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CHAPTER 60 - WATCHKEEPING MATE, MODU/INLAND

PART I - GENERAL REQUIREMENTS OF APPLICANTS

- 60.1 Every applicant for a certificate as Watchkeeping Mate, MODU/Inland, shall:
- (a) complete 18 months service as follows:
 - (i) a minimum of six months sea service as deck rating, driller, engine-room rating or engineer on watch on a MODU/inland; and
 - (ii) the remaining time made up of any combination of service as a deck rating, driller, engine-room rating or engineer on a MODU;
 - (b) obtain a medical certificate prescribed in the Crewing Regulations;
 - (c) obtain a Restricted Operator Certificate (ROC) with Marine Qualifications issued by Industry Canada;
 - (d) obtain a Marine First Aid Advanced Certificate on completion of a course set out in TP 13008,;
 - (e) obtain a certificate of completion for each of the following MODU courses, set out in TP 10937:
 - (i) Hydrogen Sulphide Alive (H₂S);
 - (ii) Stability for Surface or Self-Elevating Units, as applicable; and
 - (iii) Basic Offshore Survival;
 - (f) pass an examination in each of the following subjects:
 - (i) Communications;
 - (ii) Chartwork and Pilotage;
 - (iii) Navigation Safety; and
 - (iv) General Rig Knowledge; and
 - (g) pass an oral examination in General Seamanship.

PART II - EXAMINATIONS

60.2 The following table indicates the examinations for the Watchkeeping Mate, MODU/Inland, Certificate, the qualifying sea service required before each may be attempted, and other requirements.

Examination	Qualifying Service	Other Requirements
012 Communication	NIL	NIL
041 Chartwork and Pilotage	12 months	NIL
061 Navigation Safety	18 months	NIL
151 M General Rig Knowledge	12 months	NIL
165 A General Seamanship	18 months	All other exams must have been passed.

PART III - VALIDITY OF CERTIFICATE

60.3 A Watchkeeping Mate, MODU/Inland, Certificate has validity as third or second mate of a MODU/surface or self-elevating on site or under tow on the inland waters of Canada.

PART IV - SYLLABUSES OF EXAMINATIONS

60.4 Communications


Examination number 012

ITEM	COLUMN
1.	Visual The recognition of letters and numerals sent by flashing light or sound in Morse code, International Code Flags, meaning of single-letter International Code; coding and decoding of messages sent by flag, Morse and voice procedures using the International Code of Signals.
2.	Radio The use of radio aids to marine navigation for ascertaining facilities and services.

Note: The examination consists of:


- (a) reading Morse flashing light at a speed of four words per minute;
- (b) satisfying the examiner of ability to send Morse by flashing light; and
- (c) a multiple-choice test on the remainder of the syllabus.

Duration as necessary.

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60.5 Chartwork and Pilotage
Examination number 041

ITEM	COLUMN
1.	Pilotage Preparations for pilotage, using available charts and publications, possession and ready for immediate use all necessary charts, including large-scale charts of the pilotage area duly corrected to date, latest sailing directions, <i>Notices to Mariners</i> , light lists, Traffic Zone Regulations, as applicable, tide tables, Charts and Publications Regulations, Code of Navigation Procedures and Practices, and <i>Radio Aids to Marine Navigation</i> .
2.	Steering Common steering procedures, their purpose and how to put them into effect; the importance of establishing and adhering to internationally-accepted procedures in issuing helm and steering orders and having them acknowledged and complied with; the instruction of helmsmen in this matter.
3.	Symbols The chart symbols and abbreviations as published in <i>Canadian Hydrographic Service(CHS) Chart No. 1</i> .
4.	Sailing Directions The contents of preface to <i>Sailing Directions</i> , the important general navigational information contained in the preamble and opening chapter of these volumes.
5.	Lists of Lights Light characteristics, colours and sound signals used as aids to navigation; use of Lists of Lights, Buoys and Fog Signals; the terms used to define the power of lights (e.g., geographical range, luminous range, charted range, computed range, nominal range, computed visibility); use of a luminous-range diagram; the effect of abnormal refraction fog signals of different types, anomalies of sound propagation in fog, notices regarding lights lighthouses and buoys etc. published in <i>Notices to Mariners</i> .
6.	Tidal Currents Finding the set and rate of tidal current that may be expected at a given point from information given in tide and current table or on the chart; ability to use tables and information on the chart of the locality with awareness of the possibly significant effect of weather on the reliability of the information so obtained.
7.	Navigation in Confined Waters Navigation in confined waters: altering course; transits; leading marks and bearings; recording the vessel's progress; making allowance for height of tide; the preparatory details to be attended to when entering confined waters (e.g., a review of the relevant sections of the sailing directions, ready availability of large-scale charts of the area with proposed track drawn indicating distances, courses and near dangers noted); navigational aids with their characteristics to be identified, clearing lines, marks and bearings to be used during the passage to be drawn in, precalculation of tidal heights where critical depths of water may be encountered; the maintenance of a record of the vessel's progress in chart and logbook, including times of passing successive points, course's compass error, speed, weather; fixing the vessel's position by relative and true bearings, transits; dead-reckoning position, estimated position and observed position.
8.	Navigation Aids Navigational aids in pilotage situations; the necessity of continuing the customary checks and counts of the vessel's safe progress by the officer of the watch (OOW) and ship's personnel with record of the details of duties performed, notwithstanding that the vessel was under the conduct of a pilot; the duty of the OOW to ensure that the pilot's advice is understood and effectively carried out, the extent to which reliance is placed on buoys.
9.	Canadian System Canadian System of Buoyage in detail; differences between lateral and cardinal systems; use of <i>Sailing Directions</i> for determining other buoyage systems in use; current and new Canadian buoyage system with an understanding of the basic principles employed in the lateral and cardinal buoyage systems, the importance of consulting the applicable volume of <i>Sailing Directions</i> for details of buoyage system in force locally prior to entering unfamiliar waters of other countries; <i>Aids to Navigation</i> .

