April 2005

Presentation "Reach for the Sky – with Safer Lifting" by Ken Richardson, Barloworld Training

Ken Richardson has had a wide experience in the Engineering Industry, dealing with lifting operations and he said that in his early career he had worked on unusual military applications for moving loads with helicopters! Most of his time now is spent training operatives for a variety of clients, giving him an ever-changing experience in very different industries.

Although the Lifting Operations and Lifting Equipment Regulations (LOLER) 1998 were the key legislation for this topic, Ken said that it was essential to support their effective application with the provisions of Health and Safety at Work etc. Act 1974 and the Provision & Use of Work Equipment Regulations 1998.

Ken went on to say that a key requirement of LOLER was Regulation 4, Strength and Stability. This was an absolute duty on employers to ensure that –

- **Lifting Equipment is of adequate strength and stability for each load, having regard in particular to the stress included at its mounting or fixing point.**
- **Every part of a load and anything attached to it and used in lifting it is of adequate strength.**

This is an extremely stringent requirement because, if a pallet or container breaks or distorts during lifting, an accident could occur. Ken quoted examples of load hooks being attached to banding or wires, which are not tested to any standard and could break during the operation. Neither are they marked with their safe working limit.

Regulation 7, Marking of Lifting Equipment, is also an absolute requirement for every employer to ensure that:

- **Machinery and accessories for lifting loads are clearly marked to indicate their safe working load.**

Ken emphasised that there were no exceptions to this requirement, so it was easy to understand and follow! It was important to beware of old slings that had been used for some time, which people assumed, by 'custom and practice', were suitably rated although the original markings had long since disappeared. A common pitfall was the label marked with a biro pen whose markings become rubbed off quite easily. Another problem area was the use of integral eyebolts on motors, pumps or control cabinets. These were part of the load itself and not considered to be 'lifting attachments' under these Regulations. Difficulties arose, however, when these units were built into larger machinery and it was assumed, wrongly, that the eyebolts would lift the complete assembly. Another difficulty arose with eyebolts when they were 'recycled' into other situations and they were not marked with a safe working limit, as would be a new item.

- **Where the safe working load of machinery for lifting loads depends on its configuration –**
  - **The machinery is clearly marked to indicate its safe working load for each configuration; or**
  - **Information that clearly indicates its safe working load for each configuration is kept with the machinery.**

Ken showed us a photograph of a Manitou Fork Lift Truck where the rating plate had been painted over and he said that it was commonplace for these plates to become detached and lost or obscured in this way.

The next requirement was Regulation 8, The Organisation of Lifting Operations, which means **"….an operation concerned with the lifting or lowering of a load".** This requires that every employer shall ensure that every lifting operation involving lifting machinery is -

1. **properly planned by a competent person;**
2. **appropriately supervised; and**
3. **carried out in a safe manner.**

Ken observed that this was a very rigorous requirement, based on competence. He added that operatives could be perfectly competent to plan and supervise repetitive operations with standard loads in standard situations.

However, if operations required the lifting of dissimilar loads in differing situations, then more experience and theoretical knowledge may be required to devise an acceptable plan for the lifting operations. Complex plans may, for instance, have to address the size, weight, shape, rigidity and centre of gravity of the load, and to where it has to be moved. The movement route would also have to be planned, to take account of overhead and underground services, slinging requirements, ground stability and safe placement. Equally important is the clearing up operation afterwards.

On the matter of supervision, this usually became necessary under exceptional circumstances, where there may be obstacles to oversail, or there may be adjacent work operations or hazards like electrical services. The need for supervision would normally be identified during the planning stage, which looked at the hazards and risks, involved.

The correct "Accessories for Lifting" are essential for attaching the loads to the "machinery for lifting" in a safe manner. Ken said that there were no rules against designing 'customised' accessories and, in fact, some may be specified as a result of arranging the lifting plan. However, any item used in a lifting operation must conform to all current regulations and must be tested accordingly.

On the subject of lifting accidents, Ken reviewed the Lifting Incidents investigated by the HSE in the five years from 1996 to 2001. In that time, they investigated 1,821 accidents, involving 106 deaths, 678 Major Injury Accidents, of which 381 resulted in over 3 days absence. In the same period there were 656 dangerous occurrences.

The top ten Contributory Causes were Falling Load, Unsafe Slinging, being Struck by Load, Crane Collapse, Inadequate Training, Lack of Planning, Proximate Hazard, Operator Error, Safe System of Work Not Followed and Inadequate Maintenance. Obviously some accidents were the result of more than one of these causes.
Ken singled out one of these categories for special mention and that was "Struck by Load". Very often, he said, operatives attempted to stop a swinging load, apparently in ignorance of its huge inertia and the considerable difficulty of stopping even a slow moving object!

An important safeguard in lifting operations is the need to take simple precautions. Operator Pre-use Checks are a crucial factor in ensuring that damage done in a previous shift do not cause an accident in the one afterwards! Ken showed some slides of damaged and worn chains, wire ropes and slings and fibre slings to reinforce the point.

