NZ MARITIME MUSEUM (NZMM)

S.S PUKE

MNZ No 124121

VESSEL MANUAL

Diagrams by Wayne Macdonald, Engineering: Sean Harris & Daniel Hicks

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Contents

SHIP DETAILS

S.S. **PUKE** is reputed to have been a tender in the Kaipara logging trade and built by E Thompson & Son at Aratapu towards the end of the 19th century. She is typical of the small craft used for local transport on the Kaipara and other Northland harbours & rivers. Her original name was **WAI AWA**. Built of kauri, her hull is planked in two skins, the inner diagonal and the outer fore & aft. The plumb bow, counter stern, and large propeller, are typical of launches of the period.

In 1977 she was salvaged from the Tamaki River and a steam engine & boiler installed. She worked for several years on the Waihou and Ohinemuri Rivers from Paeroa and on the Mahurangi from Warkworth. In 1993 a major rebuilt was carried out by the Boat Yard at Hobson Wharf.

S.S. PUKE was gifted to NZ Maritime Museum by the Union Steam Ship Company of NZ, in whose colours she is painted.

Type	Restricted limits, Passenger Ship	**Displacement**	2.4 tonne
		Beam	2m
Port of Registry	Auckland	**Draft**	0.75m
Call Sign	ZMR7278	**LOA**	8m
Engine	10kw		

OPERATIONAL CONDITIONS

Passenger numbers Enclosed Waters – 5 passengers

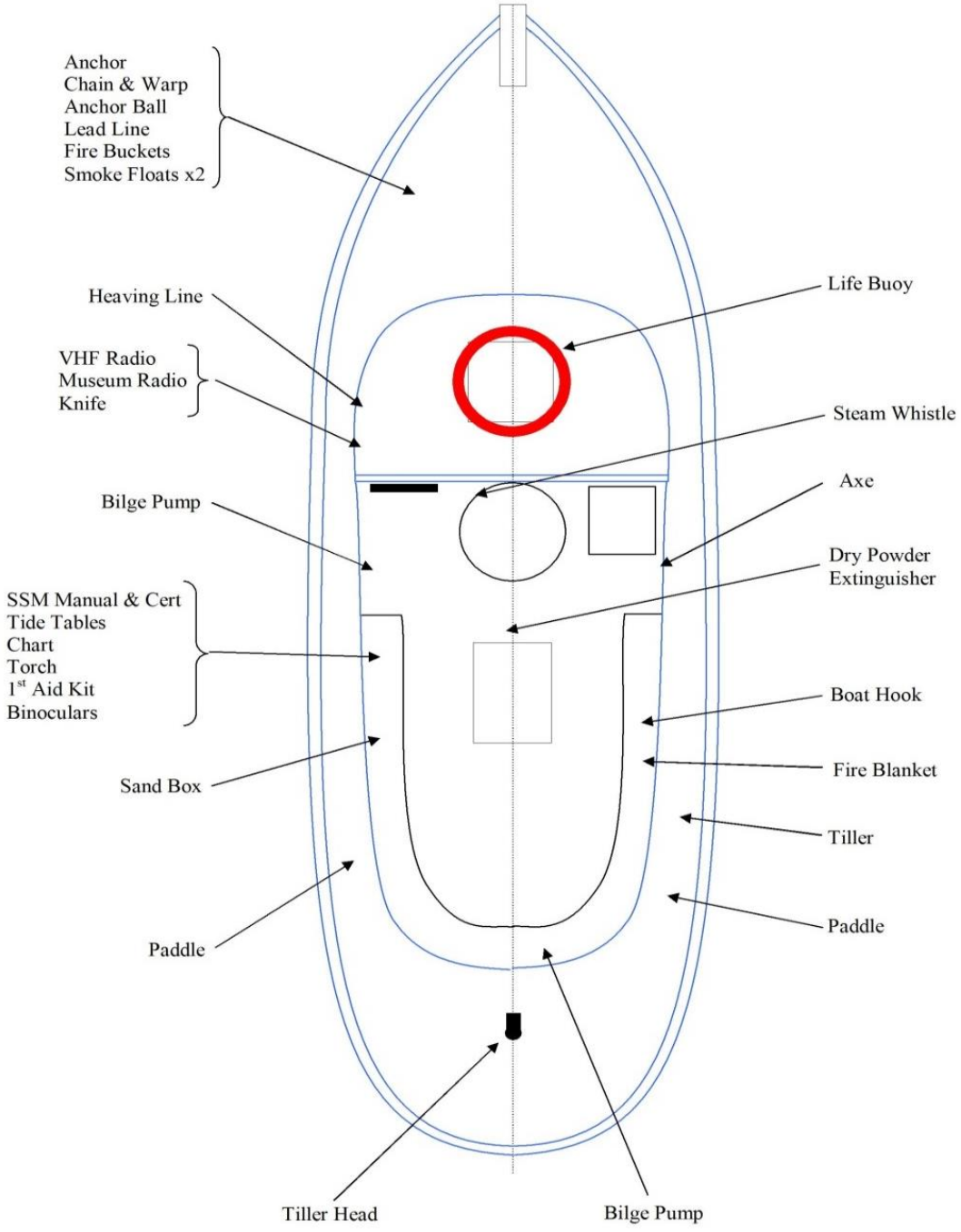
Manning Enclosed waters – Master x1, Engineer x1

Weather and/or sea conditions may restrict PUKE form steaming:

- Wind exceeding 15 knots, swells or choppy sea in excess of 0,5 metres (500mm)
- Tidal movements in specific areas
- Any condition that the Master believes is unsafe for the vessel to operate**.**

EQUIPMENT

Important: It is expected that each crew member will be acquainted with the position and use of the safety equipment.



