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Messrs. Smith, Bell & Co., Ltd.,  
Lloyd's Agents, Iloilo, P. I.

No. 3 SPECIAL SURVEY REPORT

T.S.M.V. "MAMBUKAL"

I, the undersigned, W. McG. Davies, at the request of Messrs. Hijos I. de la Rama Steamship Co., Owners, and Messrs. Smith, Bell & Co., Ltd., Lloyd's Agents at this Port, did attend on board the M/V "MAMBUKAL" Ex "Bataan", of Gross Tons 190.74, Net 100.92, during the period of repairs and renewals, March to October 1939, for the purpose of making a complete survey of the Hull and Machinery for Re-Classification in Lloyd's Register of Shipping, London, and I report as follows:

HULL REPAIRS & RENEWALS

Prior to vessel being placed on slipway for underwater repairs, steam engines, boiler and auxiliaries, including all piping, removed. Vessel placed on slipway, cargo holds, peak tanks, chain locker and spaces cleared of all obstruction. Engine foundation and flooring between frames 22 to 37 removed.

Shell Plating internally and externally including peak and inner bottom tanks, floors, frames, deck beams, bulkheads, stringer and tie plates chipped to bare metal.

Shell Plating. All plating examined, drilled and gauged for thickness. Twenty three (23) plates found to be wasted below requirements, cut out and removed (see shell expansion plan). Material Bethlehem open hearth process. Bond tests made to rule requirements and found satisfactory. Remaining shell plating found to be in good order and condition.

Stem Shoe removed and renewed, plate  $3/8"$  x  $1'4"$  x 7' 0" long.

Forecastle, Shelter Deck, stringer and tie plates found in good order and condition.

Deck Planking found in good order and condition, seams recaulked, all rails and stanchions overhauled and placed in good order and condition.

Forecastle, Main Deck. Hawse pipes renewed, 12 feet wooden fender renewed, F & S. doubling plates below hawse pipes renewed,  $3/8"$  thick plating, bulwark plating drilled and found to be  $1/4"$  thick, Deck beams  $3"$  x  $2-1/2"$  x 25, brackets, side frames found in good order and condition.

Bulwark Side Plating. General condition good, several cover patches fitted; bulwark plating round stern found wasted, cut out and renewed.

Bulwark Doors removed, overhauled, hinge pins renewed, frames angles found in good order and condition.

Wash Ports. All removed, overhauled and replaced in good order and condition.

Shelter Deck, Beam angles  $3"$  x  $2-1/2"$  x .25 spaced 29" apart. Runner angles  $5"$  x  $3-1/2"$  x .35. Curtain angles  $5"$  x  $3"$  x .35. Stringer plates  $12"$  x .25, examined and found in good condition; sections of margin planking lifted for examination general condition found satisfactory; all metal chipped and

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painted before replacing planking.

Support Tee Bars 5" x 3" x .35 spaced 7' 3" apart, brackets 12" x 12" x .30, found in good order and condition.

Wood Decking 4" x 1-3/4" Oregon pine, found in good order and condition, all seams recaulked.

Main Deck. 1,841 lineal feet deck planking taken off for examination of deck beams, stringer and tie plates; deck beams and brackets found in good order and condition, stringer plates in water ways found wasted, cut out and renewed (see deck plan); Deck plating in way of Fore Peak tank and chain locker renewed entirely; water way angles 2-1/4" x 2-1/4" x .25 renewed entirely, stringer angles 3" x 3" x .30 found in good order and condition.

After Peak Tank, deck planking and cement on toilet floors removed, plates drilled and gauged and found in good order, given two (2) coats red oxide before relaying planking and cement; defective planking renewed; cast iron deck scuttle removed and replaced with new caves. Deck beams, brackets, tie plates, bulkheads, floors and angles, all drilled, gauged for thickness and found in good order and condition, given two (2) coats red lead and two (2) coats cement wash. Soil, air and sounding pipes renewed entirely. Tank tested to deck level, deck scuttle not being water tight.

