Claims

1. An airport runway arrangement for commercial aircraft, comprising:
a first runway section;
a second runway section extending substantially in prolongation of the first runway section; and
an intermediate section between the first and second runway sections.

2. An airport runway arrangement according to claim 1 wherein the second runway section has the same direction of operation as that of the first runway section.

3. An airport runway arrangement according to claim 1 or 2 wherein the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

4. An airport runway arrangement according to claim 1, 2 or 3 further comprising a safety area at the ends of each take-off runway section.

5. An airport runway arrangement according to any preceding claim comprising a further safety area at the start of each landing section.

6. An airport runway arrangement comprising a pair of runway arrangements each according to any of claims 1 to 5.

7. An airport runway arrangement according to claim 6 wherein the pair of runways is separated by at least 1035m.

8. An airport runway arrangement according to claim 1, further comprising a third runway section.

9. An airport runway arrangement according to claim 8 further comprising a fourth additional runway section extending substantially in prolongation of the third runway section.

10. An airport runway arrangement according to claim 8 or 9 wherein the first and second runway sections have opposing directions of operation.

11. An airport runway arrangement according to any of claims 9 to 10 wherein the third and fourth runway sections have opposing directions of operation.

12. An airport runway arrangement according to any of claims 8 to 11 wherein the third runway section is adjacent the first runway section.

13. An airport runway arrangement according to any of claims 8 to 12 wherein the fourth runway section is adjacent the second runway section.

14. An airport runway arrangement according to claim 12 or 13 wherein the first and third runway sections are contiguous and the second and fourth runway sections are contiguous.

15. An airport runway arrangement according to any of claims 9 to 14 wherein the third and fourth runway sections are designated as take-off runway sections.

16. An airport runway arrangement according to any of claims 8 to 15 wherein the first and second runway sections are designated landing runway sections.

17. An airport runway arrangement according to claim 16 wherein the directions of operation of the first and second runway sections are towards each other and preferably towards the or each intermediate section.

18. An airport runway arrangement according to any of claims 9 to 17 wherein the third and fourth runway sections have a common section configured to be usable in either direction of operation.

19. An airport runway arrangement comprising a pair of runway arrangements each according to any of claims 8 to 18.

20. An airport runway arrangement according to claim 19 wherein the runway sections on the outside of the pair are designated as landing runway sections.

21. An airport runway arrangement according to claim 19 or 20 wherein the runway sections on the inside of the pair are designated as take-off runway sections.

22. An airport runway arrangement according to any of claims 19 to 21 wherein the pair of runways is separated by at least 1035m.

23. An airport runway arrangement according to any of the preceding claims wherein each runway section is between 1000m and 8000m long.

24. An airport runway arrangement according to any preceding claim wherein the first and second runway sections are substantially the same length.

25. An airport runway arrangement wherein each runway section is between 1000m and 4000m, preferably between 2200m and 3200m.

26. An airport runway arrangement according to any of claims 1 to 23 wherein the first and second runway sections are of different lengths.

27. An airport runway arrangement according to claim 26 wherein one runway section is between 1000m and 2500m long and the other runway section between 2500m and 4000m long.

28. An airport runway arrangement according to any preceding claim wherein the or each intermediate section is at least 200m in length, preferably between 240m and 600m in length.

29. An airport runway arrangement according to any preceding claim wherein the safety sections are at least 200m in length, preferably between 240m and 300m or 600m in length.

30. An airport runway arrangement according to any of the preceding claims wherein a terminal area is situated adjacent the or each intermediate section.

31. An airport runway arrangement comprising a pair of substantially parallel runways, the runways each having a main runway section and an intermediate section adjacent a first end of the main runway section, the intermediate sections of the pair of runways being substantially adjacent each other and laterally offset from one another, and each main runway section extending away from the intermediate section towards a second end thereof in an opposite direction from the other runway.

32. An airport runway arrangement according claim 31 wherein the majority of the main runway sections are not adjacent each other.

33. An airport runway arrangement according to claim 31 or 32 wherein the main runway sections have different lengths.

34. An airport runway arrangement according to any of claims 31 to 33 wherein each substantially parallel runway further comprises an additional runway section

extending from each intermediate section in the opposite direction to the main runway.

35. An airport runway arrangement according to any of claims 31 to 34 wherein the additional runways are designated for use in the opposing direction to the main runways, when the main runways are not in use.