It was important to look for: -

- Repetitive use on similar loads producing wear on the same spot
- Chains cut, dented or gouged on loads
- Chain corrosion which can be started by storing on unpainted floors, instead of being hung in racks. They are also tidier in racks, less prone to other damage and easier to find.
- Chain abrasion from use in dusty atmospheres.
- Chain corroded by use near acid – they need more frequent daily inspection
- Broken strands on wire ropes and slings. If any strand is broken, always scrap the whole item. Never derate – always scrap – there may be other latent damage.
- Birdcaging and abrasion wear on wire ropes and slings.

Fibre Slings are the most commonly used, the most vulnerable to damage and, hence, regularly replaced. They can easily develop 'hardspots' due to friction, suffer welding burns and receive small cuts, which cause catastrophic failures after shock loadings.

Care of equipment thus becomes a major issue because of the potential for high-cost accidents. Rigorous systems for periodic, 12-monthly inspection (6-monthly for personnel lifts) by a competent person. This usually means someone who is independent of the user and the inspection scheme will require serial markings to control the equipment inventory. Storage conditions are another important consideration and, as previously mentioned, it is standard practice to paint floors to damproof them and hang equipment in racks.

Ken went on to comment about the use of fork lift trucks (FLT) for lifting operations. If a boom or lifting attachment is used on a FLT it must be correctly identified. Furthermore, if the attachment is fitted to the forks, then it is considered to be a 'lift truck attachment'. If, however, the forks are removed and the boom is fitted to the carriage plate, then the whole vehicle is classified as a 'mobile crane'.

Because of the specialist, and sometimes-infrequent nature, of lifting operations the resources are often obtained from outside the firm and this outsourcing can take two forms. Firstly, **"Contract Hire",** where the crane is hired from the hire company, which is responsible under LOLER for providing a copy of the latest examination report to accompany the crane. The user is responsible for checking that this evidence is available and for managing the subsequent lifting operation in a safe manner.

The second type of arrangement is known as a **"Contract Lift",** where the third party is contracted to provide lifting equipment, an operator and manage the whole lifting operation, on behalf of the client. In these circumstances, the crane owner has to ensure that it is correctly maintained, examined and safe to use and that the lifting operation is carried out safely. The client should make sure that the examination certificate is available. Ken commented that users very rarely, if ever, checked certificates and Barlows are often asked to do this on behalf of clients. On occasions they have discovered fraudulent certificates being used and he cite one example where the same name appeared on 5 different certificates! This reinforces the message that it is extremely critical for users to fulfil their obligations!

On the subject of training, Ken said that it is obviously important to train operators on the specific crane equipment in use. But equally importantly to the success of the whole planned lifting operation, it is crucial to train other workers on site, who may be adjacent, or passing. All planned operations must include emergency procedures and everyone on site needs to be instructed and trained to carry these out effectively, as well!

Members' Questions

Gerry Mulholland of Carillion commented that a recent HSE inspection blitz on Construction sites, which focussed on **Fa**lls, **T**ransport and **L**ifting operations (**FaTals**). He said that he would ask Ray Cooke for information on the results for the West Midlands and the results we have received since the meeting are as follows:

Category	Falls	Transport	Lifting	Overall Result
PNs	12	7	2	24
Ins	0	2	0	2
VCWs	11	0	0	12
Total Sites				64

Other matters of concern were dealt with by inspectors if they came across them on site, which is why the numbers of notices and VCWs do not add up to the overall totals

Gerry added that he thought that good planning was the key issue and that access and ground stability were critical elements to address in all plans. He commented that BS7121 required an Appointed Person and that Generic Lifting Plans were perfectly acceptable for repetitive tasks.
David Hughes of Hughes Business Services commented that Insurance Companies exerted considerable influence and expected employers to adhere to laid down procedures for safe working. He cited a recent example where a certificate was presented on a contract for the wrong crane. Ken added that operatives were also responsible for complying as well. Some employers, he said, also appoint in-house trainers and this approach makes for a positive improvement because they are available on the shop floor for rapidly available on-job training.

Mark Hoare of Birmingham University asked how the load tests were conducted. Ken answered that the specialists applied an overload until the crane tipped and the Safe working Limit was calculated to be 80% of that figure.

Graham Kilford of Veolia Water Systems Ltd. asked if shackles were considered to be the same as eyebolts. Ken said they were not, as shackles were rated

John Wood of Birmingham Area Fire Protection Association suggested that a recent accident with a falling load was the result of a poor plan. Ken agreed and added that it was also the result of poor maintenance of the lifting accessory built into the load. In this case, slings had been used regularly at a very acute angle, near to 120°, whereas most slings were fully rated at 90°. Although they can be used at angles < 120°, it is essential to obtain the manufacturer's data for SWL at the more acute angles. At an angle of < 120°, the tension in each leg was equivalent to the full weight of the load.

Peter Evans asked if Barloworld trainers assessed the suitability of the trainees to be trained. Ken stated that they did not, as this was the responsibility of the client. If a problem, say, of lack of dexterity occurred, then the employer would be informed, to enable him to take appropriate action as early as possible. This was because, if the trainee failed the tests, the employer would lose the training fee.

At this point there were no further questions and Gerry thanked Ken for the very informative presentation. The audience added their own thanks in the traditional manner.