Fore Peak Tank, formerly chain locker, deck plating renewed (see deck plan). Deck beams and side frames found in good order and condition, flooring plates and angles on frames 71 to 73 cut out and renewed.

Bulkhead bottom plate cut out and renewed, 5/16" thick. Bulkhead stiffener angles 4" x 2-1/2" x 6/20" found in good order and condition, tank painted with two (2) coats Bitumastic; tank tested to deck level. Cast iron scuttle not water tight, tank not used to carry liquid.

Chain Locker. Position changed to after side W. T. B. frame 66 to 70, overall width new anchor windlass, 4" thick wooden bulkhead fitted with centre plate; deck reinforced with 3/8" plate and two (2) 3" x 3" x 3/8" angles, deck beams, brackets, tie plates, side frames and flooring found in good order and condition. Wood Hatch renewed complete with cover, battens and tarpaulin.

Store Room. Bulkhead lower section plate on frame 62 found wasted, cut out and renewed 5/16" plate; floor plating and reverse angles on frames 63 and 64 cut out and renewed; deck beams, brackets, side frames and remainder of floors, centre keelson plates and angles found in good order and condition.

Forward Cargo Hold, side frames at turn of bilge 41 to 48 P & S. toes of angles found wasted, 169' 0" x 4" x 2-3/4" x 5/16" angle cut out and replaced, splices electric welded and double angles 3" x 2-1/2" x ~~1/4~~ 1/4" x 20" long fitted, splices staggered 24". Flooring and intercostal plates and top angles on frames 41 to 61 found wasted, cut out and renewed. Plating 1/4" thick, angles 2-1/2" x 2-1/2" x 1/4". Intercostal plates between frames 42 to 50 cut out and renewed, 72 lineal feet top angle on centre line keelson 3-1/2" x 3-1/2" x 5/16" renewed, 28 angle 2-1/2" x 2-1/2" x 1/4" x 6" long clips renewed, 15 plate frame knees 12" x 31" x 5/16" re-



newed. Bulkhead frame 42 bottom section extending into starboard fuel bunker and forming stokehold bulkhead found wasted, whole section cut out and renewed 5/16" plate; water tight door, passage to old coal bunker, removed and 1/4" plate fitted; two (2) bulkhead stiffener angles renewed 4" x 2-1/2" x 3/8"; two (2) flooring angles renewed 2-1/2" x 2-1/2" x 1/4" x 17" long; side frames, deck beams and brackets in way of bulkhead found in good order; bulkhead made water tight; Pillars 2" diam. found in place and in good order.

Hatch Coaming. Plates, angles, batten cleats, hatch cover and tarpaulin, found in good order and condition.

Engine Room. As mentioned above, all flooring from frames 22 to 37 were removed for installation of new foundation, side frames were found to be in good order and condition; centre or docking Keelson removed, new Keelson fitted from Bulkhead to Bulkhead frames 22 to 42, intercostal plates 3/8" x 12" high; old angles bottom 3-1/2"x3-1/2"x .30" top angles 3-1/2" x 3" x .35" being in good order and condition were replaced. Plans for new engine foundation were submitted to Kobe, Japan, through Mr. C. B. Nelson at Manila. New floors and foundations were installed according to plan, under the direct supervision of the Engine Makers' representative and the undersigned, all material of Bethlehem manufacture (true copy of certificates attached). All rivet holes in plates and angles were drilled, well bolted and rivets well driven; electric welding of corners done before riveting. Web frames fitted according to plan; flooring between frames 37 to 42 found in good order and condition, flooring raised to height of engine foundation and securely fastened; ends electric welded, 1/2" thick cover plate fitted for base of 46 H.P. light and compressor set 3/8" thick cover plate fitted for 12 H.P. lighting set, fuel and lubricating oil pumps; all rivet heads fastening angles to fuel bunker sides were electric welded on bunker side. Bracket plates on frames 34 to 37 P. & S. extended as per sketch attached. ✓✓

Engine Room Main Deck Strong Beam. After due consideration it was found necessary to remove existing strong beam due to interference with cylinder heads; two (2) 10"-23.5 lbs. "I" beams were fitted fore and aft of Main Engine (See deck plan).

