NATIONAL STEEL AND SHIPBUILDING COMPANY

LAUNCHING SCHEDULE
CONCORD - AFS 5
M/V HYAK WSF 1
December 17, 1966

10:30	Pre-launch pictures
11:00	Advance Colors
11:01	National Anthem
11:02	Retire Colors
11:03	Invocation
11:04	Opening remarks
11:06	Mr. Banks
11:10	Mr. Prahl
11:20	Admiral Fahy
11:25	Admiral Sharp
11:30	Congressman Van Deerlin
11:35	Introduce platform
11:40	Christening parties to platform
11:45	Launch AFS-5
11:50	Lay Keel WSF No. 3
11:55	Lay Keel WSF No. 4
12:00	Burn off commences MV HYAK
12:05	Launch MV HYAK

DETAILS ON THE FOUR MAIN PROPULSION DIESEL

ENGINES FOR THE MV HYAK

GM MODEL 16-567E-5 DIESEL ENGINE

Built By

ELECTRO-MOTIVE DIVISION

General Motors Corp.

La Grange, Illinois

Type of engine	2 cycle
Approximate weight	36,000 lbs.
Number of cylinders	16
Bore, inches	8.5
Stroke, inches	10.0
Total displacement, cu. in.	9072
Compression ratio	14-1/2:1
Crankshaft main journal diameter	7.5
Crankshaft pin journal diameter	6.5
Number of main bearings	10
Number of exhaust valves per cylinder	4
Type of scavenging	Uniflow
Method of scavenging	Turbo Blower
Type of lubrication	Pressure
Type of injection system	G.M. Unit Injectors

SPECIFIC

	800 RPM
Eng. BHP-to Gen. & Gen. Blower; full load continuous	2240
Eng. BHP-at Overload Rating, 2 hrs. in any 24 hr. period	2440
Operating Speed Range	400-800
Piston Speed, ft/min	1333
BMEP, lbs. sq. in.	122
* Air Intake Volume, CFM based on 90°F; 29.5" Hg atmos. press.	6600
* Exhaust Gas Volume, CFM based on 90°F intake	14450
Exhaust Back Pressure-Muffler & Piping total, "H_2O	5
Exhaust Temperature, based on 90°F, ± 25	735
Air Intake Pressure Loss (intake filter & piping) "H_2O	6
Lube Oil Pump Capacity, GPM	164
Piston Cooling Oil Pump, GPM	82
Fuel Oil Pump Capacity, GPM	4
Fuel Oil Pump Suction Lift, ft.	12
Fresh Water Pump Capacity, GPM @ 35 psi (2 pumps)	660
Fresh Water contained in engine, gal.	125
Raw Water Pump, capacity, GPM @ 39 psi	500
Raw Water Maximum Temperature	85
Starting Motor Air Working Pressure, psi	150
Starting Air Capacity, cu.ft. req'd - (6 starts per eng.) free air	165
Heat Rejection to Engine Room Spaces, Engine & Accessories, BTU/min/hr.	10
Fuel consumption, #BHP/hr., 4/4 load (typical)	.372

* Flow data to be corrected for temperature, differing from 90°F.

Sperry Supplies Steering Systems For New Ferries

The Sperry Rand Corporation's Sperry Piedmont Division in Charlottesville, Virginia, will provide complete steering and control systems for four 382-foot Washington state cross-sound ferries.

