

UNDERWATER MINE PROGRAM

Arma-SEA offers the following types of training mines:

- Anti-landing mine, type A-S-TR-120
- Shallow Water mine, type A-S-TR-250
- Deep Water mine, type A-S-TR-750 and A-S-TR-75-PI

These training mines do not contain any explosives, and are specifically designed for signature collection and validation of the fuze program.

The physical attributes, sensors and performance of the training mines corresponds to the respective combat mines of the same type; which can be supplied by Arma-SEA's partner if required.

The training mines are capable to monitor the sensors' response, and validate the fuze program effectiveness against its intended targets.

Identical to the combat mines, the housing of the training mines are made of polymeric and non-magnetic materials, making the mines very stealthy and difficult to detect using mine hunting sonars and magnetic anomaly devices (MAD).

All training mines are equipped with intelligent sensors and fuze which are programmable to activate upon a combination of vessel signatures: hydro-acoustic, sonar, magnetic, electric and pressure.

The deployment depths are as follows:

1. Anti-landing mine, type A-S-TR-120: Up to 20m
2. Shallow Water mine, type A-S-TR-250: From 15 to 40 meters.
3. Deep Water mine, type A-S-TR-750 and A-S-TR 75PI: Beyond 40m.

TYPES OF MINES



Figure 1. A-S-TR-120



Figure 2. A-S-TR-250



Figure 3. A-S-TR-750



Figure 4. A-S-TR-75P.I

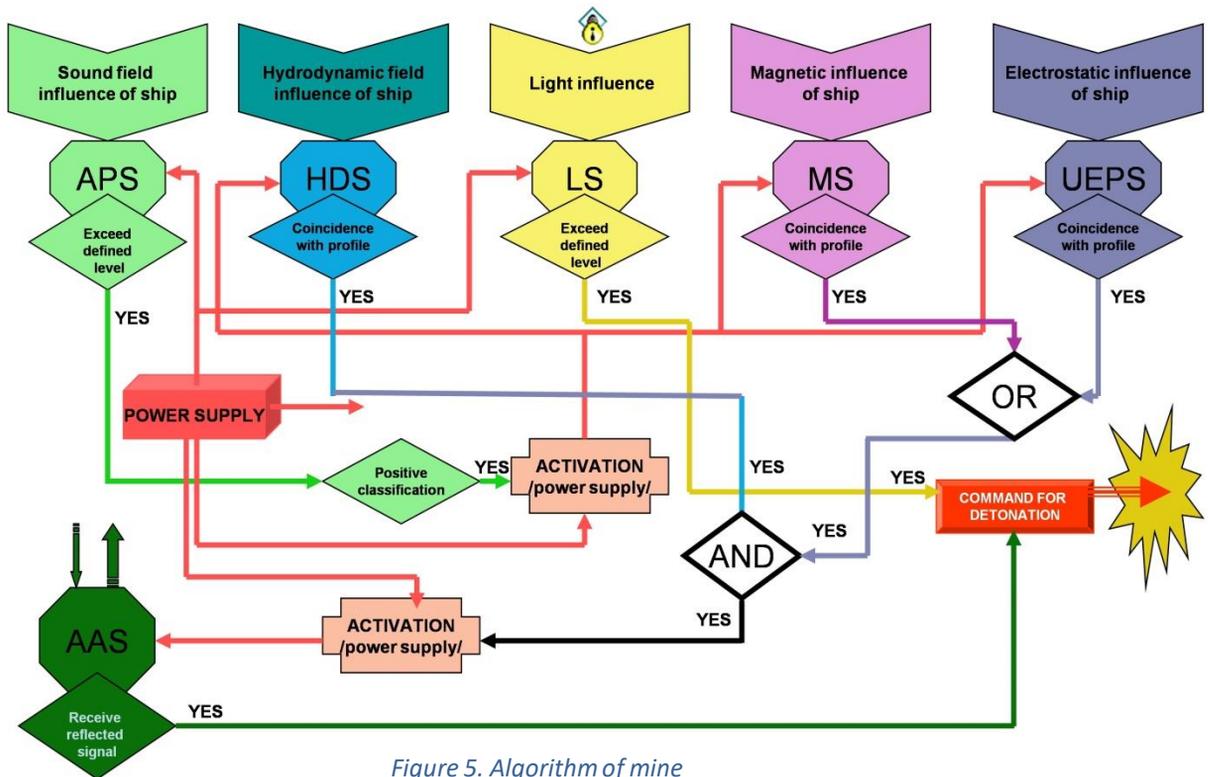


Figure 5. Algorithm of mine



Types of Sensors

Depending on customer requirement, the training mines may be fitted with a combination of the following sensors:

