WHAT IS CLAIMED IS:

1. A heat transfer system, comprising:

a heat exchanger that defines a first fluid path and a second fluid path;

a first variable control pump for providing variable flow of a first circulation medium through the first fluid path of the heat exchanger;

a variable flow controlling mechanical device for providing variable flow of a second circulation medium through the second fluid path of the heat exchanger;

sensors for detecting variables, the sensors comprising first at least one sensor for sensing at least one variable indicative of the first circulation medium and second at least one sensor for sensing at least one variable indicative of the second circulation medium; and

at least one controller configured to control the first variable control pump and the variable flow controlling mechanical device in a first type of flow control mode that is a first type of feed forward control loop based on the detected variables of the first circulation medium and the second circulation medium, and switch control of the first variable control pump and the variable flow controlling mechanical device to a second type of flow control mode that is a second type of feed forward control loop that is different than the first type of control mode based on the detected variables of the first circulation medium and the second circulation medium.

2. The heat transfer system as claimed in claim 1, wherein the at least one controller is configured to automatically perform the switch control based on the variables detected from the sensors.

3. The heat transfer system as claimed in claim 1, wherein the first type of feed forward control loop is one of a)-d) as follows, and the second type of feed forward control loop is a different one of the a)-d) as follows:

a) wherein the at least one controller maintains a specified fixed ratio of flow of the first fluid path to flow of the second fluid path;

b) wherein the at least one controller maintains source-side output temperature of the heat exchanger at a fixed setpoint;

c) wherein the at least one controller maintains output temperature from the heat exchanger to variable load source-side output temperature of the heat exchanger at a fixed setpoint; or

d) wherein the at least one controller maximizes temperature differential across the heat exchanger to a temperature source.