CLAUSES

Clause 1. A system (100) for cooling at least one computing device using water, the system (100) comprising: a body of water (400) defining a first waterline (401); a structure (300) at least partially submerged in the body of water (400) and comprising: an internal volume of water (600) defining a second waterline (601); at least one outlet (310) configured to drain water from the internal volume of water (600) to the body of water (400); a container (210) at least partially submerged in the internal volume of water (600) and comprising at least one computing device configured to generate heat in use; an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and a flow path of water across the container (210) towards the at least one outlet (310); wherein the second waterline (601) is at a height above the first waterline (401) to drive the flow path to provide cooling of the container (210) and at least one computing device therein.

Clause 2. The system (100) according to clause 1, wherein the body of water (400) is one of: a sea; an ocean; a lake; a river; a reservoir or a fjord.

Clause 3. The system (100) according to clause 1 or 2, wherein the structure (300) is or is part of a boat or a ship or an offshore platform or a floating structure.

Clause 4. The system (100) according to any preceding clause, wherein the structure (300) defines an internal space, wherein the internal volume of water (600) and container (210) are in the internal space.

Clause 5. The system (100) according to clause 4, wherein the internal space is sealed such that the environment within the internal space can be controlled.

Clause 6. The system (100) according to any preceding clause, wherein the at least one outlet (310) comprises at least one flow control device configured to control the flow of water from the internal volume of water (600) to the body of water (400).

Clause 7. The system (100) according to any preceding clause, wherein the container (210) comprises a heat exchanger (220) configured to remove heat from the computing device, wherein the flow path of water across the container (210) is at least partially across the heat exchanger (220).

Clause 8. The system (100) according to any preceding clause, wherein the container (210) comprises at least one electrical connection for receiving power and/or data communications, wherein the at least one electrical connection is located on a portion (302) of the container (210) not submerged in water.

Clause 9. The system (100) according to any preceding clause wherein the inlet pipe (500) is between 20m and 200m long, or between 50m and 150m long, or between 75m and 125m long or around 100m long.

Clause 10. The system (100) according to any preceding clause, wherein the inlet pipe (500) is configured to move water from a depth (d) in the body of water (400) which is deeper than the draught of the structure.

Clause 11. The system (100) according to any preceding clause, wherein the inlet pipe (500) is telescopic and is configured to move between a collapsed configuration and an expanded configuration.

Clause 12. The system (100) according to any preceding clause, wherein the inlet pipe (500) is arranged to deliver water to the internal volume above the second waterline (601).

Clause 13. The system (100) according to any of clauses 1 to 11, wherein the inlet pipe is arranged to deliver water to the internal volume in an upper half of the internal volume.

Clause 14. The system (100) according to any preceding clause, wherein the height (h) of the second waterline (601) above the first waterline (401) is between 1cm and 1m, or between 1cm and 10cm, or between 4cm and 8cm, or between 5cm and 6cm.

Clause 15. The system (100) according to any preceding clause, wherein the at least one outlet (310) comprises a plurality of outlets.

Clause 16. The system (100) according to any preceding clause, further comprising a control system configured to control the pumping of water through the inlet pipe (500) and the draining of water through the at least one outlet (310), such that the second waterline (601) is maintained at a height above the first waterline (401).

Clause 17. The system (100) according to any preceding clause, wherein inlet pipe (500) is configured to move water from a depth (d) in the body of water (400) where the temperature of the water is less than at the surface (401) of the body of water (400).

Clause 18. The system (100) according to any preceding clause, wherein the structure (300) is partially opaque or fully opaque.

Clause 19. A system (100) for cooling a computing device using water, the system (100) comprising: a body of water (400) defining a first waterline (401); a structure (300) at least partially submerged in the body of water (400) and comprising: an internal volume of water (600) defining a second waterline (601); an outlet (310) configured to drain water from the internal volume of water (600) to the body of water (400); a computing device configured to generate heat in use and at least partially submerged in the internal volume of water (600); an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and a flow path of water across the computing device towards the outlet (310); wherein the second waterline (601) is at a height above the first waterline (401) to drive the flow path to provide cooling of the computing device.

Clause 20. A system (100) for cooling a data centre using water, the system (100) comprising: a body of water (400) defining a first waterline (401); a structure (300) at least partially submerged in the body of water (400) and comprising: an internal volume of water (600) defining a second waterline (601); at least one outlet (310) configured to

drain water from the internal volume of water (600) to the body of water (400); a plurality of containers (210) each at least partially submerged in the internal volume of water (600) and together comprising a data centre configured to generate heat in use; an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and a flow path of water across the plurality of containers (210) towards the at least one outlet (310); wherein the second waterline (601) is at a height (h) above the first waterline (401) to drive the flow path to provide cooling of the plurality of containers (210) and the data centre therein.

Clause 21. A method of cooling at least one computing device using water, the method comprising the steps of: providing a system (100) for cooling at least one computing device according to any of clauses 1 to 18; pumping water from the body of water (400) to the internal volume of water (600) to maintain the second waterline (601) at a height (h) above the first waterline (401); and maintaining a flow path of water across the container (210) by draining water from the internal volume (600) to the body of water (400) via the at least one outlet (310).

Clause 22. The method according to clause 21, wherein the step of pumping water comprises pumping water from a depth (d) deeper than the draught of the structure (300).

