

iDdrift

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reliability
with
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“To be the leading knowledge company within the area of maintenance and production management”



Per Möller, President of Idhammar AB.

Improved reliability with Lean Maintenance

“Methods from automotive industry can be used to improve the efficiency of maintenance. Not only can Lean be used for manufacturing, it is also equally well suited to maintenance.”

In times of crisis, it is well worth highlighting a philosophy with as much potential as Lean. Something that has been so effective in creating resource-efficient manufacturing can also be relevant in other areas as trading conditions slow down. As most people know, these methods have their origins in Toyota’s manufacturing philosophy. So far, Lean has proven to be unbeatable when it comes to eliminating various losses within processes.

However, not only is Lean aimed at the manufacturing industry, it is also of use to service companies. A growing number of reports from the healthcare industry have shown how the various Lean tools can be used to eliminate losses and free up time that can then be used for patient care.

The fact that Lean is effective in service industries means that it can also be used in maintenance operations. In recent years, however, crisis have insisted that there are no benefits to be had from using Lean in maintenance.

This suggests a lack of awareness of what Lean is all

about. Lean involves eliminating wastefulness and increasing productivity, not making savings. If anything, using Lean in maintenance is essential if manufacturing uses the method. Lean production places strict demands on stable operational reliability. Implementing the philosophy in manufacturing places tougher demands on the maintenance organisation to deliver the level of reliability required.

Even today, there are many maintenance organizations that work extremely well and provide a high degree of reliability. Nevertheless, there is room for improvement in even the most efficient organizations, and many have yet to start heading towards effective, resource-efficient maintenance.

However, succeeding in delivering the correct level of reliability and supporting manufacturing is only one of the benefits of Lean. The other involves using Lean to improve the efficiency of maintenance.

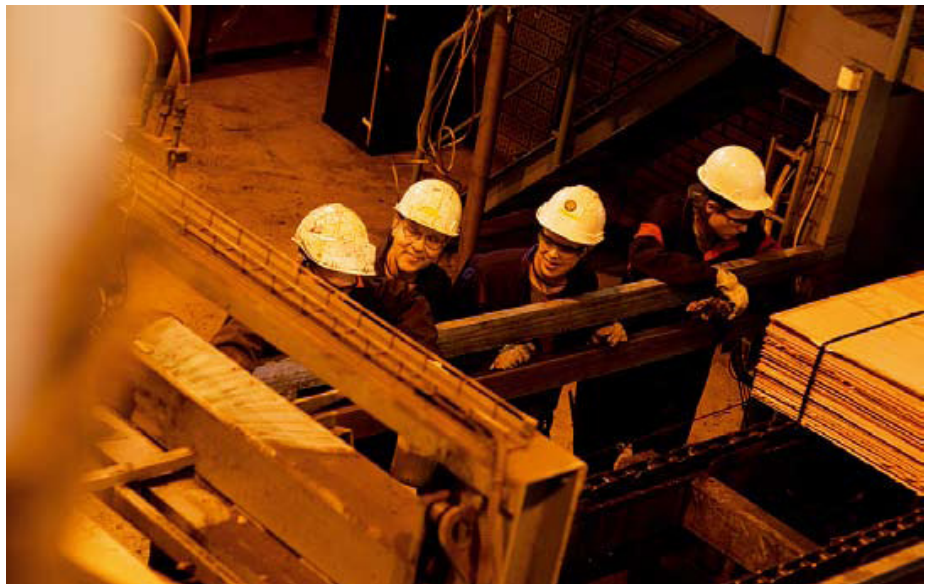
Lean features all manner of tools that are ideal for use in maintenance. Anyone who has visited a number of different maintenance workshops will

have noticed that tidiness can often be improved. Very few maintenance workshops apply the Japanese 5S method, which is one of the foundations for creating an efficient organisation.

The Lean philosophy focuses on eliminating losses. One way of doing this is to reduce variation which, in terms of maintenance, means a process-oriented, standardized way of working. Alongside this, there is a wealth of other tools that can be used to make maintenance work more efficient. One example is the SMED method, which is used in manufacturing to eliminate changeover time; in maintenance, it can be used to reduce the time needed for planned maintenance.

