

# ACCIDENT ALERT

## MIG Welding Explosion: Aluminium Boat

### The Situation

A man was attempting to MIG weld an aluminium lug plate onto the floor pan (also aluminium) of a Naiad aluminium inflatable dinghy (N.43029). He tacked the plate into position and started to weld it. It was not penetrating through to the hull. He increased the welder temperature and began welding a second time. An explosion occurred throwing him 3-4 metres away.

### The Injury

Life-threatening injuries were sustained including serious head, neck, chest, pelvic, elbow and foot injuries.

### Probable Cause

It was not possible to substantiate the exact cause. The most likely cause was the ignition (by the MIG welding torch) of a highly combustible hydrogen/oxygen gas mixture trapped in the pressure tight bilge of the boat.

The hydrogen may have been generated by:

1. A reaction between aluminium corrosion and moisture in the bilge compartment;

2. Decomposition of water in the high energy welding arc; or
3. Release of hydrogen trapped in the gas pores of welds attaching the floor to the hull.

### What Can Be Done?

- A number of incidents of a similar nature have occurred in the past and greater awareness of the hazard is needed.
- Manufacturers should attach a warning plate or stamp on their boats.
- The boat design should allow for a through flow of ventilation (for example, by having extra bungs) so the boat can be ventilated prior to welding.
- The work should be thoroughly ventilated before and during the welding process.
- Because of the complexity of the problem and different designs of boats, emphasis should be placed on alternatives to welding, such as the use of screws and rivets, etc.

