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CHAPTER 58 - OFFSHORE INSTALLATION MANAGER (OIM), MODU/INLAND

PART I - GENERAL REQUIREMENTS OF APPLICANTS

- 58.1 (1) Every applicant for a certificate as Offshore Installation Manager, MODU/Inland, shall:
- (a) subject to subsection (2), complete 12 months service as follows:
 - (i) a minimum of six months service on a MODU as a barge supervisor while holding a certificate as Barge Supervisor, MODU/Inland;
 - (ii) the remaining time made up of any combination of service as a watchkeeping mate or engineer, maintenance supervisor, tourpusher or toolpusher; and
 - (iii) the service referred to in paragraph (a) shall include:
 - (A) assisting in at least 20 cargo-transfer operations at sea between a MODU and a supply ship of which not less than two shall have been observed from the supply ship; and
 - (B) assisting in at least four complete relocation moves of a MODU/Inland;
 - (b) obtain a medical certificate prescribed in the Crewing Regulations;
 - (c) obtain a certificate of completion for each of the following courses from a school listed in TP 10655:
 - (i) Marine Emergency Duties Course, set out in TP 4957:
 - (A) Survival Craft (B1);
 - (B) Marine Fire Fighting (B2);
 - (C) Officer Certification (C); and
 - (D) Senior Officer (D);
 - (ii) Marine First Aid Advanced Course, set out in TP 13008; and
 - (iii) Mobile Offshore Drilling Unit Course, set out in TP 10937:
 - (A) Advanced Drilling;
 - (B) Second Line Supervisor functions, Offshore Well Control; and
 - (C) Basic Offshore Survival;
 - (d) pass a written examination in each of the following:
 - (i) MODU Management;
 - (ii) Rig Construction; and
 - (iii) subject to subsection 58.2, Engineering Knowledge; and
 - (e) pass an oral examination in General Seamanship.

PART II - EXAMINATIONS

58.2 The following table indicates the examinations for the Offshore Installation Manager Certificate, the qualifying service required before each may be attempted, and other requirements.

Examinations	Qualifying Service While Holding a Barge Supervisor MODU Certificate	Other Requirements
95 M MODU Management	NIL	
125 M Rig Construction	NIL	
135 M Marine Engineering* Knowledge	NIL	
165 C General Seamanship	12 months	All other exams must have been passed.

*Holders of a Marine Engineers Certificate may be exempted from the requirement to pass 135 M.

PART III - VALIDITY OF CERTIFICATE

58.3 The OIM, MODU/Inland, Certificate has validity as offshore installation manager of any MODU/surface or self-elevating unit while the unit is secured or positioned on location on inland waters for the purpose of conducting drilling operations or is in transit under the charge of a towing vessel, provided that such certificates granted without geographical restriction are also valid as the person in charge of a navigational watch when the unit is in transit.

PART IV - SYLLABUSES OF EXAMINATIONS

58.4 MODU Management

Examination number 095 M


ITEM	COLUMN
1.	Business and Law The provisions of the <i>Canada Shipping Act</i> relating to ship safety, ship registration, ship manning, seafarers' rights, pollution and protection; certification of seafarers; accident investigation; use of councillors' offices; engagement and discharge of personnel, inside and outside Canada; maintenance of discipline; port wardens and steamship inspectors; limitation of liability; provisions, health and accommodation; <i>Pilotage Act</i> ; pilotage; coasting trade, coasting licences and regulations; customs and immigration procedures; <i>Carriage of Goods by Water Act</i> ; control of ships and Canada's international obligations, <i>Canadian Labour Code</i> , hazardous goods regulations.
2.	Contracts Marine insurance; charter parties, deviation and its effect on various contracts; function of ship's agents; OIM's responsibilities in the event of salvage and salvage agreements; business aspects of putting into port with damaged ship or cargo; noting and extending protest.
3.	Management General organization of MODU and ship's management; MODU and shipboard accounting; procurement of stores; entering and clearing ships in foreign ports; sick seafarers in foreign ports; personnel training; union representation; putting into port with damaged ship or cargo.
4.	Conventions Function and jurisdiction of International Maritime Organization, International Labour Organization, Safety Of Life at Sea, Standards of Training, Certification and Watchkeeping for Seafarers, 1978; Antwerp Rules; United Nations Convention on Trade and Development; Tonnage Measurement, 1976; tonnage rules for coasting; Suez and Panama rules; articles, regulations and resolutions; MARPOL.
5.	Regulations Shipping Casualties Reporting; Vessel Traffic Reporting Systems; Foreign-Going, Home-Trade, Inland Waters and Minor Waters Voyage; Potable Water; Medical Examination of Seafarers; Quarantine; Ship's Crew's Food and Catering; Inspection Certificate for Non-Convention Ships; Safety Certificate; Oil Prevention; <i>Canada Labour Code</i> Part II pertaining to marine; MODU's obligation and responsibilities in the event of emergencies, collision, distress, search and rescue; legal consequences of infractions of regulation.

