# Federal Wage System Job Grading Standard For Small Craft Operating, 5786

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# WORK COVERED

This standard covers nonsupervisory work involved in the operation of small oar, sail or mechanically propelled craft, generally under 55 meters (180 feet) in length, to transport personnel and supplies, control harbor pollution, remove aquatic plants, conduct hydrographic surveys of rivers and harbors, or carry out similar functions. The operations are characterized by regular daily tours of duty followed by employees' physical departure from the boat rather than watch and watch, which is characteristic of maritime industry practices. This work requires the ability to steer and navigate the small craft, operate the engines and, in some assignments, to make operating repairs to the engines and the boat itself.

# WORK NOT COVERED

This standard does not cover work which primarily involves:

- Operating ships, tugboats, seagoing dredges or other similar vessels, often greater than 55 meters (180 feet) in length, requiring knowledge of the handling and operation of large vessels offshore or in the Great Lakes and/or large vessels under tow. (See Ship Operating Series, 5782 or reporting codes under the 9900 Family.)

- Operating riverboats, towboats with tows, self-propelled dredges and other similar craft, often larger than 55 meters (180 feet) in length, requiring knowledge of river currents, stages, obstructions, navigation locks, dams, navigation aids and the handling and operation of large vessels or tows in rivers. (See Riverboat Operating Series, 5784.)

- Maintaining, repairing and painting decks, hull and superstructure of vessels, operating cargo gear and deck machinery, rigging booms, handling lines, standing lookout and wheel watches, and similar work. (See Deckhand Series, 5788 or reporting codes under the 9900 Family.)

- Piloting of vessels into and out of harbors, docking and undocking, berthing and unberthing and shifting and moving ships and other craft of unlimited draft. (See Ship Pilot Series, 9904.)

- Operating and maintaining steam, gasoline, diesel and electric propulsion systems and maintenance and repair of auxiliary mechanical and electrical systems. (See Utility Systems Repairing-Operating Series, 4742, Marine Machinery Mechanic Series, 5334, or Stationary-Engine Operating Series, 5419, or reporting codes under the 9900 Family.)

# TITLES

Jobs covered by this standard are to be titled *Small Craft Operator*.

# GRADE LEVELS

This standard does not describe all possible grades at which jobs might be established. If jobs differ substantially from the skill, knowledge, or other work requirements described for the grade levels in the standard, they may be graded above or below the levels described, based on sound job grading methods.

# NOTES TO USERS

## Glossary

**Bearing:** The direction of an object from the observer.

**Bow (and stern) Thruster**: An auxiliary maneuvering device situated near the bow (or stern) to provide transverse thrust as an aid turning or sidewise movement of the vessel.

**Fender**: A device that protects the hull; a cushion to lessen shock or prevent abrasion.

**Fix**: The position of a vessel determined by bearings, observations, radio or radar.

**Hull**: The body of a vessel.

**Inboard/Outboard**: A type of small motor vessel characterized by an internally mounted engine coupled to a flexibly mounted drive unit outside the hull which both propels and steers the vessel.

**Kedge**: A small anchor used especially in kedging, i.e., moving a vessel by carrying out the anchor in the desired direction, dropping it, and pulling the vessel up to the anchor.

**Loran**: From Long Range Navigation: A system of electronic navigation in which pulsed signals sent out by two pairs of radio stations are used to determine the geographical position of a vessel.

**Mooring Line**: A line, chain, or wire rope by which a vessel is made fast to a dock or other resting place.

**Pelorus**: A navigational instrument resembling a mariner's compass without magnets and having two sighting vanes by which bearings are taken.

**Piloting**: The art and science of safely directing the movements of a vessel from one point to another using visible references, the depth of water, etc.

**Ranges**: Pairs of fixed aids so located that when observed in line, the vessel is on the centerline of a channel.

**Sea way**: A moderate or rough sea.

**Single Screw**: A propulsion arrangement using one propeller mounted on or near the center line of the vessel.

**Spring Lines**: Docking (mooring) lines which lead from the bow aft or the stern forward to prevent the boat from moving ahead or astern. Also valuable in maneuvering vessels into or away from docks.

**Tide Rip**: Short steep waves caused by the meeting of tidal currents or strong opposing forces of wind and tide.

**Twin Screw**: A propulsion arrangement using two propellers, one on each side of the centerline of the vessel.

**Watch**: A portion of time during which a part of a ship's company is on duty.

**Winch**: A mechanical device, either hand or power, for exerting an increased pull on a line or chain.

**Yawing**: Erratically running off course to either side as a result of wind or wave action or improper steering.

## Grading Considerations

In this occupation, the size of the craft operated and the horsepower of its propelling machinery have frequently been used as the primary criteria for determining grade levels. These are not sufficient indicators since they do not have the same impact on all job grading factors and on all jobs. A general discussion of these factors follows:

*Skill and Knowledge*: The basic skill and knowledge required is similar for most small craft operator jobs. Most operators must have some degree of knowledge of such things as rules of the road, compass navigation, navigational aids, chart navigation, required lights and shapes, boat handling, first aid, and fire fighting and prevention. The depth and detail of the knowledge and skill which must be applied varies with the type of assignment. For instance, required skill in boat handling is much greater to maneuver a 23 meter (75 foot) deep draft single screw boat with a high superstructure through a winding and shallow channel with strong winds or currents to a safe landing alongside a wharf than it is to maneuver a 6 meter (20 foot) inboard/outboard launch up the same channel. The mass and momentum of the larger boat and the increased

effects of wind and current require greater knowledge and skill. The size of the boat is not the only criteria for grading small craft operator jobs, however. Operating a 45 meter (150 foot) ferry boat between slips in a protected harbor with a wide deep channel and known currents demands less knowledge of Piloting and boat handling than maneuvering a 23 meter (75 foot) boat through narrow channels and tide rips across an unprotected strait where currents and wave heights vary greatly according to wind direction and velocity.