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10.	<p>Bridge Practices</p> <p>Bridge practices and procedures in pilotage situations charts, various projections in common use; the requirement to continue the practice of good navigation procedures by the OOW and ship's personnel and the realization that the presence of a pilot on the bridge does not absolve the ship's personnel from their continuing responsibility for the safe navigation of the ship; the principle employed in construction charts on the Mercator, polyconic, and gnomonic projections, the limitations associated with each of these projections and the purposes of each in practical navigation.</p>
11.	<p>Charts</p> <p>Significant distortion, numbering and the presentation of information; the cause of chart distortion, need for nautical charts on board ship; the replacement of superseded editions; the mode of presentation of information on charts; metrication; chart catalogues and numbering.</p>
12.	<p>Chart Usage</p> <p>Using charts produced by the major projections in common use by the Canadian Hydrographic Service, including gnomonic charts; the use of charts in the practice of coastal navigation and on ocean passages; the plotting of bearings, position lines, clearing lines etc.; the transfer of positions from a chart of one projection to another of a different projection; the use of a gnomonic projection chart, Mercator and polyconic charts.</p>
13.	<p>Fixing Position</p> <p>Fixing the ship's position by means at the disposal of the OOW, including electronic navigational aids; considerations to be taken into account, including errors and limitations of equipment; the correction and plotting of bearings taken visually, by radar or direction finder (DF) and the limitations of accuracy inherent in each of these methods; the ship's position established by bearings or ranges taken simultaneously or with an interval and run intervening.</p>
14.	<p>Estimating Position</p> <p>Estimating the vessel's position, including allowing for effects of wind and/or tide; the reliability of the value in direction and force of wind, current and tidal effect used in arriving at the ship's DR position and the resulting area of doubt.</p>
15.	<p>Laying Off Courses</p> <p>Laying off courses, including allowance for effects of wind and tide; the problem of combining vectors of wind, current, tidal effect and course to steer to arrive at course made good, scrutiny of chart for off-lying dangers.</p>
16.	<p>Conversion of Course</p> <p>Conversion of true courses laid off to magnetic courses, including determination of variation at any place; conversion of true courses to gyro, magnetic and compass courses and vice versa; determining the up-to-date value of variation and interpolating for variation at a given locality from isogonic lines or compass roses; use of transit lines, azimuth and amplitude to determine compass error.</p>
17.	<p>Distance Measurement</p> <p>Distance measurement and the determination of speed made good and speed through the water; the measurement of distance on a Mercator or polyconic chart; the factors contributing to speed made good and speed through the water, how the difference between the two is expressed.</p>
18.	<p>Range of Visibility</p> <p>Factors controlling the range of visibility; terms associated with visibility of lights on navigational aids.</p>
19.	<p>Reliability of Charts</p> <p>Reliability of charts; indications by which reliability may be judged (e.g., date of original survey and possibility of subsequent surveys, adequacy of recorded soundings corrections having been made to date); large-scale charts show a small area in greater detail than small-scale charts; care and upkeep of charts.</p>
20.	<p>Publications</p> <p>Use of publications at the disposal of the coastal navigator, including <i>Notices to Mariners</i> for the correction of charts and publications; the various publications available to the navigator and the nature of their contents; the importance of chart corrections being kept up-to-date.</p>
21.	<p>Tidal Terms</p> <p>The meaning of tidal terms in common use in CHS and US tide tables; general understanding of tidal phenomena necessary for the comprehension of tidal terms; tidal atlases.</p>