ENGINE & BOILER

BOILER

The boiler on Puke is described as a vertical fire tube boiler, i.e. The hot gases pass vertically through 61 tubes and impart their heat energy to the surrounding water in the boiler drum. The upper part of the drum is the steam space, where the steam is drawn off to the engine and auxiliaries described below:

Some figures on the boiler

- Total volume 131 litres,
- Water volume at half glass 86 litres
- Heating surface area 4.6 meter square
- Grate area 0.16 meter square
- Grate area to surface area ratio roughly 30:1

Boiler construction

Boiler shell 10 mm thick single vertical welded seam, upper and lower tube plates 12 mm thick welded to shell. The tubes have an o.d. of 31.8mm and there are 61 in total, 54 having 2.9 mm wall thickness expanded into the tube plates and 7 stay tubes of 6.3mm wall thickness welded to the tube plates as stays. Shell clad with 20 mm kaowool insulation surrounded by 3mm stainless steel wrapper. This in turn is clad with 10 mm wooden strips.

Vertical fire tube working pressure 100 PSI (7 bar).

ENGINE

Maker A & G Price 6HP 180 RPM - vertical double acting, simple single cylinder condensing marine engine, with Fink reversing gear. Refer Engineers manual for further information.

PROPELLER

Unlike most propellers, it is very large in diameter for the size of boat and has much more pitch (or twist in the blades) to allow the slow speed of the engine to move the boat effectively.

- Some figures:
    - Diameter: 23 inches (584mm)
    - Pitch: 29 inches (736mm)

SPEED

Approximately -7 knots.

ENGINE

Operated by Engineer.

The Engineers Manual contains an in-depth explanation of the workings of the Boiler and Steam engine.

PLANT COMPONENTS

The following is a basic overview of the components of the plant, and how they work.

Boiler

The boiler is the steam producer for the operation of the system. In the case of Puke, the boiler assembly consists of three separate major components:

- Firebox
    - Located under the boiler, the circular firebox contains the fire, has the combustion space to allow the fire to burn effectively, and has a space for ash under the fire grate
    - The firebox is the main support for the boiler itself
    - The firebox has two doors, the main fire door, which is hinged, and the lower ash pit door which is located by two brackets and is lifted out.
- Boiler
    - The boiler itself is located on top of the firebox
    - The boiler is the pressure vessel, in which steam is made by the heating of water to such a temperature to allow steam to be formed.
    - The boiler is known as a vertical fire tube type, meaning that the hot gases from the fire pass up through the boiler inside vertical tubes, which heat the water surrounding them.
- Smoke box
    - The smoke box sits on top of the boiler and gathers the hot gasses and directs them up the funnel.
    - The smoke box also houses the draft enhancing and soot blowers.

Engine

The engine is a single cylinder marine steam engine by A and G Price of Thames.

- As with most steam engines, it is double acting, meaning that steam is used on both sides of the piston. Thus, steam pushes the piston down, and then pushes it back up again, every stroke being a power stroke.
- The engine is a reversing engine, meaning the whole engine runs in reverse for the reversing of the vessel. This is achieved through use of Fink reversing gear.
- Some figures:

    - Engine Bore: 5 inches (127mm)
    - Engine Stroke: 4 inches (102mm)

Attached to the engine are two pumps:

- Air Pump
    - Used to remove the condensate from the condenser.
    - The condensate is returned to the feed tank
    - Also known as a condensate pump.
- Feed Pump
    - Pulls water from the feed tank and pumps it back to the boiler
    - The volume going back into the boiler being regulated by the bypass line.

Condenser

Located on the outside of the hull below the waterline, this copper pipe condenses the exhaust steam back into water, allowing the water to be reused in the boiler.

