

# **Non-technical Note**

## **Rubber lining system for submarine battery pit compartments and its application technology**

Battery pits of submarine are highly prone to corrosion due to spillage of sulfuric acid. NMRL has developed a rubber lining system and its application methodology, which when applied on board the battery pit compartments of submarines can provide a service life of more than ten years in the corrosive environment for more than ten years. The lining system comprises the following components:

1. Vulcanized neoprene rubber sheets compounded with speciality fillers
2. NMR51 adhesive for surface modification of rubber sheet (to be sourced from ToT partners)
3. Epoxy putty (to be sourced from ToT partners)
4. Polyurethane sealant (to be sourced from ToT partners)



### **Neoprene rubber lined mock up structure of battery pit compartment**

The neoprene rubber is compounded suitably to provide excellent acid resistance and mechanical properties, fabricated by calendaring to the required thickness. The method of application of the neoprene rubber sheets on board the battery pit compartment is based on a nesting plan to conformally secure the lining system using the sealant and adhesive.

## **Salient features:**

### **❖ Neoprene rubber**

- Color : Off-white
- Fabrication : Calendered sheets of thickness  $2\pm 0.1$  mm
- Dimension : 1 m x 1 m x 0.2 mm
- Hardness (Shore A) : 50-60
- Adhesion strength (with epoxy putty):  $> 3$  kN/m
- Adhesion strength (with sealant) :  $> 3$  kN/m

### **❖ Composite lining system:**

When applied on board the submarine battery pit compartment can provide corrosion resistance against sulfuric acid for more than ten years.

Qualifies holiday tests probed by a high voltage holiday tester

### **❖ Application method:**

Based on the nesting plan developed by NMRL for conformal securing of the rubber lining using the adhesive and sealant

## **Application Area**

- ✓ The battery pit compartments of submarines