Shelter Deck in way of engine Room, deck beams 3" x 3-1/2" x .25 spaced 29"; two (2) fore and aft 8" - 20.5 lb. "I" beams fitted for Trolley beams supported at ends with 2" diam. pillars. Funnel Base Plate renewed; 4 - 2" diam. pillars fitted to support Funnel, all pillars supporting main deck on frames 26 to 30 were replaced. Deck beams, deck and side plating in way of engine Room and fuel bunkers were found in good order and condition.

Fuel Bunkers. Air and overflow pipes were removed, examined and found in good order; gauge wire fitted on pipe outlets; deck beams, brackets, side frames, end and side plating found in good order; shell plating renewed (see Shell Expansion plan); Deck plating renewed (see Deck plan). Both tanks thoroughly cleaned and tested to 4' 0" head. Sounding pipes, deck fitting overhauled and put in good order, doubling plates fitted under sounding pipes.



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After Cargo Hold. Deck Stringer plates renewed (see Deck Plan). Deck Beams, brackets and tie plates, side frames and flooring plates, angles and brackets found in good order and condition. Bulkhead on frames 6 and 22 plates drilled and found satisfactory. Bulkhead on frame 22 - four (4) stiffener angles and four (4) flooring angles renewed. Pillars 2" diam. all in place and in good order.

Double Bottom Fresh Water Tank. Opened up, chipped to bare metal, plates drilled for thickness and found satisfactory; frame angles found in good order and condition; air and sounding pipes removed and renewed; doubling plates fitted under all sounding pipes; Tank given two (2) coats red lead and two (2) coats cement wash. Tested to main deck level and found water tight. Hatch Coaming, plates and angles, batten cleats, hatch covers and tarpaulins found in good order and condition. After completion of repairs all metal in holds given two (2) coats gray paint.

Note. Cement between floors in Cargo Holds not replaced at Owner's request. # |||

Rudder. Removed entirely, trunk plating chipped to bare metal and found satisfactory. Rudder stock 4" diam., chipped to bare metal and found in good order and condition, all pintles and lignum vitae bushing renewed; steel washer fitted under heel pintle. Deck stuffing boxes overhauled and new Lignum Vitae blocks fitted. Quadrant found in good order.

Propeller Shafting. Upon examination I found both tail and intermediate shafting unfit for further service. New tail shafting supplied by the Taikoo Dock & Engineering Co., Hongkong (True copy of Certificate attached). Extension shafts included in this certificate. Note. Bronze liners fitted on Tail shafts are smaller in diameter than that required by the rules, due to limited inside diameter in both stern tubes and "A" Brackets and to maintain diameter of steel shafts as per Engine Makers specification. Blue Prints of shafting attached.

Stern Tube & "A" Bracket Bushings. Old bushings were of cast iron, lined with lignum vitae bushing (solid type). I found these unfit for further service. New Brass Casings fitted, all shaft bearing rubber fitted in brass casing. Blue prints attached.

Stern Tubes removed for renewal of shell plating. Both tubes and "A" Brackets found in good order and condition. Packing glands and Bronze Neck brushes renewed, also packing gland studs. Circulating Water piping on stern tube renewed. Copper piping.

Propellers. Two three bladed solid manganese bronze propellers fitted, two spare propellers carried. True copy of Certificate attached). Propellers and Shaft couplings fitted in the presence of the undersigned and found satisfactory.

Intermediate Shafting. New shafting made from old tail end shafts and I found same to be in good order and condition. Couplings made of high grade steel of Bethlehem manufacture shrunk on and keyed.