Clause 23. The method according to clause 21 or 22, wherein the step of pumping water comprises pumping water from a depth (d) in the body of water (400) where the water temperature is lower than at the surface (401) of the body of water (400).

CLAIMS

1. A system (100) for cooling at least one computing device using water, the system (100) comprising:

a body of water (400) defining a first waterline (401);

a structure (300) at least partially submerged in the body of water (400) and comprising:

an internal volume of water (600) defining a second waterline (601);

at least one outlet (310) configured to drain water from the internal volume of water (600) to the body of water (400);

a container (210) at least partially submerged in the internal volume of water (600) and comprising at least one computing device configured to generate heat in use;

an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and

a flow path of water across the container (210) towards the at least one outlet (310);

wherein the second waterline (601) is at a height above the first waterline (401) to drive the flow path to provide cooling of the container (210) and at least one computing device therein.

2. The system (100) according to claim 1, wherein the structure (300) is or is part of a boat or a ship or an offshore platform or a floating structure.

3. The system (100) according to any preceding claim, wherein the structure (300) defines an internal space, wherein the internal volume of water (600) and container (210) are in the internal space and wherein the internal space is sealed such that the environment within the internal space can be controlled.

4. The system (100) according to any preceding claim, wherein the at least one outlet (310) comprises at least one flow control device configured to control the flow of water from the internal volume of water (600) to the body of water (400).

5. The system (100) according to any preceding claim, wherein the container (210) comprises a heat exchanger (220) configured to remove heat from the computing device, wherein the flow path of water across the container (210) is at least partially across the heat exchanger (220).

6. The system (100) according to any preceding claim, wherein the container (210) comprises at least one electrical connection for receiving power and/or data communications, wherein the at least one electrical connection is located on a portion (302) of the container (210) not submerged in water.

7. The system (100) according to any preceding claim wherein the inlet pipe (500) is between 20m and 200m long, or between 50m and 150m long, or between 75m and 125m long or around 100m long.

8. The system (100) according to any preceding claim, wherein the inlet pipe (500) is configured to move water from a depth (d) in the body of water (400) which is deeper than the draught of the structure.

9. The system (100) according to any preceding claim, wherein the inlet pipe (500) is telescopic and is configured to move between a collapsed configuration and an expanded configuration.

10. The system (100) according to any preceding claim, wherein the inlet pipe (500) is arranged to deliver water to the internal volume above the second waterline (601).

11.. The system (100) according to any of claims 1 to 10, wherein the inlet pipe is arranged to deliver water to the internal volume in an upper half of the internal volume.

12. The system (100) according to any preceding claim, wherein the height (h) of the second waterline (601) above the first waterline (401) is between 1cm and 1m, or between 1cm and 10cm, or between 4cm and 8cm, or between 5cm and 6cm.

13. The system (100) according to any preceding claim, further comprising a control system configured to control the pumping of water through the inlet pipe (500) and the draining of water through the at least one outlet (310), such that the second waterline (601) is maintained at a height above the first waterline (401).

14. The system (100) according to any preceding claim, wherein inlet pipe (500) is configured to move water from a depth (d) in the body of water (400) where the temperature of the water is less than at the surface (401) of the body of water (400).

15. The system (100) according to any preceding claim, wherein the structure (300) is partially opaque or fully opaque.

16. A system (100) for cooling a computing device using water, the system (100) comprising:

a body of water (400) defining a first waterline (401);

a structure (300) at least partially submerged in the body of water (400) and comprising:

an internal volume of water (600) defining a second waterline (601);

an outlet (310) configured to drain water from the internal volume of water (600) to the body of water (400);

a computing device configured to generate heat in use and at least partially submerged in the internal volume of water (600);

an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and

a flow path of water across the computing device towards the outlet (310);

wherein the second waterline (601) is at a height above the first waterline (401) to drive the flow path to provide cooling of the computing device.

17. A system (100) for cooling a data centre using water, the system (100) comprising:

a body of water (400) defining a first waterline (401);

a structure (300) at least partially submerged in the body of water (400) and comprising:

an internal volume of water (600) defining a second waterline (601);

at least one outlet (310) configured to drain water from the internal volume of water (600) to the body of water (400);

a plurality of containers (210) each at least partially submerged in the internal volume of water (600) and together comprising a data centre configured to generate heat in use;

an inlet pipe (500) configured with a pump (511) to move water from the body of water (400) to the internal volume of water (600); and

a flow path of water across the plurality of containers (210) towards the at least one outlet (310);

wherein the second waterline (601) is at a height (h) above the first waterline (401) to drive the flow path to provide cooling of the plurality of containers (210) and the data centre therein.

18. A method of cooling at least one computing device using water, the method comprising the steps of:

providing a system (100) for cooling at least one computing device according to any of claims 1 to 15;

pumping water from the body of water (400) to the internal volume of water (600) to maintain the second waterline (601) at a height (h) above the first waterline (401); and

maintaining a flow path of water across the container (210) by draining water from the internal volume (600) to the body of water (400) via the at least one outlet (310).

19. The method according to claim 18, wherein the step of pumping water comprises pumping water from a depth (d) deeper than the draught of the structure (300).

20. The method according to claim 18 or 19, wherein the step of pumping water comprises pumping water from a depth (d) in the body of water (400) where the water temperature is lower than at the surface (401) of the body of water (400).