperbaric medical first-aid treatment; and
  - (b) that person holds a current hyperbaric first aid, and St. John Ambulance Occupational First Aid Certificate or approved equivalent from an approved training establishment.
- (3) A person shall not carry out the duties of a diver medical technician unless that person -
- (a) has an approved level of advanced training in underwater medicine and first-aid procedures;
  - (b) has gained an approved level of competence in the field of that person's expected duties and responsibilities;
  - (c) is able competently to assess and evaluate the medical condition of a diving casualty, and to attempt to stabilize that casualty's condition;
  - (d) has such knowledge or experience as will enable that person, under the supervision of a diving supervisor and in consultation with a medical practitioner referred to in clause 807 by remote radio-voice communication, to carry out specific medical tasks, including -
    - (i) the accurate reporting of the medical condition of a diving casualty, and the stabilising of that casualty's condition;
    - (ii) the maintaining of the airway of a casualty; and
    - (iii) venepuncture, pleurocentesis, catheterisation, sub-cutaneous and intramuscular injections, simple suture techniques and the use of specific anti-venenes for injuries caused by marine animals and the treatment of those injuries; and
  - (e) has been certified medically fit for exposure to pressures greater than atmospheric pressure.

Documentation Requirements

Diving* manual and maintenance schedule	809*	<p>(1) Prior to the initial commencement of diving operations a manual of safety requirements and procedures ("diving manual") and a schedule of preventative maintenance requirements for diving operations and equipment shall be submitted to the Director for approval.</p> <p>(2) The diving manual shall include provisions for securing the health and safety of persons engaged in diving operations and in particular provisions covering matters specified in Appendix 7.</p>
Diving* operations record	810*	<p>(1) A record of diving operations shall be maintained at the site of all diving operations. Such records shall be an accurate record of all matters relevant to the diving operations as specified in Appendix 8 and shall be signed daily by the diving supervisor.</p> <p>(2) The records of diving operations referred to in sub-clause (1) shall be retained for at least five years.</p>
Diver's* log book	811*	<p>(1) Each diver shall have and maintain a personal log book to be known as the "diver's log book".</p> <p>(2) The diver's log book shall have affixed in it a clear "head and shoulders" photograph of the diver with that diver's name and signature on it.</p> <p>(3) Each diver shall record and maintain in the diver's log book -</p> <p style="margin-left: 40px;">(a) a report containing, so far as practicable, the details specified in Appendix 9, signed by the diver and by the diving supervisor of the diving operation to which that report relates;</p> <p style="margin-left: 40px;">(b) the results of each medical examination of the diver; and</p> <p style="margin-left: 40px;">(c) any other matters relating to the diver's suitability to dive that are referred to in Appendix 9.</p>
Emergency* drill reports	812*	<p>A record shall be kept of each emergency drill carried out in compliance with clause 817, including the type of emergency simulated, the results and conclusions drawn and any changes to operation procedures made as a consequence of these results and conclusions.</p>

Operating Requirements

Manning\*  
levels

- 813\* (1) At all times when any diving operation is or is about to be carried out there shall be present a sufficient number of divers and other competent persons ('the diving team') to ensure so far as is reasonably practicable that the operation can be undertaken safely, and to operate plant, equipment and other facilities necessary for the safe conduct of the operation.
- (2) Subject to this clause and unless otherwise approved, a surface-oriented diving operation shall not be carried out unless, during the period when a diver is in the water, there are present and engaged in that operation a minimum of five persons - one diving supervisor, one diver in the water, one diver's attendant, one standby diver, one standby diver's attendant, or, one diving supervisor with four divers. At all other times during that operation these persons shall be readily available to assist in that operation.
- (3) Subject to this clause and unless otherwise approved, a diving operation involving the use of a diving bell shall not be carried out unless, during the period when a diver is either in a diving bell or in the water, there are present and engaged in that operation, a minimum of six persons - one bell diving supervisor, one diver outside the bell, one standby diver/attendant in the bell, one diver on the surface, two divers attending on the surface, or, a diving supervisor with three bell divers and two diver's attendants. At all other times during that operation these persons shall be readily available to assist in that operation.
- (4) Subject to this clause and unless otherwise approved, a diving operation involving the use of saturation diving techniques shall not be carried out unless, during the period when a diver is either in a diving bell or in the water, there are present and engaged in that operation a minimum of the following - one bell diving supervisor, one life support technician, three bell divers, one system maintenance technician and a sufficient number of diver's attendants to ensure the safety of the operation.

At all other times during that operation these persons shall be readily available to assist in that operation; and

- (a) There shall be available on the diving platform or vessel a person other than the diving supervisor who shall have supplementary qualifications to enable that person to carry out the duties of a medical technician outlined in clause 808(3).
- (5) (a) Subject to this clause -

- (i) in every diving operation one member of the diving team who is a diver, other than the diving supervisor of that operation, shall be the stand-by diver;
  - (ii) unless otherwise approved, the stand-by diver shall be at all times in the immediate vicinity of the dive control station and be ready to dive immediately as required but may perform duties which do not prejudice the safety of any diver in the water; and
  - (iii) where a diving bell is being used, a stand-by diver shall remain in the bell to monitor the diver or divers who leave it and be in immediate readiness to assist them in an emergency.
- (b) During surface orientated diving operations, where two divers are in the water at the same time, one may act as stand-by diver for the other provided that both divers have -
- (i) visual contact with each other;
  - (ii) means to communicate with the surface; and
  - (iii) independent breathing medium supplies.
- (6) Nothing in sub-clause (5) shall prevent the stand-by diver or any diver, if instructed to do so by the diving supervisor, from going to the assistance of any other diver in an emergency.

Place from\*  
which diving  
is allowed

814\*

Diving operations shall be conducted only from -

- (a) a base established on land, a jetty, a platform or a vessel that is at anchor or aground or made fast to the seabed or a fixed structure -
  - (i) that is safe and suitable for the purpose;
  - (ii) on which the equipment necessary for the diving operations is kept; and

- (iii) that has suitable and safe means of access to and egress from the water for both working divers and any rescue or stand-by diver in an emergency; or
- (b) a dynamically positioned vessel -
  - (i) that is safe and suitable for the purpose;
  - (ii) that is maintained in position with adequate precautions taken to secure the safety of the divers from any dangers associated with the dynamic positioning system and the flow of water created;
  - (iii) that is approved for use in diving operations; and
  - (iv) that complies with the Guidelines for the Operation of Dynamically Positioned Diving Support Vessels.

Equipment\*  
inspection  
and approval

815\*

Diving operations at any one location shall not commence unless -

- (a) The specifications of the diving plant and equipment have been submitted and approved;
- (b) The diving plant and equipment have been inspected by an inspector at that location and have been approved prior to their initial use; and
- (c) Pre-dive function tests have been carried out on the diving plant and equipment prior to diving.

Medical\*  
examination  
of divers

816\*

Diving operations shall not be carried out unless each diver who dives in those operations -

- (a) has, within the period of 12 months before the commencement of those operations, undergone a medical examination by a medical practitioner referred to in clause 807 in accordance with the Schedule of minimum examination requirements specified in Australian Standard AS 2299;
- (b) has, after that medical examination, been declared in a certificate by endorsement in the divers log book given by that medical practitioner to be medically fit to dive; and
- (c) has not, since that declaration was made, knowingly ceased to be medically fit to dive.

