CLAIMS:

1. A method for scrubbing a marine vessel flue gas containing particulates and sulfur dioxide comprising:

spraying an alkaline fluid into the flue gas to produce a saturated flue gas stream containing the alkaline fluid;

flowing the saturated flue gas stream containing the alkaline fluid through a venturi to cause the particulates in the flue gas to impact the alkaline fluid and react at least a portion of the sulfur dioxide with the alkaline fluid; and

flowing the saturated flue gas stream through a separator downstream of the venturi for separating water from the flue gas, wherein the separator is a scrubber, wherein the scrubber has a disengaging zone for receiving flue gas that has passed through the venturi and at least one packing section for receiving flue gas after it passes through the disengaging zone.

2. The method of claim 1, wherein the alkaline fluid is added in sufficient quantities to enable the flue gas to flow through the venturi under suction without the assistance of a fan.

3. The method of claim 1, wherein the alkaline fluid is sprayed co-currently with the flue gas stream in the direction of the venturi.

4. The method of claim 1, wherein the alkaline fluid comprises sea water.

5. A method for scrubbing a marine vessel flue gas containing particulates and sulfur dioxide comprising:

spraying an alkaline fluid into the flue gas to produce a saturated flue gas stream containing the alkaline fluid;

flowing the saturated flue gas stream containing the alkaline fluid through a venturi to cause the particulates in the flue gas to impact the alkaline fluid and react at least a portion of the sulfur dioxide with the alkaline fluid, wherein the alkaline fluid comprises sodium bicarbonate, sodium carbonate or a combination thereof.

6. The method of claim 1, wherein the method is performed onboard the marine vessel.

7. The method of claim 1, wherein the flue gas has a SO_2 concentration of 150 to 2500 ppmv.

8. The method of claim 1, wherein 85% to 99% of the sulfur dioxide in the flue gas is removed, as measured on a mass transfer basis.

9. The method of claim 1, wherein 95 to 99% of particles of 2 micron or larger in the flue gas are removed, as measured on a mass transfer basis.

10. The method of claim 1, wherein 90 to 99% of particles of 1 micron and larger in the flue gas are removed, as measured on a mass transfer basis.

11. The method of claim 1, wherein the marine vessel has an operating power in the range of 0 to 80 MW.

12. The method of claim 1, further comprising collecting and recycling the alkaline fluid.

13. The method of claim 5, wherein the alkaline fluid is added in sufficient quantities to enable the flue gas to flow through the venturi under suction without the assistance of a fan.

14. The method of claim 5, wherein the alkaline fluid is sprayed co-currently with the flue gas stream in the direction of the venturi.

15. The method of claim 5, further comprising collecting and recycling the alkaline fluid.

16. A system for scrubbing a marine vessel flue gas comprising:

a flue gas stream containing particulates and sulfur dioxide produced from the marine vessel;

an alkaline fluid spraying system adapted to spray an alkaline fluid into the flue gas stream to produce a saturated flue gas stream containing the alkaline fluid;

a venturi adapted to receive the saturated flue gas stream and impact the particulates in the flue gas onto the fluid and react at least a portion of the sulfur dioxide with the alkaline fluid; and

a separator downstream of the venturi for separating water from the flue gas, wherein the separator is a scrubber, wherein the scrubber has a disengaging zone for receiving flue gas that has passed through the venturi and at least one packing section for receiving flue gas after it passes through the disengaging zone.

17. The system of claim 16, wherein the alkaline fluid spraying system sprays the alkaline fluid in sufficient quantities to enable the flue gas to flow through the venturi under suction without the assistance of a fan.

18. The system of claim 16, wherein the alkaline fluid spraying system sprays the alkaline fluid co-currently with the flue gas stream in the direction of the venturi.

19. The system of claim 16, wherein the alkaline fluid comprises sea water.

20. The system of claim 16, wherein the system is located onboard the marine vessel.

21. The system of claim 16, wherein the flue gas has a SO_2 concentration of 150 to 2500 ppmv.

22. The system of claim 16, wherein the system removes 85% to 99% of the sulfur dioxide in the flue gas, as measured on a mass transfer basis.

23. The system of claim 16, wherein the system removes 95 to 99% of particles of 2 micron or larger in the flue gas, as measured on a mass transfer basis.

24. The system of claim 16, wherein the system removes 90 to 99% of particles of 1 micron and larger in the flue gas, as measured on a mass transfer basis.

25. The system of claim 16, wherein the marine vessel has an operating power in the range of 0 to 80 MW.

26. The system of claim 16, wherein the system operates in a closed loop mode.

27. The system of claim 16, where in the system is switchable between an open loop and a closed loop mode.

28. A system for scrubbing a marine vessel flue gas comprising:

a flue gas stream containing particulates and sulfur dioxide produced from the marine vessel;

an alkaline fluid spraying system adapted to spray an alkaline fluid into the flue gas stream to produce a saturated flue gas stream containing the alkaline fluid; and

a venturi adapted to receive the saturated flue gas stream and impact the particulates in the flue gas onto the fluid and react at least a portion of the sulfur dioxide with the alkaline fluid, wherein the alkaline fluid comprises sodium bicarbonate, sodium carbonate or a combination thereof.

29. The system of claim 28, wherein the alkaline fluid spraying system sprays the alkaline fluid co-currently with the flue gas stream in the direction of the venturi.

30. The system of claim 28, wherein the system operates in a closed loop mode.

31. The system of claim 28, where in the system is switchable between an open loop and a closed loop mode.