



Safe machinery saves lives

Through my job, that has taken me to practically every industrialized country in the world, I have become a fervent advocate of international crane standards. Having seen them at work, I have seen the advantages they can bring to the crane industry in terms of safety, of reputation and in costs. And, what is true for cranes is certainly true for a good number of similar industries.

“In a tight world economy, there is no place for unreliability.”

There are nearly 10 million cranes in operation today worldwide, on such a scale, it is barely surprising that economies can be big when crane management programmes are fully implemented: potentially, an estimated USD 3 billion per year can be saved. But money is not the only consideration. Safety is another – and a truly vital one.

Lower costs, better quality, fewer accidents

International crane standards set up conditions under which everyone wins. Crane builders can count on producing better, higher quality products. Crane operators enjoy safer working conditions and cranes with improved ergonomics. Firms can rely on increased crane productivity with lower costs for use and maintenance. And business in general can expect fewer accidents, increased operational safety, and increased reliability.

Proper preventive maintenance routines increase the reliability of equipment performance. Using a mandatory defect history database, combined with inspections and repairs carried out by qualified crane specialists, decreased safety-related faults are found. By specifying qualification requirements for operators and specialists to train them, safety is enormously improved (crane operator errors lie at the root of 73% of all crane accidents). International Standards provide crane maintenance firms

Radical improvements in crane safety

By Rolf Lovgren, former Chair, ISO/TC 96, Cranes, SC 5, Use, operation and maintenance of cranes

In a tight world economy, there is no place for unreliability. This is true of all fields, including cranes. To keep cranes shipshape, in a constant state of readiness, and properly maintained is no longer desirable – it is simply vital. **Question:** How do you make them safe and reliable? **Answer:** By introducing quality crane safety management. And to do so, one key weapon, and particularly effective one – International crane standards.

Photo © ISO

The story of a safe handler



Photo © CranePartner International

Control panel in a overhead bridge crane.



Photo © CranePartner International

Bridge wheels badly worn, rail broken, no brakes etc.



Photo © CranePartner International

Stell structure damages caused by wery rough handling.

with tools to evaluate how well they are doing in meeting their customer's requirements. In my experience with crane operations in paper mills in North America and Europe, such maintenance practice has reduced maintenance cost from 33% to 64% while reducing failures between 46% and 60% and safety incidents between 33% and 97%. Results of International Standard level maintenance in steel mills is also impressive: maintenance costs reduced by from 28% to 56%, failures reduced by 50% up to 83% and safety incidents by 63% up to 95%. The demanding automotive industry in USA (namely, in General Motors) has seen some radical improvements in crane safety and reduced maintenance costs after focusing their crane management on international crane standards (see box opposite). Annual crane defects have declined by 86% and maintenance costs by 57%.

Let's look at a shining example of the implementation of crane inspection and condition monitoring standards for 500 cranes in an automotive plant (General Motors/Saginaw Metal Casting Operation, Saginaw, Michigan USA).

GM's Powertrain operations engine-block casting facility in Saginaw was first established in the 1920s, and has grown since then to having approximately 140 000 m² under roof. They use 500 cranes/hoist in their operations, in 24 different locations within the plant, made by 22 different manufacturers, with capacities ranging from 0,125 to 15 tons. The average crane/hoist is 20 years old.

They set out to increase safety, reduce costs and be on world-class level as far as crane safety and maintenance are concerned.

So what did they do ?

GM's Powertrain operations engine-block casting facility in Saginaw decided to implement ISO's International Standards on crane inspection and condition monitoring ISO 9927:1994, *Cranes – Inspections – Part 1: General*, and ISO 12482: 1995, *Cranes – Condition monitoring – Part 1: General*, for their crane maintenance.

CranePartner International's service division in Michigan (CraneCare Inc.) was selected for the implementation and maintenance for 500 cranes/hoists in the plant.

Operations started in 1997 by tailoring individual checklists for every crane/hoist, collecting information about operational data etc. and adapting the CranePartner Crane Maintenance and Condition Monitoring programme (CranePartner System CPS) for the task.

And the results ? Development between June 1997 and December 2001 was as follows:

- Crane defects have declined from average 7,2 / Hoist/Year in 1997 to 0,85/ Hoist/Year in 2001 (see diagram p. 23)
- Crane Maintenance Costs have declined from average USD 1 274/ hoist/year, to USD 580/hoist/year (see diagram p. 23)
- GM/SMCO purchase specifications for cranes are similar to ISO crane standards.



Photo © GM

The only market that counts is the world market

Throughout the world, there are increasing safety and environmental demands and regulations, and the customer's expectations are constantly on the rise. New technological developments simplify procedures and maintenance if properly channelled through International Standards.

A modern comprehensive crane maintenance programme pays substantial dividends when it is congruent with International Standards.