➤ Electric /Potentiometric sensor:

a two component transducer to sense changes in underwater electrical potentials, induced by cathodic currents in a ship's hull.

➤ Magnetic sensor:

a digital magnetic sensor to sense changes to the Earth's magnetic field as the vessel passes the area.

➤ Acoustic sensor:

a hydrophone to detect hydro-acoustic noise generated by the vessel.

➤ Hydrostatic pressure sensor:

To measure variation in hydrostatic pressure due to the vessel displacement as it moves through the sea.

➤ Sonar sensor:

To detect sonar transmissions from the vessel, the training mines are programmed via a wireless programmer, which is designed for rugged operation and ease of programming in the field. The programmer allows testing of fuse condition; setting of arming duration, safety delay and ship counter; and programming all the sensors parameters.

After deployment on the seabed, the fuze can be remotely controlled via a hydro-acoustic link, with two-way communication up to a range of 500m from the mothership.

The hydro-acoustic link allows the operator on-board the mothership to monitor the status of the fuze, including any activation of the sensors. With the appropriate software, the data from the various active sensors can also be presented in graphic form.

When a passing vessel activates all the sensors in accordance with the programmed parameters, the fuze would send a signal via the hydro-acoustic link to indicate that the mine has "detonated".

The process of programming the fuze, deployment, and receiving feedback of the sensors and fuze status via the hydro-acoustic link, allows continuous improvement and validation of the fuze program effectiveness against its intended target.

The hydro-acoustic link also allows the fuze to be reprogrammed, dis-armed and armed remotely from the mothership.

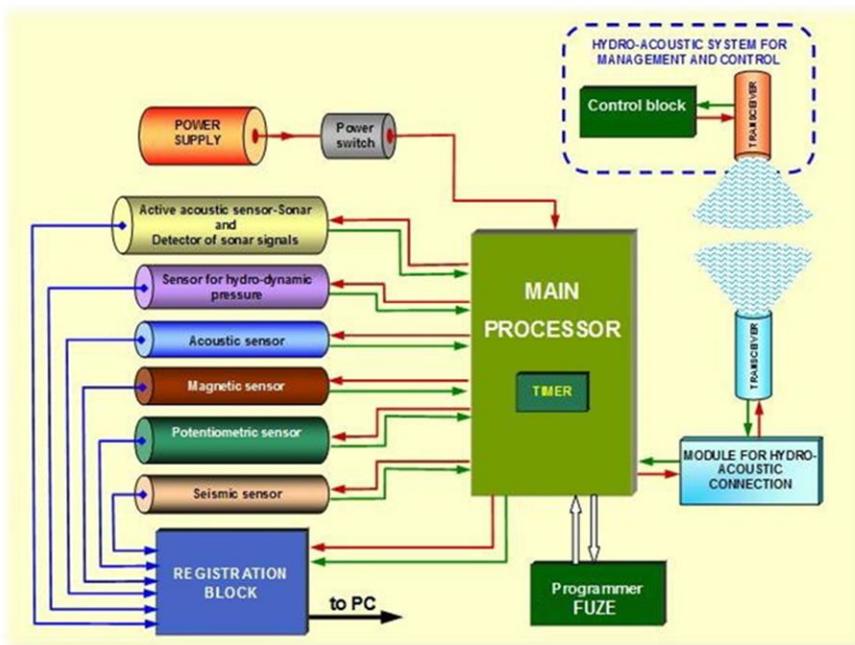


Figure 6. System Configuration