Emergency\*

817\*

At least once during each calendar month emergency

drills

drills shall be carried out from each site of diving operations, and the results recorded on the diving operations record.

Decompression\* 818\*  
schedules

- (1) With the exception of saturation diving operations, diving operations shall not be carried out unless there is used in those operations a decompression schedule that contains an inert gas exposure limiting line, is recognised and approved by the Director, and used in accordance with sub-clause (2).
- (2) Where a diver is in a compression chamber and is subjected to pressure above normal atmospheric pressure -
  - (a) procedures for or in relation to decompression or the operation of a surface compression chamber shall be carried out by at least two of the following people - a diving superintendent, diving supervisor, life support technician or diver, one of whom shall be in charge of the operation and one of whom shall be in the immediate vicinity to assist.  
  
For the purpose of this sub-clause, during saturation diving operations the person in charge shall comply with sub-clauses 804(3) and (4).
  - (b) unless the diving supervisor is one of the persons carrying out the decompression procedures, one of the two persons required by sub-clause (2)(a) shall report immediately to the supervisor the occurrence of any abnormal event during the procedures.
- (3) Where a diver has carried out a dive using air as breathing medium and is required to carry out a subsequent dive (or dives) within a period of 12 hours after the commencement of the first dive, the bottom time for each subsequent dive shall be determined by adding, to its bottom time, the bottom times of all previous dives, and the depth to be entered into the decompression schedule in conjunction with that bottom time shall be the maximum of any dive so far carried out within that 12 hour period.

- (4) Where a diver has carried out a dive in which the limiting line (as determined by the decompression schedule used for that dive) was reached or exceeded, that person shall not commence another dive for a period of at least 24 hours after completion on the first mentioned dive. which a mixed gas breathing medium was used, that person shall not commence another dive within a period of 24 hours after completion of the first mentioned dive.
- (6) Where a diver has undergone saturation diving that person may not commence either surface oriented or bell-bounce diving within a period of 48 hours after the completion of decompression from saturation diving. The initial 24 hour period following that decompression shall be used to monitor the diver for any symptoms of decompression sickness and during this period that person shall remain within the vicinity of the compression chamber and not be subjected to more than light levels of exertion.
- (7) No diver shall undergo saturation diving for a period exceeding 28 days from the commencement of compression to the completion of decompression.
- Hours of\* duty 819\* (1) Subject to sub-clause (2), a person engaged in diving operations who is the diving supervisor, diver, diver's attendant, life support technician or systems maintenance technician shall not be on duty for more than 12 hours, either consecutively or in total during any period of 24 hours, not taking into account "handover" briefing periods required for safety reasons.
- Diving\* depths 820\* (1) Except in an emergency, surface-oriented diving operations involving the use of either air or mixed gas as breathing medium shall not be carried out at a depth exceeding 50 metres.
- (2) Except in an emergency, diving operations shall not be carried out at a depth exceeding 50 metres unless those operations involve the use of a diving bell and a suitable mixed gas breathing medium.
- (3) Diving operations shall not be carried out at a depth exceeding 300 metres without approval.
- Application\* for diving beyond 300 metres 821\* An application made to the Director for consent to the carrying out of diving operations at a depth exceeding 300 metres shall include details of -
- (a) the equipment proposed to be used;
- (b) the decompression schedules proposed to be used;

- (c) the therapeutic recompression treatment for decompression sickness proposed to be used; and
- (d) other procedures including emergency procedures proposed to be used.

Decompression* general	822*		A diver who has undergone decompression following a dive shall remain in the vicinity of the surface compression chamber for four hours after the completion of decompression.
Therapeutic* recompression procedures	823*		Where, in diving operations, therapeutic recompression procedures are followed, such procedures shall not be used unless they are procedures, recognised by the diving industry and approved by the Director, or are authorised by a medical practitioner referred to in clause 807.
Decompression* sickness	824*	(1)	Where a diver suffers decompression sickness as a result of carrying out a dive, that diver shall not commence another dive within 24 hours of completing the first-mentioned dive or therapeutic recompression, or such period as a medical practitioner referred to in clause 807 determines.
		(2)	<ul style="list-style-type: none"> <li>(a) Where a person has serious symptoms of decompression sickness, or has suffered a recurrence or relapse of musculo-skeletal decompression sickness, that required further recompression, a medical practitioner referred to in clause 807 shall be consulted as soon as possible and treatment of the person shall be continued under the supervision of the diving supervisor in consultation with that medical practitioner.</li> <li>(b) The person referred to in 2(a) above shall not carry out any further diving until that person has been examined and passed as fit to dive by a medical practitioner qualified in underwater medicine as referred to in clause 807.</li> </ul>
Flying* after diving	825*		Precautions shall be taken as far as practicable to ensure that the restrictions on elapsed time between completion of dives and commencement of flying are as given in Australian Standard AS 2299.
Diving in* current	826*		Diving operations shall not be carried out where the velocity of the water current or weather conditions are considered by the diving supervisor to be such that a diver is unable to carry out work safely.
Diving with* self-contained breathing	827*	(1)	Diving operations using self-contained breathing equipment shall not be carried out without approval.

equipment

- (2) Closed circuit self-contained pure oxygen rebreathing apparatus shall not be used in diving operations.

Diving with\*  
closed or  
semi-closed  
circuit  
rebreathing  
equipment

828\*

Diving operations using self-contained, closed circuit or semi-closed circuit rebreathing equipment shall not be carried out without approval.

Manned\*  
submersible  
craft

829\*

Manned submersible craft shall not be used without approval and shall be used in accordance with the Guidelines for the Operation of Manned Submersible Craft.

Diving\*  
from  
platforms

830\*

Where diving operations are being carried out from a platform, a person shall not -

- (1) where the dive being carried out involves decompression of the diver, dive from a platform on which drilling operations are in progress or from another platform within 500 metres of that platform if -
- (a) the depth of the well is within 30 metres of the predicted top of a hydrocarbon bearing zone; or
  - (b) after penetration of that zone the well has been found unstable following one complete circulation from bottom to surface; or
  - (c) the well is being perforated; and
- (2) where the dive being carried out involves decompression of the diver, unless otherwise approved, weld within 5 metres of any processing equipment that contains hydrocarbons, except that such welding operations are permitted where they are carried out in a pressurised enclosure or where the welding site and nearest processing equipment containing hydrocarbons are clearly separated by a solid plate deck or a continuous firewall;
- (3) carry out any activity at a place from which sparks or slag could fall upon any item of diving equipment being used for diving operations;

- (4) operate a crane or other equipment not associated with diving operations or carry out any activity if diving personnel or diving equipment engaged in or being used for the diving operations could be struck by any material moving or falling as a result of the use of the crane or other equipment or the carrying out of the activity;
- (5) transfer methanol, diesel fuel or other flammable or combustible substances between supply vessels and the platform;
- (6) where the dive being carried out involves decompression of the diver, carry out any wireline operations on the platform;
- (7) carry out operations associated with depressurising vessels or pipelines as a result of which hydrocarbons could be released on or near the platform;
- (8) detonate a charge underwater within -
  - (a) 2 km of the platform; and
  - (b) 8 km of the platform unless adequate notification to the person in charge of the diving operations has been given of -
    - (i) the type of energy source to be used, its frequency and intensity;
    - (ii) the times at which the energy source is to be used;
    - (iii) in the case of explosive charges any misfires; and
    - (iv) any other pertinent information; or
- (9) cause a vessel to approach or depart from that platform, or cause its propellers or thrusters to be engaged, without notifying the person in charge of diving operations.