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Engineers

Prop.  
1550 du

Approved size 131" without

Approved size 115 1/4"



Extension Shafts. Solid flanged coupled to Fly wheels. (Material supplied by Taikoo Dock & Engineering Co., Hongkong). Certificate included with tail end shafts. Shaft bearings. Floating oil ring type and supplied by Engine Makers.

Anchor Windlass. New Windlass driven by 8 K.W. D.C. 220-Volt Electric Motor. (True copy of Certificate attached). Windlass fitted on main deck on 3" thick hard wood base and well fastened.

Anchor Cables. Six shackles of 15 fathoms fitted star-board. Five shackles of each 15 fathoms fitted to Port side or a total length of 165 fathoms of  $7/8$ " diam., length of links  $3-1/8$ " to  $3-5/16$ ", breadth  $3-1/8$ ". True copies of certificates attached. Note. 60 fathoms carried as spare at Owners' request. (Certificate No. 5 of spare cable) 96806 & 7, 47402 & 3 each 15 fathoms. Windlass tested, cables run out in deep water off Iloilo, first with single anchor, then with two anchors out. Windlass found to have ample power and found entirely satisfactory. ✓✓

Anchor. Three Bower anchors, weight  $4-1/4$  to 5 cwt. each, Ex Stock, Stock Ball ends renewed, shackle pins renewed and placed in good order and condition.

Steam Anchor. One on board, weight  $1-1/2$  cwt. Ex stock, overhauled and placed in good order and condition.

Anchor Davit. Overhauled and placed in good order and condition.

Steering Gear. Hand operated, overhauled and placed in good order and condition. Fair leads, rollers, pins and bushings, rods and pins, hangers and lignum vitae bushings, shackles overhauled and placed in good order and condition. Steering chains forward size of links  $3-3/4$ "x $2-1/2$ "x $5/8$ " Aft  $3-1/4$ "x $2-1/4$ "x $5/8$ "; all chains were annealed, links examined and found in good order and condition.

Deck Hand Pumps. One fitted to after end forward cargo hold, one fitted to after end after cargo hold, new suction pipes and strum boxes fitted, Pump chambers removed, pumps overhauled and put in good working order, tested and found satisfactory.

Boat Davits. Lifeboats and rafts overhauled and put in good order and condition. Mast - Oregon pine used for signals; mast and rigging, found in good order and condition.

Hull Plating. During repairs all plating given two (2) coats red lead, after installation of machinery vessel put on slipway and given two (2) coats anticorrosive and two (2) coats antifouling paint, two (2) coats boot topping; top sides two (2) coats white paint.

Freeboard. Verified from original marking on ship sides as per blue print attached. Note. Owners are preparing stability curves and verifying Freeboard, copies will be forwarded later.



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PROPELLING MACHINERY & AUXILIARIES

Main Propelling Engines. Consist of two (2) compressorless eight cylinder M.A.N. diesel engines, direct reversible. Type G.8.V.42, vertical, single acting, four stroke design.

Main Dimensions. Cylinder diameter 285 mm; stroke 420 mm.; Crankshaft diameter 185 mm.

Normal Rating measured at the crankshaft flange of engine, when using a suitable fuel oil, air pressure of 760 Hg; each 505 H.P. at 375 R.P.M.

Standard Equipment on each Main Engine,

- 1 Starting Air Compressor
- 1 Cooling Water Pump
- 1 Bilge Piston Pump
- 1 Fly Wheel Diam. 1200 mm., width 180 mm.  
moment of inertia 750 Kgm<sup>2</sup>

Two (2) Fuel tanks with armatures and fillup pumps by hand, 700 lit. capacity each.

Two (2) lubricating oil tanks with hand pumps.

One (1) Water filter with two (2) shut off valves.

All piping both steel and copper for lubricating oil, cooling water, fuel oil, suction air, exhaust cooling, exhaust gases supplied by Engine Makers.

Indicator device with valves.

One (1) pressure gauge each engine for starting.

Air, cooling water and lubricating oil.

