Claims

1. A marine vessel power system (10) comprising:

an engine (12, 12A, 12B) configured to operate at varying engine speeds;

a controllable pitch thruster (14, 14A, 14B) driveably coupled to the engine (12); and

a control unit (16, 16A, 16B) configured to:

receive a thrust command value that indicates a desired thrust of the controllable pitch thruster (14, 14A, 14B);

determine a current speed of the controllable pitch thruster (14, 14A, 14B); and

calculate a pitch of the controllable pitch thruster (14, 14A, 14B) to produce thrust in accordance with the thrust command value based on the current speed of the controllable pitch thruster.

2. The marine vessel power system of claim 1, wherein the control unit (16, 16A, 16B) is further configured to:

determine a current engine speed of the engine (12, 12A, 12B);

determine an engine load at the current engine speed; and

vary the current engine speed depending on the engine load.

3. The marine vessel power system of claim 2, wherein the control unit is configured to decrease the engine speed when the engine load is below a lower threshold.

4. The marine vessel power system of claim 2 or 3, wherein the control unit is configured to increase the engine speed when the engine load is above an upper threshod.

5. The marine vessel power system of any one of claims 2 to 4, wherein the control unit is configured to vary the engine speed in a stepwise manner.

6. The marine vessel power system of any one of claims 2 to 5, wherein the control unit is configured to vary the engine speed in accordance with a plurality of predetermined speed settings for the engine (12, 12A, 12B).

7. The marine vessel power system of any one of claims 2 to 6, wherein the control unit is configured to continuously vary the engine speed based on the engine load.

8. The marine vessel power system of any one of claims 2 to 7, further comprising:

a controllable pitch main propeller (18, 18A, 18B) driveably coupled to the engine (12, 12A, 12B),

wherein the control unit (16, 16A, 16B) is further configured to:

receive a thrust demand for the controllable pitch main propeller (18, 18A, 18B); and

calculate a pitch command for the controllable pitch main propeller (18, 18A, 18B) on the basis of the thrust demand and the current engine speed of the engine (12, 12A, 12B).

9. The marine vessel power system of any one of claims 1 to 8, further comprising:

an alternator (20, 20A, 20B) configured to be driven by the engine (12, 12A, 12B) to supply AC power, the frequency of the AC power varying with the speed of the engine (12, 12A, 12B); and

an electric motor (23) configured to drive the controllable pitch thruster (14, 14A, 14B) using the AC power supplied by the alternator (20, 20A, 20B).

10. The marine vessel power system of claim 9, further comprising a frequency controller (24) connected to the alternator (20, 20A, 20B) and configured to convert the AC power supplied by the alternator (20, 20A, 20B) and supply the converted AC power to one or more electrical loads (26, 27, 28).

11. The marine vessel power system of any one of claims 1 to 10, further comprising a pitch control valve (34) operatively coupled to the control unit (16, 16A, 16B), wherein the control unit (16, 16A, 16B) is further configured to output a valve control command to the pitch control valve (34) to set the pitch of the controllable pitch thruster (14, 14A, 14B).

12. The marine vessel power system of any one of claims 1 to 11, further comprising an operator input device (30) configured to receive an operator input and to output the thrust command value in accordance with the received operator input.

13. The marine vessel power system of any one of claims 1 to 12, comprising:

a plurality of engines (12A, 12B); and

a plurality of controllable pitch thrusters (14A, 14B), each of the plurality of controllable pitch thrusters (14A, 14B) driveably coupled to a corresponding one of the plurality of engines (12A, 12B),

wherein the control unit (16, 16A, 16B) is configured to:

determine a current speed of each of the plurality of controllable pitch thrusters (14A, 14B); and

calculate a pitch of each of the plurality of controllable pitch thrusters (14A, 14B) to produce thrust in accordance with the thrust command value.

14. A method of operating a marine vessel power system comprising an engine (12) configured to operate at varying speeds and a controllable pitch thruster (14) driveably coupled to the engine (12), the method comprising:

receiving a thrust command value that indicates a desired thrust of the controllable pitch thruster (14, 14A, 14B);

determining a current speed of the controllable pitch thruster (14); and

calculating a pitch of the controllable pitch thruster (14) to produce thrust in accordance with the thrust command value based on the current speed of the controllable pitch thruster.

15. The method of claim 14, further comprising:

determining a current engine speed of the engine (12);

determining an engine load at the current engine speed; and

varying the engine speed depending on the engine load.