Cathodic\*  
protection

831\*

Where diving operations are being carried out from a platform or within 20 metres of a platform, the person in charge of the platform is responsible for ensuring that the power supply to all impressed current cathodic protection equipment is supplied in accordance with the Guidelines for the Safe Use of Electricity Underwater.

Breathing\*  
medium  
quality

832\*

- (1) Diving operations shall not be carried out unless the breathing medium and unmixed pure components of breathing medium used in those operations are suitable for use at the depths and for the periods required in those operations and conform to the requirements of purity and composition as specified in Part A of Appendix 1.
- (2) Compressed air for breathing supplied by an air compressor shall not be used in diving operations unless, within the period of three months preceding the operations, the compressed air delivered by the compressor has undergone a test carried out in accordance with clause 801 that has shown that the compressed air satisfied the standard referred to in sub-clause (1).

Plant and Equipment Requirements

Suitability* of plant and equipment	833*	<p>All diving plant and equipment shall -</p> <ul style="list-style-type: none"> <li>(a) be adequate for the safe conduct of diving operations;</li> <li>(b) be properly designed in accordance with recognised codes of construction, of adequate strength and of good construction in accordance with sound engineering practice and from sound and suitable material;</li> <li>(c) be suitable for the conditions in which it is intended to be used, be properly maintained and comply with the requirements of clauses 840-845; and</li> <li>(d) where its safe use depends on the depth or pressure at which it is used, be marked with its safe working pressure or the maximum depth at which it may be used.</li> </ul>
Additional* requirements for plant and equipment	834*	<p>(1) Without limiting the generality of the requirements of clause 833, the diving plant and equipment shall -</p> <ul style="list-style-type: none"> <li>(a) include a means of supplying a breathing mixture (including a reserve supply for immediate use in the event of an emergency and for therapeutic recompression or decompression) - <ul style="list-style-type: none"> <li>(i) which is suitable in composition and temperature and of adequate pressure; and</li> <li>(ii) at an adequate rate -</li> </ul> <p style="margin-left: 20px;">to sustain a prolonged vigorous exertion;</p> </li> <li>(b) include a lifeline for each diver except where the nature of the diving operations renders a lifeline unsuitable, in which case an approved alternative system for ensuring the diver's safety is to be used;</li> <li>(c) subject to sub-clause (2), unless a diving bell is used in diving operations or the diver is lowered by a diver's stage or cage, include a shot-line of adequate strength and made of a suitable material of which, during ascent and descent, one end is attached to a fixed object at the surface and the other end to an object at the diver's work-site;</li> <li>(d) include a system enabling oral communication to be carried out between each diver and diving supervisor;</li> </ul>

- (e) where it is lifting and handling equipment used in or in connection with diving operations, comply with the requirements of Appendix 2;
- (f) where diving operations are carried out at a depth exceeding 20 metres or where decompression of the diver is required the equipment provided for that diving operation shall include a surface compression chamber with all necessary ancillary equipment, and the chamber and equipment shall comply with the requirements of Appendix 3 and Appendix 5 - Paragraphs 1 and 3.
- (g) where diving operations are carried out at a depth exceeding 50 metres, include a diving bell as required under sub-clause 820(2) which shall have all necessary ancillary equipment and shall comply with the requirements of Appendix 4;
- (h) where environmental conditions dictate, include an adequate means by which a diver can be maintained at a safe temperature;
- (i) include a dive control station which shall have all necessary ancillary equipment and shall comply with the requirements of Appendix 5 - Paragraphs 1 and 2.
- (j) where a surface compression chamber is used, include a decompression control station which shall have all necessary ancillary equipment and shall comply with the requirements of Appendix 5 - Paragraphs 1 and 3.
- (k) where saturation diving operations are being carried out, include a life support control station which shall have all necessary ancillary equipment and shall comply with the requirements of Appendix 5 - Paragraphs 1, 3 and 4.
- (l) include minimum first-aid equipment as detailed in Appendix 6; and
- (m) include for use by a diver during diving operations -
  - (i) a sharp knife to be carried in an accessible position at all times whilst diving;
  - (ii) a weight belt which shall not be of the quick-release type;

- (iii) a bail-out cylinder to be worn by the diver wherever practicable, the capacity of which cylinder shall be such as to allow the diver to swim in an emergency the maximum possible excursion length to the nearest independent breathing medium source;
- (iv) a lifting harness to be worn by the diver which operates on a pelvic rather than head-and-shoulders type lifting principle; and
- (v) approved head protection so as to prevent any injury caused by falling objects or other serious impacts.

- (2) Where the nature of the diving operation renders a shot-line unsuitable an alternative system for ensuring that the diver can safely reach and return from the work site shall be used.

Emergency\*  
plant and  
equipment

835\*

Without limiting the generality of the requirements of clause 833, the diving plant and other available on site equipment shall include equipment to be available for use in an emergency and in particular shall include -

- (1) such equipment as is necessary to provide an alternative and safe back-up means of recovering a diving bell from the seabed or underwater work-site to a mating position with a surface compression chamber;
- (2)
  - (a) for saturation diving operations, such equipment and back-up support as is necessary to allow all divers under hyperbaric pressure at any time to be evacuated under hyperbaric pressure from the location of the diving operations to a safe place where life support can be maintained and all divers safely decompressed to atmospheric pressure;
  - (b) for other than saturation diving operations, such approved equipment and back-up support as is necessary to allow all divers under hyperbaric pressure to be safely evacuated; and
- (3) such equipment in diving bells as is necessary as far as practicable to allow the lives of divers trapped in a stricken bell to be sustained for not less than 24 hours - and emergency procedures relating to the use of such emergency plant and equipment shall be included in the diving manual required under clause 809.

Breathing\*  
medium  
equipment  
- general

- 836\* (1) Compressed air for breathing supplied by an air compressor shall not be used in diving operations unless -
- (a) there is connected to the system supplying air from the compressor to the diver a pressure volume tank, a water and oil filter and where practicable a carbon monoxide filter; and
  - (b) the air intake from the compressor is located in a position in which it will not be affected by exhaust gases, sources of hydrocarbon or acetylene and in which it will take in only uncontaminated fresh air.
- (2) A cylinder filled with breathing medium shall not be used in diving operations unless -
- (a) it has been filled with and contains after filling only breathing medium satisfying the requirements of clause 832;
  - (b) approved procedures which comply with the requirements of Part B of Appendix 1 were used for the filling, gas testing and supply of the cylinder; and
  - (c) where the cylinder was filled on a platform, the filling was done under the supervision of a diving supervisor.
- (3) Pure oxygen shall not be used in diving operations unless -
- (a) in all pure oxygen supply lines only rising-stem-type valves, which have either metal-to-metal seats or seats of another material suitable for pure oxygen service, are used;
  - (b) stored pure oxygen is located as far as practicable away from equipment in which people may be subjected to hyperbaric pressure, from hydraulic equipment and any other flammable substance;
  - (c) where practicable, fixed rigid piping is used for oxygen supply;
  - (d) the oxygen supply pressure is reduced to a maximum of 4.1MPa (600 psi) gauge pressure at the supply cylinder; and
  - (e) care is taken to avoid sharp bends in all oxygen supply lines.