Note: The examination consists of written descriptive questions.
Duration is three and a half hours.

58.5 Marine Engineering Knowledge

Examination number 135 M

ITEM	COLUMN
1.	Steam Boiler Principles of combustion, fuel burning methods and arrangements, manual and automatic controls, steam generation up to the delivery of steam in the superheated state, the closed-feed system, boiler construction including mountings and associated auxiliaries, an appreciation of maintenance, the use of heaters and economizers, auxiliary and domestic boilers.
2.	Internal Combustion Engines Principles of operation of two- and four-cycle and opposed-piston engines; ignition of fuels in diesel engines, effects of turbocharging; cooling and lubricating systems associated with main engines; effect on engine of sub-zero air temperatures; control arrangements, reversing, auxiliaries associated with main diesel units, and diesel electric propulsion.
3.	Pumps Types of reciprocating, rotating and screw pumps; circulation systems for vessels operating in ice.

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4.	Piping and Pumping Arrangements Bilge, ballast, cargo, fuel and fire systems; high- and low-level intakes; overboard discharges; hull fittings; special arrangements for navigating in ice.
5.	Drive Systems Thrust and trailing blocks, reduction gearing, electromagnetic coupling or hydraulic coupling for two or more engines on one shaft, flexible couplings; reduction gears, table drives; hydraulic motors and valving.
6.	Transmission of Heat Principles of transmission of heat; refrigeration and insulation.
7.	Remote-Control Systems Principles of operation of remote-control systems; types of control transmission, pneumatic, electric, hydraulic, data logging, alarm and fail-safe systems, bridge-control systems, basic computer concepts as found on ships.
8.	Hydraulic Systems Hydraulic systems on board ship; block diagrams of system; characteristics of fluids; storage of fluids, contamination of fluids; safety in operation; prevention of water contamination and saltwater corrosion.
9.	Shaft Vibration and Critical Speed Causes and effects of shaft vibration, propeller cavitation, relationship between vibration and critical engine speed, effect of draft and trim, effective remedies, reasons why engine should not be operated within a critical speed range.
10.	Venturi System Principle, use and limitations for ventilation, ejectors and syphons.
11.	Air Receivers Periodic internal cleaning, cleaning materials to avoid and why, mountings fitted, inspection and testing, certificate.
12.	Engine Power Calculation of power (diesel); reasons for loss of power in individual cylinders of a diesel engine; effect of power imbalance and how corrected (diesel); effect on power by quality of fuel; energy management.
13.	Propellers Advantages and disadvantages of fixed, controllable-pitch, and shrouded propellers.
14.	Electrical Units Electric potential, potential difference, units and dimension.
15.	Electric Circuit Resistance, its definition, units and dependence on temperature and dimensions of conductor; Ohm's law, effective resistance of groups of resistances connected in series and in parallel; potential-difference batteries, principles of primary cell and secondary cell, lead-storage battery, specific gravity of the electrolyte of cell, charging a battery, general care and maintenance; alkaline cell; nickel-iron cell; cells connected in series and parallel.
16.	Kirchhoff's Law Statement of Kirchhoff's law with calculations involving their application in series and parallel DC circuits.
17.	Power Definition and dimension of power in an electric circuit, statement of joule's law with calculations.
18.	Alternating Current Definition of alternating current and meaning of cycle, sinusoidal wave form, frequency and period, peak value, RMS and average value per half cycle of an alternating current, arithmetic relation of each to value of a direct current of equal power; the purpose for which knowledge of RMS values are required and the purpose involving peak values; ratio as the form factor, and the value of this ratio for a sine wave.
19.	AC Circuits Electrical terms used with AC circuits, including inductive impedance, capacitive impedance, reactance, admittance, susceptance; capacitors in series and parallel; capacitance, its units and dimensions, calculations of equivalent capacitance of capacitors connected in series and in parallel; leading and lagging power factor, apparent power, reactive power, series and parallel resonance, phase angle, current leading and lagging voltage; calculation of series and parallel circuit parameters, combinations of resistance, capacitance and inductance; determination of resonant frequency; calculation of the power factor of a complex circuit.