Furthermore, improvement groups, troubleshooting solutions such as poka-yoke, etc. can be used in maintenance. Through focused work to eliminate wastefulness and losses within maintenance, efficient maintenance operations can be achieved. This efficiency can then have the knock-on effect of giving an even greater degree of reliability in manufacturing. Naturally, however, this all begins with the knowledge that Lean is not just a philosophy for manufacturing - it is also at least a well suited to maintenance operations.

Text: Anders Tiger





Sandvik maps maintenance competence

A competence analysis shows what every employee in the maintenance department knows. This makes it easier to carry out tasks such as planning the training needed in order to strengthen the maintenance process and achieve improved reliability. Idhammar's competence analysis model is now being tested at one of Sandvik's maintenance departments.

"The advantage of carrying out a competence analysis is that it shows us where to focus our training resources," says **Micael Koch, Head of Maintenance** at one of Sandvik's Primary Products units. "This enables the organisation to deliver what it has promised."

The unit consists of 34 people who carry out mechanical, electrical and preventive maintenance at a production unit within a division that manufactures products such as drilling steel.

Micael himself is relatively new to the unit. He previously worked at Grycksbo Paper, taking up the newly-created position at Sandvik just two years ago.

His first step in the new job was to analyse the unit's operations. This resulted in a maintenance strategy, a maintenance policy and three-year maintenance plan. Competence development is a key part of this.

"I therefore wanted to visualize the current competence-related situation. We need to know about this in order to achieve the level of competence we want."

The goal is a high level of reliability and availability, minimal unplanned downtime and lower costs.

"In order to achieve this, it is important for maintenance staff to have high degree of competence. We want to be proactive in our work, taking control of our machinery rather

than allowing our machinery control us."

A SIMPLE MODEL

IDrift came to visit at a particularly busy time for the maintenance department. This was the second day of a 16-day planned production stoppage, during which a variety of maintenance measures were being carried out. In addition to this, three overhead cranes and their rails were being replaced, and a furnace was being rebuilt. A new production hall was also being built, and was due to be linked to the existing facility during this period.

Micael met IDrift at the gates of the plant, and led the way to the unit's red office buildings. Over lunch, he talked about the competence-related work.

"I wanted to get a picture of competence within the department, so I contacted the division's HR department. They had a number of tools for measuring competence, but nothing that was suitable for maintenance."

That's why he turned to Idhammar. "Idhammar has competence analysis tools that are easy to use. They run in MS Excel, which we already have installed on all our computers. We didn't want to have to start using new systems or software."

The model is based on producing individual competence cards that describe and grade

employees' maintenance competencies within various areas. These cards can then be used to analyse the competence of an entire group, such as a maintenance department.

"The process is simple and attractive, not least because it uses Excel, which everyone has," explains **Erik Seger, a Senior Consultant** at Idhammar who helped Sandvik's maintenance department to adapt the competence analysis to suit its needs. "No new software is required."

A COMPETENCE CARD FOR EVERY EMPLOYEE

The analysis involves everyone within the unit. First, every employee completes a card, assessing his or her own knowledge, within each area. There are different parameters for different maintenance areas. For example, for an automation engineer this may relate to knowledge of maintenance systems and their modules, while for a mechanical maintenance technician this could involve knowledge of hydraulic operation. Other possible parameters include troubleshooting, repairs, preventive maintenance and reading plans.

The employees then review the results with their line managers to see whether they have the same view of the employee's competencies. The work began in October last year, and was complete by the end of the year.

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"This shows us where to focus our training resources"

"The process went extremely well, and our assessments were fairly similar," says **Hans Westblom Head of Mechanical Maintenance** at the unit.

He and the 13 employees in his group completed the competence cards. "Actually, the most difficult part was the self-assessment."

Ingemar Nyberg is responsible for electrical maintenance, and his experience of the process was similar. Both rate the system highly, finding it a useful aid for planning work. "It gives a clear picture of every employee's competencies," says Ingemar. "This makes it easier to set up a project group or see who should be sent to carry out a job."