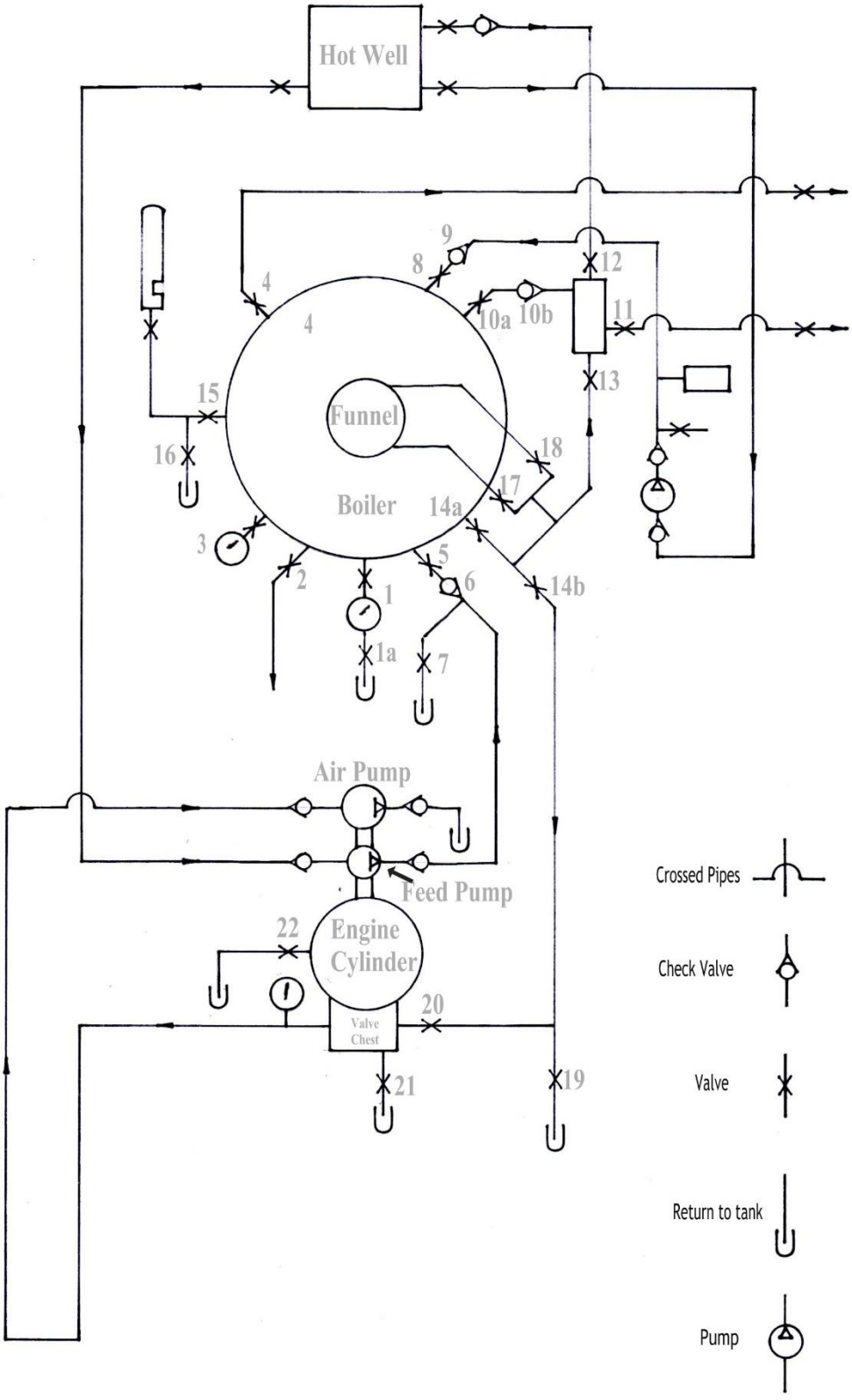
Feed Tank (Hotwell)

Located ahead of the boiler, this stainless-steel tank holds the main water the system requires to operate.

Bunker

This box is located beside the boiler on the starboard side, it contains the necessary wood or coal to feed the fire

PIPING SCHEMATIC



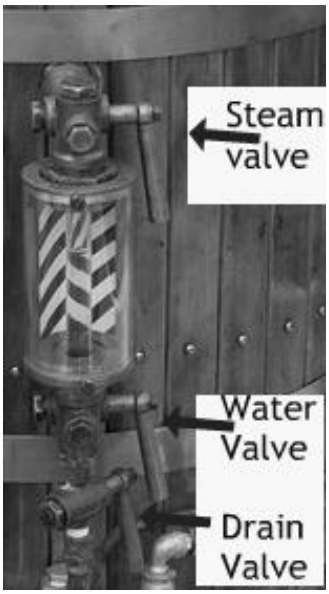
CONTROLS, VALVES AND AUXILIARIES

These are the main items the system needs to function, to regulate the plant. A number of special valves and fittings are attached to the boiler. By convention all valve handles are colour coded-

- Red for steam
- Blue for water
- Black for drains

Numbers (1…) indicate location on the schematic. The schematic is an approximate indication of the steam and water circuits and item locations

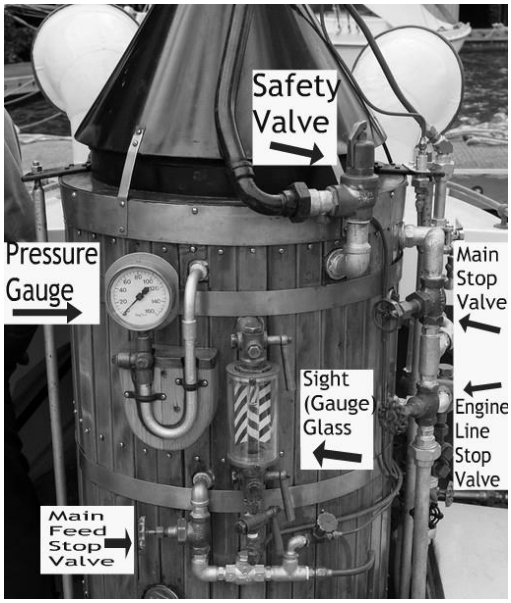
Sight (Gauge) Glass (1)



- The most important safety item on the boiler is the water Sight Glass, or Gauge Glass.
- The Gauge Glass shows the level of water contained in the boiler.
- The Gauge Glass consists of five major components:
    - Steam Valve: the upper most valve, this allows steam to travel into the glass.
    - Water Valve: the middle valve allows water into the bottom of the glass.
    - Drain Valve (1a): the lower valve allows the glass to be drained, and thus tested using the proper testing procedure
    - Glass: The Gauge Glass itself, a glass tube which shows the level of water in the boiler.
    - Shield: the glass and brass frame around the gauge glass itself, this protects the operator in the case of a glass failing.

Safety Valve (2)

- This valve prevents the boiler from containing a pressure greater than it is designed to operate at.
- The operation is automatic, and it should be tested for correct operation every time the boiler is steamed.



