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NSMV Phase 3 Design
List of Capabilities & Requirements

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KEY CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Hull Particulars	Length Overall	159.85 m (524'-5")	Not to exceed 600 ft - target of 550 ft
	Beam	27.0 m (88'-7")	Not to exceed 105 ft - target of 85 ft
	Draft	6.5 m (21'-4") design draft (training ship mode) 7.25 m (23'-9" ft) load line draft (full load)	Not to exceed 25 ft with the ability to reach 22 ft
	Design service speed	18 kts with 15% sea margin	18 kts with 15% sea margin, reduced from 22 knots
	Air draft	36.75 m (120.6 ft) at full load draft 23'-9" 37.5 m (123 ft) at light draft of 21.4 ft	Not to exceed 123 ft
Propulsion	Power source	Diesel Electric	Diesel Electric, Integrated Electric Drive
	Propulsion engines	4 x Diesel Generators - MAN Diesel Engines or Similar 4 units 7L32/44CR at 3,920 kW each Total installed Power: 15,680 kW Normal Operating Power: 85% of MCR	Power to meet design speed at full load draft of 23'-9" ft plus ship's electric load
	Propellers	1 propeller about 5.85 m diameter (19.2 ft), fixed pitch	Single screw fixed pitch propeller
	Rudders	1 flap type rudder on centerline	One
	Fuel	Single fuel- marine gas oil (MGO), ISO 6217 DMA type, max Sulfur content 0.1%	Single fuel, no heavy fuel required
Maneuverability	Thrusters	Bow Thruster: retractable combi type - tunnel thruster in up position, azimuthing thruster if down position, "Take Home" source of power, 1450 kW Stern Thruster: tunnel type, 890 kW	Provide thrusters to reduce need for tugs, provide "Take Home" source of propulsion in addition to primary source of propulsion.
	Docking & Undocking	Docking and Undocking possible without tugs using bow and stern thrusters, flap type rudder, and diesel electric power allowing low rpm operation of propeller and quick reversing	Capability to dock/undock without tugs in primitive ports

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Category	Characteristic	Capability	Requirement
Consumption Rates	Electric Loads at 12 knots	Propulsion 2,300kW + Service 3,220kW = Total 5,520kW	For Info
	Fuel Consumption at 12 knots	26 tons/day, \$15,700/day at \$600 per ton	
	Electric Load at 18 knots	Propulsion 9,525kW + Service 3,240kW = Total 12,765kW	
	Fuel Consumption at 18 knots	60 tons/day, 36,000/day at \$600 per ton	
	Fresh Water (including sanitary water)	35 gal/day per person for 700 = 93 tons + 5 tons Ship Service FW = 98 tons/day	
Endurance	Fuel range	2,200 m ³ storage capacity (1580 tons usable at 95% full with 10% in reserve) , about 11,000 nm range at 18 knots design speed with 10% remaining fuel	10,000 nm range at design speed
	Food & Stores	60 days food storage for 700 persons 2970 m ² (3,200 ft ²) reefer provisions 240 m ² (2,580 ft ²) dry provisions	60 days
	Freshwater storage	1375 tons of storage, about 14 days for 700 persons	14 days for 700 persons
	Freshwater generation	About 130 tons per day, sufficient for 1000 persons onboard. FW Generation by reverse osmosis, with 2 to 4 units provided	100 tons/day
	Gray water storage	600 tons storage, about 7 days for 700 persons. Disinfecting capability provided for gray water discharged overboard	7 days storage onboard, plus disinfection capability
	Sewage (black water)	160 tons storage, about 14 days for 700 persons, based on vacuum toilet system (13 liter/per day/person)	14 days for 700 persons
	Garbage storage	80 m ² (860 ft ²) garbage storage space on same deck as galley and mess rooms and deck below, plus incinerator to burn plastics, paper and food on a daily basis. Additional storage space using containers on deck is possible, Macerator for processing food waste before discharge overboard	60 days for 700 persons