The level of skill and knowledge required for a particular small craft operator job therefore depends on the size and characteristics of the boat, the service the boat performs, the physical and traffic conditions of the waterways in which the boat is operated and the weather conditions affecting operations.

Similarly, the horsepower of the main propelling machinery is not usually a significant classification factor for small craft operators. Whatever the engine size, if it is usual and appropriate for the size and service of the boat, it does not affect significantly the boat handling skill and knowledge of the operator. Only radically underpowered or overpowered boats might create a need for increased skill for safe handling.

*Responsibility*: A very few small craft operators work in a closely controlled environment literally under the eye of and in communication with a supervisor who has full knowledge of all conditions of the work, e.g., serving as tender or utility boat to a work crew or dredge, engaged in repair of piers or deepening of docks at a Federal reservation. Such close control is not typical but if found will have to be carefully evaluated to determine the impact on the whole job.

Most small craft operators have a high level of responsibility. They determine whether it is safe for a boat to leave the dock, whether it should complete its assignment or return to harbor and even to which harbor it should return. The boat is usually out of sight of the supervisor, often miles away, and conditions of weather, sea state, traffic, etc., must be evaluated on the spot. Work review is usually on the basis of the operator's record of safe operation and timely completion of assignments.

*Physical Effort*: The physical effort required of small craft operators varies over a small range. The operation of wheel and engine controls requires substantially the same effort in an 8 meter (25 foot) launch or a 38 meter (125 foot) ferryboat. The controls of the smaller boats often are mechanical linkages requiring some effort to operate. Larger boats usually have hydraulic, electric, or pneumatic controls, giving power assistance. The handling of mooring lines, fenders, anchors and cargo have similar offsetting conditions. Smaller boats have relatively light equipment. Larger boats have crews to assist in the work and/or powered winches, cranes, etc.

*Working Conditions*: Small craft operators work outside in all kinds of weather. They are subject to discomfort from exposure to hot sun, spray and rain and upon occasion, sleet and ice. They are exposed to the possibility of injury from falls due to slippery decks and erratic motion. They may wear protective clothing such as non-skid shoes or boots, weather protective slickers and pants, and life jackets. In the very smallest open craft, the operators are continuously exposed to weather. As the craft get larger, however, there is more interior accommodation, and

even heating and air conditioning on some boats, which reduces exposure. In this respect and in the steadier movement in a seaway which is characteristic of larger boats, the severity of working conditions often will be inversely proportional to size.

Many offsetting factors may exist which complicate evaluation of skill and knowledge. Single screw boats are more difficult to handle in close quarters than are twin screw types. They often require the use of spring lines, kedge anchors, or similar auxiliary means of positioning and directing the boat, while a twin screw boat can maneuver by changing the speed and direction of the engines, even turning in its own length. If work in close quarters is an important part of the boat operation, the impact on the total job must be assessed. Usually, there is no grade level significance between single and twin screw operation.

Use of auxiliary controls might be considered to add to the complexity of operation. Bow thrusters and variable pitch propellers, for example, are devices under the control of the small craft operator which increase the maneuverability of the craft. If such devices are used to extend the operation of the craft into situations which would not otherwise be possible, e.g., maneuvering in extreme wind and sea conditions or in unusually close proximity to rocks or other obstructions, there may be significant increases in the levels of skill in boat handling, knowledge of weather, hydrography, etc. and responsibility of assuring safe operation in unfavorable circumstances.

The use of such devices to perform operations more easily which could be safely and expeditiously performed without them will have no impact on the skill, knowledge or responsibility of the position. Similarly, many small craft are equipped with depth sounders, radio direction finders, radar and similar aids to navigation. If these are used in situations which would otherwise prevent safe operation, there may be significant impact. Use of radar is an example. It is an accepted procedure to navigate using dead reckoning, that is, computing the proper courses and times of travel, considering such things as boat speed, effect of wind and current, compass deviation and variation, and visual, radio or radar bearings plotted on a chart in order to maintain safe position and heading. Using radar, day or night, to take bearings, measure distance from known points, etc., as a back-up to the other methods of piloting and visual observation would have no greater significance than the use of compass, pelorus, etc. Use of radar in fog or storm to find a disabled vessel of unknown or approximate location, where precise knowledge of position is also needed to avoid hazard to one's own craft and visual methods are not available, requires greater knowledge of radar and skill in interpretation of data.

