Abstract: This paper describes the deployment and first results of an acoustically-linked multidisciplinary observing system at the Lucky Strike vent field, with satellite connection to shore.

Keyword: hydrothermal vents, deep sea observatory, Mid Atlantic Ridge

INTRODUCTION
Hydrothermal circulation at mid-ocean ridges is a fundamental process that impacts the transfer of energy and matter from the interior of the Earth to the crust, hydrosphere and biosphere. The unique faunal communities that develop near these vents are sustained by chemosynthetic micro-organisms that use the hot fluid chemicals as a source of energy. Environmental instability resulting from active mid-ocean ridge processes create changes in the flux, composition and temperature of emitted vent fluids and influence the associated hydrothermal communities.

The MoMAR (which stands for Monitoring the Mid-Atlantic Ridge) project was initiated 10 years ago by the InterRidge Program to promote and coordinate long-term multidisciplinary monitoring of hydrothermal vents at MAR. It aims at studying vent environmental dynamics from geophysics to microbiology. More recently, the MoMAR area has been chosen as one of the 11 key sites of the European project ESONET-NoE. MoMAR-D was selected as a demonstration mission to deploy and manage a deep sea observatory at Lucky Strike for one year. Monitoring this large hydrothermal field, located in the centre of one of the most volcanically active segment of the MAR, will offer a high probability of studying vent environmental dynamics from geophysics to microbiology.

DEPLOYMENT
The observatory infrastructure is composed of two Sea Monitoring Nodes (SEAMON) acoustically linked to a surface relay buoy (BOREL, Fig. 1), ensuring satellite communication to the land base station in Brest (France). The system should be recovered in summer 2011 after 12 months on the bottom.

3. BUOY DESIGNED
As important as the electronic development is the design of the mechanical structure of the buoy. The deployment of a WSN in the marine environment involves more difficulties than on land and therefore the importance of ad-hoc design to deployment characteristics [2]. Moreover it must be considered several requirements, some of these are the visibility for sea traffic, the use of the eco-material, stable behavior in adverse atmospheric conditions, low cost, light-weight, electronics housing free of the condensation phenomenon and design watertight packages. Other important factor is the mooring system to maintain horizontal the buoy and to prevent twists.

Fig. 2 shows the buoy designed. It is a vertical structure which includes the different components required [2]. The communication antenna (9), the beacon light (8), the electronic mote and battery housing (10) and solar panels (11) are situated on top of the buoy. There is a float (1) on middle of the tube (2) and a counterweight (3) on bottom of the structure to provide stability to the buoy. Moreover, an anchor (4)(5) is situated on bottom of the sea to avoid displacement of the buoy location. Finally, oceanographic sensors (6)(7), on bottom of the sea, are connected with the electronic equipment (mote) on top of the buoy.

REFERENCES