Pressure Gauge (3)

- It shows the steam pressure in the boiler
- Its operation is automatic

Blowdown Valve (4)

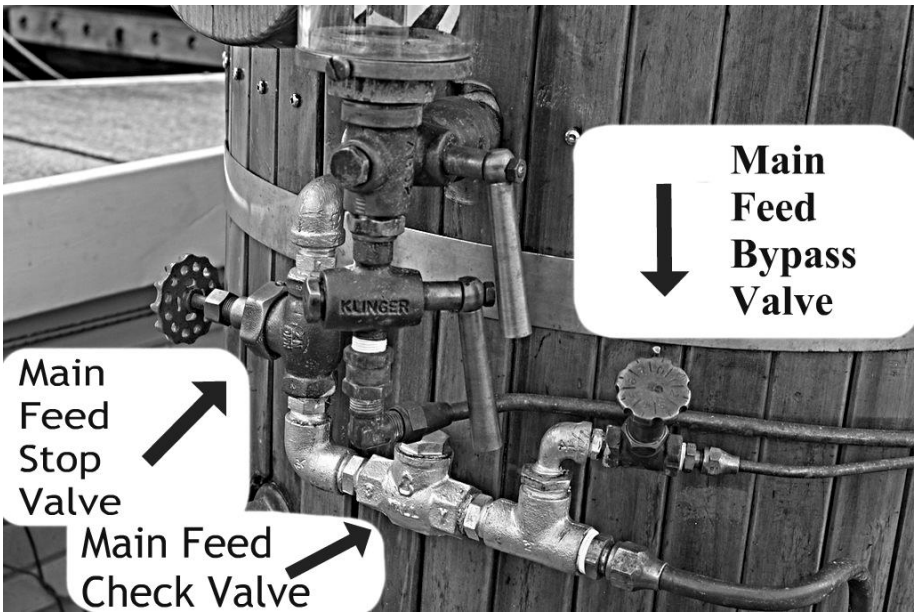
- This valve allows the boiler to be emptied.
- The line on the square head of the valve indicates closed, when across the flow of the valve.
- A spanner is needed to operate this valve.

The following valves and equipment allow the addition and control of water level in the boiler:

<u>From the engine driven feed pump:</u>

Main Feed Stop Valve (5)

- This valve allows the water from the engine driven feed pump into the boiler.
- This valve should be opened before the engine is run and should stay open when the plant is in use.



Main Feed Check Valve (6)

- This non-return, beside the Feed Stop Valve, prevents steam from exiting the boiler via the feedline, but allows water into the boiler from the pump.

Main Feed Water Bypass Valve (7)

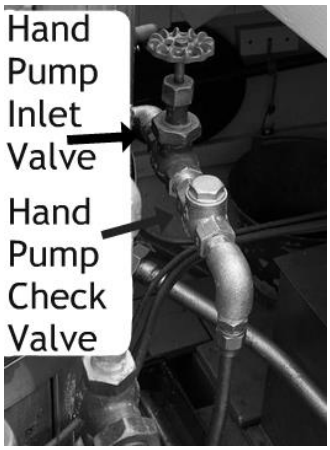
- Allows the Engineer to regulate the amount of water going into the boiler from the engine driven feed pump.
- For ease of use it has a notched handle with numbers on it.
- The more the valve is open, the less water is fed into the boiler.

From the hand feed pump:

The hand pump is located beside the engineer's seat and allows the engineer to feed water into the boiler without the engine running or in addition to that supplied by the engine driven feed pump. The hand pump stop valve needs to be opened to allow the pump to work.

Hand Pump Inlet Valve (8)

- This valve has a blue handle
- It should be opened when the Engineer wants to use the hand pump to feed water into the boiler

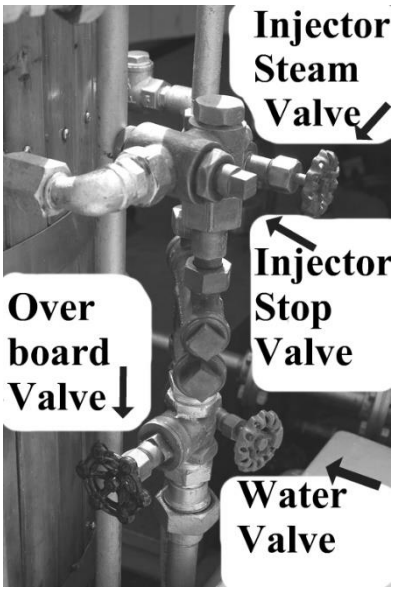


Hand Pump Boiler Check Valve (9)

- This non-return valve prevents steam from exiting the boiler via the feed line, but allows water into the boiler from the hand pump.

For the Boiler Feed Injector:

- It uses steam, through a series of venturi to suck water from the feed tank and blow it into the boiler.
- It can be used to put water in the boiler quickly, while not running the engine.
- The injector puts water into the boiler very quickly, but uses a lot of steam to do so, and cools the boiler in the process.
- The injector will not work with hot water, so may not work at the end of the day. If it does not work, the engineer has to top the tank up with cold water, or use the hand pump.



Combined Injector Stop Valve and Check Valve (10a&b)

- This large bronze assembly beside the injector has a square headed valve on it.
- The line on the starboard face of the square show whether it is open or closed.
- The line is vertical when closed.
- A spanner is needed to turn.