## Maintenance of Small Craft

During periods of reduced operation or winter lay-up, operators of small craft frequently perform maintenance of hull, engines and equipment including painting, carpentry and mechanical, electrical and fiberglass repair. Such assignments come under the provisions dealing with mixed jobs. Usually the maintenance work performed will be found to be at a lower grade level than the work of small craft operator and will affect neither series nor grade level determination. If the grade level of maintenance work assigned or permitted to be performed by the operator exceeds the grade level of small craft operating work and the maintenance work is regular and

recurring, the series and grade of the job must reflect the type and level of difficulty of the maintenance work. In such cases, since the type and level of maintenance skills are apt to vary widely from applicant to applicant, the basic operator level of the position should be documented and vacant jobs should be reclassified and advertised and filled at the basic level with a later review of maintenance duties when, and if, they have evolved.

## Supervisory Duties

This standard describes various nonsupervisory levels of work performance. Even in relatively small boats, a small craft operator may have to direct the work of one or two lower graded deckhands, engine operators or small craft operators. This has no direct grade level impact. However, in the larger craft, the operator may have to direct the work of a number of lower graded employees. In this case, the work must be evaluated both on the basis of the nonsupervisory work performed by the small craft operator and on the leader or supervisory duties. The pay schedule and grade level assigned will be those which provide the highest level of compensation.

## Mate Duties

This standard describes various levels of work of the operator-in-charge of small craft. In some cases, particularly in the larger craft, there is a full time assistant to the operator-in-charge. Care must be taken to determine whether this is a deckhand position or a small craft operator. By their nature as assistants, small craft operators serving as mates do not have the very high degree of responsibility characteristic of the operator-in-charge. Therefore, to arrive at an equitable grade level, the classifier must deduct one grade from the grade level appropriate for an operator-in-charge position.

# GRADING PLAN

Due to the number of significant, interacting variables which can affect the grade level determination, the usual grade level format would result in cumbersome, conflicting criteria. Therefore, benchmark job descriptions are used to illustrate work at a number of grade levels.

These are not the only possible operating situations nor the only ones which could support the various grades but they represent the most clear-cut situations studied during factfinding. Job requirements which differ from these situations must be evaluated in light of the discussions under the Notes to Users, above. The total job to be graded must be compared to the total job described in the standard to determine the appropriate grade. Comparison of phrases, paragraphs or factors taken out of the total context will lead to inaccurate grade determinations.

A number of the small craft operator jobs, particularly on large boats, or those without pilot house control of engines, may involve directing the work of other employees. The benchmark job descriptions which follow do not include duties of directing the work of three or more employees. The grade levels are based on nonsupervisory skill, knowledge and responsibility.

# Small Craft Operator, Grade 4, BMK #1

*General*: Small craft operators, grade 4, may operate small oar, sail, outboard or inboard powered boats and launches, from 3-7 meters (10 to 20 feet) in length to transport passengers or light materials between the shore and larger craft, or between several vessels or land sites. The small craft are operated in good weather, in protected areas with little waterborne traffic.

*Skill and Knowledge*: The small craft operators, grade 4, must have:

- Knowledge of basic rules of the road such as the stand-on and give-way vessels in crossing situations and when and how to execute changes of course or speed to best show to other vessels the operator's intent. Ability to steer a straight course, visually or by compass, making minor alternations to ease over larger waves. Ability to maneuver small boats to dock and undock or come alongside larger vessels, allowing for such things as propeller effect at low speeds, tendency to carry headway, and the pivoting effect of rudder movements during turns. Knowledge of engine and control operation in order to perform operator maintenance such as cleaning, greasing and oil changes and recognize improper operation in order to secure repairs or adjustments. Skill in handling lines such as adjusting length of dock lines to allow for changes in water level.

- Knowledge of local waters sufficient to plan assigned trips to points within sight or occasionally operate from one obvious landmark or navigational aid to another following a course previously explained and demonstrated. Ability to estimate rough compass courses such as nearest cardinal or intercardinal points to make a course toward shore in event of reduced visibility.

- Ability to understand and follow equipment operating instructions and work orders which are direct and fully applicable such as operator maintenance routines or trip orders which lay out load, destination, route, departure time and cruising speed.

- Ability to load and maneuver small, open, power, sail or rowboats when possible hazards of water traffic, weather, sea state, etc., are slight due to geographical and supervisory limitations and difficulty of maneuvering boat is limited by small size and weight and quick responsiveness to controls. Possesses balance and agility in order to board and operate small boats which have limited stability.

*Responsibility*: The small craft operators receive assignments which detail the purpose, (i.e., convey passengers or deliver packages), the destination, and the route to travel, when there are alternate routes, depending on weather conditions. The supervisor assures that the loads assigned are appropriate for the type of boat and the existing wind and sea conditions. The operators are responsible for such things as adherence to the rules of the road, proper positioning of passengers and cargo, operation at safe speed, and cleanliness and mechanical condition of the boat. They report defects of equipment or operation to the supervisor.

*Physical Effort*: The small craft operators frequently perform light lifting of equipment into or out of the boat and hauling on lines to moor, unmoor or move the boat. Most items carried will weigh 18 kilograms (40 pounds) or less. The operator may climb ladders or ramps on docks or ships' side and must stand or move on surfaces which may be wet and slippery or subject to erratic tipping or movement, which require coordination of hands, eyes, legs and body.

*Working Conditions*: The small craft operators work in open or semi-enclosed boats, exposed to rain, sun, and wind. No outside work is performed during high winds or storm conditions. Operators are exposed to moderate noise and vibration of engines, to possible falls on deck, and to the possibility of falling overboard. A life jacket is worn at all time while underway.

