

1081.2.h. con't.

- f. Electronic imaging systems, specially designed or modified for underwater use, capable of storing digitally more than 50 exposed images;
- g. Light systems, as follows, specially designed or modified for underwater use:
 - 1. Stroboscopic light systems capable of a light output energy of more than 300 J per flash and a flash rate of more than 5 flashes per second;
 - 2. Argon arc light systems specially designed for use below 1,000 m;
- h. "Robots" specially designed for underwater use, controlled by using a dedicated "stored programme controlled" computer, having any of the following:
 - 1. Systems that control the "robot" using information from sensors which measure force or torque applied to an external object, distance to an external object, or tactile sense between the "robot" and an external object; **or**
 - 2. The ability to exert a force of 250 N or more or a torque of 250 Nm or more and using titanium based alloys or "fibrous or filamentary" "composite" materials in their structural members;
- i. Remotely controlled articulated manipulators specially designed or modified for use with submersible vehicles, having any of the following:
 - 1. Systems which control the manipulator using the information from sensors which measure the torque or force applied to an external object, or tactile sense between the manipulator and an external object; **or**
 - 2. Controlled by proportional master-slave techniques or by using a dedicated "stored programme controlled" computer, and having 5 degrees of freedom of movement or more;

Note:
Only functions having proportional control using positional feedback or by using a dedicated "stored programme controlled" computer are counted when determining the number of degrees of freedom of movement.
- 2. j. Air independent power systems, specially designed for underwater use, as follows:
 - 1. Brayton or Rankine cycle engine air independent power systems having any of the following:
 - a. Chemical scrubber or absorber systems specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;
 - b. Systems specially designed to use a monoatomic gas;
 - c. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz, or special mounting devices for shock mitigation; **or**
 - d. Systems specially designed:
 - 1. To pressurise the products of reaction or for fuel reformation;
 - 2. To store the products of the reaction; **and**
 - 3. To discharge the products of the reaction against a pressure of 100 kPa or more;
 - 2. Diesel cycle engine air independent systems, having all of the following:
 - a. Chemical scrubber or absorber systems specially designed to remove carbon dioxide, carbon monoxide and particulates from recirculated engine exhaust;

- b. Systems specially designed to use a monoatomic gas;
- c. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; **and**
- d. Specially designed exhaust systems that do not exhaust continuously the products of combustion;
- 3. Fuel cell air independent power systems with an output exceeding 2 kW having either of the following:
 - a. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; **or**
 - b. Systems specially designed:
 - 1. To pressurise the products of reaction or for fuel reformation;
 - 2. To store the products of the reaction; **and**
 - 3. To discharge the products of the reaction against a pressure of 100 kPa or more;
- 4. Stirling cycle engine air independent power systems, having all of the following:
 - a. Devices or enclosures specially designed for underwater noise reduction in frequencies below 10 kHz or special mounting devices for shock mitigation; **and**
 - b. Specially designed exhaust systems which discharge the products of combustion against a pressure of 100 kPa or more;
- 2. k. Skirts, seals and fingers, having any of the following:
 - 1. Designed for cushion pressures of 3,830 Pa or more, operating in a significant wave height of 1.25 m (Sea State 3) or more and specially designed for surface effect vehicles (fully skirted variety) controlled by 1081.1.f.; **or**
 - 2. Designed for cushion pressures of 6,224 Pa or more, operating in a significant wave height of 3.25 m (Sea State 5) or more and specially designed for surface effect vehicles (rigid sidewalls) controlled by 1081.1.g.;
- l. Lift fans rated at more than 400 kW specially designed for surface effect vehicles controlled by 1081.1.f. or 1081.1.g.;
- m. Fully submerged subcavitating or supercavitating hydrofoils specially designed for vessels controlled by 1081.1.h.;
- n. Active systems specially designed or modified to control automatically the sea-induced motion of vehicles or vessels controlled by 1081.1.f., 1081.1.g., 1081.1.h. or 1081.1.i.;
- o. Propellers, power transmission systems, power generation systems and noise reduction systems, as follows:
 - 1. Water-screw propeller or power transmission systems, as follows, specially designed for surface effect vehicles (fully skirted or rigid sidewall variety), hydrofoils or small waterplane area vessels controlled by 1081.1.f., 1081.1.g., 1081.1.h. or 1081.1.i.:
 - a. Supercavitating, super-ventilated, partially-submerged or surface piercing propellers rated at more than 7.5 MW;
 - b. Contrarotating propeller systems rated at more than 15 MW;
 - c. Systems employing pre-swirl or post-swirl techniques for smoothing the flow into a propeller;
 - d. Light-weight, high capacity (K factor exceeding 300) reduction gearing;