CLAIMS

WHAT IS CLAIMED IS:

1. A method for cooling a heat source, comprising:

(a) providing a cooling system in thermal communication with said heat source, wherein said cooling system comprises (i) a container comprising a container wall, wherein said container comprises said heat source submerged in a first liquid, (ii) a baffle disposed between said heat source and said container wall, and (iii) a recirculation loop comprising (A) a passageway comprising a converging structure disposed between said baffle and said container wall and (B) a pump that directs the flow of said first liquid through said converging structure, wherein said first liquid is in thermal communication with said heat source;

(b) transferring thermal energy from said heat source to said first liquid and, during said transferring, using said baffles to direct flow of said first liquid away from said heat source; and

(c) using said pump of said recirculation loop to direct said first liquid through said converging structure of said passageway to generate a suction force that pulls said first liquid through said converging structure and generates flow of said first liquid between said baffle and said container wall to thereby cool said heat source.

2. The method of claim 1, further comprising flowing said first liquid such that said first liquid is maintained in a subcooled state.

3. The method of claim 1 or claim 2, wherein said baffle directs said first liquid towards said container wall.

4. The method of any one of claims 1-3, wherein said first liquid is a dielectric liquid.

5. The method of any one of claims 1-4, wherein said baffle comprises a bottom plate comprising perforations that permit flow of said first liquid through said bottom plate.

6. The method of any one of claims 1-5, wherein said baffle comprises a flow diverter that directs flow of said first liquid around said heat source.

7. The method of any one of claims 1-6, wherein said container comprises a lid that seals said container.

8. The method of any one of claims 1-7, wherein said container comprises a liquid lid disposed adjacent to and above said first liquid.

9. The method of claim 8, wherein said container comprises a float that displaces a volume of said liquid lid.

10. The method of any one of claims 1-9, wherein said container comprises a relief valve that maintains a pressure of said container below a threshold value.

11. The method of any one of claims 1-10, wherein said container comprises a liner configured to seal said first liquid inside said container.

12. The method of any one of claims 1-11, further comprising using one or more processors coupled to said pump to control a flow of said first liquid through said converging structure.

13. The method of any one of claims 1-12, wherein said heat source is a mining machine, and wherein said mining machine comprises a wireless handle.

14. The method of claim 13, wherein said wireless handle comprises a wireless emitter.

15. A method for predicting an overheating event to aid in cooling a heat source, comprising:

(a) receiving a plurality of parameters associated with a plurality of electrical components of an electrical network from a plurality of sensors, wherein one of said plurality of sensors is a temperature sensor; and

(b) computer processing said plurality of parameters with a predictive model to generate an output indicative of said overheating event, wherein said predictive model is trained on a training dataset comprising a plurality of historical data of said plurality of parameters across different time points, and wherein said plurality of historical data is labeled as originating or not originating from an electrical component that has undergone an overheating event.

16. The method of claim 15, wherein said predictive model is a binary predictive model, and wherein said output is a binary output that indicates whether one of said plurality of electrical components will or will not have said overheat event.

17. The method of claim 15 or claim 16, wherein said predictive model is a multi-class predictive model, and wherein said output comprises a probability distribution over a plurality of levels or imminency of said overheat event.

18. The method of any one of claims 15-17, wherein said plurality of sensors comprises electrical characteristic sensors.

19. The method of any one of claims 15-18, wherein said training dataset comprises topological relationships between said plurality of electrical components.

20. The method of any one of claims 15-19, wherein said temperature sensor is an infrared thermometer.