- (4) All breathing medium supply lines shall be arranged so as to ensure adequate protection against their accidental damage and to ensure adequate protection for personnel.
- (5) Any enclosed compartment in which large quantities of oxygen, inert gas or gas mixtures other than air are stored, shall be fitted with a visual and audible low and high oxygen content alarm device to provide warning that the atmosphere in the compartment is unsafe.

Breathing\*  
medium  
hoses

837\*

- (1) A hose shall not be used in diving operations for the conveyance of breathing medium unless -
  - (a) it has been tested not more than 12 months prior to those operations at a pressure equal to 1.5 times its maximum expected operating pressure;
  - (b) it is kink resistant;
  - (c) it is capable of carrying the breathing medium at a flow rate required in the operations;
  - (d) the hose and its couplings are in alignment;
  - (e) the couplings are not scoured or substantially corroded;
  - (f) the couplings contain no damaged threads;
  - (g) the hose fittings are made of brass, stainless steel, monel metal or other non-corrosive material;
  - (h) the fittings connecting the hose with other hoses are incapable of accidental disengagement or loosening; and
  - (i) it is, where practicable, of such diameter and has such type of connection as will minimise the possibility of wrongly connecting hoses and fittings.

Breathing\*  
medium  
supply

838\*

- (1) Diving operations shall not be carried out unless there is provided -
  - (a) a pressure reducing regulator to control the pressure at which breathing medium is supplied to a diver from a cylinder; and
  - (b) a means to allow ready changeover to an alternative pressure reducing regulator or an alternative breathing medium supply in case of failure of the primary pressure reducing regulator or the primary breathing medium supply.

- (2) The oxygen content of mixed gas breathing medium supplied to a diver shall be continuously monitored using an oxygen content analyser in conjunction with an audible and visible high and low oxygen content alarm.
- (3) Discrete inert gases or oxygen shall not be connected to a dive control panel nor supplied to any diver in the water.
- (4) With the exception of breathing medium supplied to a diver by the use of a gas recirculating unit involving gas reclaim, carbon dioxide removal and oxygen enrichment, breathing medium produced on-site by either a gas mixing apparatus or by a gas reclaim unit shall not be delivered to a diver without first being stored for at least 24 hours and then re-analysed.

Pressure\*  
measuring  
equipment

839\*

- (1) Diving operations in which surface supply breathing equipment is used shall not be carried out unless there are used in those operations -
  - (a) equipment to enable a person on the surface to ascertain at all times during which a diver is submerged, the depth of the diver;
  - (b) a gauge to enable a person on the surface to ascertain the pressure at which the breathing medium is supplied from on-line compressors or cylinders;
  - (c) a gauge to enable a person on the surface to ascertain the pressure at which the breathing medium is supplied to the diver;
  - (d) where a surface compression chamber is used, pressure measurement equipment and gauges as indicated in Appendix 3.
- (2) A gauge used in or in connection with diving operations shall -
  - (a) if used to measure the depth of the diver or the pressure in a diving bell or surface compression chamber, be calibrated uniformly throughout the diving plant in either metres head of sea-water or feet head of sea-water and in all other cases either in kPa, psi or bars;
  - (b) at least once in each period of three months, and whenever it appears to be incorrect, be checked by a dead-weight tester or suitable master test gauge;

- (c) if it is a master gauge, be calibrated at least once in each period of 12 months by a test carried out in accordance with clause 801; and
  - (d) if it is a dead-weight tester, be verified under, and in accordance with, the Weights and Measures (National Standards) Act 1960 of the Commonwealth of Australia.
- (3) A dead-weight tester or master gauge used for checking a gauge in accordance with sub-clause (2) shall be available to an inspector on demand.
- (4) A pressure gauge used in diving operations to measure diver, diving bell or surface compression chamber depth of sea-water or equivalent depth of sea-water at a given internal pressure, shall have an accuracy within 0.25% of the maximum scale reading.

Plant and Equipment Maintenance, Examination and Testing Requirements\*

Maintenance\*  
certification  
and  
documentation

840\*

Plant and equipment shall not be used in any diving operation unless -

- (a) it is regularly maintained in a condition which ensures that it is safe while being used;
- (b) in the case of a surface compression chamber, diving bell, associated trunking and other pressure vessels which form part of a diving system, it is certified in writing by a classifying authority or other verifying body in accordance with the rules of that authority pertaining to that equipment;
- (c) in the case of lifting or handling equipment used to raise or lower persons in the course of diving operations, it is certified in writing by a classifying authority or other verifying body in accordance with the rules of that authority pertaining to that equipment;
- (d) there is maintained a register containing -
  - (i) in the case of a surface compression chamber, other pressure vessels and lifting and handling equipment, the certificates referred to in paragraphs (b) and (c);
  - (ii) in the case of a surface compression chamber or a diving bell, sufficient information, including information relating to the materials used in its construction, to

enable it to be safely used, repaired and altered;

- (iii) in the case of all plant and equipment used in diving operations, a full schedule of all routine preventative maintenance to be carried out, which schedule has been signed or initialled as a mark of acceptance by the diving supervisor upon successful completion of any such maintenance; and
- (iv) in the case of all plant and equipment used in diving operations, a record of non-routine equipment maintenance or equipment replacement, which record has been signed as a mark of acceptance by the diving supervisor upon successful completion of any such work;
- (e) it has been examined and tested as necessary in accordance with a defined schedule of pre-dive checks within the six hours immediately prior to the commencement of operations.

Certificates\*  
of examination  
and testing

841\*

- (1) The certificates referred to in paragraph 840(d) shall state -
  - (a) the plant and equipment to which it relates;
  - (b) that the classifying authority or other verifying body or diving supervisor has examined it;
  - (c) that it has been tested by or under the close supervision of the authority, verifying body or supervisor issuing the certificate;
  - (d) the conditions under which it can be safely used; and
  - (e) the period during which it can be safely used.
- (2) The certificates referred to in paragraph 840(d) shall cease to be valid -
  - (a) when any repair or alteration has been made to the plant or equipment which affects its safe working; and
  - (b) on expiration of the period in accordance with sub-clause (1)(e).

Periodic\*

842\*

- (1) Subject to sub-clause 841 (2), the following

testing

testing requirements for equipment used in diving operations, including test frequency and minimum test certificate signatory requirements, shall apply -

- (a) for complete lifting and handling equipment upon installation and thereafter at least every 5 years a static overload test of 1.25 times and a dynamic overload test of 1.1 times the full weight of the equipment to be lifted including the expected weight of personnel during launch and recovery. The test certificates shall carry an approved classifying authority or other verifying body's signatures;
- (b) for main lifting wires of diving bells, diving stages and wet bells upon initial installation and thereafter at least every 6 months a destructive overload test on a section of the wire to determine that the breaking strength is at least 8 times the full weight of the equipment to be lifted including the expected weight of personnel during launch and recovery. The test certificates shall carry an approved classifying authority or other verifying body's signatures;
- (c) for swivels used on main lifting wires, including diving bell, diving stage and wet bell swivels -
  - (i) a visual examination for abnormalities at least every month, the records of which to carry the signatures of the diving supervisor;
  - (ii) a non-destructive test to detect any cracks or other abnormalities at least every year, the records of which to carry signatures of the diving supervisor; and
  - (iii) a non-destructive test to detect any cracks or other abnormalities at least every 5 years, the certificates of which to carry NATA signatures;
- (d) for all sheaves and lead-blocks -
  - (i) a visual inspection and lubrication as required at least every month, the records of which to carry the signatures of the diving supervisor;
  - (ii) a non-destructive test to detect any cracks or other abnormalities at least every year, the records of which to carry signatures of the diving supervisor; and

