

Incident during lift bag operations

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A Member has reported an incident where a lift bag connected to a 10" blind flange made a rapid uncontrolled ascent to surface.

What happened?

No damage or harm was occurred, but the event had the potential to cause both considerable damage (e.g. to ships' thrusters, subsea infrastructure, etc.) and injury (e.g. by dragging or from dropping onto divers).

Divers were operating at around 40 metres (130 ft) close to a well head protection structure. They were attempting to move the 10" blind flange using a lift bag. The bag and flange suddenly broke free and ascended to the surface out of control. The bag and load arrived on surface quickly, where they drifted away from the ship.

The resulting investigation identified the following immediate cause of the incident – an oversize bag had been connected to the 10" flange, which appeared to have snagged on something in the vicinity of the protection structure, preventing it freely raising the flange. The divers and diving supervisor were unaware of the snag and continued to fill the bag with air. The bag was over-inflated in relation to the 490kg flange's weight and, when the snag point freed, the bag shot towards the surface with the load attached. The dynamics resulting from the rapid acceleration and mass of the flange with the movement of the entrained mass of water created a dynamic force well in excess of the breaking strength of the 'hold-back' rope.

The following points were also noted as having contributed to the incident:

- The task plan had called for a 500kg air bag to be used, which had been available on the ship's deck. However, the divers had used a 1000kg bag instead, which had previously been used for lifting a pig receiver and was unavailable in the work basket which was deployed on the seabed.
- The diver had used the normal practice of filling the bag by judicious control of the flow control valve, allowing only sufficient quantities of air to raise the flange slowly. He had checked at various times to ascertain the effective lift, which the flange was experiencing. The flange had risen off of the bottom and remained at an angle of about 45°, but still touching the bottom after over one minute of filling and remained like that for a further 90 seconds of filling. The bag became significantly over-filled.
- The divers and diving supervisor were unable to see the top of the bag because of in-water visibility and camera viewing limitations. An ROV was not being used to monitor the position of the bag.
- The way that the air bag inverter line had been rigged, on this occasion, was not in accordance with the specific instructions given in IMCAD 016 Rev. 1 –

Underwater air lift bags – but instead had been connected to the load itself rather than a fixed point.

A new lift bag operating procedure has been issued by the company, which includes the following points:

- All lift bag operations to be conducted in accordance with the revised procedure.
- The correct sizes of bag, as specified in approved procedures, are to be used.
- Rigging arrangements for restraining and ‘hold-back’ lines are to be as specified in the company’s instructions and the sizing of these lines is to take into account dynamic run-off situations, not just the marginal static load difference between the load and the lift bag capacity.
- The clearance of the load and lift bag are to be assured at all points on the lifting route, in accordance with the company’s lifting instructions.

Members may wish to review:

- [IMCA LR007](#) *Guidance on open parachute type underwater air lift bags*

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