20.	<p>Alternators</p> <p>Production of an EMF in a conductor as a consequence of the relative motion of the conductor in a magnetic field altering the flux linkages; direction of the induced EMF as determined by Right Hand Rule; relationship between speed, number of poles and frequency; operation of a simple alternator with production of a sine wave EMF; construction of large alternator of rotating field type; diagram illustrating the important features; magnetic circuit and the method of supplying current to magnet coils; importance of reducing magnetic reluctance at the air gap and how achieved; effect of shaped pole facings on the shape of the EMF curve generated; deleterious effects of eddy currents in the armature and method of reducing these currents; inductor-type alternator; diagram showing position of the armature winding and the field magnet winding and shape of the rotor, polyphase alternator, three-phase generator, advantages of polyphase generator, connection of the three phases in a star or delta with consequent differing line voltages and currents.</p>
21.	<p>AC Motors</p> <p>Characteristics of AC motors without commutators as fundamentally single-speed machines; induction motor; constructional details of a large-size machine with stator carrying polyphase winding connected to the supply; speed characteristics with explanation of the existence of slip; rotor speed being less than synchronous speed; synchronous motor; advantage of this motor where constant speed with no slip is desirable, method of starting and the consequences of switching on the three-phase supply before the motor rotates at the supply frequency, method of exciting the magnetic field; use of this motor to compensate for excessive inductance, reactance and thus improve the power factor.</p>
22.	<p>Transformers</p> <p>General construction and elementary principles; functions performed by a power transformer with diagram identifying the parts, including the magnetic flux circuit and the primary and secondary windings; transformation ratio and the effect of a primary EMF on the secondary when the latter is on open circuit; no load current of a transformer, its components and the phase relation of each to the applied voltage; the effect of the secondary being put on load, including the changes that take place in magnetic flux in currents in the primary, secondary; effect on the power factor of the nature of load, resistive or reactive; arrangements for dissipating the heat generated in core and winding of large transformers.</p>
23.	<p>Unit Generation and Distribution System</p> <p>Diagram of the electrical installation on a modern unit identifying the various components, including the generating machines, distribution, safety devices, circuit breakers, grounding of machines, general layout; switch gear, motor starters, circuit breakers, tracing systems and arrangement of other appliances.</p>
24.	<p>Measuring Instruments</p> <p>General knowledge of the use and principles employed by common measuring instruments found on board a unit; moving coil-type ammeter and voltmeter, essential features with sketch showing the moving coil and the field of comparative high flux of a permanent magnet ensuring a uniform torque, the manner of providing a control torque, connections of the instrument as an ammeter and as a voltmeter; moving iron-type ammeter and voltmeter, main features with sketch of the attracted iron or repulsion-type arrangement by which the soft iron experiences an attraction or repulsion and so moves the pointer over the scale; method of providing a control torque, availability of this instrument for AC measurements, lack of uniformity of the scale; wattmeter, general method of measuring power in an AC circuit with details of connections; megger, type of measurement made by this instrument, principle employed, components of the measuring system, the direction of the coils as mounted and when in equilibrium position at test, the generation of the testing current, method of balancing the bridge.</p>

Note: The examination consists of descriptive questions that permit the applicant some options.
Duration is three and a half hours.