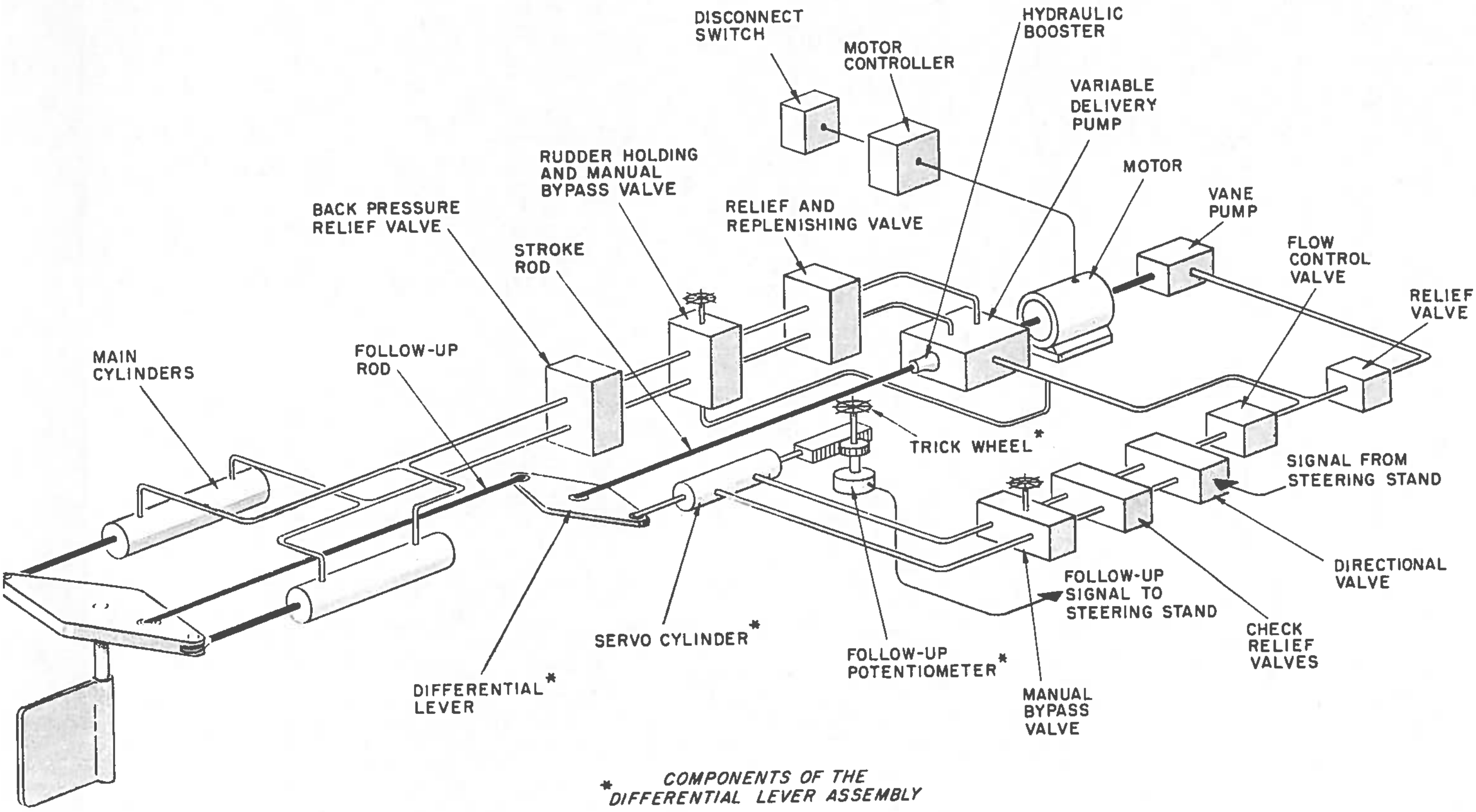
Sperry equipment to be supplied will include electric steering controls, complete steering gear, and the rudder angle indicator systems.

The system is similar to those supplied by Sperry for three Washington state ferries in 1958-1959. Two identical but independent 30-hp steering gears are used, each consisting of two special heavy-duty, single-ended cylinders, a Differential Lever Assembly and a Hydraulic Pump Unit which includes a Drive Motor and Controller.

The equipment uses a piston-type variable delivery pump, designed and built for continuous operation and high pressures. In accordance with current Marine practice, provision is made to hold the rudder fast should the power supply fail. The equipment is designed so the rudder movement is directly proportional to steering wheel rotation, thus full follow-up control of the rudder is obtained.