Injector Overboard Discharge Valve (11)

- The handle is Black
- The skin fitting is directly ahead of the bunker
- At the beginning of the day check the skin fitting valve is open

Injector Water Control Valve (12)

- The handle is Blue
- The valve regulates the flow of water to the injector

Injector Steam Valve (13)

- This valve regulates the steam to the injector, and is fed via the main steam line

The following valves allow the control of steam from the boiler to the engine and auxiliary items:

Main Stop Valve (14)

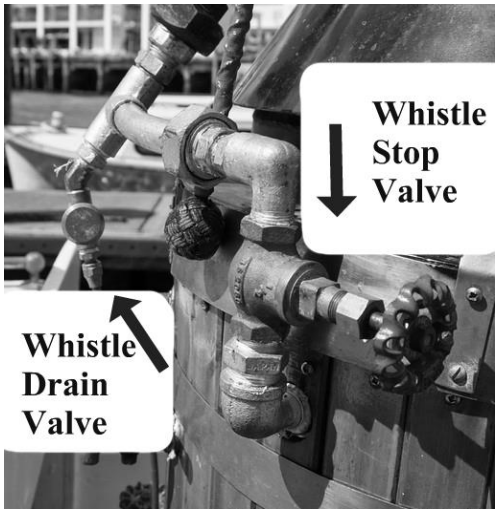
- This valve allows steam into the main steam line
- Engine Steam Line Stop Valve (14a)
    - Located directly below the Main Stop valve
    - This valve allows the engine pipework to be shut off, but still allows steam to be used by the blowers and injectors.
    - This valve is normally left open

Whistle Stop Valve (15)

- This allows steam to the whistle line
- The Whistle is controlled by its own valve on the lanyard

Whistle Drain Valve (16)

- This brass handled valve at the bottom of the whistle line allows condensed steam to be drained from the whistle line by the Master.
- It should only be opened for a short period of time.



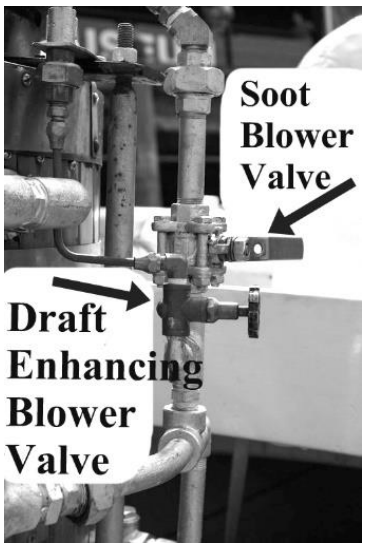
Blower valves – see blower procedures below

Draft Enhancing Blower Valve (17)

- This valve has a small round Black handle
- It is used to allow steam to the small blower to enhance the draft on the fire

Soot Blower Valve (18)

- This valve operates the big soot blower
- It should only be opened for very brief periods of time.



Engine valves –see engine procedures below

Main Steam Line Drain Valve (19)

- This lever valve is used to drain condensed water from the main steam line when warming through.

Engine Throttle Valve (20)

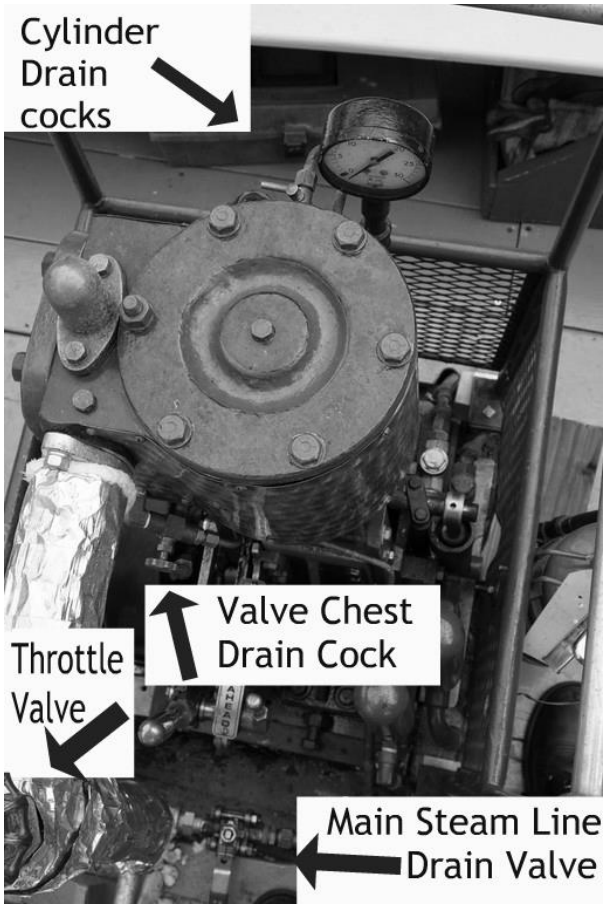
- The Red handled valve beside the engine is used to adjust the amount of steam fed to the engine, and thus its speed.

Valve Chest Drain Cock (21)

- Used on warm up, and if the engine locks up due to too much pressure on the valve during manoeuvring.

Cylinder Drain Cocks (22)

- Two lever handled valves
- Used to drain condensed water from the engine during warming through.



All feed suctions, and engine and gauge glass drains originate or end at the hotwell. This is located ahead of the boiler and contains the main running water. Extra make up water is carried in plastic cans, and is used to "make up" the losses that occur due to leaks, evaporation, whistle and safety valve blowing etc.

The injector overboard line, and the blowdown line both end at the starboard hull side with a second set of valves attached to the skin fittings that pass through the hull side. Both these valves are normally left open, but should be checked at the beginning of the day.

STEAM PLANT OPERATION

Consider the engine and boiler as a system.