KEY CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Accommodation Size	Training Mode	100 officer, crew, faculty & staff 600 cadets	100 officer, crew, faculty & staff 600 cadets
	Officer Class staterooms	29 single state rooms with private toilet/shower unit	Officer & Crew about 50 staterooms
	Crew Class staterooms	34 single state rooms with private toilet/shower unit	See above
	Faculty & Staff Class staterooms	37 single state rooms with private toilet/shower unit	Faculty & Staff about 50 staterooms
	Cadets	384 cadets in 4 person staterooms with private toilet/shower unit 216 cadets in larger berthing areas – 18 to 36 cadets. Toilet/shower units in each berthing area, 1 unit per 6 cadets	600 Cadets total
	Surge Mode	Up to 60 additional persons by doubling up all Faculty, Staff and Crew Cabins, so up to 760 persons onboard at sea in surge mode	Maximum 760 persons at sea in surge mode with doubling up on some staterooms
In Port Surge Mode	Up to 1000 persons onboard in port	Maximum of 1,000 persons onboard in port	
Machinery	Main machinery space	Two separate main machinery spaces in separate fire zones with dividing watertight bulkhead. No more than 1 sliding watertight door connects them.	Main machinery space subdivision into multiple main machinery spaces with no more than 1 sliding watertight door connection them.
	Auxiliary machinery spaces	Separate auxiliary machinery space under each accommodation zone for providing services to that zone	Separate auxiliary machinery spaces
	Air handling rooms	Air Handling Units for deckhouse spaces on roof, for lower decks fan rooms in each fire zone to provide HVAC to surrounding deck areas	Provide HVAC throughout the accommodation spaces
	Propulsion motors	For redundancy, propulsion motors are in separate watertight compartments for in case of flooding or fire in one compartment	Redundancy to be provided
	Switchboards	Each main machinery space with diesel generators has its own switchboard and control space for redundancy in case of damage to one. Four switchboard rooms on 3rd and 4th decks to serve each fire zone.	Redundancy to be provided
	Storeroom / workshop location	Storerooms and Workshops located on the 4th deck forward of the engine rooms with trolley beam type lifts and access hatches. Workbench with tool board in each engine room.	Reachable with trolley beam type lifts to lift heavy parts from main machinery spaces

DETAILED CAPABILITIES & REQUIREMENTS				
Category	Characteristic	Capability	Requirement	
Accommodation Arrangement	Security zones	Higher security zone - fire zone in the forward part of the accommodation; access is limited with keyed or coded doors. Lower security zone - fire zone in the after part of the accommodation area	Security Zones to limit access to transient persons in emergency response mode	
	Distinguished Visitors Class	4 large stateroom suites	Accommodation for Distinguished Visitors	
	Captain Class	4 single staterooms w/ attached day room	Accommodation for Captain, Chief Engineer, Chief Mate and office space for working and holding small meetings	
	Senior Officer & Faculty Class	Single staterooms w/ one bed	Accommodation for senior officers and faculty	
	Junior Officer, Crew, Faculty & Staff Class	Single staterooms w/ bunkbeds for surge capacity	Accommodations for junior officers, crew, faculty, and staff, with capacity for surge	
	Cadet Class	384 in 4 person staterooms with two high bunks	216 in 18 - 36 person berthing areas w/ triple bunks	Accommodation for cadets
Elevator	3rd Deck to Main Deck	Sized to fit stretcher		
Lounges / Study Areas	Officer, Crew, Faculty & Staff Lounges	Lounge on Main Deck	Lounge area for recreation w/ wireless internet	
	Cadet Lounge	Cadet mess to double as Lounge, with additional area in Ship Store / Café. Upper Class cadet lounges on 02 to 04 decks.	Quiet area for cadets to study outside of berthing	
	Cadet Study Areas	2 dedicated Study rooms convenient to classrooms and large cadet berthing areas, outfitted with countertops. Class rooms, computer lab and labs can also be used as study areas.	Quiet area for cadets to study outside of berthing	

DETAILED CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Galley / Mess Areas	Officer & Faculty mess	40 persons seating	Ability to accommodate and feed all persons aboard in Training Mode in two shifts, with good flow of traffic in and out of the serving
	Crew & Staff mess	30 persons seating	
	Cadet mess	260 persons seating, space area is 335 m ² (3600 ft ²) or 13 ft ² /person, adequate for rectangular tables with bench type seating	
	Main Galley	760 persons capacity between two shifts with cafeteria serving, space area is 173 m ² (1860 ft ²)	
	Service Areas	Food service area adjacent to the galley for cadets and separate area for officers/faculty/staff/crew	
	Scullery	Away from the serving area serving both cadets and non-cadets, space area is 42 m ² (450 ft ²)	
Hospital / Medical facilities	Hospital capacity	Ward spaces for 10 patients in 2 high bunks; 3 examination rooms; storage room; waiting room for 10 persons, space area is 155 m ² (1670 ft ²) with separate medical office and support staff offices across the passageway Separate quarantine stateroom adjacent to hospital	Fully functional hospital with ward, examination room, office space, and storage space
	Surge capacity	Alternate medical space in forward area of accommodation on main deck level as backup to main hospital (per SOLAS Regs) Ability to add 2 or 4 modular operating rooms w/necessary connections in RoRo space; can convert nearby class rooms and conference room to surge treatment areas.	Ability to expand medical facilities for emergency response

