# BSEE: Electromagnetic lifting device dropped steel plate

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The United States Bureau of Safety and Environmental Enforcement (BSEE) has published Safety Alert 500 relating to a defective lifting device dropping a steel plate during drilling operations.

**IOGP Life Saving Rules:**

Safe mechanical lifting

## What happened?

The United States Bureau of Safety and Environmental Enforcement (BSEE) has published Safety Alert 500 relating to a defective lifting device dropping a steel plate during drilling operations, and two persons were injured. The incident occurred while transferring a partial 3/8” (95mm) steel plate sheet using a magnetic lifting device. During the lift, the steel plate unexpectedly detached from the magnet and fell approx. 1.2m, landing on top of both individuals’ left feet. Both personnel reported bruising and swelling and were evacuated for medical evaluation.

## What went wrong?

- Investigation revealed that the magnetic lifting device was ineffective due to wear and tear;
- Manufacturer tests indicated that wear damage to the lifting device could create air gaps, preventing it from functioning effectively;
- The job safety analysis (JSA) conducted before the operation did not adequately address the specific hazards associated with the lifting equipment. While the JSA noted general hazards, it failed to identify the risk of the plate prematurely releasing from the lifting device;
- BSEE notes additionally that:
  - “A critical factor in this incident was a failure to stop work and review the JSA before proceeding with the lifting operation” and that this reflected a safety culture where crew members did not feel empowered to halt operations to reassess potential hazards;
  - There was a perception of haste among the personnel, which may have contributed to their decision to proceed without thoroughly discussing the risks involved. This urgency to complete tasks underscores the need for improved communication and adherence to safety protocols.

## Recommendations (BSEE)

- Safety
  - Encourage open communication among crew members regarding safety practices and adhering to established protocols.

    - Foster a culture of safety that encourages personnel to exercise stop work authority and discuss potential hazards whenever uncertainties arise.
    - Revise job plans to ensure that the team adequately addresses specific hazards associated with lifting gear and suspended loads.
    - Conduct thorough JSAs that include a comprehensive hazard assessment for all lifting operations.

- Lifting
    - Ensure proper training on use of lifting equipment and the importance of confirming that all safety mechanisms are engaged before lifting operations begin.
    - Robust inspection programmes for lifting devices to ensure they are maintained in safe working condition and regularly evaluated for wear and tear.
    - A reporting mechanism for any observed defects or safety concerns related to lifting equipment.

- Electromagnetic lifting devices
    - Even brief power spikes can disable electromagnets, leading to dropped loads. To prevent sudden loss of magnetization, implement procedures to monitor power stability and ensure that backup systems are in place.
    - Ensure there are procedures in place to prevent coils from burning out by limiting how long operators keep the  power on with electromagnetic lifting devices.
    - Turn off the magnets when they are not in use, especially if the magnets are not designed for continuous duty cycles.
    - Consider a pre-use inspection and load testing procedures for electromagnetic lifting devices.
    - Ensure the lifting surface is clean and free from debris, oil, paint, or rust, which can interfere with the magnet’s contact and reduce lifting capacity.

## Members may wish to refer to:

- IMCA HSS 019 M 187 LR 006 Guidelines for lifting operations