CLAIMS

1. A method for regulating the buoyancy of an underwater vehicle in such a way that it exhibits substantially a predetermined target buoyancy when it is immersed in a volume of liquid delimited by a first surface and a second surface, along a vertical axis, the method comprising:

- starting from an initial buoyancy of the vehicle that keeps the vehicle at the level of the first surface, a first step of modifying the density of the vehicle so that it moves closer to the second surface, the first step being implemented as far as a second step of detecting the crossing, by the vehicle, of a predetermined non-zero threshold on distance with respect to the first surface, along the vertical axis, the first step being implemented in such a way that the vehicle exhibits a predetermined buoyancy upon the detection of the crossing of the threshold,
- then a third step of modifying the density of the vehicle until the vehicle exhibits substantially the target buoyancy, the variation in density during the third step being predetermined,

the target buoyancy having the same sign as the initial buoyancy and an absolute value lower than the absolute value of the initial buoyancy.

2. The method as claimed in the preceding claim, wherein, during the implementation of the method, the vehicle moves, along the vertical axis, only under the effect of a variation in its buoyancy.

3. The method as claimed in either one of the preceding claims, wherein the first surface is the surface of the liquid and the initial buoyancy is positive, the first step of modifying the density being a step of increasing the density of the vehicle, the distance threshold being an immersion threshold.

4. The method as claimed in either one of claims 1 and 2, wherein the first surface is a bottom of the volume of liquid, the initial buoyancy is negative, the

first step of modifying the density being a step of reducing the density, the distance threshold being a threshold on altitude with respect to the first surface.

5. The method as claimed in any one of the preceding claims, wherein during the first step and during the third step, the mass of the vehicle is varied for a constant volume of the underwater vehicle, and/or the volume of the marine vehicle is varied for a constant mass for a constant mass of the underwater vehicle.

6. The method as claimed in any one of the preceding claims, wherein the vehicle comprises a first variable-density reservoir, the variation in density of which causes the density of the vehicle to vary, this being positioned near a first longitudinal end of the vehicle, and a second variable-density reservoir the variation in density of which causes the density of the vehicle to vary and which is positioned near a second longitudinal end of the vehicle, wherein, during the first step, the density of a predetermined single one, of the first reservoir and the second reservoir, is varied.

7. A balancing method comprising the method for regulating the buoyancy as claimed in any one of the preceding claims, followed by a step of regulating the longitudinal pitch of the vehicle.

8. A device for regulating the buoyancy of an underwater vehicle comprising means of varying the buoyancy allowing the density of the underwater vehicle to be varied, and at least one sensor making it possible to detect the crossing, by the vehicle, of a predetermined non-zero threshold on distance with respect to a first surface delimiting, in a vertical direction, the volume of a liquid in which the vehicle is immersed, the buoyancy regulating device being configured to implement a method comprising the following steps when a buoyancy regulating condition is satisfied:

- starting from an initial buoyancy that keeps the vehicle at the level of the first surface; a first step of modifying the density of the vehicle via the buoyancy varying means so that the vehicle moves closer to a second surface delimiting the volume of liquid in the vertical direction, the first step being implemented as far as a second step of detecting, via the sensor, the crossing by the vehicle of the distance threshold, the first step being implemented in such a way that the vehicle has a predetermined buoyancy upon the detection of the crossing of the threshold,

- then a third step of modifying the density of the vehicle, using the buoyancy varying means, until the vehicle exhibits substantially the target buoyancy, the variation in density during the third step being predetermined,

- the target buoyancy having the same sign as the initial buoyancy and an absolute value lower than the absolute value of the initial buoyancy.

9. An underwater vehicle comprising the device for regulating the buoyancy as claimed in claim 8.