Knowledge within various areas is graded on a scale from one to four, depending on whether the person in question has no knowledge at all, some knowledge, good knowledge or excellent knowledge.

"A grade of one means that the employee needs help carrying out the task, while a four means that other people can turn to this person for help," explains Erik.

MEASURING DIFFERENT TYPES OF COMPETENCE

However, a competence analysis does more than just measuring technical knowledge - it also includes softer values such as the ability to work with others, attitudes, and the employee's understanding of the company's vision and strategy.

"We also work with values, the expectations placed on managers and employees, our operational organisation and how we act towards each other," continues Micael. "Everything has gone very well."

The local branch of the metalworkers' union and the HR department were also involved in the process. "Ensuring that staff are on board is essential," says Micael, "and the union was positive." The division's HR department is monitoring the work, which will be evaluated during the year.

"We'll be looking into the possibility and practicalities of rolling out competence analysis to the whole of Primary Products. This will help us to see the bigger picture." So far, the experiences have been almost entirely positive. "One possible disadvantage is the risk of building up unrealistic expectations," he concedes.

The entire maintenance plan runs from 2007 from 2010. After just two years, he has already seen that the OEE value, which is calculated on the basis of downtime, has risen. In addition, maintenance costs have fallen. This is partly due to the fact that fewer people need to be hired in, and partly due to simple factors such as more tightly sealed systems requiring less hydraulic oil. Micael believes that the competence analysis will generate additional cost savings in the long term.

"With the right competence, we can tackle the underlying problems instead of just the symptoms."

TRAINING TO ACHIEVE DESIRED COMPETENCIES

The maintenance unit has finished working with the competence cards, and the competence analysis is now complete. The next step is to compare current competence levels with the levels that various roles should actually have. The aim of this is to identify the gap between current and optimal competence levels, and to gain an understanding of where improvements need to be made. This analysis will result in individual competence development plans.

"In the future, there will be new machinery and new technology. Automation in particular is undergoing rapid changes, with increasingly complex systems. It's a case of keeping up with the pace of change and being able to deal with it."

The unit has therefore already started some training. Maintenance staff have completed courses in hot work, protection, electrical safety, electrical engineering, electrical qualifications, hydraulics, warehousing technology and maintenance technology certification.

"The aim is that everyone should have their own competence plan that supports our overall goals," concludes Micael. "Simply investing in machinery isn't enough."

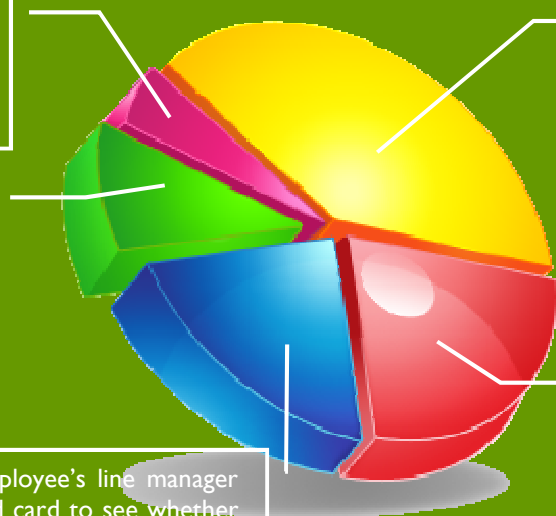
Text: Siv Cederboerg

Carrying out a competence analysis

1. Go through any existing competence analysis documentation. This could include job descriptions, which can be used in the next step.

2. Adapt the Excel model to suit your own operations. The model should correspond with the information for various professional categories, and should describe the equipment to be maintained.

4. The employee and the employee's line manager then go through the completed card to see whether they agree on the employee's competencies.



3. The employee begins by completing a competence card in Excel, grading himself or herself on a scale of one to four according to how well he or she can carry out various tasks included in the role. These grades relate to the level of knowledge, from no knowledge to excellent knowledge.

5. The current competencies, strengths and weaknesses at various levels within the maintenance organisation can now be analysed by producing various extracts from the model.

The results can be used, for example, to produce a competence development plan for achieving future desired competence levels.