## Small Craft Operator, Grade 6, BMK #2

*General*: Small craft operators, grade 6, may operate 8 or 9 meter (25 or 30 foot) single or twin screw motorboats to transport personnel, official visitors, and supplies on sheltered bays or rivers with little or no waterborne traffic except privately operated open and small cabin craft, with generous maneuvering room and adequate depth of water.

*Skill and Knowledge*: The small craft operators, grade 6, must have:

- Knowledge of basic rules of the road such as the stand-on and give-way vessels in crossing situations and when and how to execute changes of course or speed to best show to other vessels the operator's intent. Ability to steer a straight course, visually or by compass, making minor alterations to ease over larger waves. Ability to maneuver small boats to dock and undock or come alongside larger vessels, allowing for such things as propeller effect at low speeds, tendency to carry headway, and the pivoting effect of rudder movements during turns. Knowledge of engine and control operation in order to perform operator maintenance such as cleaning, greasing and oil changes and to recognize improper operation in order to secure repairs or adjustments. Skill in handling lines such as adjusting length of dock lines to allow for changes in water level. Knowledge of the load capability of the boat, depending on type of load and wind and weather conditions. Knowledge of local weather conditions, i.e., thunderstorm periods, wind directions and velocities which cause quick build up of unsafe sea conditions, etc., in order to plan sheltered route or cancel trip.

- Ability to lay out approximate compass courses for use between navigational aids in hazy conditions or to arrive at destination when there are no distinctive landmarks or navigational aids close by. Ability to compare soundings and charted depths, correcting for tide stage, as a rough check of position, i.e., in the channel, over a moderate shoal area in an area of generally deeper water, etc.

- Ability to interpret charts of local areas to determine shallows, channels, and shore conformation. Ability to interpret trip orders and operating procedures to resolve problems such as priority of loading when amount of cargo and/or number of passengers would cause

an overload in or to determine what should be loaded, whether an extra trip should be run, etc.

- Ability to independently load and maneuver small craft in situations of limited difficulty, i.e., protected waters, moderate small craft traffic and little or no large commercial traffic. Ability to explain and enforce safety regulations among passengers and skill in the use of safety equipment such as life jackets, fire extinguishers and emergency signals. Physical agility and balance to work safely on wet and moving decks.

*Responsibility*: The small craft operators receive general instructions covering such things as trip destination, desired departure time and passengers or cargo to be transported. The operators assure that the loading is appropriate for the type of boat and the expected wind and sea conditions. They choose the route, which is usually the straight line course between known departure and destination points but occasionally must be varied due to sea state, exceptionally low tides or unusual destinations. The operators are responsible for such things as adherence to rules of the road, proper positioning a safety of passengers and cargo, operation at safe and efficient speed, modification or cancellation of trip in response to severe weather conditions such as thunderstorms, cleaning and servicing of hull and engines and reporting of defects of equipment.

*Physical Effort*: The small craft operators often lift and carry supplies and materials when loading and unloading the boat. Occasionally, when objects weigh more than 20 or 23 kilograms (45 or 50 pounds), they are assisted by other personnel. Moderate effort is required during general maintenance work. Coordination of hands, eyes, body, and legs is needed to work safely on wet and moving decks.

*Working Conditions*: The small craft operators work on deck, exposed to sun, wind, spray and rain when mooring, unmooring, loading and unloading cargo. The boat is operated from a sheltered cabin. Operations are suspended during winter months so there is little exposure to cold or severe storms. Operators are exposed to possible falls on deck and to the possibility of falling overboard. A life jacket is worn at all times while underway.

## Small Craft Operator, Grade 8, BMK #3

*General*: Small craft operators, grade 8, may operate an 8 meter (25 foot) twin screw oil skimmer motor boat to recover oil spills on protected to moderately exposed bays, rivers, or sounds. They operate in all seasons and all weather. The operators control the heading and speed of the vessel and operate auxiliary controls for skimming equipment, sweep booms, trash hoist, oil-water separators, etc.

*Skill and Knowledge*: The small craft operator, grade 8, must have:

- Knowledge of basic rules of the road such as identification of and proper actions of the stand-on and give-way vessels and when and how to execute changes of course or speed to best advise other vessels of the operator's intent. Ability to steer a straight course by visual

references, making proper allowances for yawing and wind effects and minor alterations to ease over larger waves. Ability to maneuver small boats to dock or undock; to come alongside other vessels; to maintain control at very low speeds while operating in heavy wind and sea conditions; and to coordinate with another boat when towing an oil sweep.

- Knowledge of the handling characteristics of the vessel in such situations, the propeller effect, tendency to carry headway, pivoting effect of rudder movement and the effects of leeway. Knowledge of engine and auxiliary equipment control and operation. Ability to perform operator maintenance to mechanical, electrical, hydraulic and pneumatic main control and auxiliary equipment; cleaning, greasing, changing oil, adjusting, and recognizing improper operation in order to secure repairs or adjustments. Ability to perform a variety of pollution containment procedures such as sweeping or containing with booms, spraying with water jets or applying chemicals.

- Knowledge of local waterways, currents, shallows, eddies, prevailing winds, etc., to anticipate the behavior of oil spills or other floating pollutants or debris in order to track and confine reported spills and plan regular patrols through the most likely areas of concentration.

