CLAIMS

We Claim:

1. A method for determining a landing site for an aircraft (900), the method comprising:

receiving flight data corresponding to a flight path;

identifying (902) at least one landing site proximate to the flight path;

generating (904) a spanning tree between the at least one landing site and the flight path; and

storing (906) the spanning tree in a data storage device, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

2. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at a routing tool (100) associated with the aircraft during planning of a flight.

3. The method of claim 1, wherein receiving the flight data comprise receiving the flight data at a routing tool (100) associated with the aircraft during a flight.

4. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at an off-board routing tool associated with an air traffic control system before a flight is commenced.

5. The method of claim 4, further comprising:

detecting an emergency condition during a flight of the aircraft.

in response to detecting the emergency, transmitting data to the air traffic control system indicating occurrence of the emergency; and

receiving the spanning tree from the air traffic control system.

6. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at an off-board routing tool associated with an air traffic control system during a flight.

7. The method of claim 1, further comprising detecting an emergency condition during a flight of the aircraft.

8. The method of claim 7, further comprising:

in response to detecting the emergency, retrieving (908) the spanning tree from the data storage device; and

passing the spanning tree to a display system of the aircraft.

9. The method of claim 8, further comprising:

displaying the spanning tree; and

receiving a selection of a displayed landing site (202) associated with the spanning tree.

10. The method of claim 9, further comprising displaying a countdown timer with the spanning tree, the countdown timer indicating an amount of time for which the landing site (202) may be selected.

11. The method of claim 9, further comprising:

obtaining real-time weather data (124) for the landing site (202), wherein the real-time weather data (124) is evaluated before selecting the landing site (202).

12. The method of claim 9, further comprising displaying a vertical profile view (320) of a glide path (324A, 324B) for ingress to the selected landing site (202, 304A, 304B).

13. A routing tool (100) for determining a landing site for an aircraft, the routing tool comprising a database (104) configured to store flight data corresponding to a flight path for the aircraft, and a routing module (102) configured to:

receive the flight data;

identify (902) at least one landing site proximate to the flight path;

generate (904) a spanning tree between the at least one landing site and the flight path; and

store (906) the spanning tree in a data storage device, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

14. The routing tool (100) of claim 13, wherein the routing tool comprises a component of the aircraft.

15. The routing tool (100) of claim 13, wherein the routing tool comprises a component of an air traffic control system.

16. The routing tool (100) of claim 13, wherein the spanning trees are generated before a flight is commenced.

17. The routing tool (100) of claim 11, wherein the spanning trees are generated in real-time, in response to detecting an emergency during a flight of the aircraft.

18. The routing tool (100) of claim 13, further comprising a performance learning system for generating an aircraft

performance model, wherein the aircraft performance model is used to generate the spanning tree.

19. A computer readable storage medium having computer executable instructions stored thereon, the execution of which by a processor cause a routing tool to:

receive flight data corresponding to a flight path;

identify (902) at least one landing site proximate to the flight path;

generate (904) a spanning tree between the at least one landing site and the flight path;

store (906) the spanning tree in a data storage device;

detect an emergency at the aircraft during a flight of the aircraft; and

in response to detecting the emergency, display the spanning tree for selection of a landing site, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

20. The computer readable storage medium of claim 19, further comprising computer executable instructions, the execution of which make the routing tool further operative to:

transmit data indicating the emergency on board the aircraft, the data being transmitted to an air traffic control system; and

receive instructions for selecting the landing site from the air traffic control system.

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We Claim:

1. A method for determining a landing site for an aircraft (900), the method comprising:

receiving flight data corresponding to a flight path;

identifying (902) at least one landing site proximate to the flight path;

generating (904) a spanning tree between the at least one landing site and the flight path; and

storing (906) the spanning tree in a data storage device, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

2. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at a routing tool (100) associated with the aircraft during planning of a flight.

3. The method of claim 1, wherein receiving the flight data comprise receiving the flight data at a routing tool (100) associated with the aircraft during a flight.

4. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at an off-board routing tool associated with an air traffic control system before a flight is commenced.

5. The method of claim 4, further comprising:

detecting an emergency condition during a flight of the aircraft.

in response to detecting the emergency, transmitting data to the air traffic control system indicating occurrence of the emergency; and

receiving the spanning tree from the air traffic control system.

6. The method of claim 1, wherein receiving the flight data comprises receiving the flight data at an off-board routing tool associated with an air traffic control system during a flight.

7. The method of claim 1, further comprising detecting an emergency condition during a flight of the aircraft.

8. The method of claim 7, further comprising:

in response to detecting the emergency, retrieving (908) the spanning tree from the data storage device; and

passing the spanning tree to a display system of the aircraft.

9. The method of claim 8, further comprising:

displaying the spanning tree; and

receiving a selection of a displayed landing site (202) associated with the spanning tree.

10. The method of claim 9, further comprising displaying a countdown timer with the spanning tree, the countdown timer indicating an amount of time for which the landing site (202) may be selected.

11. The method of claim 9, further comprising:

obtaining real-time weather data (124) for the landing site (202), wherein the real-time weather data (124) is evaluated before selecting the landing site (202).

12. The method of claim 9, further comprising displaying a vertical profile view (320) of a glide path (324A, 324B) for ingress to the selected landing site (202, 304A, 304B).

13. A routing tool (100) for determining a landing site for an aircraft, the routing tool comprising a database (104) configured to store flight data corresponding to a flight path for the aircraft, and a routing module (102) configured to:

receive the flight data;

identify (902) at least one landing site proximate to the flight path;

generate (904) a spanning tree between the at least one landing site and the flight path; and

store (906) the spanning tree in a data storage device, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

14. The routing tool (100) of claim 13, wherein the routing tool comprises a component of the aircraft.

15. The routing tool (100) of claim 13, wherein the routing tool comprises a component of an air traffic control system.

16. The routing tool (100) of claim 13, wherein the spanning trees are generated before a flight is commenced.

17. The routing tool (100) of claim 11, wherein the spanning trees are generated in real-time, in response to detecting an emergency during a flight of the aircraft.

18. The routing tool (100) of claim 13, further comprising a performance learning system for generating an aircraft

performance model, wherein the aircraft performance model is used to generate the spanning tree.

19. A computer readable storage medium having computer executable instructions stored thereon, the execution of which by a processor cause a routing tool to:

receive flight data corresponding to a flight path;

identify (902) at least one landing site proximate to the flight path;

generate (904) a spanning tree between the at least one landing site and the flight path;

store (906) the spanning tree in a data storage device;

detect an emergency at the aircraft during a flight of the aircraft; and

in response to detecting the emergency, display the spanning tree for selection of a landing site, wherein the spanning tree comprises a plurality of ingress flight paths to the at least one landing site and identifies which flight paths are blocked by obstruction.

20. The computer readable storage medium of claim 19, further comprising computer executable instructions, the execution of which make the routing tool further operative to:

transmit data indicating the emergency on board the aircraft, the data being transmitted to an air traffic control system; and

receive instructions for selecting the landing site from the air traffic control system.