One (1) Tachometer on each engine.

One (1) Thermometer on each engine for cooling.

Water outlet of each cylinder, hand turning device on each engine.

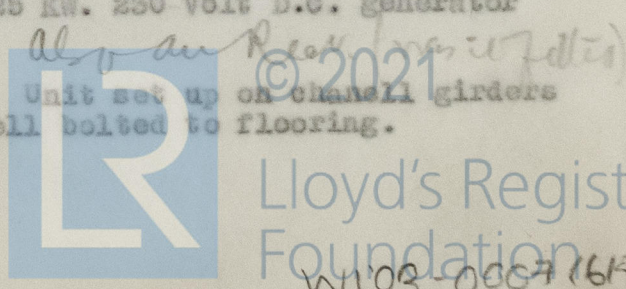
Fuel & lubricating oil filter on each engine.

Installation. Engines were shipped knocked down, cleaned and installed under the supervision of the Engine Makers' representative. I found engine to be accurately aligned to thrust shaft; extension, intermediate and tail end shafting, all coupling bolt holes reamed and coupling bolts well fitted; mild steel chocks approximately 1-1/2" thick fitted under and in way of each holding down bolts; fore, aft and centre bolts fitted and locked with double nuts; hard wood chocks fitted between mild steel chocks.

Compressed Air Tanks. Two (2) starting air tanks 600 lit. capacity each 30 atms.; W.P. O.D. diameter 624 mm. overall, length 2860 mm. Tested pressure 60 atms., tanks fitted to starboard side of Engine Room and well supported, all air connection pipes tested to 60 atms., tanks and pipes water tested to 60 atms. after installation and found satisfactory.

Auxiliary Lighting & Compressor Unit. One (1) 46 H.P. 4 stroke cycle, single acting, 2-cylinder 160 mm. diameter and 250 mm. stroke; oil engine, driving clutch coupled, one vertical, single acting, two cylinder two stage high pressure air compressor, also Vee Belt coupled 25 KW. 230 Volt D.C. generator for light and power set.

Base Plate. 1/2" thick. Unit set up on channel girders supplied by Engine Makers and well bolted to flooring.





Switch Board, Marine Type, consisting of an ebonite asbestos panel of 36" x 36" x 3/4" thickness, mounted on a steel frame and fastened to Bulkhead, frame 42, containing the following:

- 1 Generator Voltmeter, type AN.O - 250 Volts
- 1 " Ammeter, " AN.O - 150 Amps.
- 1 " Main Switch, 2 pole, knife type, 200 amps. with required cutout and fuses.
- 6 Feeder switches, 2 pole, knife type, 60 amps. with required cutouts and fuses, for the following:

- 1 - for Anchor Windlass
- 1 - " Water Pump for water cooling of main engines
- 1 - " Fire, Bilge and Deck Wash pump
- 1 - " fuel delivery pump
- 1 - " spare lub oil pump
- 1 - " light service to connect with the switch board of the 12 H.P. lighting plant.

Auxiliary Lighting Plant consisting of the following:

- 1 - 12 H.P. Schlueter Full diesel engine, Type D.S.C.-14 1100 R.P.M., Vertical.
- 1 - Cylinder type with 2 extra heavy flywheels direct connected by means of flexible coupling to
- 1 - 7 K.W. Generator, D.C. with compound winding, 230 Volts, with tropical insulation, complete with Rheostat.

All mounted on combined base plate.

Switch Board, Marine Type, consisting of an ebonite asbestos panel of 24" x 24" x 3/4" thickness, mounted on a steel frame and fastened to Bulkhead frame 42, containing the following:

- 1 Generator Voltmeter type A.K. 0-250 Volts
- 1 " Ammeter " A.K. 0- 30 Amps.
- 1 " Main Switch, 2 pole, knife type, 60 amps. double throw, to connect either with the light feeder switch of the 25 K.W. switchboard on dynamo of the 7 K.W. plant with required cutout and fuses.
- 6 Feeder switches, 2 pole, knife type, 30 amps. with required cutouts and fuses.