DETAILED CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Offices / Stores	Senior Officers & Faculty Class	Office space for 4 senior officers or faculty adjacent to their staterooms	Convenient office space
	Faculty & Staff Class	Office space for faculty and staff in the same fire zone as their quarters	
	Ships Offices	Convenient to public spaces on Main Deck	
	Engineering Office	Engineering office near the chief engineer's stateroom and also in available office spaces on the main deck	Space provided for ships drawings, files, and records
	Barber shop	Barber shop with 2 chairs and waiting area	Dedicated barber shop
	Ships Store	80 m ² (860 ft ²) garbage storage space on same deck as galley and mess rooms and deck below, plus incinerator to burn plastics, paper and food on a daily basis. Additional storage space using containers on deck is possible, Macerator for processing food waste before discharge overboard	Ship's store and cafe to purchase snacks, and general stores
Lifesaving	Lifeboats	4 x 77 person lifeboats - 308 persons capacity each side; one lifeboat on each side arranged to act as launch, muster areas adjacent to the lifeboats and extending to the roof of the multi-purpose space	37.5% x 765 persons lifeboat capacity (287 persons) on each side of the vessel, USCG approved
	Liferafts	10 x 39 person life rafts, 5 each side, Life rafts are davit launched, self righting, USCG approved Total life saving capacity = 616p in lifeboats +390p in life rafts = 1006 persons	125% x 765 persons = 956 persons total capacity for lifeboats and life rafts, USCG approved launching appliances / evacuation slides
	Rescue Boat	1 SOLAS approved Rescue Boat with Davit Launch Capable of manned-launch underway up to 5 knots, 1 life boat set up to act as a rescue boat	Rescue boat w/ davits as required by SOLAS and SMA's
	Storage Space	Space for 2 SMA launch boats on after deck, reachable by crane	Space for SMA-provided launch boats

DETAILED CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Classrooms, Training Spaces, Special Purpose Areas	General classrooms	2 classrooms x 60 persons with ability to be divided at 103 to 125 m ² (avg. 1250 ft ²) each 2 x 45 persons at 85 m ² (915 ft ²) each 4 x 30 persons at 59 to 80 m ² (650 ft ²) each Outfitted as per requirements	Minimum of 8 classrooms, provided without furniture or outfitting. Fitted with lighting, HVAC, internet connections, floor coverings, bulkhead lining, and ceiling panels for noise suppression
	Deck & Engine Department Training spaces	1 large training area for deck cadets on 2nd deck forward and large training/lab areas for engine cadets on 4th deck Training rooms with services only provided	2 x training areas for 20 persons, one for deck and one for engine cadets
	Large Group training	Ro/Ro deck area	Large area for training in inclement weather
	Training Bridge	Training bridge space for navigation training below the navigation bridge. Acts as back up navigation bridge in case of casualty to main bridge	Space for navigation training for deck cadets
	Navigation and Communication lab	Located aft of navigation bridge for centralized location in emergency response mode. Electronics and furniture to be provided by SMA and government agencies.	Able to be secured for use in emergency response mode
	Training rooms, laboratory space, workshops	Machinery lab and Cadet Workshop spaces to be provided on 4th deck that are divided into 4 large spaces for workshops and same for labs, but can be further subdivided by the SMA including making space for faculty offices and additional class space, total area is about 400 m ² (4,300 ft ²) for workshops and 445 m ² (4790 ft ²) for labs. Workshops and labs furniture and equipment to be provided by SMA.	Spaces for various labs, workshops, and training rooms.
	Multi Purpose Space	Large aft space for at least 200 persons to be fitted with folding dividers so it can be divided into two rooms. Seating to be removable/portable chairs for alternate uses for the space, space area is 280 m ² (3000 ft ²)	Space for minimum of 200 persons
	Gym / Exercise Rooms	Large open space of about 125 m ² (1,350 ft ²) that can be subdivided by the SMA to provide multiple gym and exercise rooms.	At least two rooms

DETAILED CAPABILITIES & REQUIREMENTS			
Category	Characteristic	Capability	Requirement
Cargo / Modular Storage Space	RoRo deck	RoRo space aft with length of about 40 m (130 ft), width inside framing of 24 m (80 ft), clear height of at least 4.7 m (15.3 ft). Usable deck area is about 1,000 m ² (10,700 ft ²). Suitable for about 10 x 40 ft trailers with 26 autos or about 49 autos/light trucks	RoRo space for auto, light trucks, trailers. Must meet class safety requirements.
	Modular Storage Space	Open Main Deck area aft of the deck house with a length of about 50 m (165 ft) and clear width of about 24 m (80 ft), total area of about 1200 m ² (12,900 ft ²). The forward 50 ft of this area is one deck up, on top of the multi-purpose space. Suitable for storage of 2 groups of 40 ft containers or 4 groups of 20 ft containers at 8 wide, on Main Deck. On multi-purpose space for 4 wide containers with centerline container a 20 ft only. Stack weight is 50 mt, suitable for two tiers of 25 mt containers. Total container capacity about 64 TEU for two high.	Multi-purpose modular storage space with "medium" deck strength (~ 350lbs/sqft). All containers should be reachable by the deck mounted crane with 24 m outreach (except most aft and outboard 20 ft containers)
	Electric outlets on Deck & RoRo space	Electrical outlets for up to 15 x 40 ft reefer containers w/ 440V standard reefer container plugs. Up to 10 modular units, each about 16 ft or wider (double wide containers), can be landed on container sockets on the deck. For each module, 120 V electrical power and internet connection. If 440 V power is needed, it is available from reefer container outlets on deck. Additional 5 outlets to be provided in the RoRo space.	Electrical outlets for reefer containers w/ 440V standard reefer container plugs, and electrical connections for modular units
	Fresh water and sanitary drain hose connections	Fresh water and sanitary drain hose connections for two of the modular units mounted on the Main Deck just aft of the auditorium, and for four units in the Ro/Ro deck for emergency response modular units that include lavatories/operating rooms	Fresh water and sanitary drain hose connections for modular units

