

NWSS Annual Safety Check Guide – latest revision: 04/14/12

This is a quick guide intended to help our steamboat owners and Safety Committee Members accomplish the NWSS owner's annual boiler safety check. A copy of the *Guidelines for Operating Safely in our Hobby* handbook, Appendix C, will be a handy reference and is considered appropriate for testing our boilers. This is available online for downloading from the "safety" page of our website:

<http://www.northweststeamsociety.org/Pages/NWSSsafety.htm>

Purpose: The purpose of the boiler safety check of NWSS Members' boats is to ensure that the boiler(s) do not have any cracks, fractures, or other defects which could cause a boiler failure, exposing operating personnel and/or bystanders to possible injury. To this end a non-destructive hydrostatic test at 1.5 times MAWP, or the safety valve setting (whichever is greater), in accordance with ASME code; a test of the boiler safety valve to ascertain relief pressure and volume; and verification of the correct working of the boiler water gauge glass are required.

Vessel Owners:

- First, do your own inspection to locate any problems before formal inspection.
- Determine if you will need an external hand pump, a pressure gage with an increased range, or any fittings to conduct the tests.
- Do your hydro test – temperature of water for this test should be 60°F to 120°F:
 - Close all valves connected to the boiler including the water gauge glass valves but excepting the pressure gauge valve;
 - Remove the safety valve but do not "cap" or "plug" the connection to allow for venting of air or excess water when filling the boiler for the test;
 - Open the feedwater valve and fill the boiler with water, allowing air and excess water to overflow through the safety valve connection;
 - Plug or cap the safety valve connection after all air has been discharged;
 - Determine test pressure (1.5 times MAWP or safety valve setting as in Purpose);
 - Ensure boiler pressure gage has sufficient range (change if necessary);
 - Pump up to test pressure with a hand pump (a hand pump allows the test pressure to easily be kept within the plus/minus 6% allowable pressure variance), closing the feedwater valve when completed;
 - The pressure should not markedly decrease over a ten (10) minute time span. Typically, there will be some minor (not to exceed 6%) pressure loss due to valve leakage, or entrained air;
 - Ensure pressure vessel is sound;
 - Check boiler and fittings for leaks and fix as needed;
 - Drain water to normal steaming level using the blowdown valve;
 - Verify the boiler water gauge glass is operating and free of obstructions – see "Verifying Water Gauge Glass Accuracy" instructions below;
 - Properly re-attach safety valve and discharge piping;
 - Light fire;
 - Verify safety valve operating pressure and ability to limit further pressure build up by raising steam pressure to safety valve relief pressure. Safety valve should open with a definite "pop", and remain open until pressure drops approximately 5% below set pressure, then the valve should close instantly without subsequent leakage. A tiny bit of initial leakage is permissible, if it ceases in a few seconds.
- All Okay? Then schedule a Safety Committee Member as the "Witness". A list of current Safety Committee Members may be found on the NWSS website on the "safety" page.
- Contact the "Witness" of your choice.

Safety Committee Witness:

- Determine a mutually agreeable time and place to “witness” the owner’s test.
- Agree to the MAWP (Maximum Allowable Working Pressure) for the test with the owner.
- Observe the owner testing (as noted above) and assist or advise as needed.
- Upon successful completion:
 - Completely fill out one Safety Certificate form;
 - Owner and Witness sign and date the Safety Certificate form;
 - Issue the completed Safety Certificate form to the Vessel Owner.
- “Witness” is to promptly advise the NWSS Safety Committee Records Manager of the vessel name, owner name and date of signature, witness name and date of signature, date of the Safety Certificate issue, type of boiler tested (fire or water tube), water gauge glass accuracy, and safety valve setting.
- Safety Certificates are required for steamboat participation in NWSS Sanctioned Meets and are valid for one year from the date of issue or until boiler is modified – whichever comes first.

Verifying Water Gauge Glass Accuracy:

Sometimes also called “blowing down the glass”, this important and critical procedure should always be done before lighting up and after shutting down. There is a correct sequence of steps/actions to be taken to ensure that accurate results are obtained:

- Close the water valve and open the drain valve for approximately 5 seconds.
- Close the drain valve and open the water valve
- Water should return to its normal working level quickly. If this does not happen then a blockage in the water valve could be the reason, and remedial action should be taken as soon as possible.
- Close the steam valve and open the drain valve for approximately 5 seconds.
- Close the drain valve and open the steam valve.
- If the water does not return to its normal working level relatively quickly, a blockage may exist in the steam valve. Remedial action should be taken as soon as possible.
- Under normal operating conditions the water level should always be “lively”, not static. It will change with boat motion and throttle opening or closing.