- (iii) for primary load bearing sheaves, a non-destructive test to detect any cracks or other abnormalities at least every 5 years, the certificates of which to carry NATA signatures;
- (e) for pressure vessels used as diving plant and equipment other than compressed air and hydraulically operated tools or fire extinguishers at least every 2 years a pneumatic pressure test at a pressure equal to 1.25 times or at least every 5 years a hydrostatic pressure test at a pressure equal to 1.5 times the working pressure, the certificates of which to carry the signatures of the classifying authority or other verifying body - pneumatic pressure testing shall not be carried out without approval;
- (f) for seamless gas cylinders an inspection and test in accordance with SAA AS 2030 Gas Cylinder Code, the certificates of which to carry NATA signatures -
  - (i) taken underwater at least every 2 years; and
  - (ii) not taken underwater at least every 5 years;
- (g) for air compressors for the supply of low or high pressure air breathing medium, at least every 3 months an analysis of the air from the compressor to determine compliance with clause 832 as to purity requirements specified in Appendix 1, Part A. The test certificates shall carry NATA signatures;
- (h) for breathing medium hoses at least every year, the records of which to carry the signatures of the diving supervisor - a pressure test on the hose at a pressure equal 1.5 times the maximum expected operating pressure as required by sub-clause 837(1)(a);
  - (i) for pressure measuring equipment -
    - (i) for working depth/pressure gauge at least every 3 months a calibration using a master gauge or dead-weight tester as required by sub-clause 839 (2)(b), the records of which to carry the signatures of the diving supervisor; and
    - (ii) for master depth/pressure gauge at least every year a calibration by a NATA approved testing laboratory as required by sub-clause 839 (2)(c); and

- (j) for complete diving bell ballast release systems a visual inspection at least every 3 months and a complete disassembly at least every year of all lifting links in the drop-weight attachment rigging including lifting slings, chains, shackles, pins, rings etc., the records of which to carry the signatures of the diving supervisor.
- (2) A reference in sub-clause (1) to a test is a reference to a test the procedures for which have been approved and which is carried out in accordance with those approved procedures.
- Retaining\* registers 843\* The register referred to in paragraph 840(d) shall be retained -
- (a) in the case of a register containing certificates relating to any surface compression chamber, diving bell or seamless gas cylinder not taken under water, for at least 5 years from the date of the last such certificate it contains; or
- (b) in any other case, for at least 2 years from the date of the last certificate it contains.
- Alterations\* to equipment 844\* A person shall not carry out any repairs, additions or alterations to diving plant or equipment other than of a routine nature which could affect its safe working without prior approval, and any repairs, additions or alterations are only to be carried out under the supervision of a classifying authority or other verifying body.
- Unattended\* equipment 845\* (1) A surface compression chamber or diving bell may be used for diving operations only if -

- (a) during the whole of the preceding 14 days it has been under the surveillance of divers or other persons competent to maintain the equipment properly; or
  - (b) in the event that it has been unattended for any part of the preceding 14 days, it has passed an internal leak test and pre-dive function tests prior to the initial recommencement of diving operations.
- (2) In sub-clause (1) an internal leak test means an internal leak test held for at least 30 minutes in which the test pressure is not less than the maximum pressure (gauge) equivalent to the maximum depth of dive in which the chamber or bell is or is about to be used.

#### Division 2 - Reporting and Data Submission

Reporting\*  
of death,  
serious  
injury and  
decompression  
sickness of  
divers

- 847\* (1) In this clause and clause 848 a reference to a serious injury is a reference to an injury to a person as a result of which the person requires immediate attention by a medical practitioner.
- (2) Where a person dies or suffers a serious injury while engaged in diving operations in the adjacent area -
- (a) a report of the death or serious injury shall forthwith be made to an inspector;
  - (b) a report in writing giving full particulars of the death or serious injury shall be transmitted to the Director as soon as practicable after the occurrence of the death or serious injury; and
  - (c) a person shall not interfere with the place of such death or serious injury without the approval of an inspector except only insofar as it is necessary for the purposes of providing for the immediate protection or saving of health or life.
- (3) Where a diver suffers from decompression sickness or any other adverse physiological condition as a result of exposure to higher than atmospheric pressure in the course of diving operations -
- (a) a report of the sickness or condition shall forthwith be made to an inspector; and

- (b) a report in writing giving full particulars of the sickness or condition shall be transmitted to the Director as soon as practicable after the occurrence of the sickness or condition, or the completion of treatment.

Written\*  
records of  
diver death,  
injury or  
decompression  
sickness

848\*

- (1) Where a diver during a diving operation dies or suffers any injury or decompression sickness, a written record of that death, injury or decompression sickness shall be kept and specify -
  - (a) particulars of death, injury or decompression sickness;
  - (b) the names of the supervisor, the divers and the divers' attendants and of any other person involved in activities directly relevant to the death, injury or decompression sickness;
  - (c) in respect of the dive, the times when the diver became exposed to pressure exceeding atmospheric pressure, when that diver commenced decompression, and when decompression was completed;
  - (d) the equipment used;
  - (e) the decompression schedule used;
  - (f) the breathing medium used by the divers;
  - (g) the work performed by the divers;
  - (h) details of unusual conditions (if any);
  - (i) the nature of the injury;
  - (j) the circumstances leading to the injury;
  - (k) the medical treatment given; and
  - (l) the names of medical practitioners consulted and who attended the injured diver.
- (2) Subject to the reporting requirements of clause 847, and not later than the 15th day of each calendar month, a copy of the records kept under sub-clause (1) of injuries which occurred during the preceding calendar month which have not been reported shall be transmitted to the Director.

- (3) A report in writing required under sub-clause (2) shall as far as practicable be made in accordance with the form specified in SAA AS 1885 Code of Practice for Recording and Measuring Work Injury Experience.
- Reporting of\*  
potentially  
hazardous  
events
- 849\*
- (1) Where an event occurs during a diving operation which is not in the normal or ordinary course of such an operation and which is professionally considered to be likely to cause injury to a person or serious damage to property, but such event does not cause injury or serious damage -
- (a) a report of the event shall forthwith be made by the titleholder to an inspector; and
- (b) a report in writing of the event shall be sent to the Director as soon as practicable specifying measures taken or to be taken to prevent such events.

## APPENDIX 1 - PART A\*

A\*

Clause 832 - Requirements as to purity and composition of breathing medium and unmixed pure components of breathing medium used in diving operations

- (1) Compressed natural air supplied by a low pressure air compressor used by divers for breathing in diving operations shall not -
- (a) contain more than 3 parts per million by volume of halogenated hydrocarbons;
  - (b) contain more than 5 parts per million by volume of -
    - (i) carbon monoxide; or
    - (ii) acetylene;
  - (c) contain more than 25 parts per million by volume of methane;
  - (d) contain more than 500 parts per million by volume of carbon dioxide;
  - (e) contain more than 20 milligrams of oil per cubic metre at 100 kPa; and
  - (f) have an objectionable or nauseous odour.
- (2) Compressed natural air supplied from a cylinder other than that supplied by a a low pressure air compressor used by divers for breathing in diving operations shall not have contamination levels higher than those specified in Table 1.
- (3) Compressed natural air used by divers for breathing in diving operations shall not contain less than 19.5% or more than 22% by volume of oxygen.
- (4) Pure unmixed components to be used for breathing medium in diving operations shall not have contamination levels higher than those specified in Table 1, and where these pure components are mixed to form breathing medium, then the maximum allowable contamination level in the mixture, where different levels are specified for a given contaminant, shall be the larger of the two levels listed in either pure component specification.
- (5) Allowable percentage composition tolerances for the mixture minor components are as follows:-

For the minor component content,

± 5% of nominal content of the minor component is allowed

eg. for 10% oxygen in helium

± 0.5% oxygen is allowed.