Additional system information may be obtained from Sperry Piedmont Company, Division of Sperry Rand Corporation, Charlottesville, Virginia.

SPERRY MARINE STEERING SYSTEM - SIMPLIFIED SCHEMATIC



SPECIFICATIONS

Variable Delivery Pump Capacity - 45 G.P.M.

Maximum Vessel Speed - 20 knots, 10 knots astern

Maximum Calculated Gross Rudder Torque - 336,000 lb.-ft.

Hard Over to Hard Over time for 70° rudder angle - 20 seconds

Maximum hydraulic system pressure - 2,000 P.S.I.

Electric Motor - 30 H.P., 1800 R.P.M.

Special Clevis Mounted hydraulic cylinders - 8" bore, 57"total stroke

All Sperry equipment is built to meet ABS and USCG requirements.

NATIONAL STEEL & SHIPBUILDING COMPANY

HARBOR DRIVE & 28TH ST.

SAN DIEGO, CALIFORNIA 92112

SHIPBUILDING HISTORY

Shipbuilding at National Steel and Shipbuilding Company started in 1945 with the launching of the 52-foot tuna clipper "Juana". Prior to that time, the company had attained no small amount of experience in the construction of fifty (50) refrigerated barges for the Navy, three (3) 80-ton floating cranes for the Army Transportation Corps, as well as wartime contracts for marine equipment such as towing winches, deck winches, and the like.

During the post World War II period, National Steel and Shipbuilding Company steadily added to its field by launching vessels of ever-increasing size. From the small 52-foot Juana class came the 70-foot Pico class followed by a number of fishing vessels of 106 feet and 111 feet in length. These were followed by a flight of fifteen (15) shrimp trawlers, several barges, and then in 1951, the 127-foot Conte Bianco was launched. In the same year, National Steel constructed two (2) 138-foot wooden tuna clippers, the Equator and the Equador. The Conte Bianco and her sister ships were so well received by the fishing industry that the University of Southern California commissioned National Steel and Shipbuilding to build the Valero IV, a million dollar marine laboratory built around the graceful hull design of the modern tuna clippers. The Valero IV was completely equipped with the latest scientific instruments and equipment for marine exploration. From her luxurious lounge to her spacious living quarters, she remains today one of the finest marine laboratories afloat.

With the advent of hostilities in Korea, National Steel undertook the construction of forty-eight (48) 125-foot deck cargo barges for the Army Transportation Corps. Five (5) 144-foot Navy AMS-60 wooden minesweepers were built, along with thirty (30) 45-foot steel Army harbor tugs, twenty-four (24) 65-foot passenger cargo boats, thirteen (13) 100-foot seagoing tugs, and six (6) 64-foot distribution box boats. When the national emergency was over, National Steel had become the most active shipbuilder on the West Coast with a reputation for workmanship seldom attained in industry.

During this period immediately following the cessation of hostilities in Korea, shipbuilding all over the United States declined alarmingly, but at National Steel and Shipbuilding engineers worked long hours to alter and modernize the Conte Bianco type tuna clipper, now a proven veteran of the fishing fleet. These modifications resulted in an entirely new class of vessels destined to become the most successful tuna clippers in Western fishing history. By June 1957, nine (9) vessels were added to the fleet.

About this time, the decision was made for NASSCO to enter the intensely competitive "big ship" field. Putting the know-how of its personnel and the facilities of the yard to work, NASSCO successfully bid against other larger and longer established major shipyards in the East, Gulf and West Coast ports.

Typical examples of vessels built and delivered on schedule under this program have been the BDL-IX, a vertical screw, 338 feet long, prototype experimental vessel for the United States Army Transportation Corps. Another example is the SURVEYOR, a fully-equipped, modern experimental research vessel built for the United States Coast and Geodetic Survey, U. S. Department of Commerce.