22.	Calculation of Tides Calculation of tides and heights of high and low water at reference and secondary ports and the calculation of depth of water at those times; use of the calculated depth of water at high and low water to determine the height of water at a given charted position.
23.	Set and Rate of Tides Estimation of set and rate of tidal currents by reference to tidal current tables and by actual observation; the tentative nature of tabulated tidal current values and the need for caution in using them; the care required in making tidal current observations and the associated details that must be recorded.
24.	Records The need for keeping an accurate record of the vessel's progress and the keeping of such a record; the duty of the OOW to maintain an accurate, detailed and continuous record of the vessel's progress from which a position may be readily determined at any time; the value of such a record being available as a measure of safe navigation and in the event of an emergency requiring immediate knowledge of the ship's position.

Note: The examination consists of:
(a) a practical chartwork paper, and
(b) a multiple-choice examination.
Duration is three and a half hours.

60.6 Navigation Safety

Examination number 061


ITEM	COLUMN
1.	Navigation Safety Application of the content of Collision Regulations with Canadian Modification, 1983; recommended Code of Nautical Procedures and Practices.

Note: The examination is a multiple-choice test supplemented by oral questions as necessary.
Duration is one and a half hours.

60.7 General Rig Knowledge

Examination number 151 M

ITEM	COLUMN
1.	Types of Drilling Units Semi-submersible, column-stabilized, anchored, dynamically-positioned; surface type, self-propelled, ship type, non self-propelled, barge type.
2.	Design Criteria Water depth; maximum wind, wave, current, ice, temperature and tidal conditions; maximum load criteria (structure, deck, derrick, and hull); marine growth; damage criteria.
3.	MODU Structural Strength (Accomplished by excluding individual consideration of fatigue and corrosion) Column stabilized units, strengthening of deck (column, hull, tubular) structures against wave impact, strengthening watertight compartments against hydrostatic pressure, strengthening in way of anchoring, mooring systems, methods of stiffening tubular members, column and tubular bracing critical joints, local strengthening for ice; surface units, strengthening in way of drilling structure (moon pool), maintaining continuity of longitudinal strength, compensating for large hatches/moon pool, strengthening in way of anchoring and mooring systems, strengthening in way of thrusters, strengthening in way of derrick and deck loads, strengthening in way of ice surface hull; general material strength, steel types, welding connections.

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4.	<p>Dimensions</p> <p>Column stabilized (e.g., identify dimensions on longitudinal profile or transverse section), moulded baseline load, waterline length overall (pontoons), breadth moulded, total height to crown, elevations, freeboard, column spacing centre to centre (F to A, P to S), maximum operating draft, storm draft, transit draft, pontoon width moulded, pontoon depth moulded, principal dimensions of columns, air gap; drilling capacity, drilling depth, water depth, air gap, environmental criteria, riser angle limitations, slip joint stroke.</p>
5.	<p>Modes of Operation</p> <p>Normal drilling condition (afloat); severe storm condition (afloat); transit condition.</p>
6.	<p>General Terminology</p> <p>Longitudinal framing, transverse framing, centre line, midship section, camber, sheer, shell, bulkhead, deck, hatch, superstructure and deck house, bilge, cofferdam, watertight doors, thruster pods.</p>
7.	<p>Structural Terminology</p> <p>Angles, frames, beams, stringers, flanges, brackets, floors, coaming, lug projection for grabbing, pillar, girders, stiffeners, tripping brackets, ring frames, diagonals, struts, tubulars, plating.</p>
8.	<p>MODU and Equipment</p> <p>Identify, on an appropriate drawing, decks, pump room, control room, ballast tanks, fuel tanks, machinery space, crew spaces, watertight bulkheads (flats), rudder, thrusters, freshwater tanks, helicopter deck (fuelling), crane, drilling derrick, crown block, travelling block, hook, swivel, rotary table, racking platform, mooring equipment (windless), pontoons, davits, blow-out preventers, choke, riser tensioner, guideline tensioner, mud tanks, cement tanks, stability columns, footings, moon pool, columns, bracings, thruster compartments, crane pedestals, drill water tanks, motion compensators, kelly, diverter, shaker room, mud-pump room, sack storage area, mud-pit room, pipe deck, pipe stowage, substructure, emergency generator room, production test equipment, flare room, marine riser (bays), casing, bop-test pits (stowage), anchor racks (stowage), chain locker, fairleads, elevator (column), column tanks, cement room (pump).</p>
9.	<p>Frames</p> <p>Type, spacing, numbering (longitudinal, transverse), connection to shell plating; bulb bar or flat bar; longitudinal, transverse, intermediate, combination, web frame, ring frame (tubular members columns).</p>
10.	<p>Shell Plating</p> <p>Purpose, to shut out water, take up sheer stresses resulting from water pressure, bending stresses (sea, ice, other craft, deck loads); conventional numbering of plates for drill ships.</p>
11.	<p>Beams</p> <p>Transverse, longitudinal, connection to frames, decks, coamings, shell.</p>
12.	<p>Decks</p> <p>Numbering of decks, load density of each and where shown.</p>
13.	<p>Bulkheads</p> <p>Tank bulkheads, watertight bulkheads, oiltight bulkheads, decks and flats, corrugated bulkheads (tanks, housing), arrangements and connection of plates, stiffeners, beams, girders, webs and tripping brackets, fire rating.</p>
14.	<p>Mooring Equipment and Towing Arrangements</p> <p>Type; anchor storage, chain locker closures; where positioned; fair leads; tension measurement, how often tested, who tests.</p>
15.	<p>Hatchways and Moon Pools</p> <p>Connecting and strengthening members, protection arrangements.</p>
16.	<p>Cranes, Drilling Derrick and Personnel Lift</p> <p>Terms used and signals, hoisting, lowering, outreach, slewing, travelling (in case of gantry crane), SWL at various rodii; names of parts, preparation procedures for use, how often tested, by whom, non-destructive tests, dynamic-load derating; complete understanding of cranes, drilling derrick operation, inspection, examination and testing procedure including completion cargo hauling machinery and gear register; test certificates of wires, chains, shackles and hooks, routine maintenance.</p>