INSERT TABLE ONE HERE

APPENDIX 1 - PART B\*B\* Clause 836(2) - Requirements as to the filling, gas testing and supply of cylinders for the supply of breathing medium used in diving operationsGeneral

- (1) Under sub-clause 836(2)(a), a cylinder filled with breathing medium shall not be used in diving operations unless it is filled with and contains after filling breathing medium satisfying the requirements of clause 832 and as detailed in Appendix 1, Part A.

Testing of cylinders and gas in cylinders shall be carried out in accordance with the requirements of clause 801.

Design and Handling of Cylinders

- (2) All cylinders are to be manufactured in accordance with SAA AS 2030, Gas Cylinders Code and are to be subjected to periodic testing in accordance with sub-clause 842(1)(f).
- (3) All cylinders are to be colour coded and labelled in accordance with the requirements of SAA Rules for Gas Cylinders Identification and in particular Identification of Medical Gas Cylinders (AS1944). This applies to individual cylinders as well as to cylinders supplied as part of a multi-cylinder pack or unit whether individually or commonly manifolded.
- (4) In addition to the colour coding referred to above, and in accordance with SAA AS 2030, Gas Cylinders Code, Section 1.15 'Identification', each cylinder is to carry prominently a printed label, tag or other approved means of identification.
- (5) Each individually supplied cylinder or group of cylinders supplied as a unit is to be identifiable by a clearly visible and prominent mark or serial number.
- (6) Supplies of oxygen-medical and air-medical are to remain captive in diving and/or medical traffic only.

Supplies of all remaining gases not normally part of medical traffic are to be dedicated exclusively to diving traffic and are to be so marked in bold letters such as "DIVING ONLY"

Filling and Testing

- (7) All cylinders returned for filling (or re-filling) are to be vented to atmospheric pressure and evacuated to a pressure not exceeding 20 kPa absolute.

- (8) Analysis is to be carried out on the gas actually contained in a cylinder (or group of cylinders) and not on the gas upstream of the cylinder being filled, that is, before it reaches the cylinder.
- (9) Analysis is to be carried out as follows -
- (i) Every cylinder (including every individual cylinder within a multi-cylinder pack) is to be tested for carbon monoxide and odour contamination. These tests are 'on-site' tests and do not require NATA certificates;
  - (ii) Every cylinder of a gas or gas mixture containing oxygen (other than air) is to be analysed for oxygen content. These tests are 'on-site' tests and do not require NATA certificates;
  - (iii) In the case of 'G' size or equivalent cylinders supplied individually (and not commonly manifolded) one cylinder out of each batch of not more than sixteen is to be analysed comprehensively for impurities as required under clause 832 (and specified in Appendix 1, Part A) and the results are to be reported on a NATA endorsed test certificate (see point No 1) which specifies the serial numbers of the batch of cylinders concerned and the serial numbers of the cylinder from which the analysis was taken;
  - (iv) In the case of larger than 'G' size or equivalent cylinders supplied individually (and not commonly manifolded) and unless special dispensation to the contrary is applied for and given by the Director, each cylinder is to be analysed comprehensively for impurities as required under clause 832, (and specified in Appendix 1, Part A) and the results are to be reported on a NATA endorsed test certificate (see point No 1) which specifies the serial number of the cylinder from which the analysis sample was taken; and
  - (v) In the case of commonly manifolded 'G' size or equivalent or larger cylinders supplied as a composite unit, a composite representative sample of no more than 16 commonly manifolded cylinders is to be taken and analysed comprehensively for all impurities as required under clause 832, (and specified in Appendix 1, Part A) and the results are to be reported on a NATA endorsed test certificate (see point No 1) which specifies the serial numbers of all cylinders tested by the composite sample or the serial number of the framed bottle pack as appropriate (provided all cylinders within the pack contributed to the composite sample).
- (10) Any NATA endorsed composition analysis certificate applicable to a cylinder (or group of cylinders) is to accompany that cylinder to its user destination and is to be available to the user and to an inspector on demand for verification of the acceptability of the gas for use as diving breathing medium.

- (11) Attached to every individually supplied cylinder or to every commonly manifolded group of cylinders is to be a tag contained within a waterproof envelope which gives details of the mixture (or the pure component) supplied.

## APPENDIX 2\*

Clause 834(e). Requirements for lifting and handling equipment used in the course of diving operationsEquipment used for raising and lowering persons in diving operations

- (1) Lifting and handling equipment shall not be used in diving operations for the raising and lowering of persons unless -
- (a) if it is a winch -
    - (i) it is so constructed that the brake is automatically applied except when the controls are in the operating position; and
    - (ii) the winch, winch drum and wire on the winch drum are clearly visible to the winch operator when operating the winch;
  - (b) if it is a diving bell lifting winch, the lowering of the diving bell is controlled by its drive system and not by its brakes;
  - (c) if it is a diver's stage -
    - (i) it is sufficiently large to carry at least two divers and their associated tools in uncramped conditions and contains no equipment other than for diving;
    - (ii) it is suitably enclosed to prevent its occupants from falling out;
    - (iii) it is fitted with appropriate inboard handholds and is secured against tipping or spinning in a manner dangerous to its occupants;
    - (iv) it is fitted with an adequate reserve supply of breathing mixture to allow for the safe return of the diver; and
    - (v) where the distance between the diving platform and the water surface is greater than 3 metres, there is provided a diver's stage and stage handling system for the diver and the stand-by diver.
  - (d) if it is a lead-block or sheave -
    - (i) it has an internal diameter of at least 24 times that of the lifting wire passing through it; and

- (ii) it is equipped with a sheave restraint which is designed such that in the event of failure of the sheave, its lifting wire cannot move by more than one and a half times the internal diameter of the sheave;
  - (e) if it is a shackle, it is properly wired in the closed position when closed;
  - (f) in the case of a diving bell, a swivel is installed between its hull lifting point and main lifting wire;
  - (g) in the case of terminal wire rope connections, bull-dog grips are not used on any such connections where the wire is subject to other than purely static loads;
  - (h) where split pins are used as retainers on clevis pin or other similar connections, they are used in conjunction with castellated nuts; and
  - (i) suitable safety restraining harnesses are provided for and worn by all persons engaged in potentially hazardous rigging activities associated with diving bell launch and recovery such as -
    - (i) fitting and removal of chain-stops; and
    - (ii) attachment and removal of diving bell guide or cross haul wire end connections at the diving bell either before or after its deployment.
- (2) Equipment used for raising and lowering loads in diving operations

Lifting and handling equipment shall not be used in diving operations for the raising and lowering of loads unless -

- (a) there is a continuous means of communication between the winch or crane operator and the diving supervisor;
- (b) if it is a winch, the winch drum and wire on the winch drum are clearly visible to the winch operator; and
- (c) if it is a crane, there is provided an audible and visible alarm system to indicate to the crane operator when the wire on the winch drum is near to being fully unspooled.