Other examples in this program have been a series of conventional and engine-aft, 17,000-ton C-3 cargo vessels, a series of 22,000-ton C-4 cargo vessels, and finally, the 17,000-ton AFS supply vessels for the United States Navy. These particular vessels are a "first of type" combat supply ship, representing a combination of facilities of three earlier supply vessels. National Steel and Shipbuilding Company is proud to have been selected by the Navy as a partner in this pioneering venture.

Three times NASSCO has had to modify and expand its ways to accommodate the ever increasing tonnages it is building.

In addition to the Army Corps of Engineers and the United States Coast and Geodetic Survey, owners for whom NASSCO has contracted to build major vessels have included the State of Washington, American Export Lines, States Steamship Company, American Mail Line, American President Lines, as well as the United States Navy.

While the principal activity of NASSCO's shipbuilding division has been the construction of medium and large cargo vessels, other activities indicating the yard's versatility have included off-shore drilling platforms for both the Standard Oil Co. of California and the Signal Oil Company, and ferries for the state of Washington.

National Steel and Shipbuilding Company is equally owned by the Kaiser Industries Corporation and Morrison-Knudsen Company, Inc. with management supervision by Kaiser Engineers.

NASSCO now has about 2500 employees and covers more than 80 land and water acres.

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Westinghouse

Western Public Relations

Westinghouse Electric Corporation
410 Bush Street, San Francisco, California 94108
EXbrook 2-5353

FACT SHEET
Washington State Ferries

PURPOSE: Four ferries linking Seattle and the Olympic Peninsula, reducing present running times between Seattle-Bremerton, Seattle-Winslow.

BUILDER: National Steel and Shipbuilding Company of San Diego, for Washington State Ferries, an agency of the Washington Toll Bridge Authority. Designed by W. C. Nickum & Sons, Seattle naval architect.

CAPACITY: Two decks accommodating 2600 passengers and 160 automobiles.

SIZE: 382 feet long, 73-foot beam, 18-foot draft.

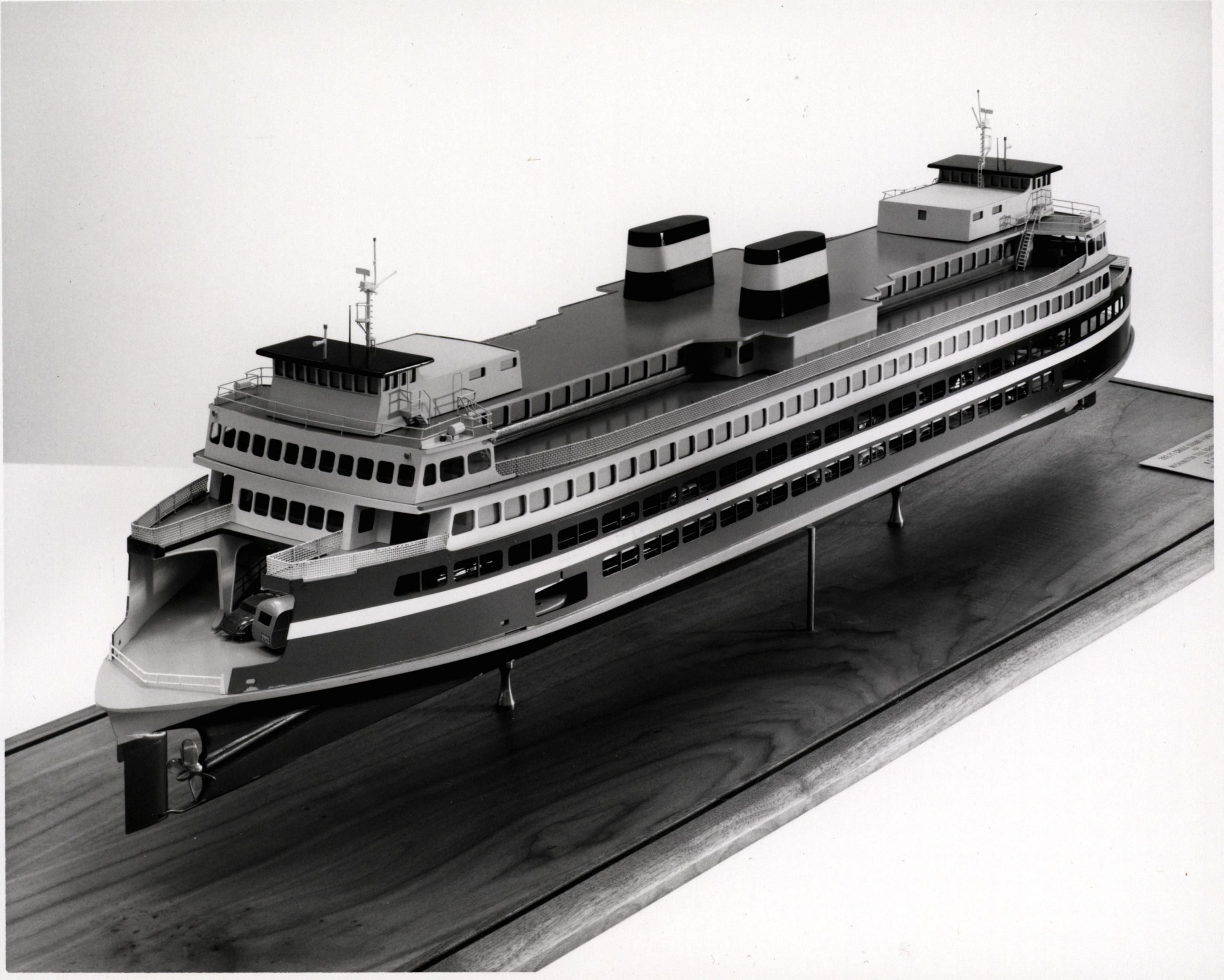
TYPE: Diesel-electric, with propellers at both ends.