- Ability to plan trips from one landmark or navigational aid to another following previously explained courses or from information derived from charts.

- Ability to interpret charts, tide tables, and current diagrams to determine bottom and shore conformation, probable drift of oil slicks and eddy areas where pollution might collect.

- Ability to interpret standard operating procedures governing operation and operator maintenance of oil skimmers and other pollution control equipment, including engine, hydraulic drive and control systems and mechanical systems. Ability to interpret EPA and agency guidelines governing methods to deal with spills, taking into consideration such factors as type and amount of spill, location, and current, wind, wave, and temperature conditions.
  - Ability to maneuver safely the small craft assigned in situations of storm, reduced visibility, icing, close proximity of other craft or of floating objects such as oil booms. Skill in the use of safety equipment such as life jackets, and fire extinguishers. Balance and dexterity to work safely on slippery and moving decks while operating small craft, clearing debris or deploying oil booms.

  - *Responsibility*: The small craft operators receive general instructions covering location of spill or protective assignment, general approach to be used and any unusual features anticipated. Most assignments are performed independently. However, assignments involving especially large or critical spills, use of new techniques or operation under severe weather or sea conditions are performed under the direct observation and control of the supervisor. The operators are responsible for adherence to rules of the road, the safety of other personnel aboard, and safe, economical operation of the craft, cleaning and servicing of hull and equipment and reporting of defects of equipment.

*Physical Effort*: The small craft operators occasionally lift and carry parts and equipment weighing 23 kilograms (50 pounds) or more. Assistance is usually available with heavy or bulky equipment. Moderate effort is required during general maintenance work. Coordination of hands, eyes, body, and legs is needed to work safely on wet and moving decks, climbing up and down ladders, or transferring from one boat to another.

*Working Conditions*: The small craft operators work on deck, exposed to sun, wind, spray, rain, and ice during year around operations. They are exposed to the possibility of falling overboard, thus a life jacket is worn at all times. Other protective devices such as foul weather Gear, safety shoes and ear protectors may be required. Possible injuries include sprains or broken bones caused by falls on deck.

## Small Craft Operator, Grade 9, BMK #4

*General*: Small craft operators, grade 9, may operate 9-14 meter (35 to 46 foot) single or twin screw motorboats to patrol waterways to prevent unauthorized access to danger areas within a Federal reservation. They operate on exposed estuaries with adequate depth and width of channels, in all seasons and weather conditions except during freeze-up or major storms. The boats are equipped with radar for navigation and location of unauthorized vessels during darkness or bad weather. The operator is usually assisted by one other employee.

*Skill and Knowledge*: The small craft operators, grade 9, must have:

- Knowledge of basic rules of the road such as identification and proper actions of the stand-on and give-way vessels in crossing situations and when and how to execute changes of course or speed to best advise other vessels of the operator's intent. Ability to steer a straight course, visually or by compass, making proper allowances for leeway and yawing and minor alterations to ease over larger waves. Ability to maneuver small boats to dock and undock or come alongside other vessels, allowing for such things as propeller effect at low speeds, tendency to carry headway, the piloting effect of rudder movements during turns, the effects of leeway due to high winds and seas and course disruptions due to wave actions.

- Knowledge of engine and control operation. Knowledge of anchoring practices including setting-in anchors, proper scope, and breaking out deeply imbedded anchors using engine power or wave action.

- Ability to perform operator maintenance to mechanical equipment such as cleaning, greasing and oil changes and to recognize improper operation in order to secure repairs or adjustments.

- Ability to operate electrical equipment such as VHF radios and radio direction finders, radar and depth sounders, using operator controls to tune for best reception, accurate null, or proper range and clearest picture. Knowledge of the load capability of the boat depending on type of load and wind and weather conditions. Knowledge of local weather conditions, i.e.,

thunderstorm periods, wind directions and velocities which cause quick build up of unsafe sea conditions, etc., in order to plan sheltered route or cancel trip.

- Ability to lay out courses to assigned destinations, avoiding shoals and other hazards and using navigational aids, landmarks, speed of boat, etc., to determine position, estimate time of course change or arrival time. Ability to compare sounding and charted depths, correcting for tide stage, as a rough check of position, i.e., in the channel, over a moderate shoal area in an area of generally deeper water, etc. Ability to determine position of boat by visual or radar bearings on landmarks or navigational aids or radio direction finder bearings. Skill in taking bearings on approaching vessels with compass or radar and plotting their courses in order to intercept and warn off potential intruders.

- Ability to interpret charts of local area to determine shallow channels, shore conformation, buoys, beacons and landmark and plot positions of own and intruder vessels. Ability to interpret tide tables and skill in interpolating for depth correction to charted depths in order to calculate when it is safe to cross shallows and when to avoid them. Ability to interpret standard operating procedures. For example, evaluating weather conditions and determining if it is appropriate to use modified procedures, which are to be used in case of bad weather.

- Ability to load and maneuver small craft independently in situations of storm, reduced visibility, icing, and moderate commercial and small craft traffic. Ability to explain and enforce safety regulations among passengers. Skill in the use of safety equipment such as life jackets, fire extinguishers and emergency signals. Physical agility and balance to work safely on wet and erratically moving decks.

