plurality of load cells, determine, based on the signals, a center of gravity of the cargo, perform a comparison of the center of gravity of the cargo to an expected center of gravity of the cargo, and accept the cargo in response to the comparison by the controller, that a difference between the determined center of gravity of the cargo and the expected center of gravity of the cargo satisfies a center of gravity difference threshold.

According to another implementation of the present disclosure, a method includes receiving, at a controller, a signal from each load cell of a plurality of load cells coupled to an aircraft cargo roller panel of an aircraft. Each signal is indicative of a load experienced by the load cell when cargo is on the aircraft cargo roller panel. The method also includes determining, based on the signals, a center of gravity of the cargo,. The method further includes performing a comparison of the center of gravity of the cargo to an expected center of gravity of the cargo, and accepting the cargo in response to the comparison by the controller, that a difference between the determined center of gravity of the cargo and the expect center of gravity of the cargo satisfies a center of gravity difference threshold.

According to another implementation of the present disclosure, an aircraft cargo roller panel includes a plurality of omnidirectional rollers configured to facilitate loading aircraft cargo into a compartment of an aircraft. The aircraft cargo roller panel also includes a plurality of load cells. Each load cell of the plurality of load cells is configured to generate a load signal indicative of a load experienced by the load cell when cargo is on the plurality of omnidirectional rollers and to send the load signal to a controller. The aircraft cargo roller panel also includes one or more motive devices configured to selectively engage, responsive to a control signal from the controller that indicates a center of gravity is below a threshold, the cargo to move the cargo within the compartment. The control signal is generated responsive to the load signals.

One advantage of the above-described implementation is an ability to verify whether aircraft cargo is compliant with reported parameters on an aircraft load and trim sheet or other similar document when the aircraft cargo is loaded on an aircraft. For example, the aircraft cargo is placed onto an aircraft cargo roller panel that includes multiple load cells. Based on a load experienced by each load cell, a controller can determine a weight of the aircraft cargo and a center of gravity of the aircraft cargo while the aircraft cargo is on the aircraft cargo roller panel. If the weight and the center of gravity are compliant with a reported weight and center

of gravity in the aircraft load and trim sheet or other similar document, the aircraft cargo roller panel loads the aircraft cargo into a compartment of the aircraft. However, if the weight or the center of gravity is not compliant, crew members may be alerted. Additionally, the features, functions, and advantages that have been described can be achieved independently in various implementations or may be combined in yet other implementations, further details of which are disclosed with reference to the following description and drawings.

WHAT IS CLAIMED IS:

1. An aircraft comprising:

an aircraft cargo roller panel configured to facilitate loading aircraft cargo into a compartment of the aircraft;

a plurality of load cells coupled to the aircraft cargo roller panel, each load cell of the plurality of load cells configured to generate a signal indicative of a load experienced by the load cell when cargo is on the aircraft cargo roller panel; and

a controller configured to:

receive signals from the plurality of load cells;

determine, based on the signals, a center of gravity of the cargo;

perform a comparison of the center of gravity of the cargo to an expected center of gravity of the cargo; and

accept the cargo in response to the comparison by the controller, that a difference between the determined center of gravity of the cargo and the expected center of gravity of the cargo satisfies a center of gravity difference threshold.

2. The aircraft of claim 1, wherein the controller is further configured to:

perform a comparison of a weight of the cargo and the center of gravity of the cargo to acceptance criteria; and

based on a result of the comparison, determine whether to accept the cargo.

3. The aircraft of claim 2, further comprising a display device configured to display a notification that indicates whether the cargo is accepted.

4. The aircraft of claim 2, wherein the controller is configured to generate an override prompt based on a determination by the controller that the cargo is not accepted, wherein the override prompt enables a user to provide user credentials and to identify the cargo as accepted.

5. The aircraft of claim 4, wherein the controller is further configured to:

authenticate the user credentials;

generate an override command responsive to authentication of the user credentials; and

store the user credentials with cargo manifest data to identify the user that authorized acceptance of the cargo.