OPERATING THE SYSTEM:

1. On arrival on board the boiler should be in one of two conditions.
    a) Completely full to the top (wedged)
    b) Completely empty (blown down)
2. Ideally it would be in the first condition, being completely full, thus the first thing to do is to lower the water level to around half the site glass
    a) Check the level of water in the hotwell forward. If this is in need of topping up, the boiler can be emptied into it via the drain on the site glass.
    b) To allow air into the boiler so that the water level can drop, it is necessary to open the whistle line.
    c) If the hotwell is full, the excess water can be dumped over the side via the blow down cock on the lower port side of the boiler.
    d) The skin valve on the hull should also be open.
    e) Keep a watchful eye on the glass as the level will drop quickly, close valve to stop draining.
3. When the correct water level is obtained the following valves, which should have been closed at the end of the previous run, need to be opened fully.
    a) Main feed stop valve
    b) Hand pump inlet valve
    c) Main stop valve
    d) Whistle line (should already be open on filling)
    e) Throttle valve on engine (quarter turn open)
    f) Cylinder drains and chest drain on engine
    g) Feed valve from hotwell (usually open)
4. Of these, the first is the most important as this allows water into the boiler when the engine starts.

Note on valves: Only valves that are shut should be tight to the touch. If a valve is open do not wind valve fully open to the stop, but leave it slightly off fully open. This is so when a

valve is tested by hand, one can tell if it is truly open or shut. This is an important safety requirement, as one must be sure that a valve is truly shut and not jammed open.

5. Clean ash from ash pan
6. Lubricate engine
    a) All rotating or sliding parts of the engine require manual lubrication from the oil can or grease gun
    b) It is necessary to lubricate these components at least every couple of hours
    c) Greased points are greased at the beginning of the day
7. Check for any loose components on valve gear
8. Set and light fire
    a) The fire is controlled by the amount of fuel supplied, either from below or from above.
    b) When starting and running, the damper should be removed.
    c) Having the door slightly open, on lighting up, will help prevent smoke, as this secondary air will help burn the un-combusted gases as they form
    d) Firing technique: Wood
    i. This can vary greatly with size and quality
    ii. If possible, split into even size chunks, ideally 1-2 times the size of a fist
    iii. Try to keep the entire grate covered as air will pass through the fire, cooling the boiler.
    iv. It is best with wood to add new fuel mostly at the front, and push the fire back as the new fire lights
    v. Wood teds to burn more quickly than coal, requiring more attention than coal
    e) Firing technique: Coal
    i. If firing with coal a good hot wood fire needs to be established, before small amounts of coal are added to prevent excessive smoke.
    ii. When a bed of hot coals is achieved, add coal in small amounts to shallow areas in the fire and avoid smothering the glowing coals, as this will cause the fire to “go black” and will reduce steam production immediately.
    iii. Complete holes in the fire should be avoided, as these will let cold air through and will immediately cool the fire around it.
    iv. The same use of a partially open door will help by preventing excessive smoke as will adding small amounts of coal.
    f) Other factors affecting firing:

i. Wind – the fire is harder to establish on still days and will be easier to maintain on windy days as the wind tends to induce more draught in the funnel.

ii. Soot – if the boiler has not had the tubes cleared of sot via the soot blower prior to shutting down, some difficulty in raising steam can be experienced

9. Warming through

a) At the point steam vapour starts to issue from the whistle, jiggle the whistle lanyard to shut the whistle valve.

b) At the same time steam vapour will begin to enter the engine, and return to the hotwell via drains as condensate.

c) Occasionally turn the engine over by hand to let steam into the cylinder above and below the piston.

d) Carefully feel the engine to ensure it is hot

e) There will be a delay of up to quarter of an hour or more after steam issues from the whistle before a pressure rise will be seen on the gauge.

f) The engine will start at very low pressure <10 psi, and it is a good idea to do so as soon as it will start.

g) This will bring boiler/engine temperature up together to form a 'steady state' ready for operations.

10. Engine Starting

a) Before attempting to start, blow condensed water from the main steam line via the drain valve at your feet until a clean 'roar' of steam is heard.

b) Slowly open the throttle to about quarter open, and manually turn engine over with the cylinder drains still open and shut the chest drain cock

c) Move the reversing lever back and forth if the engine seems to 'stick' in one position

d) Adjust throttle position until engine is turning over slowly by itself for a few minutes, and then close cylinder drains. This is to ensure all water is expelled and will prevent engine from 'hydraulicing'

e) With the engine now idling and the pressure slowly rising, a check must be made to ensure water is being pumped by the engine into the boiler.

f) By now pressure should be climbing, a close watch being kept on pressure and water level.

g) Should the pressure increase to approach blowing the safety valve (100 psi), open the throttle and / or fit the damper to prevent blowing off.

HAND PUMP

- This is located on the end of the seat on the starboard side and has a folding handle

- To use, ensure feed valve on boiler, and delivery valve on hotwell, are open and then operate pump lever
- This pump is for emergencies and if boiler is out of steam and you wish to raise water level
- This pump is very slow and it takes a long time to raise water level with it.

BLOWING DOWN

If the boiler is to be completely blown down the fire must be completely burned away, and the firebox cooled down.

- Blow down should not be done at pressures above 30 psi, as the sudden release of pressure can strain the boiler and cause the tubes to move relative to the tubeplate causing leaks.
- This means blow down should not be done until at least half an hour after shutting down
- To blow down, the over side valve should be open, and the blow down cock opened for short blasts.
- Eventually all the water and steam will be blown out and the cock can be closed.
- All other valves should now be closed as well.
- The boiler will be blown down if the vessel is not to be used for the next 2 weeks or so.
- In this case the museum maintenance staff will refill the boiler the next day and leave it 'wedged'.
- After blowing down, 150ml of treatment is added to the dosing station and will be automatically flushed into the boiler when it is refilled the next day.