*Responsibility*: The small craft operators receive general instructions which include patrol area, and type and duration of hazardous operation. Methods and procedures of patrol operation are contained in standard operating procedures. The operators are responsible for detecting unauthorized vessels within the restricted area and determining whether it is necessary to stop operations until the intruder is escorted from the area; for evaluating wind and sea conditions to determine safe limits of operation and whether it is necessary to return to harbor; for adherence to rules of the road, proper positioning and safety of passengers or cargo, if carried, and safe, economical operation of the boat; and for cleaning and servicing of hull and engines and reporting of defects of equipment.

*Physical Effort*: The small craft operators occasionally lift and carry parts and equipment weighing 18 to 23 kilograms (40 to 50 pounds). Moderate effort is required during general maintenance work. Coordination of hands, eyes, body, and legs is needed to work safely on wet and moving decks especially when anchored in exposed locations during storms.

*Working Conditions*: The small craft operators work on deck, exposed to sun, wind, spray, rain, and ice during year around operations when mooring, unmooring, anchoring or weighing anchor or coming alongside to contact unauthorized vessels. The boat is operated from a sheltered pilot house. Operators are exposed to possible falls on deck and to the possibility of falling overboard. A life jacket is worn at all times when on deck.

# Small Craft Operator, Grade 9, BMK #5

*General*: Small craft operators, grade 9, may operate a 53 meter (175 foot) double-ended passenger and vehicle ferry over a fixed route between two terminals. The operator works on a harbor or river which is well protected with few severe weather conditions except occasional fog, where tidal or river currents are of known directions and velocities and commercial traffic is usually light but ranges to moderately heavy in peak periods. The operators are usually assisted by other employees. The boat is equipped with radar for navigation and traffic avoidance during poor visibility.

*Skill and Knowledge*: The small craft operators, grade 9, must have:

- Ability to operate or direct operation of wheel and throttle to perform limited maneuvering to lineup with and enter a slip while counteracting affects of cross current and wind set. Ability to operate radio and radar for navigation over short distances in a known area in conditions of reduced visibility. Ability to plan load distribution based on visual surveys of number and type of vehicles waiting to load. Knowledge of rules of the road, especially identification of stand-on and give-way vessels and maneuvering signals. Knowledge of prohibited cargos and visual indications of such cargo such as type of carrier or placarding of load. Knowledge of operator maintenance required of steering system, radio, radar, and deck and hull structures. Ability to recognize improper operation of equipment beyond the scope of operator maintenance in order to secure timely repairs or adjustment.

- Ability to run visual and (in fog) compass courses over short distances. Ability to calculate and allow for set of current to maintain desired course. Ability to use radar to fix position and locate other vessels. Skill in plotting courses of intersecting vessels and determining evasive action.

- Ability to interpret charts of local area for general shoreline conformation and location of shallows, landmarks and navigational aids along the route. Ability to interpret tide tables and current charts for predictions of velocity to aid in planning approach to slip. Ability to relate standard operating instruction such as limitations on hazardous cargo to specific occurrences.

- Ability to load and maneuver small craft independently in situations of limited difficulty, i.e., protected waters, moderate commercial and small craft traffic. Ability to explain and enforce safety regulations among passengers and assisting employees and skill in the use of safety equipment such as life jackets, fire extinguishers and emergency signals. Physical agility and balance to work safely on occasionally moving decks.

*Responsibility*: The small craft operators work in accordance with standard operating procedures and established schedules. The operator is responsible for proper maneuvering of the boat, safety of passengers and cargo, adherence to rules of the road, and noting and reporting maintenance or repair work required. In the event of severe fog and inoperative radar, the operator may cancel trips.

*Physical Effort*: The small craft operators use moderate effort when operating controls and observing conditions while underway. Coordination of hand and eye is necessary to direct or operate controls while maneuvering into slips.

*Working Conditions*: Most work is performed in the shelter of the pilot house. It is necessary to stand for prolonged periods. Possible injuries include bruises or broken bones from falls on wet surfaces or steep stairs. Operators are exposed to the possibility of falling overboard.

## Small Craft Operator, Grade 10, BMK #6

*General*: Small craft operators, grade 10, may operate a 20 meter (65 foot) single screw motorboat to transport and assist personnel involved in fishery studies, locating the desired fishing area, engaging in fishing activities with various types of commercial or experimental equipment and methods, and assisting in the handling and operation of sampling or measuring equipment. The operators work in exposed bays and offshore within reach of harbor, in areas of moderately heavy commercial traffic, where visibility for navigation and lookout is often restricted by haze. The boat is equipped with radar and loran for navigation and winches, cranes and davits for handling fishing and sampling equipment. The operators are often assisted by another employee.

*Skill and Knowledge*: Small craft operators, grade 10, must have:

- Comprehensive knowledge of rules of the road including navigation lights, fog signals, and day shapes appropriate for various conditions and proper action of stand-on and give-way vessels. Knowledge of drags, seines, trawls and similar fishing devices, their use and effective handling. Ability to operate steering, throttle and clutch controls to maneuver boat at low speed with fishing gear over the side, and to approach and take aboard buoys or small auxiliary craft in a sea way. Skill in the operation of auxiliary equipment such as anchor and hoisting winches, cargo booms, etc., assuring that lines, blocks, etc. are of sufficient strength for the load. Ability to operate electronic equipment such as loran, radar, communications radio, radio direction finder and depth sounders.

