

SUMMARY OF THE INVENTION

[005a] In accordance with one aspect of the present disclosure, there is provided a computer program product fixed in a tangible medium for determining one or more effects of changes to a chilled water plant comprising: machine readable code fixed on the tangible medium, the machine readable code comprising one or more instructions for: receiving specification data for one or more components of a chilled water plant; receiving load data indicating the load on the one or more components for one or more periods of time; determining one or more summarized load values from the load data for the one or more periods of time; receiving representative log data from one or more logs of the chilled water plant, wherein the representative log data has an attribute of being log data from the one or more logs having a load value closest to at least one of the one or more summarized load values; and determining an idealized power utilization for the chilled water plant from the specification data and the representative log data.

[005b] In accordance with one aspect of the present disclosure, there is provided a qualification system for determining one or more effects of one or more chilled water plant upgrades comprising: a processor; a memory device; and machine readable code executable by the processor and stored on the memory device; one or more first data input fields generated by executing the machine readable code, the one or more first data input fields configured to accept empirical log data for a chilled water plant for one or more periods of time; one or more first data processing units configured to generate at least one numerical value summarizing the empirical log data for the one or more periods of time, the one or more first data processing units implemented by the machine readable code; one or more second data input fields generated by executing the machine readable code, the one or more second data input fields configured to accept representative log data, the representative log data comprising data selected from one or more logs of the chilled water plant having a value closest to the at least one numerical value of at least one of the one or more periods of time; one or more third data input fields generated by executing the machine readable code, the one or more third data input fields configured to accept specification data for the chilled water plant; one or more second data processing units configured to calculate at least an idealized power utilization and a current power utilization for the chilled water plant with at least the specification data and the representative log data, the one or more second data processing units implemented by the machine readable code.

[005c] In accordance with one aspect of the present disclosure, there is provided a method of determining the effect of one or more chilled water plant upgrades utilizing a qualification system comprising: inputting specification data for one or more components of a chilled

water plant into one or more data inputs of the qualification system; inputting chiller load data indicating the load on one or more chillers for one or more periods of time into the one or more data inputs to calculate an average chiller load from the chiller load data for the one or more periods of time; identifying representative log data from one or more logs of the chilled water plant, wherein the representative log data has an attribute of being data from the one or more logs having a chiller load value closest to the average chiller load of at least one of the one or more periods of time; inputting the representative log data identified from the one or more logs of the chilled water plant into the one or more data inputs to calculate a power utilization of the chilled water plant from the representative log data; and initializing an analysis to compare the power utilization of the chilled water plant to an idealized power utilization of the chilled water plant, wherein the idealized power utilization is calculated with at least the specification data.

[006] A qualification system for determining the effect(s) of one or more chilled water plant upgrades is disclosed herein. The qualification system allows the effect of upgrades to be accurately determined. In one or more embodiments, the qualification system is capable of producing an accurate representation of the effect of upgrades using a reduced data set. This allows the effect of upgrades to be determined very quickly and efficiently. In addition, the qualification system may utilize various types and amounts of actual chilled water plant log data and characteristics to produce an accurate analysis for a particular chilled water plant. The qualification system may accept additional log data to reduce margins of error as desired in one or more embodiments.

[007] The qualification system may be configured in various ways. For instance, in one exemplary embodiment, a qualification system for one or more equipment upgrades is provided. The qualification system may comprise a processor and a memory device having machine readable code executable by the processor stored thereon. The machine readable code may comprise one or more instructions for receiving specification data for one or more components of a chilled water plant, receiving load data indicating the load on one or more components of the chilled water plant for one or more periods of time, and determining one or more summarized load values for the one or more periods of time by summarizing the load data.

[008] It is noted that the specification data may comprise design specifications for at least the chillers of the chilled water plant. For example, the design specifications may be specifications such as energy utilization, output, water supply temperatures, and water return temperatures. The load data may comprise load values for one or more components, such

as chillers, of the chilled water plant. The representative log data may comprise plant log data for the components of the chilled water plant, such as pumping frequencies, fan frequencies, water supply temperatures, and water return temperatures.

[009] The one or more instructions may also be for receiving representative log data from one or more logs of the chilled water plant, and determining idealized power utilization for the chilled water plant from the specification data and/or representative data. The representative log data may have an attribute of being log data from the one or more logs having a load value closest to at least one of the summarized load values.

[010] It is noted that the instructions may also or alternatively be configured to calculate the idealized power utilization from the specification data and wet bulb data for a geographic location where the chilled water plant is located. The machine readable code may include one