PROPULSION: Four main propulsion diesel generator sets, each 1525 KW, 500 volt DC, 835 rpm, driven by diesel engines. System drives two 7000 hp motors, one at each end of ferry. Motors are 1000 volt DC, 180 rpm, weigh 132,000 pounds and have frame diameters of 12 feet. Generators and motors built by Westinghouse in East Pittsburgh, Pennsylvania.

CONTROL: Propulsion control switchboards each contain 1-pole breakers type DMD, 4000 amps, 1000 volts DC for two generators, one 3-pole type SCN-8P generator set-up switch, 3300 amps and necessary switches, relays and resistors for operation of breakers and control system and bus disconnect links for isolating of generators and motors. Generators and motors connected in parallel loop system. Both motors are connected to common propulsion power bus so both operate whenever ship is being propelled. Speed of bow motor is reduced so it operates at minimum drag. Propulsion control equipment built by Westinghouse in Sunnyvale, California.

EXCITERS: Static exciters, two for normal use and one standby, each capable of supplying excitation for 2 propulsion generators and 1 propulsion motor. Excitation equipment built by Westinghouse in Buffalo, New York.

OPERATION: Normal operation at rated power utilizes 4 generators. For reduced power, ferry can be operated at 80% speed using two generators. Entire power plant controlled by console in central engine room.



DARREL WOOD PHOTOGRAPHER
ROOM NO. FIVE THE LLOYD BLDG.
MAIN 3-6902 SEATTLE, WASH.