58.6 Rig Construction

Examination number 125 M

ITEM	COLUMN
1.	Mobile Offshore Drilling Unit Construction Basic construction of principal MODU types, including construction of: columns, drilling derrick, pontoons (footings), tubulars, deck houses, main and pipe decks, helicopter deck, ballast tanks, drilling well (moon pool), watertight doors, hatches; pressure vessels; location and extent of watertight bulkheads and flats; stiffening arrangements of watertight and tank-boundary bulkheads, including those made of corrugated plating.
2.	Construction Portfolio Contents, including: general arrangement, inboard and outboard profile, arrangement showing watertight compartments, decks and load density plans including helicopter deck, transverse section showing scantlings, longitudinal section showing scantlings, framing, shell plating, bulkheads (watertight), structural and tanks showing location of air pipes and overflows, watertight doors and hatches, and capacity plans.
3.	Structural Strength Stresses to which a MODU is subjected; minimizing of concentrated stress; structural strengthening to compensate for stress in areas of anticipated failure.
4.	Welding Welding criteria for new construction and repair; acceptable welding procedures and inspecting methods; welding methods and materials, preparation of surfaces, atmospheric and gas-free conditions suitable for welding, sequence used in production welding to minimize shrinkage, types of welds, advantages and shortcomings of various welding types; conditions suitable for welding.
5.	Corrosion Corrosion-control arrangements and their effect on scantlings during construction if provision is not made for effective implementation of such arrangements.
6.	Testing and Inspection Methods of testing of tanks, bulkheads, other watertight or oiltight work, pressure vessels of various types; inspection and repair (major, minor) procedure to maintain a MODU in compliance with regulatory requirements; requirements and preparation for statutory surveys and inspections; classification societies and advantages of classification; docking and inspection procedures, periodic and annual inspection programs; non-destructive testing/inspecting; underwater cleaning techniques; underwater inspection methods and programs; quality assurance and preventative maintenance system.
7.	Documentation Compiling damage and defect reports; IMO Code for the construction and equipment of a MODU and Canadian standard (TP 6472); contents and use of construction portfolio; contents and use of marine operations manual; application of loadline regulations to the principal type of MODUs, surface and column-stabilized.
8.	Watertight Integrity and Damage Control Ballast piping, pumping and control systems, bilge piping, pumping deck and rig floor-draining systems; maintenance of fire integrity on a MODU; definition of various hazardous zones; access and ventilation conditions affecting the extent of hazardous areas.

The examination will consist of nine questions of which the applicant shall answer six. The examination may include calculations, sketches, and written description and multiple-choice questions. A question may consist of several parts.
Duration is three and a half hours.

58.7 General Seamanship
Examination number 165 C

ITEM	COLUMN
1.	Machinery Use and care of electric and hydraulic winches, ordinary and self-tensioning; windlasses and capstans; main and emergency steering gears associated with MODUs; electric and hydraulic deck cranes; elevators for personnel, stores and equipment.
2.	Voyage Preparation Manoeuvring a MODU under power; preparations for getting underway; planning for a towed voyage; preparing and inspection of towing equipment; securing towing vessels; the use, handling and securing of towing units; getting underway under tow; communicating with tug masters; authority of OIM when MODU is under tow.
3.	Anchoring Manoeuvres and cable handling involved in the use of ground tackle and ancillary equipment, including the use of anchor buoys; planning an anchor pattern; deployment of anchors with and without anchor-handling vessels; communication with anchor-handling vessels; clearing a foul anchor; hanging off an anchor; securing anchor gear in preparation for sea passage; use of anchors in emergency, to take way off; anchor and cable stowage, fittings and cable markings.
4.	Mooring Lines Use, care and stowage of mooring lines, comprising: types of line used for mooring and their characteristics; the names of the various mooring lines; making fast supply vessels; emergency cast-off procedures; the use of mooring wire-rope reels; types of fairlead, their construction, naming and use.
5.	Stowage and Handling Working of stores and equipment, comprising: mate's responsibilities in transfer of cargo, stores and personnel to and from supply vessel; inspections of holds, decks and spaces to receive goods; preparation and operation of cranes; arrangements and working of heavy lifts by ship equipment and lifts that cannot be handled by a single runner; the overhaul and regular inspections of lifting gear.
6.	Organization MODU routine and organization, comprising: the OIM's executive and organizational duties; crew watches direction of work; drawing up emergency muster lists with appropriate duties for crew members; the organizational duties for fuelling, storing or ballasting in all conditions; the OIM's duties concerning the official logbook, entries in the deck log and owner's or charter's records; the OIM's duties when repair, alteration or maintenance work is being carried out; the OIM's duties when preparing MODU for sea; the OIM's duties and responsibilities on joining a MODU; the necessary paperwork or documentation to encompass the foregoing items, where applicable; control room and deck discipline, organization and routine under all circumstances; steering orders and responses; maintenance of a proper lookout; duties and responsibilities of the OIM, officer of the watch, ballast control and other bridge personnel (jointly and separately); the purposes, necessity and general content of standing orders, night orders, bridge or movement book, ship's logbook and similar material; anchor watch duties and responsibilities; means of assessing a tendency to drag anchors; arrangement and responsibility of departments aboard ship.
7.	Pollution-Prevention Management Duties related to loading, transfer and storage of pollution responsibilities under oil pollution-prevention regulations and MARPOL; response to a pollution incident; identification of pollutants; obligation to prevent pollution.
8.	Emergency Response Emergency duties and responsibilities for equipment, comprising: the organization, frequency and routing of fire patrols under routine and exceptional conditions; recognition and assessment of fire hazards; importance of cleanliness and good housekeeping; organization of realistic fire drills, training of crew for emergencies; taking charge of marine emergencies; inspections, testing and maintenance of portable and fixed firefighting equipment; organizations of realistic boat and lifesaving appliance drills, training of crew in use of lifesaving appliances and man-overboard drills; stowage, inspections, testing and maintenance of lifeboats, capsules, rafts and their equipment, lifejackets, immersion suits, lifebuoys, self-igniting lights and distress signals; taking charge of the launching of boats, rafts and capsules; assessing damage and flooding in cases of collision or stranding; search and rescue procedures, including a knowledge of AMVER, MERSAR, and TC publications.