36. An airport runway arrangement according to any of claims 31 to 35 wherein the intermediate sections are contiguous.

37. An airport runway arrangement according to any of claims 31 to 35 wherein the pair of runways is separated by a distance of between 50m – 300m, preferably approximately 190m.

38. An airport runway arrangement according to any of claims 28 to 37 further comprising at least one taxiway adjoining the intermediate section.

39. An airport runway arrangement according to any of claims 31 to 38 comprising two pairs of runways, according to any preceding claim, which are substantially parallel to each other.

40. An airport runway arrangement according to claim 39 wherein the intermediate sections of each pair are substantially laterally aligned.

41. An airport runway arrangement according to claim 39 or 40 wherein the main runway sections on the outer side of each pair extend from the intermediate section in the same direction, and the main runway sections on the inner side of each pair extend from the intermediate section in the same direction.

42. An airport runway arrangement according to claim 41 wherein the main runway sections on the outer side of each pair are substantially aligned, and the main runway sections on the inner side of each pair are substantially aligned.

43. An airport runway arrangement according to claim 41 or 42 wherein the runways on the outer side of each pair are designated as landing runways, and the runways on the inner side of each pair are designated as take-off runways.

44. An airport runway arrangement according to any of claims 31 to 43 wherein a terminal area is situated adjacent the intermediate section.

45. The airport runway arrangement of any of claims 1 to 44, being for commercial passenger carrying aircraft.

46. The airport runway arrangement of any of claims 1 to 45, being for aircraft operating under civil regulations.

47. A method of providing a runway arrangement comprising:
dividing an existing runway longitudinally into first and second parallel runways;
designating a first section of each runway as an intermediate section, and a second part of each runway as the main runway section.

48. The method according to claim 47 further comprising extending the length of the runway and/or extending the width of the runway and/or separating the first and second runways.

49. The method according to claim 47 or 48 comprising further designating the remainder of each first and second runway as an additional runway.

50. A method of providing a runway arrangement as in any of claims 31 to 49 comprising:
widening a central section of the runway to provide an intermediate section, and
offsetting the centre line of the runway on each side of the central area such that the centre lines are laterally offset in the intermediate section.

51. A runway comprising a designated landing section and a designated take-off section, the sections being separated by an intermediate section.

52. A runway arrangement as claimed in any one of claims 1 to 46 comprising a landing threshold which is substantially further along the runway than the start of the runway.

53. A runway arrangement as claimed in claim 52 wherein the landing threshold is between 1km and 5km distal from the start of the landing runway, preferably between 1.5km and 3km, more preferably 2km.

54. A method of operating an airport runway arrangement for commercial aircraft, the method comprising the steps of:

directing an aircraft to move along a first runway section;
directing an aircraft to move along a second runway section;
providing an intermediate section between the first and second runway sections.

55. A method according to claim 54 wherein the step of directing an aircraft to move along a first runway section comprises directing an aircraft to land.

56. A method according to claim 54 wherein the step of directing an aircraft to move along a second runway section comprises directing an aircraft to take off.

57. The method of any of claims 54 to 56 using the runway of any of claims 1 to 46.

58. A system incorporating an airport runway configuration according to any of claims 1 to 46, and further comprising:
means for defining the first runway section;
means for defining the second runway section; and
means for defining the intermediate section.

59. A system according to claim 58 wherein the means for defining comprises marking the runway.

60. A system according to claim 59 wherein the markings comprise at least one of lights, painted markings and reflectors.

61. A system according to any of claims 58 to 60 wherein the means for defining comprises means for communicating the definitions of the sections, optionally to a user such as a pilot or an air traffic controller.

62. A runway configuration substantially as described herein with reference to Figures 2, Figures 3 and 4, Figures 5, Figure 6, Figure 7 and Figures 8 of the accompanying figures.

63. A method substantially as described herein with reference to Figures 2, Figures 3 and 4, Figures 5, Figure 6, Figure 7 and Figures 8 of the accompanying figures.

Claims

1. An airport runway arrangement for commercial aircraft, comprising:

   a first runway section;

   a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section; and

   an intermediate section between the first and second runway sections;

   wherein the intermediate section is designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement;

   thereby simultaneously allowing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

2. An airport runway arrangement according to claim 1 further comprising a landing aircraft and a departing aircraft.

3. An airport runway arrangement according to claim 1 or 2 wherein the first runway section is designated a landing runway section and the second runway section is designated a take-off runway section.

4. An airport runway arrangement according to claim 2 further comprising a safety area at the end of said take-off runway section.