4046

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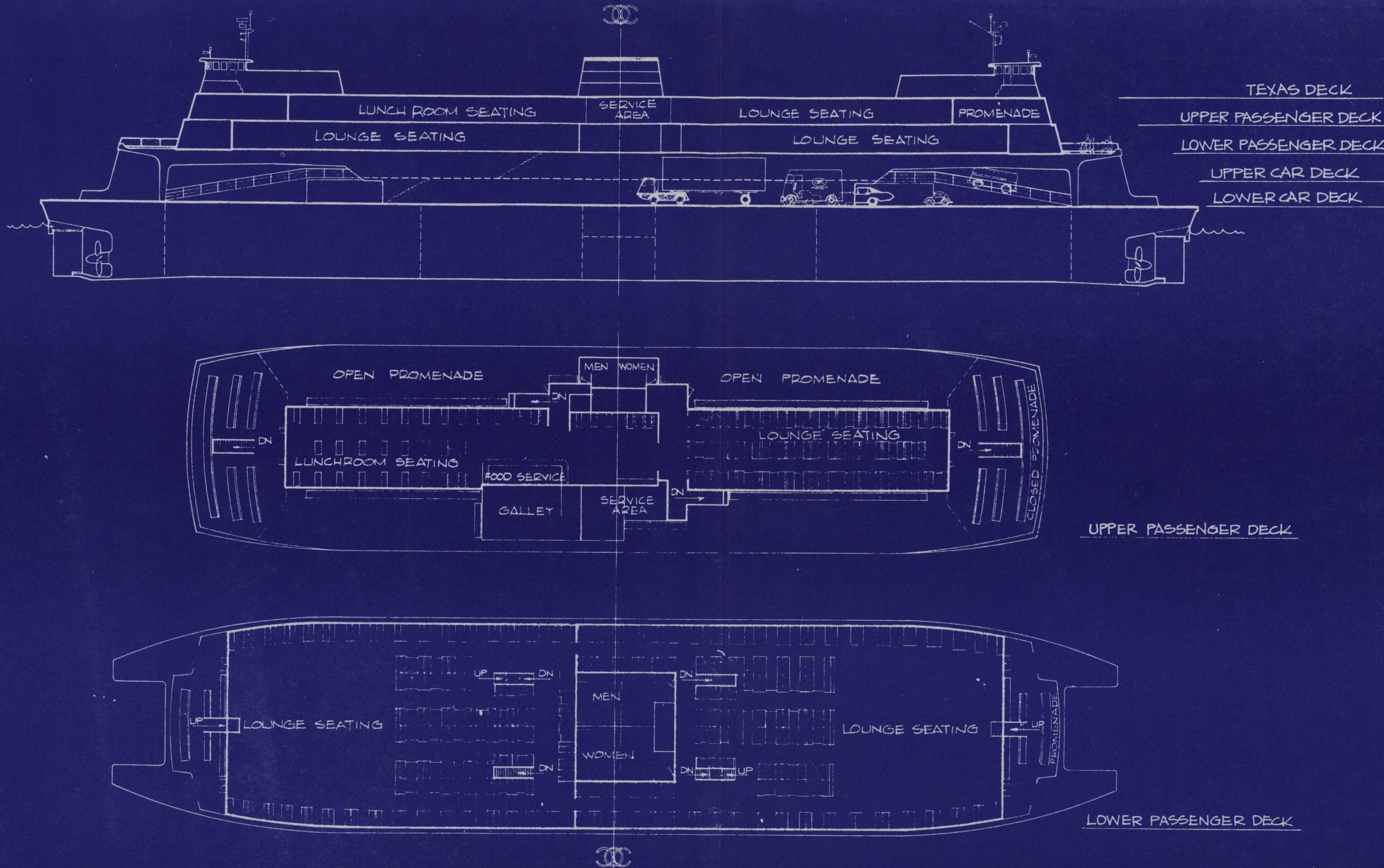
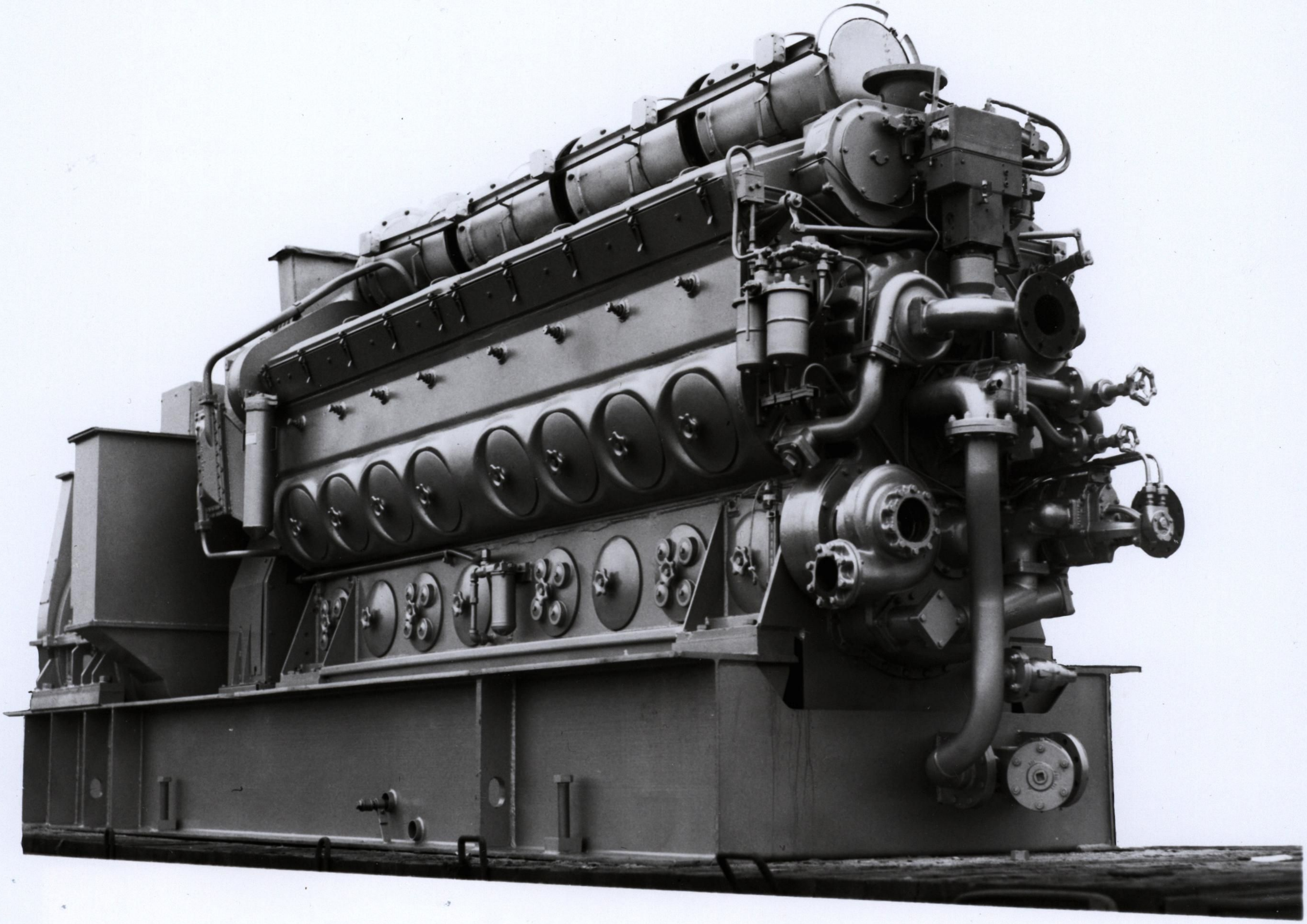


382 FT FERRY
FOR THE
WASHINGTON TOLL BRIDGE AUTHORITY
STATE OF WASHINGTON

DESIGNED BY
W.C. NICKUM & SONS
NAVAL ARCHITECTS & MARINE ENGINEERS
SEATTLE, WASHINGTON



GM POWER FOR NEW SUPERFERRY MV HYAK

Four of these 16 cylinder GM Model 567-E5 turbocharged Diesel engines rated at 2240 BHP each provide the power for the electric drive of the new superferry, MV HYAK. These engines built by Electro-Motive Division of General Motors in La Grange, Illinois, will also be utilized in the three new sister ships of the MV HYAK being built for Washington State Ferries.

11-29-66