9.	Personnel Documentation Rights and privileges of certificates of competency limited to MODUs; certificated personnel required; general manning required to meet safety requirements.
10.	Collision Avoidance Collision Regulations and their intent, ship routing, MODU safety zone; <i>Notices to Mariners</i> concerning MODU locations.
11.	MODU Underway MODU handling in a seaway; transverse thrust and its effect; wind effects on a MODU; how to heave to anchoring in a tide, current, or wind; manoeuvring characteristics of other types of vessels; stern power and its effect; the handling characteristics of tugs and problems of towing vessels; turning and manoeuvring in a channel; docking problems; close-quarters situations at anchor and underway.
12.	Rigging and Cordage Rigging of MODUs, comprising: the names, purpose, and construction of standing and running rigging, drilling, derricks, burner booms and geronimo rigs; basic knotting, gripping and splicing with reference to current practice, seizing, rackings, frapping, and stoppers; reeving of blocks and purchases, rigging of stages and bosun's chairs; rigging of booms and hoses.
13.	Duties of Marine Crew Action required of the officer of the watch in emergencies at sea when underway and on location, comprising: man overboard; running aground; collision; sighting of derelicts; sighting or receiving distress signals; breakdown of navigational aids or equipment; power failure; capsizing of tugs when under tow or manoeuvring; tending of anchors; routine and exceptional fire patrols and inspections; action on discovery of fire aboard; precaution when taking on or transferring fuel, water or stores; safe working practices in the protection of crew members; parted supply boat moorings, burst oil lines, tank overflow; actions required when a passing vessel is approaching on a close-quarters course; accidents to any person on board including collapse of a crew member in a tank or other confined space.
14.	Terminology and Identification Anchors and associated equipment, comprising: construction and names of the parts of stocked and stockless anchors; chain cable and shackles; chain-cable markings and reporting; cable stowage; combination wire and chain cables; wire cables; stowage of wire cables; securing devices; manual and automatic tensioning devices; emergency releasing arrangement; fittings between cable locker and hawse pipe; common terms used in anchor work; terms associated with lead of cable; anchoring in shallow or deep water; anchoring in an emergency; heaving up and securing cable; terms pertaining to a MODU at anchor.

The examination is taken from the syllabus for the examinations for Watchkeeping Mate, MODU, and First Mate, MODU.

The applicant is expected to have a deeper understanding of the intent and interpretation of the Collision Regulations as demonstrated by examination 062, which is supplemented here by oral questions and demonstrations.