## APPENDIX 3\*

Clause 834(f) - Requirements for surface compression chambers

A surface compression chamber shall -

- (1) comply with clause 833 and be certified by a classifying authority or other verifying body to be in accordance with the rules of that authority;
- (2) contain the first-aid equipment required under paragraph 834(l) (see Appendix 6);
- (3) have at least two compartments with doors each of which acts as a pressure seal and can be unlatched from either side ('a two-compartment chamber');
- (4) be equipped with suitable view-ports to enable a person outside the chamber to observe all occupants of each chamber lock as well as all measurement devices; and all ports are to be suitably located so as to -
  - (a) avoid physical damage caused by falling objects; and
  - (b) prevent damage caused by heat from any external light source shining through a port;
- (5) have sufficient space to allow all occupants expected to occupy it at any one time to move about and lie down comfortably as required; and if the chamber is to be used in circumstances in which a person is intended to remain inside under pressure for a continuous period of 12 hours or more, excluding therapeutic decompression it shall have a minimum internal diameter of 2 metres; and in all other cases it shall have a minimum internal diameter of 1.75 metres unless a smaller diameter is approved by the Director.
- (6) provide a suitable environment and suitable facilities for those who are to use it, having regard to the kind of operation in connection with which it is used and the period during which the pressure is raised; and in particular -
  - (a) overboard-dump mask breathing systems shall be provided for all occupants requiring oxygen-rich decompression or therapeutic treatment breathing mixtures;
  - (b) facilities shall be provided where necessary to minimise the noise inside the chamber during rapid pressurisation;
  - (c) adequate facilities shall be provided for heating, lighting and cooling; and

- (d) adequate sanitary facilities shall be provided, with particular care being taken in the design of any toilet system so as to prevent the possibility of a pressure seal being formed between the chamber interior and toilet bowl interior areas by any person using the toilet;
- (7) be so designed as to minimise the risk of fire; and in particular -
- (a) no chamber shall be fitted with electrical service connections that are physically capable of being wrongly connected;
  - (b) all motors installed inside a chamber shall be designed and operate so as to be safe and suitable for use in a hyperbaric environment;
  - (c) all electrical wiring and electric lighting installed inside a chamber shall be designed and operate so as to be safe and suitable for use in a hyperbaric environment;
  - (d) extreme care shall be exercised in the handling and piping of oxygen to and from a chamber; and particular care shall be taken to ensure -
    - (i) that oxygen delivery pressures to a chamber are suitably low and compatible with the design of the piping system in which the oxygen is transmitted;
    - (ii) that the valving and fittings used on oxygen lines are suitable and safe for the purpose;
    - (iii) that oxygen lines and fittings are kept clean and free from oil, dirt or other particulate matter; and
    - (iv) that only lubricants compatible with oxygen are used in oxygen service; and
  - (e) a means which is acceptable to the Director shall be provided in the chamber for extinguishing fires;
- (8) where through-hull penetrating connections are fitted -
- (a) have fitted manually operable override valves immediately on either side of fixed-rigid-piping hull penetrators;
  - (b) have electrical and communication wiring type hull penetrators of a design acceptable to the Director; and
  - (c) have clear identification labelling on both internal and external hull sides of all hull penetrators;
- (9) be equipped in an inner lock with such suitable medical support facilities as -

- (a) a device from which an intravenous drip can be suspended; and
  - (b) a suitable plug connection allowing an electrocardio-graph situated outside the chamber lock to be used on a person in the chamber lock;
- (10) be fitted with such valves, gauges and other fittings as are necessary to control and indicate the internal pressures of each chamber lock or trunking from outside the chamber; and in particular -
- (a) pressure gauges shall be calibrated uniformly throughout in either metres head of sea-water or feet head of sea-water;
  - (b) there shall be an alternative means to measure the pressure in each chamber lock or trunking in the event of malfunctioning of a primary gauge; and
  - (c) a suitable caisson pressure gauge, which can be read by a person inside the chamber lock and a person outside the chamber lock, shall be fitted internally in each chamber lock;
- (11) be equipped with -
- (a) a facility to enable a gas sample to be taken outside the chamber from each internal chamber lock; and
  - (b) such instruments or equipment fitted either internally or externally as will allow the measurement by a person outside the chamber of the content of oxygen and carbon dioxide in the internal chamber atmosphere;
- (12) be fitted with adequate equipment, including reserve facilities, for supplying and maintaining the appropriate breathing mixture at an adequate rate of supply to persons inside it;
- (13) be equipped with an effective means which includes a helium voice unscrambler as required, to enable communication between persons inside and outside the chamber;
- (14) be equipped with a suitable lock of diameter not less than 300 millimetres through which food and medical supplies can be passed into the chamber while its occupants remain under hyperbaric pressure;
- (15) if it is equipped for saturation diving -
- (a) have adequate environmental monitoring and control facilities including a back-up system to maintain adequate and safe environmental conditions if the primary control system malfunctions; and in particular environmental monitoring shall include the following:-

- (i) the continuous monitoring by a person outside the chamber of the temperature, humidity and oxygen content of the internal chamber atmosphere. The equipment for monitoring the oxygen content shall be fitted with an audible and visible high and low oxygen content alarm system;
  - (ii) the provision inside the chamber of environmental monitoring equipment or instruments to enable occupants of the chamber to monitor continuously its internal temperature, humidity and oxygen content; and
  - (iii) the provision, either at the chamber, at the life support control station or decompression control station, of environmental monitoring equipment to allow a person outside the chamber to monitor continuously its internal temperature, humidity and oxygen content and to measure its carbon dioxide content as required; and
- (b) have a suitable system for guarding against rapid depressurisation of a chamber should a rupture occur in a large diameter pipe connected to the chamber such as a pipe forming part of the reticulated environmental control piping.

## APPENDIX 4\*

Clause 834(g) - Requirements for diving bells

A diving bell shall -

- (1) comply with clause 833 and be certified by a classifying authority or other verifying body to be in accordance with the rules of that authority;
- (2) contain the first-aid equipment required under paragraph 834(l) (see Appendix 6);
- (3) be equipped with doors which act as pressure seals and which may be unlatched from either side;
- (4) have view-ports sited so as to avoid as far as possible physical damage and prevent heat damage from any external light source;
- (5) provide a suitable and safe environment for those who are to use it; and in particular shall provide -
  - (a) mask systems for all occupants through which either surface-supplied or on-board gas can be breathed;
  - (b) facilities where necessary to minimise the noise inside the bell during rapid pressurisation; and
  - (c) adequate facilities for heating and lighting;
- (6) be so designed as to minimise the risk of fire; and in particular -
  - (a) no electrical connections shall be physically capable of being wrongly connected;
  - (b) all motors installed inside a bell shall be designed and operate so as to be safe and suitable for use in a hyperbaric environment; and
  - (c) all electrical wiring and electric lighting installed inside a bell shall be designed and operate so as to be safe and suitable for use in a hyperbaric environment;
- (7) where through-hull penetrating connections are fitted -
  - (a) have fitted manually operable override valves immediately on either side of fixed-rigid-piping hull penetrators;
  - (b) have electrical and communication wiring-type hull penetrators of a design acceptable to the Director; and
  - (c) have clear identification labelling on both internal and external hull sides of all such connections;