USE OF BLOWERS

There are two blowers attached to the side of the boiler/smokebox assembly. The smaller draft enhancing blower can be used sparingly to assist a sluggish fire. Using the blower puts a jet of steam up the funnel, to help 'pull' the fire. This can be useful if the fire is sluggish, but uses steam and feed water, so can be detrimental on a long run, or if the pressure is too low.

The larger soot blower is only used briefly to clean the boiler tubes of soot build up. It should never be used for extended periods of time. The procedure for this is:

1) Bring boiler pressure as high as possible and arrange for the skipper to bring the vessel to an area where there is nothing downwind of the vessel.
2) Confirm the wind is blowing over the side of the vessel or from aft
3) Open the firebox door completely
4) In short bursts (2-5 seconds) open the soot blower valve fully, 2-3 blasts should clear the tubes

5) Close firebox door and resume normal operations, after checking there is no indication of fire on the decks.

BOILER TREATMENT

Boiler treatment chemical is added to the boiler to prevent corrosion, and the formation of scale inside the boiler. Engineers should read and understand the instructions on the test kit provided. It is worth noting that too much treatment in the boiler can be detrimental. Large amounts of treatment can cause the boiler to prime and can destroy the lubricating ability of the steam in the engine.

GAUGE GLASS TESTING AND TROUBLE SHOOTING PROCEDURES

PROCEDURE FOR TESTING A GAUGE GLASS:

1) Close the Water Valve (handle horizontal when closed)
2) Open Drain Valve (handle horizontal when open)
3) Allow steam to flow through glass to waste
4) Close Drain Valve
5) Water level will return in glass
6) Open Water Valve
7) Close Steam Valve
8) Open Drain Valve
9) Allow water to flow through glass to waste
10) Close Drain Valve
11) Water level will return in glass
12) Open Steam Valve

All valves will now have their handles in the vertical position.

If, during steps 3 and 9, the steam and water does not pass through to waste, and the water level does not return rapidly, the passage of the offending valve may be blocked. In this case the vessel must return to her berth, the boiler taken out of steam and the valve should be rodded through to clear the passage to the boiler.

During the passage back to the berth, the engineer must ensure that sufficient water is retained in the boiler by adding water with the feed pump and checking the water level using the test cocks.

BILGE - EMERGENCY PROCEDURES

Discharging oil & oily bilge water into the sea is prohibited.

Protecting NZ's unique marine environment is the responsibility of everyone.

BILGE PUMP

1) Ensure Overboard Discharge valve is open
2) Place bilge pump handle in diaphragm holder
3) Pump by hand

ANCHORING, MOORING AND BERTHING

LOWERING THE ANCHOR

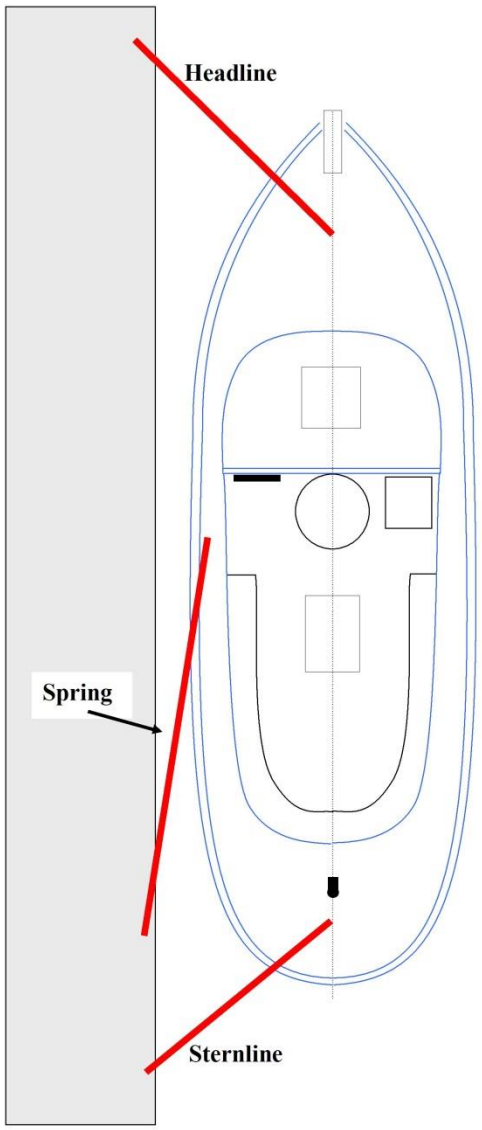
1) Carefully lift anchor from its box
2) Make fast the loose end to forward cleat
3) Ease the anchor over the bow using the Port fairlead
4) Lower into water as Engineer goes dead slow astern
5) Engineer stops engine on Master's orders
6) Anchor wrap made fast to cleat when sufficient wrap is out
7) Note bearings and transits, lay off position on chart
8) Note in log arrive time and position

RAISING ANCHOR

1) Remove anchor wrap from cleat
2) Pull in anchor though fairlead
3) If strong head wind or tide, ask Engineer for Dead Slow ahead
4) Carefully lift anchor over the bow
5) Release the loose end from the forward cleat
6) Pack the anchor away in its box carefully
7) Note in log departure time

MOORING

LINES & FENDERS



Mooring lines cast off on Master's instructions.