5. An airport runway arrangement according to claim 2 or 4 further comprising a safety area at the start of said landing section.

6. An airport runway arrangement according to claim 4 or 5 wherein such safety areas are at least 200m in length.

7. An airport runway arrangement according to claim 6 wherein the safety areas are between 240m and 300m or 600m in length.

8. An airport runway arrangement according to any preceding claim wherein the designation of said intermediate section comprises at least one of lights, markings and reflectors on said runway arrangement.

9. An airport runway arrangement according to any preceding claim wherein the first and second runway sections are substantially the same length.

10. An airport runway arrangement according to any of the preceding claims wherein each runway section is between 1000m and 8000m long.

11. An airport runway arrangement according to claim 10 wherein each runway section is between 1000m and 4000m, preferably between 2200m and 3200m long.

12. An airport runway arrangement according to any of claims 1 to 7 wherein the first and second runway sections are of different lengths.

13. An airport runway arrangement according to claim 12 wherein one runway section is between 1000m and 2500m long and the other runway section between 2500m and 4000m long.

14. An airport runway arrangement according to any preceding claim wherein the intermediate section is between 175m and 1500m in length.

15. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 180m and 1500m in length.

16. An airport runway arrangement according to according to any of claims 1 to 13 wherein the intermediate section is between 200m and 1500m in length.

17. An airport runway arrangement according to according to any of claims 1 to 13 wherein the intermediate section is between 240m and 1500m in length.

18. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 300m and 1500m in length.

19. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 600m and 1500m in length.

20. An airport runway arrangement according to any of claims 1 to 13 wherein the intermediate section is between 540m and 660m in length.

21. An airport runway arrangement according to claim 20 wherein the intermediate section is approximately 600m in length.

22. An airport runway arrangement according to any of the preceding claims wherein a terminal area is situated adjacent the intermediate section.

23. An airport runway arrangement according to any of the preceding claims further comprising a further runway arrangement parallel to said first and second runway sections.

24. An airport runway arrangement comprising a pair of runway arrangements each according to any of the preceding claims.

25. An airport runway arrangement according to claim 24 wherein the pair of runway arrangements are substantially parallel to each other.

26. An airport runway arrangement according to claim 24 or 25 wherein the pair of runway arrangements formed by the further runway section and said first and second runway sections parallel thereto is separated by at least 1035m.

27. An airport runway arrangement according to any of claims 22 to 26 wherein the further runway arrangement comprises a landing runway section.

28. An airport runway arrangement according to claim 27 when dependent on claim 2 wherein the landing runway section on the further runway arrangement is longer than the landing runway section of said first runway section.

29. An airport runway arrangement according to any of the preceding claims further comprising at least one taxiway adjoining the intermediate section.

30. An airport runway arrangement according to any of the preceding claims, being for commercial passenger carrying aircraft.

31. An airport runway arrangement according to any of the preceding claims, being for aircraft operating under civil regulations.

32. A method of operating an airport runway arrangement for commercial aircraft, the method comprising the steps of:

providing a first runway section;

providing a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section;

providing an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said

designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement; and

simultaneously landing an aircraft on one of said first and second runway sections, and taking off an aircraft from the other of said first and second runway sections, whilst not using the intermediate section.

33. A method of directing aircraft to or from a commercial airport runway arrangement, said runway arrangement comprising a first runway section, a second runway section extending substantially in prolongation of the first runway section, the second runway section having the same direction of operation as that of the first runway section, and an intermediate section between the first and second runway sections, the intermediate section being designated as an intermediate safety area, said designation indicating that the intermediate section is not to be used by aircraft under normal operation of said airport runway arrangement,

said method comprising simultaneously directing a landing aircraft to land on one of said first and second runway sections, and a departing aircraft to take off from the other of said first and second runway sections, whilst not using the intermediate section.

34. A method according to claim 32 or 33, using the runway arrangement of any of claims 1 to 31.

35. A system incorporating an airport runway arrangement according to any of claims 1 to 31, and further comprising:

means for defining the first runway section;

means for defining the second runway section.

36. A system according to claim 35 wherein the means for defining comprises marking the runway sections.

37. A system according to claim 36 wherein the marking comprises at least one of lights, painted markings and reflectors.

38. A system according to any of claims 35 to 37 wherein the means for defining comprises means for communicating the definitions of the sections.

39. A system according to claim 38 comprising means for communicating the definitions of the sections to a user such as a pilot or an air traffic controller.