



SasDev Guidelines for Submersible Drone

SasDevs

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Contents

| | | |
|----------|--|----------|
| 1 | Operator Regulations | 3 |
| 1.a | Operator Requirements | 3 |
| 1.b | Sight Line Requirements | 3 |
| 1.c | Position Assessment Requirements | 3 |
| 2 | Harm-Reduction | 3 |
| 2.a | Chemical Loss | 3 |
| 2.b | Marine Life | 4 |
| 3 | Health & Safety | 4 |
| 3.a | Taking Care of Nearby Water Users | 4 |
| 3.b | Appropriate Measures Around Deep Water | 4 |
| 4 | Construction & Practices | 4 |
| 4.a | Structural integrity | 4 |
| 4.b | Electric Safety | 5 |



Definitions

Water User: Includes: 'swimmer', 'diver', 'water-sports', 'boat', 'vessel' and any other person or person-operated vessel within the same water space.

Surface Signal: A brightly coloured object which floats on the surface above the sub to warn others where the sub is. This includes but is not limited to: Dive flags & Buoys

Operator(s): The pilot or pilots controlling the submersible drone and/or the production team responsible for its construction.

Operator(s) must have an understanding of the guidelines and must sign off a version of this document before operating the submersible drone.

As a development company, SasDev is dedicated to ensuring the utmost protection to the environment as-well as our product and it's users.

Signature _____ Signature _____

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Guidelines

1 Operator Regulations

1.a Operator Requirements

- i If the submersible drone is over 250g a flyer ID is required to operate it.
- ii An operator-ID is not a requirement due to lack of interactions with pedestrians and other operators, although it is encouraged.
- iii An operator must have an understanding of the guidelines and must sign off a version of this document before operating the submersible drone.

1.b Sight Line Requirements

- i A *surface signal* must be attached to the sub to ensure other *water users* are aware that the submersible drone is being used
- ii The *operator* of the submersible drone must maintain a sight line with the tethered surface signal at all times.

1.c Position Assessment Requirements

- i The operator must have a rough understanding of the underwater orientation of the robot and if not they must surface

2 Harm-Reduction

2.a Chemical Loss

- i The use of chemicals & batteries in the sub should be minimised where possible.
- ii Any chemical or electronic apparatus that can cause environmental harm needs to be well-sealed and tested before use in live water.
- iii Before operations, measures should be in place for recovery and environmental harm reduction. This could include a risk assessment filled out, see example
- iv In the event of chemical loss, it is the responsibility of the *operator(s)* to recover anything which could be seen as a threat to marine ecology, eg. batteries, plastic components, cabling etc. components from the sea within a reasonable time frame.
- v Use appropriate materials in the construction of the drone to ensure parts don't degrade or release harmful chemicals (for example any petrol chemical grease) if unsure what this includes contact local council for guidelines



2.b Marine Life

- i Don't damage or hunt marine life with the submersible drone.
- ii The submersible drone must never be at risk of touching the seabed or reefs, 2 or 3 meters clearance is recommended.
- iii Don't chase or approach marine life with the submersible drone.
- iv If approached by marine life cease all operation temporarily until safe to resume.
- v If the *operator(s)* see anything which could be potentially dangerous to marine life, that local authorities may not be aware of, they are responsible for making local authorities aware.

3 Health & Safety

3.a Taking Care of Nearby Water Users

- i Avoid operating in areas of high *water user* traffic.
- ii Avoid operating in common shipping paths.
- iii Take extra care when operating in hard-to-see areas or at night.
- iv Take note of nearby fishing lines to avoid tangles.
- v A *surface signal* must be attached to the sub to ensure other *water users* are aware that the submersible drone is being used

3.b Appropriate Measures Around Deep Water

- i Never hold the tether line at risk of it pulling you in instead attach it to an anchor point
- ii Never lean over the water when pulling in the tether line or picking up the drone
- iii Take appropriate measures in the events of **2.a.iv** such as usage of diving gear and or usage of gloves when handling chemicals.

4 Construction & Practices

4.a Structural integrity

- i The design of the shell or outer hull must be of appropriate strength to withstand any underwater or surface weather conditions in the intended application area, also accounting for depth



- ii Any intakes or outlets of water must have the ability to close using a valve or other appropriate measure
- iii Use appropriate materials in the construction of the drone to ensure parts don't degrade and are structurally sound

4.b Electric Safety

- i Appropriate measures should be taken to avoid electrocution and fire risks
- ii Battery terminals should have appropriate protection to avoid contact with metal objects
- iii A battery cut off switch should be provided for all systems
- iv Thick wire must be used in the construction of the submersible vehicle to avoid overheating, marine grade wire is recommended
- v Wire should be appropriately secured in place to avoid wires