

Safety Alert

Bolt Type Shackle Inspections

File 20100.30

November 30 2018

Purpose

This safety alert addresses concerns observed with the use of bolt type shackles and cotter pins and describes specific considerations and actions to be undertaken by operators, employers, supervisors, offshore training service providers and employees. The information provided on specific mechanisms and modes of failure may not be novel to all but they are in need of reinforcement.

Safety Concerns

Ensuring rigging hardware is certified for use and suited for the environment and application is critical. The offshore environment is harsh and rigging hardware is often subject to extreme environmental conditions including, but not limited to: temperature extremes, corrosive seawater, vibration, physical impact and heavy use. If not diligently maintained, visibility of current colour coding identification quickly wears or breaks off and neglected parts are at risk of failure which can result in fatalities.

4-part bolt type shackles are safe and reliable, and therefore a very common type of rigging hardware used offshore. They are used in lifting and static systems as removable links to connect wire rope, chain and other fittings (i.e. connecting slings to containers or other loads to be lifted). It has four parts: the main body/bow, bolt, nut and cotter pin.

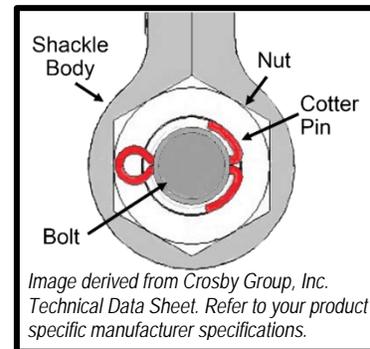
Cotter pins are a means of secondary retention for the nut to prevent it from turning and loosening. They play an important role in lifting operations but are often overlooked. They must be precisely sized to fit in the bolt's hole and be splayed according to the manufacturer's specifications in order to minimize the chances of failure from it falling out and/or cracking/fracturing at the bend. **When they are removed, they must be discarded and replaced with a new one due to low cycle fatigue.** There are several other aspects regarding cotter pin procurement and use that must be known including, but not limited to: the angle of the bend (preventing damage/fractures), material for strength and corrosion resistance, effective length of the legs/prongs, preventing snag hazards, the placement of the head against the bolt and orientation to the shackle body, the size of the head and pin relative to the hole in the bolt, and service life.



Action Required

To reduce the risk of failures associated with bolt type shackles, the CNSOPB expects the following measures to be in place in addition to strict compliance to lifting operations legislation, company procedures, manufacturer specifications and applicable standards, codes, industry best practices:

1. Operators are ensuring that all employers are following and regularly auditing compliance to the [Atlantic Canada Offshore Petroleum Industry Safe Lifting Practice](#);
2. Operators and employers are monitoring and conducting periodic audits on all personnel involved in lifting operations to ensure rigger training is current and appropriate for their position. The required training is outlined in the [Atlantic Canada Offshore Petroleum Standard Practice for the Training and Qualifications of Offshore Personnel](#);
3. Employers are conducting targeted workplace inspections to identify and quarantine any suspect lifting gear which does not prominently display the current colour coding;
4. Employers are ensuring that the current lifting colour code is well communicated and displayed throughout the workplace and that supplies (paint/plastic tags, etc.) are available to maintain prominent visibility;
5. Employers are conducting targeted workplace inspections on all shackles in use to identify and rectify any loose nuts and improperly installed cotter pins;
6. Employers are ensuring that replacement cotter pins are: fit for purpose, readily available for employees conducting lifting operations, being **used only once** and in accordance with manufacturer's specifications;
7. Employers are reviewing lifting operations procedures, checklists and risk assessments and ensuring they reflect hazards of missing and incorrectly installed cotter pins in shackles and require pre-use inspections for all lifting operations;
8. Training service providers are ensuring that reliable securing, including specific aspects on shackle cotter pin installation, is included in the content and is in accordance with industry standards/codes and manufacturer specifications;
9. All offshore personnel review this notice and employers are ensuring that it is posted in a prominent place in the workplace.



If you have any questions regarding this notice, please contact:

Chief Safety Officer

Phone: (902)422-5588

Fax: (902)422-1799

info@cnsopb.ns.ca