The marketplace, obviously, is now global: with cranes, the only market that counts is the world market, and competition is fierce: by applying self-agreed International Standards, a lot of the grind is taken out of maintenance work as components and procedures are standard.

International Standards lead to higher quality, which, in turn, means higher safety, greater reliability, and enhanced customer satisfaction, giving those that apply them an all-round image of a professional global service provider. To become – and to remain – a successful service provider means



Safe machinery saves lives

What ISO crane standards can offer

ISO/TC 96 works on standardization in the field of cranes, lifting appliances, and related equipment, particularly general design procedures, terminology, classification, load rating, terminology, safe use, maintenance, inspections and condition monitoring, crane selection etc., through nine subcommittees with delegates representing national standards groups from 30 countries. These are: subcommittee SC 2, *Terminology*, SC 3, *Selection of wire ropes*, SC4, *Test methods*, SC 5, *Use, operation, and maintenance*, SC 6, *Mobile cranes*, SC 7, *Tower cranes*, SC 8, *Jib cranes*, SC 9, *Bridge and gantry cranes*, SC 10 (previously SC 1), *Design procedures*.

Crane safety improvement standards are used to:

- “Design/specify” a safe crane.
- “Buy” a safe crane
- “Maintain” a safe crane.
- “Use” the crane safely. ■

“Crane operator errors lie at the root of 73% of all crane accidents.”

About the author



Rolf Lovgren was Chair of ISO/TC 96 *Cranes, SC 5, Use operation and maintenance of cranes* between 1986 and 2004. He is a member of ANSI/ASME

B30, Standards Committee for Cranes (USA), US Delegate to ISO/TC 96 and MIOSHA advisory board member for Crane Safety (Michigan OSHA). Mr Lovgren is President and CEO of CranePartner International Inc. and has been in the crane and maintenance engineering business worldwide for over 30 years.

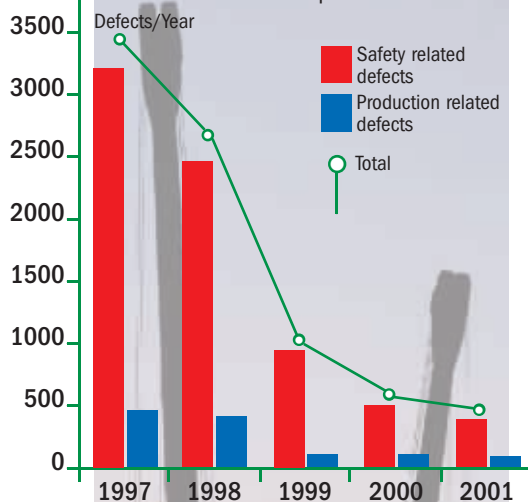


Photo © Man

paying special attention to developing and maintaining services which follow global requirements: this gives the assurance that you are on the right track, at present and for the future.

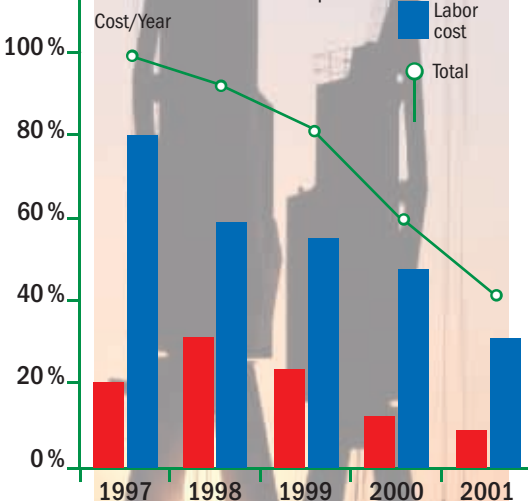
Decline in crane defects

500 cranes in automotive plant



Decline in crane costs

500 cranes in automotive plant



© CPI 2002

Crane operation and maintenance is difficult to obtain

There are three basic approaches to crane maintenance: maintenance by in-house crews; service contract by the manufacturer, and service contract by a third-party crane maintenance organization. All three approaches are appropriate if personnel have sufficient knowledge of both cranes and maintenance.

All the elements necessary for building a world-class crane management programme are included in the International Standards, even though the design and execution of such a programme will still have to be coordinated by the plant maintenance organization or an outside group contracted to handle the responsibility. The comprehensive crane maintenance programme will include crane inspection and evaluation by knowledgeable engineers, preventive maintenance tasks by operators and maintenance specialists, predictive maintenance technologies, and computerized maintenance management systems.

Comprehensive knowledge of crane operation and maintenance is difficult to obtain. Pockets of excellence exist in crane builder and crane user companies and organizations throughout the world. But if no country or company has succeeded in gathering all the best knowledge and practice for designing, building, installing, operating and maintaining cranes, the efforts of ISO/TC 96 have been promising in this field. One of the most valuable committee activities for maintenance organizations is the standard for condition monitoring.