BERTHING

Coming alongside to berth

1) Ask engineer for dead slow ahead.
2) Master to pick up spring line from pontoon and attached it to cleat next to wheel.
3) When the spring line is on bollard, ask for astern to stop the vessel.
4) Dead slow ahead and sit on the spring line.
5) Vessel held alongside berth on a spring line when boarding and discharging passengers.

DEPARTING

1) Drop all lines
2) Hold vessel alongside with spring line.
3) Rudder to port
4) Ask engineer for Astern.
5) Three blasts on the whistle.
6) Moment we start going astern, put full starboard rudder.
7) Full port rudder to go ahead.
8) Proceed on harbour run.

VIADUCT HARBOUR OPERATING INSTRUCTIONS

1) Call Viaduct Control on VHF Channel 73 to have the bridge lifted for you to pass under.
2) NOTE: At low tide you can get under without lifting the bridge.
3) Using the three roped together fenders, tie the one with the glove to the front and drape them along pontoon to the aft cleat.
4) Water is available at the public toilets on the Viaduct.
5) Return all lifejackets, firewood, fenders and Puke back to the Museum berth.

CONTROLLED BEACHING

Due to the condenser for the boiler running on the outside of the hull to use the sea water for cooling, Puke is never to be Beached unless it is an emergency

ENVIRONMENTAL CONTROL

Puke isn't fitted with any form of Blackwater system; all crew are to use shore-based facilities.

Waste from the boiler and engine are to be disposed of in accordance with the Environmental control policy in the Standard Operating Procedures.

PRE-DEPARTURE CHECKS

- Museum Handheld radio is on board & working correctly
- VHF Handheld radio is on board & working correctly
- Assessment of voyage conditions including weather as per restricted conditions of operation
- Operation of forward and reverse propulsion
- Steering is free and smooth to operate
- Crew are familiar with on board hazards, manual operation of vessel and safety gear
- All crew are fit for duty
- Suitable fitting lifejackets are worn by all persons on board at all times
- A briefing is given to passengers advising of the safety measures and hazards or potential hazards.

AT SEA CHECKS

Master to ensure safe navigation and operation of the ship by:

- Keeping an alert navigational watch at all times.
- Carrying out safety procedure drills
- Maintaining watertight integrity of the vessel.
- Stability of vessel is paramount – for this reason the Master shall ensure strict passenger control.
- All passengers will remain seated.
- Keeping in radio communications with NZMM.
- Inspect and monitor bilges and compartments.

Engineer to operate and maintain the ship's machinery and electrical systems which include monitoring of:

- Main engine and propulsion gear as per engineer's instructions.
- Steering.

In the event of the engineer becoming incapacitated, the master is to stop the engine by turning off the steam valve on the top of the engine.

POST CHECK TRIPS

1) Stern line on.
2) Bow line on.
3) Ensure bilges are clean and empty
4) Mooring lines are correct and secured at both ends
5) Vessel is left in a clean state.
6) Return firewood to shed
7) Return all lifejackets to their correct storage places

REFUELLING

1) Make sure the vessel is secure alongside
2) Move the fuel to the pontoon next to the vessel
3) Refuelling should be done by a minimum of two people
4) Port side refuelling
    a) If boiler is hot, it is recommended refuelling is done by three crew
    b) The crew member on the pontoon hands the fuel to a crew member on the port side of the vessel
    c) This crew member then passes it to a crew member on the starboard side, or
    d) The crew member throws the fuel onto the floor boards on the starboard side
    e) The fuel is then placed in the storage box on the starboard side
5) Starboard side refuelling
    a) The crew member on the pontoon hands the fuel to a crew member on board
    b) The fuel is then placed in the storage box on the starboard side

BOARDING AND DISEMBARKING

BOARDING

- Every passenger must wear a suitably fitting lifejacket prior to boarding the vessel.
- A crew member (or museum personnel) stand on the pontoon next to the seat for boarding
- A crew member stands on board next to the boiler
- Each passenger is directed to step onto the seat and then down to the floorboards
- An adult MUST proceed any children boarding the vessel
- The crew member on board them directs the passengers to the seats, giving warnings on what surfaces not to touch.

DISEMBARKING

- A crew member (or museum personnel) stands on the pontoon next to the seat for disembarking
- A crew member stands on board next to the boiler
- An adult MUST proceed any children disembarking the vessel
- The crew member on board then directs the passengers to step on the seat then the pontoon, reminding them where not to touch.

DISABLED PASSENGERS

- Less physically mobile passengers will need extra assistance in boarding.
- The Master has final say in deciding if the person's lack of mobility represents a safety concern when taking into account all factors including but not limited to the weather forecast, sea state on the intended passage.
- If necessary, a disabled passenger may require a carer be present to look after the passenger during the voyage
- Wheelchairs cannot be accommodated on the vessel

MECHANICAL FAILURE

LOSS OF PROPULSION

If Engineer can't fix the problem, or in close proximity to other vessels or structures then:

1) Retrieve the paddles from their brackets under the seats
2) If there is a suitable passenger on board they can help to paddle or steer
3) With one person on each side, paddle the vessel to a safe berth.

LOSS OF STEERING

1) Put the tiller into the tiller head on the stern deck
2) Position yourself next to the tiller and steer
3) Discuss the berthing procedure with Engineer, as the Master isn't in normal position for handling mooring lines.
4) Contact Museum security for shore assistance in berthing.

DOCUMENT LOCATION & HAZARD REGISTER

- NZMM Incident Reports are at the Kiosk and Front of House
- Once filled in Refer 1.5.4. MTOP.

HAZARD REGISTER

Hazard	Significant Yes/No	Eliminate, Isolate or Minimalise	Actions Required*	Person responsible

* How do I control it?