The above switch boards are American type, front mounted, back connected, 200 amps., main switches provided with renewable cartridge fuses; switch boards are mounted 8" distance from Bulkhead.

#### ELECTRICAL EQUIPMENT

25 K.W. Generator. Prime mover supplying power for the following units:

- Anchor Windlass 8 K.W. shunt wound D. C. electric motor, 1000 R.P.M., 220 Volts, 42 Amps.
- Spare Cooling Water Pump 7.4 K.W. shunt wound D. C. electric motor 2100 R.P.M., 220 Volts, 39 Amps.
- Fire & Bilge Pump. 6.3 K.W. shunt wound D. C. electric motor 1750 R.P.M., 220 Volts, 34 Amps.
- Lubricating Oil Pump. 3 K.W. shunt wound D.C. electric motor, 1450 R.P.M., 220 Volts, 16.6 Amps.
- Lubricating Oil Pump (Spare). 1.5 K.W. shunt wound D.C. electric motor, 1450 R.P.M., 220 Volts, 6.2 Amps.



All Cable leads to switch board, switch boxes and motors installed in water tight conduit piping, and well insulated. Cables from switch board to windlass motor under main deck through G. I. conduit piping of the approved type and well insulated.

Electric Light Wiring and fixtures, old wire and fixtures were removed entirely and replaced with lead covered wire, fixtures and fuse boxes of the approved type and quality in accordance with the Rules. All wiring and fixtures tested and found in good order. Both units were run and tested for several days before final acceptance and found entirely satisfactory.

Circulating Water Sea Connection. Main and auxiliary sea valves were opened up for examination. Valve and seats removed, machined and reground and replaced with new joints and packing, all cover and gland studs renewed. Boiler Blow down & Ash Cocks removed and holes in shell plating covered. Steam condenser circulating water shipside discharge valve removed and hole in shell plate covered. Ship side discharge nonreturn valves for Main and Auxiliary circulating water discharge, 3/4" thick, mild steel pads fitted on inside shell plating, riveted and caulked. Bilge Suction and Discharge, Suction valve chest, non return valves, renewed in brass; discharge valve chest overhauled and placed in good order and condition; all bilge suction and discharge piping renewed in copper including Main Engines and Fire and Bilge pump; strum boxes renewed, bilge piping in cargo holds renewed with G.I. piping, Main engines and Fire and Bilge pumps found to be in good working order and condition.

Sanitary & Wash Deck. Piping and valves renewed entirely, tested and found in good working order, wash deck canvas hose renewed.

Spare Cooling Water Pump and Fire and Bilge Pump discharge piping cross connected in case of failure of either pump unit.

Fresh Water Tank. Separate 5-Ton Cylindrical tank installed at foreend forward cargo hold and connected to one Ramsey 3-piston pump with cyl. of 1-3/4" x 3", No. 7452, with gears, 1" x 1" discharge and suction respectively, driven by Emerson electric motor 220 volts D.C. 1/3 H.P., Type D-74923 D.F. for supplying galley and first class passenger cabins.

Spare Gear. Lists attached as supplied by Engine Makers.

In view of the above repairs and renewals carried out on this vessel, I can report favourably on the general condition in which I now find this vessel.

City of Hilo, P. I., 18th July 1940.

*W. McG. Davies*

W. McG. DAVIES

Surveyor to Lloyd's Agents

Fee - \$1,000.00

We, the undersigned, Lloyd's Agents at this Port, certify that W. McG. Davies has been employed by the Owners of the T.S.M.V. "Mambukal" and ourselves to make the above survey, and we believe confidence may be placed in his certificate.

Hilo, P. I., 18th July 1940

P.P. SMITH & BROS., LTD.

Agency Fee - \$200.00

Total - - - \$1200.00

*E. J. Smith*  
Lloyd's Agents

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