- (8) be fitted with adequate equipment including reserve facilities for supplying the appropriate breathing mixture without interruption to persons occupying or working from the bell; and in particular -
- (a) as required under sub-clause 838(1)(b) the breathing medium distribution panel in the diving bell shall be designed so as to allow a change-over to an alternative breathing medium supply source;
  - (b) as required under paragraph 833(b), all piping systems, pressure regulators and other fittings associated with the supply and delivery of breathing medium shall be properly designed in accordance with recognised codes of construction, of adequate strength and of good construction in accordance with sound engineering practice and from sound and suitable materials and shall in addition be capable of delivery of breathing medium at adequate flow rates and pressures at all depths for which the diving bell is designed to be used;
  - (c) shall be equipped with such breathing supply manifolds and piping as will enable -
    - (i) the diver (or divers) and stand-by diver to breathe either surface-supplied or on-board cylinder supplied breathing medium; and
    - (ii) the stand-by diver to breathe from an independent supply source other than surface supply when the diver (or divers) is breathing either surface-supplied or on-board cylinder- supplied breathing medium;
  - (d) it shall be equipped with a suitable means for removal of carbon dioxide from its atmosphere; and
  - (e) it shall be equipped with adequate portable carbon dioxide and oxygen analysers for analysis of its internal atmosphere; and the oxygen analyser shall be calibrated in atmospheres partial pressure with a maximum scale reading not exceeding two atmospheres partial pressure;
- (9) be provided with a suitable sonar beacon and stroboscopic light or other acceptable system by which in the event of an emergency it can be rapidly located by rescue personnel;
- (10) be provided with a suitable means by which in the event of an emergency the lives of trapped persons can be sustained for at least 24 hours;
- (11) be provided with a through-water communication facility or other acceptable emergency means of conversation between occupants of a stricken bell and surface personnel;
- (12) be fitted with lap-type seat belts for all occupants;

- (13) be so designed that -
- (a) its main lifting wire is of adequate strength to withstand all static and dynamic loads likely to be encountered during diving operations and it shall have a maximum fully equipped weight including the expected weight of its occupants of not more than one eighth;
  - (b) if the main lifting wire parts causing the bell to come to rest on the sea floor or other obstruction, diver access to and from the bell through the bottom door is still reasonably available;
- (14) where drop-weights are fitted, have incorporated in their design -
- (a) a suitable means for prevention of their accidental disengagement; and
  - (b) adequate strength in the release mechanism and fittings for attachment of the drop-weight to the bell, such that the weight of the drop-weight shall be less than one tenth of the tensile breaking strength of the release mechanism and fittings for its attachment;
- (15) be equipped with emergency tools as required to enable -
- (a) deliberate severance of the main lifting wire; and
  - (b) emergency repairs inside the bell to be carried out;
- (16) be used in association with lifting gear which in an approved manner enables the bell to be safely lowered to working depth, maintained at that depth and returned to the surface without excessive lateral, vertical or rotational movement;
- (17) be provided with a means by which, in the event of failure of the main lifting gear, the diving bell can be returned to a mating position with a surface compression chamber;
- (18) have pipe systems, fittings or tubings carrying pure oxygen which are suitable for oxygen service and which have been thoroughly cleaned by an acceptable method to enable them to be safely used for oxygen service;
- (19) be fitted with lifting equipment sufficient to enable an unconscious or injured diver to be hoisted into the bell by a person inside it;
- (20) in the case of umbilicals and umbilical connections to the bell-
- (a) subject to (e), not have diver umbilicals longer than 40 metres fitted without approval;

- (b) have adequate, waterproof labelling or tagging fitted to divers' umbilicals which specifies their age and date of their last pneumatic pressure or other test;
  - (c) be equipped with a suitable means for preventing undue weight being placed on the umbilical connections at the bell hull;
  - (d) be equipped with suitable screwed or other acceptable external hull connection fittings, such that umbilical lines can be readily re-connected or disconnected underwater in an emergency; and
  - (e) have a stand-by bell diver's umbilical at least 2 metres longer than that of the working diver;
- (21) be equipped with such valves, gauges and other fittings (which are to be made of suitable materials) as are necessary to control and to indicate to the diving supervisor and bell occupants the pressure within the bell; and in addition, there shall be means provided for -
- (a) a person on the surface to ascertain the pressure at which the breathing medium is being supplied to the bell and the external pressure acting on the bell; and
  - (b) a person inside the bell to ascertain the pressure at which breathing medium is supplied to the bell, the pressure at which on-board gas is supplied to the bell and the external pressure acting on the bell;
- (22) be equipped with -
- (a) an internal valve of a type that will enable a person inside the bell to de-pressurise the bell in an emergency, that is, a valve fitted with a spring or other fail-safe device which requires it to be continuously held in the open position in order to prevent its otherwise automatic closure; and
  - (b) an external valve of a type that will enable a person outside the bell to pressurise or de-pressurise the bell in an emergency, and a corresponding valve on the inside of the bell hull fitted in such a way as to prevent its inadvertent or accidental closure;
- (23) be equipped for attachment between the bell and surface compression chamber a mating mechanism which is designed to ensure it cannot be mistakenly disengaged where this could cause rapid, uncontrolled depressurisation of the bell or any surface compression chamber forming part of the chamber complex to which the bell is attached;

- (24) be equipped with an effective means which includes a helium voice unscrambler as required, to enable as far as practicable clear and interference-free oral communication between the diving supervisor and divers engaged in bell diving operations; and
- (25) be clearly visible to the lifting winch operator during the above-water phases of bell launch and recovery.

## APPENDIX 5\*

\*1. Clause 834(i), (j) and (k). Requirements for dive, decompression and life-support control stations in diving operations

Where a dive, decompression or life support control station is situated in an enclosed area, the enclosure shall be equipped with -

- (a) an audible and visible high and low oxygen content alarm system;
- (b) a suitable and effective air conditioning or ventilation system; and
- (c) a self-contained or other cylinder-supplied, full-face-mask breathing system to allow a person or persons in charge of a dive, decompression or life support control station to maintain their position in the event of smoke or toxic gases making the station otherwise not habitable.

\*2. Clause 834(i). Requirements for a dive control station

The Dive Control Station shall be set aside as a single, designated location which shall be as far as practicable adjacent to where a diver enters the water and from which the diving supervisor can continuously supervise, monitor and direct the control of all systems and functions which relate to the life support and safety of a diver in the water. In particular, the equipment forming part of a dive control station shall include instruments which readily allow the diving supervisor to monitor, direct and control on a continuous basis the following:-

- (a) in relation to a diver's breathing medium -
  - (i) its supply to the Dive Control Station;
  - (ii) its oxygen content and wherever a reclaim recirculation unit is involved, its carbon dioxide content; and
  - (iii) its delivery to the diver;
- (b) the pressurisation of -
  - (i) a diving bell;
  - (ii) umbilical hoses to a diver engaged in surface-oriented diving operations or to a diving bell; and
  - (iii) any transfer-under-pressure locks and trunkings;
- (c) a diver's depth and the internal and external pressures acting on a diving bell and its occupants;
- (d) any heating, cooling or other environmental control systems as required; and
- (e) all radio, telephone or other verbal communications associated with the diving operation being supervised.

















- (c) the storage depth, excursion depth and duration of excursion;  
and
- d) the compression and decompression Schedule or Table used.