17.	<p>Helicopter Facilities</p> <p>Construction; safety arrangements, non-skid surface, drainage facilities for fuel or firefighting equipment (foam etc.); visual aids (markings, night lights and wind-direction indicator), aircraft tie-down arrangement, crash box, fuel stowage, fixed firefighting equipment maintenance.</p>
18.	<p>Ropes, Wires and Chains</p> <p>Safe working load and breaking strength calculations, natural fibre ropes, man-made fibre ropes, wire ropes, chains, open link, studded link.</p>
19.	<p>Loadlines</p> <p>Where marked, who assigned them, draft and loadline markings, rig depth below keel.</p>
20.	<p>Industrial and Environmental Safety</p> <p>Safe working practices regulations and recommendations, tackle regulations, pollution-prevention regulations, oil pollution-prevention regulations, arctic water pollution regulations, shipping safety control zones, garbage pollution prevention, provincial regulations, occupational health and safety, master oil disposal tank (burn/transfer to shore).</p>
21.	<p>Occupational Health and Safety</p> <p><i>Canada Labour Code</i> as applied to offshore drilling units.</p>
22.	<p>Cargo</p> <p>Handling, stowage, compatibility, damage, contamination, and ventilation requirements of following cargo for MODUs: pipes, chains, mud (oil base), flammable liquids, explosives, radio active materials, oxyacetylene cylinder.</p>
23.	<p>Codes</p> <p>Ability to use following codes: IMO Dangerous Goods, Deck Cargo Safety, Code of Safe Working Practices.</p>
24.	<p>Records</p> <p>Ability to complete Oil Record Book in compliance with the Pollution-Prevention Regulations, cargo log, deck log, and general record keeping.</p>
25.	<p>Plans and Drawings</p> <p>Use of following safety-related plans: location and operation of lifesaving appliances and procedure for evacuation of personnel from unit; fire control plan; plan showing hazardous locations and doors; gas detection systems; and fire- and boat-drill requirements.</p>

Open book, sections 20, 21, 22 and 23.

60.8 General Seamanship
Examination number 165 A

ITEM	COLUMN
1.	Terminology Knowledge of the rigging of MODUs, comprising the names, purpose, and construction of standing and running rigging, drilling, derricks, burner booms and geronimo rigs.
2.	Knots Ropes and Rigging Basic knotting, gripping and splicing with reference to current practice, seizing, packings, frapping, and stoppers; the reeving of blocks and purchases, rigging of stages and chairs; the rigging of fuelling booms and hoses.
3.	On Board Organization 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.
4.	Safety and Emergency 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.
5.	Anchors 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.
6.	Mooring Mooring and mooring lines or securing supply boats to unit, comprising: names of the various mooring lines, their purpose and terms used in handling and working them.
7.	Joining Responsibility on joining MODU.
8.	Collision Regulations
9.	Pollution Duties related to loading, transfer and storage of pollutants, responsibilities under pollution-prevention regulations and MARPOL.