- Knowledge of vessel capabilities and local wind and sea conditions to determine when to cancel scheduled trips. Ability to perform operator tune up and maintenance to mechanical and electrical equipment and recognize improper operation in order to secure timely repairs or adjustments.

- Ability to lay out courses to assigned fishing area, avoiding shoals, shipping lanes and other hazards, and using navigational aids, landmarks and electronic aids to plot visual bearings, lines of position and fixes, and radio, loran or radar fixes, and to calculate course and speed over the ground, course change running time, etc., to arrive at destinations which often have no visual identity since they are beyond visual range of shore, buoys or beacons.

- Ability to interpret charts of local area and occasionally of unfamiliar areas to gain knowledge of bottom characteristics such as depths, contours, bottom materials, weeds and wreckage or other fish cover in order to locate fishing areas. Ability to determine cable areas, shipping lanes, channels, shore conformation, buoys, beacons, landmarks, radio stations, loran lines, etc., to plot fixes and lay out courses. Ability to interpret publications such as tide tables and current charts, to determine actual course over the ground. Skill in interpreting project orders to determine special equipment needs and setup.

- Ability to load and maneuver small craft independently in situations of reduced visibility, icing, and commercial traffic. Ability to explain and enforce safety regulations among passengers. Skill in the use of safety equipment such as life jackets, fire extinguishers and emergency signals. Physical agility to work safely on wet and erratically moving decks.

*Responsibility*: The small craft operators receive administrative supervision and instruction such as schedules of trips to be made, destination, purpose, equipment and passengers to be carried, and operations to be performed. The operators are responsible for the safe operation of the boat, including: maintaining the boat in operating condition by performing general maintenance and scheduling repairs, replenishing supplies, loading cargo, rigging sampling equipment as directed by the user, directing the boat to and maneuvering at the fishing grounds, and determining whether scheduled operations can be safely performed or must be canceled.

*Physical Effort*: The small craft operators frequently lift, carry and position equipment weighing up to 23 kilograms (50 pounds). Heavier items are handled with the assistance of another employee. Moderate effort is required during general maintenance work. Coordination of hands and eyes are necessary when operating controls to maneuver the boat and to hoist, lower and tend experimental equipment. The operators must stand for prolonged periods and climb narrow, steep stairways and ladders.

*Working Conditions*: The small craft operators work on deck, exposed to sun, wind, spray, rain, and ice during year round operation when mooring, unmooring, anchoring or weighing anchor or assisting with experimental and sampling operations. Possible injuries include bruises or broken bones from moving equipment or falls on slippery and moving decks. Operators are exposed to the possibility of falling overboard, thus a life jacket is worn at all times while underway.

## Small Craft Operator, Grade 12, BMK #7

*General*: Small Craft Operators, grade 12, may operate a 33 meter (110 foot) passenger ferry transporting personnel and light freight in year around daily service. The operators work on an exposed body of water characterized by strong currents, heavy fogs, winter storms which create severe tide rips, periodic heavy traffic of recreational small craft and some commercial vessels, narrow channels and small exposed dock facilities. The craft is equipped with radar for navigation in bad weather and bow thruster for maneuvering in the dock. The operators are assisted by other employees.

*Skill and Knowledge*: Small Craft Operators, grade 12, must have:

- Knowledge of rules of the road including whistle signals, navigation lights, day shapes and fog signals appropriate for various conditions and proper actions of stand-on and give-way vessels. Skill in the coordination of engine, wheel and bow thruster controls combined with knowledge of vessel's handling characteristics of windage, leeway, response to helm, etc., to perform precise docking and underway maneuvers in very strong wind and sea conditions. Skill in anticipating effects of wind or current changes on behavior of boat in order to maintain course with minimum of deviation. Knowledge of vessel capabilities and local wind and sea condition to determine when to cancel, delay or set ahead the scheduled departure.

- Ability to operate electronic equipment such as radar, depth sounder, and radios. Knowledge of strength and stretch of various types and sizes of line and methods of mooring in order to secure vessel properly to withstand strong and shifting winds in exposed berths. Knowledge of operator maintenance required of hull and deck equipment, i.e., greasing winches, splicing lines, testing lifeboat davits, chipping and painting. Ability to recognize improper operation of equipment in order to secure timely repair or adjustment. Knowledge of cargo stowage to assure that loads are properly chocked or lashed down to prevent damage. Knowledge of procedures such as launching and manning lifeboats and life rafts.

- Knowledge of local waters such as channels, harbors, and areas of strong current, tide rips and shallows to be avoided. Ability to plot courses and calculate headings to compensate for wind and current effects. Ability to estimate and plot position relative to shore or other vessels, using visual or radar bearings, and lay out course changes to avoid approaching vessels and reach destination under conditions of storm, fog, or darkness.

- Ability to interpret charts of local areas to determine changes to channels, shoals, landmarks, buoys, day beacons, ranges, etc. Ability to interpret tide tables and tidal charts to determine available water over shallows and current flow to be experienced enroute. Ability to correlate weather predictions, tidal current data and local knowledge to predict and avoid severe tide rips and sea conditions. Ability to interpret standard operating procedures governing operator maintenance of equipment, procurement of supplies and fuel, cancellation of trips, etc.

