CLAIMS

1. A method of cold treatment (CT) of refrigerated cargo during shipment of a refrigeration container, implemented by an active response controller having one or more processors and having memory storage, the memory storage comprising instructions that when executed by the one or more processors implement steps comprising:

receiving, at the active response controller, a set point adjustment protocol including rules for modifying set points of a refrigeration controller of the refrigeration container, wherein each of the rules is defined by a temperature threshold and a temperature trend trigger, wherein each temperature trend trigger is a rate of temperature change per time, maintained for a given period of time;

during a period of active response operation, receiving temperature signals from a plurality of temperature probes located in the refrigeration container;

determining that a temperature indicated by one or more of the received temperature signals exceeds a temperature threshold defined by a given rule of the set point adjustment protocol and that a temperature trend of the one or more of the received temperature signals meets a temperature trend trigger of the given rule of the set point adjustment protocol; and

responsively transmitting a set point change command of the given rule to the refrigeration controller.

2. The method of claim 1, further comprising starting the active response operation responsively to determining that transport of the refrigeration container has begun.

3. The method of claim 1, wherein determining that one or more of the received temperature signals exceeds the temperature threshold comprises identifying a highest temperature reading

from among the temperature signals, and comparing the highest temperature to the temperature thresholds of the rules of the set point adjustment protocol.

4. The method of claim 1, further comprising determining that a CT treatment period of time defined in the set point adjustment protocol has been reached and responsively transmitting a second set point change command to the refrigeration controller to increase the refrigeration controller set point to a post-CT treatment period temperature.

5. The method of claim 4, wherein determining that the CT treatment period defined in the set point adjustment protocol has been reached further comprises stopping the active response operation.

6. The method of claim 1, further comprising determining that a maximum allowed CT temperature threshold has been exceeded and responsively reinitializing the CT treatment period.

7. The method of claim 1, further comprising determining that a maximum allowed CT temperature threshold has been exceeded and responsively stopping the active response operation.

8. The method of claim 1, further comprising reporting the received temperature signals, a first set point change command, and a second set point change command, to a remote computer, by transmission over a telematics unit.

9. A system for cold treatment (CT) of refrigerated cargo during shipment of a refrigeration container, comprising:

a refrigeration controller, configured to receive temperature signals from a plurality of temperature probes and temperature set point adjustment commands, to control a refrigeration unit of the refrigeration container;

a telematics unit, collocated with the refrigeration controller and configured to receive remote communications; and

an active response controller having one or more processors and having memory storage, the memory storage comprising instructions that when executed by the one or more processors implement steps comprising:

receiving, at the active response controller, a set point adjustment protocol including rules for modifying set points of a refrigeration controller of the refrigeration container, wherein each of the rules is defined by a temperature threshold and a temperature trend trigger, wherein each temperature trend trigger is a rate of temperature change per time, maintained for a given period of time;

during a period of active response operation, receiving temperature signals from a plurality of temperature probes located in the refrigeration container;

determining that a temperature indicated by one or more of the received temperature signals exceeds a temperature threshold as defined by a given rule of the set point adjustment protocol and that a temperature trend of the one or more of the received temperature signals meets a temperature trend trigger of the given rule of the set point adjustment protocol; and

responsively transmitting a set point change command of the given rule to the refrigeration controller.

10. The system of claim 9, wherein determining that one or more of the received temperature signals exceeds the temperature threshold comprises identifying a highest temperature reading from among the temperature signals, and comparing the highest temperature to the temperature thresholds of each of the rules of the set point adjustment protocol.

11. The system of claim 9, wherein the active response controller is configured to determine that a CT treatment period of time defined by the set point adjustment protocol has been reached and responsively transmitting a second set point change command to the refrigeration controller to increase the refrigeration controller set point to a post-CT treatment period temperature.

12. The system of claim 9, wherein the active response controller is configured to determine that a maximum allowed CT temperature threshold has been exceeded and responsively to reinitialize the CT treatment period.

13. The system of claim 9, wherein the active response controller is configured to determine that a maximum allowed CT temperature threshold has been exceeded and responsively to stop the active response operation.