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Category	Characteristic	Capability	Requirement
Access & Lifting	Deck, engine, and steward stores access	Side ports with 2 ton lifting trolley on either side, on 2nd deck level which opens to a cross vessel passageway with access to stores areas and elevator to main and 3rd decks. Engine room hatch, 1.5 m x 1.5 m, on 2nd deck in passageway with chain hoist down to forward engine room. Access hatches, 1.5 m x 1.5 m, down to each aux. machinery space from the passageway on 4th deck that connects to the forward engine room and up to the stores sideports on 2nd deck. Trolleys and gantry cranes in each engine room that connect to the engine room stores hatch	Access for easily and efficiently storing the vessel with deck, engine, and steward stores
	Hatches	Two hatches, 1.5 m x 1.5 m with covers, to forward stores area, accessible by provision cranes	
	RoRo Access	20 ft wide watertight wide side ramp with 40 ton capacity	Access to RoRo spaces aft
	Normal boarding access	Quarterdeck boarding at Second deck level via side port, port and starboard. Nearby staircases up to the accommodation spaces	Port and starboard boarding access
	Accommodation ladder	Standard marine type hinged aluminum Accommodation Ladders, port and starboard, that lead to the 2nd deck side port.	Boarding access from launches at anchor and for limited personnel access ashore in port.
	Helicopter Landing Area	Helicopter landing area without refueling or hangar facilities on aft deck with required marking (H). Designed with fold down handrails round the aft end of the vessel and no vertical obstructions. Estimated helicopter length is 16 m (52 ft).	SOLAS Compliant landing area
	Lifting	2 ton provision/multi-purpose cranes to be provided on port and starboard sides at forward end of the deck house to access forward stores hatches. One pedestal mounted jib boom type cargo crane on centerline to serve aft deck space to be provided, crane capacity is 35 mt with outreach of 24 m (78 ft).	Provision/multi-purpose crane, aft deck crane

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Machinery Spaces	Main machinery space	Two separate main machinery spaces in separate fire zones with dividing watertight bulkhead. No more than 1 sliding watertight door connects them.	Main machinery space subdivision into multiple main machinery spaces with no more than 1 sliding watertight door connection them.
	Auxiliary machinery spaces	Separate auxiliary machinery space under each accommodation zone for providing services to that zone	Separate auxiliary machinery spaces
	Air handling rooms	Air Handling Units for deckhouse spaces on roof, for lower decks fan rooms in each fire zone to provide HVAC to surrounding deck areas	Provide HVAC throughout the accommodation spaces
	Propulsion motors	For redundancy, propulsion motors are in separate watertight compartments for in case of flooding or fire in one compartment	Redundancy to be provided
	Switchboards	Each main machinery space with diesel generators has its own switchboard and control space for redundancy in case of damage to one. Four switchboard rooms on 3rd and 4th decks to serve each fire zone.	Redundancy to be provided
	Storeroom / workshop location	Storerooms and Workshops located on the 4th deck forward of the engine rooms with trolley beam type lifts and access hatches. Workbench with tool board in each engine room.	Reachable with trolley beam type lifts to lift heavy parts from main machinery spaces
	Fixed firefighting system	Machinery space shall have fixed water mist systems over each engine. Fixed fighting system for machinery spaces shall be Inergen or similar, alternative medium than CO2 for enhanced safety (non-toxic gas). RoRo space shall also have Inergen fixed fire fighting system plus fire hoses. Accommodation spaces shall have fire detection and water mist system Conventional fire main and fire hydrants shall be installed throughout the vessel. Fire pumps shall be in separate compartments.	USCG approved fire fighting as per SOLAS and CFR shall be installed. Fixed firefighting medium shall be non-toxic chemical or water mist type.
	Space Heating including accommodation	Waste Heat Hot Water from Engine Rooms and Electrical heating	No steam heating