- Ability to load and maneuver small craft independently in situations of storm, reduced visibility, icing, and moderate commercial and small craft traffic. Ability to explain and enforce safety regulations among passengers. Skill in the use of safety equipment such as life jackets, fire extinguishers, lifeboats and rafts, and emergency signals. Knowledge of potential fire sources and ability to plan fire fighting to contain fire from these sources. Physical ability and balance to work safely on wet and erratically moving decks.

*Responsibility*: The small craft operators work in accordance with standard operating procedures and established schedules; under administrative supervision. The operators are responsible for evaluating weather and sea conditions to determine if the scheduled trip should be canceled. They are responsible for proper maneuvering of the boat, safety of passengers and

cargo, adherence to rules of the road, replenishing supplies, performing and directing minor maintenance and scheduling major repairs.

*Physical Effort*: The small craft operators exert light to moderate effort when operating controls and observing conditions while underway and moderate effort during general maintenance. Coordination of hand and eye is necessary to operate controls while maneuvering in confined channels and harbors. Strength of arms and legs, good balance and physical agility are needed to move and work when the boat is moving violently in storm and tide rip conditions.

*Working Conditions*: The small craft operators are exposed to the prevailing weather for short periods, which includes hot sun, fog, rain, spray, wind, snow, and ice. Most work is performed in the shelter of the pilot house. Possible injuries include bruises or broken bones from falls on wet or moving surfaces or steep stairways. Operators are exposed to the possibility of falling overboard, thus a life jacket is worn at all times when on deck.

## Small Craft Operator, Grade 12, BMK #8

*General*: Small Craft Operators, grade 12, may operate a 49 meter (160 foot) twin screw motor vessel to transport scientific and technical personnel and equipment, planting and recovering experimental underwater oceanographic equipment. The operators work in the open sea, frequently out of sight of land. The launch and recovery operations are often performed at extreme depths with the need for extremely precise navigation and maneuvering.

*Skill and Knowledge*: Small Craft Operators, grade 12, must have:

- Ability to coordinate the operation of engine, steering, thruster and mooring winch controls in order to maneuver craft to precise positions for cable laying and pick-up and other operations requiring extreme accuracy of position. Knowledge of deep sea, multipoint mooring techniques. Ability to reeve lines on winches, splice wire rope and fiber lines, operate cargo handling gear such as cargo booms and winches and cherry picker cranes, and hoist and lower small boats. Knowledge of cargo stowage to receive, protect, and transport delicate experimental equipment and instruments. Knowledge of rules of the road including navigation lights, fog signals, and day shapes and recognition of and proper actions for stand-on and give-way vessels to avoid collision. Ability to operate electronic equipment such as loran, radar, depth sounders, gyrocompass, and radios to plot positions and maintain shore and internship communications. Knowledge of local weather signs and portents to predict weather developments over several days in order to determine if seas will be too rough for operations and cancel or postpone trips.

- Ability to plot courses to desired destinations, allowing for wind, current and wave influences, to calculate dead reckoning positions in order to keep track of position in conditions of reduced visibility and to calculate visual, radar or loran fixes to confirm position. Skill in estimating wind and, especially, current effects in maneuvering, particularly in positioning or deep sea mooring and recovery operations.

- Ability to interpret trip orders and instructions in order to determine type and location of operations planned, vessel equipment, supplies, and crew required, foreign clearances needed, etc. Ability to interpret navigation and current charts, light lists, coast pilot, and other pilotage publications covering local and, occasionally, unfamiliar areas to determine channels, shoals, navigation aids, shipping lanes, landmarks, shore appearance, safe operating depths and courses, etc. Ability to interpret weather advisories to determine effect on mission accomplishment and whether or not to cancel, shorten or reschedule the trip.

- Ability to load, navigate, and maneuver small craft independently in situations of storm, reduced visibility, unfamiliar waters and moderate commercial traffic. Ability to explain and enforce safety regulations among passengers and assisting employees. Skill in the use of safety equipment such as life jackets, fire extinguishers, fire hoses, and emergency signals. Knowledge of potential fire sources and ability to plan fire fighting to contain fire from these sources. Knowledge of safe working loads of hoisting equipment and safe handling practices for heavy and/or delicate objects.

*Responsibility*: The small craft operators receive work assignments explaining cargo and personnel to be carried, work to be performed and time and location of operations. The operators confer with supervisor and technical personnel to plan details of the operations. At sea, they discuss problems with the passengers to plan changes of the operation. The operators are responsible for safety of vessel, passengers and cargo, which may require postponing, altering or canceling trips if required by weather or sea conditions, as well as proper maneuvering of the boat, adherence to rules of the road, replenishing supplies, servicing of boat and engines, and reporting of defects of equipment.

*Physical Effort*: The small craft operators use moderate effort when operating controls and observing conditions during ship movements and general maintenance. Coordination of hand and eye is necessary to operate controls while maneuvering for precise positioning during operations. Strength of arms and legs, good balance and physical agility are needed to move and work when the boat is moving violently in storm or heavy seas.

*Working Conditions*: The small craft operators are exposed to the prevailing weather for short periods which includes hot sun, fog, rain, spray, and wind. Most work is performed in the shelter of the pilot house. Operators are exposed to possible falls on wet or moving surfaces and to the possibility of falling overboard. A life jacket is worn at all times while on deck and underway.