6. The aircraft of claim 2, wherein the cargo is accepted in response to a determination, by the controller, that a difference between the weight of the cargo and an expected weight of the cargo satisfies a weight difference threshold.

7. The aircraft of claim 2, wherein the cargo is accepted in response to a determination, by the controller, that a difference between the determined center of gravity of the cargo and an expected center of gravity of the cargo satisfies a center of gravity difference threshold.

8. The aircraft of claim 1, wherein the controller is configured to perform a comparison of the center of gravity of the cargo to an expected center of gravity of the cargo; and

accept the cargo in response to the comparison by the controller, that a difference between the determined center of gravity of the cargo and the expected center of gravity of the cargo satisfies a center of gravity difference threshold.

9. The aircraft of claim 8, wherein the controller is further configured to selectively enable the cargo transport system based on a weight of the cargo and the center of gravity of the cargo.

10. The aircraft of claim 1, further comprising:

a cargo identification device coupled to the controller and configured to send cargo identification data associated with the cargo to the controller,

wherein, based on the cargo identification data, the controller is configured to determine at least one of an expected weight of the cargo or an expected center of gravity of the cargo.

11. The aircraft of claim 10, wherein the cargo identification device includes a radio-frequency identification (RFID) tag scanner and the cargo includes an RFID tag, or the cargo identification device includes an optical scanner and the cargo includes a visible tag.

12. The aircraft of claim 11, wherein the controller is configured to access at least one of a cargo manifest or an electronic flight bag to determine the expected weight of the cargo, the expected center of gravity of the cargo, or both.

13. The aircraft of claim 1, wherein the aircraft cargo roller panel comprises at least two sub-panels, each sub-panel comprising at least one load cell of the plurality of load cells.

14. The aircraft of claim 1, further comprising a memory coupled to the controller, wherein the controller is configured to store cargo data at the memory, the cargo data indicating a total weight of cargo in the compartment based on the weight of the cargo and based on weights of other cargo previously loaded in the compartment via the aircraft cargo roller panel.

15. The aircraft of claim 14, further comprising a flight data system coupled to the memory, the flight data system configured to:

perform a comparison of the total weight of cargo in the compartment to flight parameters; and

output an aircraft weight notification based on the comparison.

16. The aircraft of claim 15, wherein the controller is further configured to estimate an aggregate center of gravity of at least one of the cargo in the compartment or the aircraft including the cargo in the compartment, and the flight data system is configured to:

perform a second comparison of the aggregate center of gravity to the flight parameters; and

output a second notification based on the second comparison.

17. A method comprising:

receiving, at a controller, a signal from each load cell of a plurality of load cells coupled to an aircraft cargo roller panel of an aircraft, each signal indicative of a load experienced by the load cell when cargo is on the aircraft cargo roller panel;

determining, based on the signals, a center of gravity of the cargo;

performing a comparison of the center of gravity of the cargo to an expected center of gravity of the cargo; and

accepting the cargo in response to the comparison by the controller, that a difference between the determined center of gravity of the cargo and the expected center of gravity of the cargo satisfies a center of gravity difference threshold.

18. The method of claim 17, further comprising:

performing a comparison of a weight of the cargo and a center of gravity of the cargo to acceptance criteria; and

determining whether to accept the cargo based on a result of the comparison.

19. The method of claim 17, wherein the cargo is accepted in response to a determination, by the controller, that a difference between the weight of the cargo and an expected weight of the cargo satisfies a weight difference threshold.

20. An aircraft cargo roller panel comprising:

a plurality of omnidirectional rollers configured to facilitate loading aircraft cargo into a compartment of an aircraft;

a plurality of load cells, each load cell of the plurality of load cells configured to generate a load signal indicative of a load experienced by the load cell when cargo is on the plurality of omnidirectional rollers and to send the load signal to a controller; and

one or more motive devices configured to selectively engage, responsive to a control signal from the controller that indicates a center of gravity is below a threshold, the cargo to move the cargo within the compartment, the control signal generated responsive to the load signals.