CLAIMS

1. A variable flowrate cooling system, comprising:

a first fluid cooling loop coupled to a first side of a heat exchanger;

a second fluid cooling loop coupled to a second side of the heat exchanger and including a pump for circulating fluid through the second fluid cooling loop; and

a controller operatively connected to the pump, wherein the controller is configured to monitor an actual temperature in the first fluid cooling loop and to adjust a speed of the pump based on the monitored temperature in order to achieve a desired temperature in the first fluid cooling loop.

2. The variable flowrate cooling system of claim 1, further comprising a temperature detector associated with the first fluid cooling loop, the controller operatively coupled to the temperature detector to receive signals representative of the temperature of the first fluid.

3. The variable flowrate cooling system of claim 2, wherein the temperature detector is positioned immediately upstream from a thermal load.

4. The variable flowrate cooling system of claim 3, wherein the thermal load is a diesel engine.

5. The variable flowrate cooling system of claim 1, wherein the second fluid cooling loop comprises a once through seawater loop.

6. The variable flowrate cooling system of claim 5, wherein the first fluid cooling loop comprises a closed freshwater loop.

7. The variable flowrate cooling system of claim 1, wherein the pump comprises first and second pumps, and the controller comprises first and second controllers associated with the first and second pumps, respectively, wherein the first and second controllers are operatively coupled to communicate operational information there between.

8. The variable flowrate cooling system of claim 1, wherein the controller is configured to determine a system efficiency, based on the speed of the pump and the detected temperature, and to command operation of a second pump when two pump operation is determined to be more efficient than one pump operation.

9. A method for providing variable sea water cooling flow to a heat exchange element, the method comprising:

circulating a first fluid in a first cooling loop at a first flow rate, the first cooling loop coupled to a first side of a heat exchanger;

circulating a second fluid in a second cooling loop at a second flow rate, the second cooling loop coupled to a second side of the heat exchanger;

detecting a temperature of the first fluid; and

adjusting the second flow rate to maintain a temperature of the first fluid within a predetermined temperature range.

10. The method of claim 9, wherein the temperature is detected immediately upstream from a thermal load.

11. The method of claim 10, wherein the thermal load is a diesel engine.

12. The method of claim 10, wherein the second fluid is seawater, and the step of circulating the second fluid comprises operating a pump at a variable speed to adjust the second flow rate.

13. The method of claim 12, wherein adjusting the flow rate is performed using a controller associated with the pump.

14. The method of claim 13, wherein the pump comprises first and second pumps, and the adjusting step is performed by first and second controllers associated with the first and second pumps, respectively, the method further comprising communicating operational information between the first and second controllers, the operational information relating to the first and second pumps.

15. The variable flowrate cooling system of claim 1, wherein the controller is configured to determine a system efficiency, based on the speed of the pump and the detected temperature, and to command operation of a second pump when two pump operation is determined to be more efficient than one pump operation.

CLAIMS

1. A variable flowrate cooling system, comprising:

a first fluid cooling loop arranged for coupling to a first side of a heat exchanger;

a second fluid cooling loop arranged for coupling to a second side of the heat exchanger and including a pump for circulating fluid through the second fluid cooling loop; and

a controller operatively arranged for connecting to the pump, wherein the controller is configured to monitor an actual temperature in the first fluid cooling loop and to adjust a speed of the pump based on the monitored temperature in order to achieve a desired temperature in the first fluid cooling loop;

wherein the second fluid cooling loop comprises a once through seawater loop.

2. The variable flowrate cooling system of claim 1, further comprising a temperature detector associated with the first fluid cooling loop, the controller operatively being arranged for coupling to the temperature detector to receive signals representative of the temperature of the first fluid.

3. The variable flowrate cooling system of claim 2, wherein, when installed for operation, the temperature detector is positioned immediately upstream from a thermal load.

4. The variable flowrate cooling system of claim 3, wherein the thermal load is a diesel engine.

5. The variable flowrate cooling system of claim 1, wherein the first fluid cooling loop comprises a closed freshwater loop.

6. The variable flowrate cooling system of claim 1, wherein the pump comprises first and second pumps, and the controller comprises first and second controllers associated with the first and second pumps, respectively, wherein the first and second controllers are operatively arranged for coupling to communicate operational information there between.

7. The variable flowrate cooling system of claim 1, wherein the controller is configured to determine a system efficiency, based on the speed of the pump and the detected temperature, and to command operation of a second pump when two pump operation is determined to be more efficient than one pump operation.

8. A method for providing variable sea water cooling flow to a heat exchange element, the method comprising:

circulating a first fluid in a first cooling loop at a first flow rate, the first cooling loop arranged for coupling to a first side of a heat exchanger;

circulating a second fluid in a second cooling loop at a second flow rate, the second cooling loop arranged for coupling to a second side of the heat exchanger;

detecting a temperature of the first fluid; and

adjusting the second flow rate to maintain a temperature of the first fluid within a predetermined temperature range;

wherein the second fluid cooling loop comprises a once through seawater loop.

9. The method of claim 8, wherein the temperature is detected immediately upstream from a thermal load.

10. The method of claim 9, wherein the thermal load is a diesel engine.

11. The method of claim 9, wherein the step of circulating the second fluid comprises operating a pump at a variable speed to adjust the second flow rate.

12. The method of claim 11, wherein adjusting the flow rate is performed using a controller associated with the pump.

13. The method of claim 12, wherein the pump comprises first and second pumps, and the adjusting step is performed by first and second controllers associated with the first and second pumps, respectively, the method further comprising communicating operational information between the first and second controllers, the operational information relating to the first and second pumps.

14. The method of claim 12, wherein the controller is configured to determine a system efficiency, based on the speed of the pump and the detected temperature, and to command operation of a second pump when two pump operation is determined to be more efficient than one pump operation.