On the reporting of production performance in a global operation

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ABSTRACT

In order to compete on an increasingly competitive global market the production must run efficiently and be improved continuously. This master thesis aims to answer questions of how to utilize the performance data in order to improve the production.

Alfa Laval is a producing company with production sites located around the globe. In order to achieve an efficient production they measure it in different ways. The problem they face right now is that although they gather a lot of production data it is not fully utilized in order to improve the production. This master thesis answers which root causes are behind the current production performance, how the reporting and definition of parameters differ from different sites, if the right information is stored for the KPIs currently used as well as identifying the need for new KPIs to capture the most important root causes to be addressed in improvement work.

By analyzing the production data gathered by Alfa Laval at both a production line level and at a product level it was found that the downtime causes are largely site dependent and only to a small extent product dependent. It was also found that the different sites studied share some similar causes for the downtimes giving the company a few areas that can be focused on globally, such as, a high amount of unidentified short stops, set-up related stops and personnel related stops. This is important to the company since the availability is fairly low and an increase of the availability is crucial to them in order to achieve a higher OEE. It was also found that the OEE in many cases had not been used by the company as an improvement tool but merely as a measurement. Employees also expressed that it was a tool that was hard to work with due to it containing so much information.

From the production data the Time Between Failures (TBF) and Time Between Runtimes (TBR) were calculated and studied as well. What could be learned is that the risk of failure is over 80% within 15 minutes of running the machine although the stops are on average short with the problem being resolved 7.2 minutes 80% of the time. This further illustrates the problem they have with short stops happening fairly frequently.

As a small side note some discrepancies in the data was found, such as units being produced unreasonably fast or in no time at all. The reason behind why the discrepancies occur were not investigated during the master thesis project but the company has been advised to examine this further in order for the data to become more reliable.

The data that is gathered by the company is compiled into Key Performance Indicators/Performance Indicators (KPIs/PIs). These are used by the company to gain knowledge of the production and how things are going. What was found during the project is that the knowledge of these KPIs/PIs is limited for most of the employees. The definitions for the KPIs were made in such a way that some of them were impossible to understand without extensive prior knowledge and some of the PIs did not even have definitions available making it hard for the employees to learn about them on their own. The PIs are also individual to each site and sometimes to each production unit making it possible to further standardize these in order to being able to compare and benchmark between the sites.

In order to achieve a higher understanding of the KPI/PI system amongst the employees it is suggested that the company creates a database of the KPIs/PIs which can be accessed globally containing the following.

KPI/PI

- Definition of the KPI/PI
- Target value for the KPI/PI
- The goal with measuring the KPI/PI
- Example of how to use the KPI/PI
- Which KPIs that is affected by it and how the KPI/PI aggregates to higher levels

This would enable the company's employees to easily learn more about the KPI/PI system, for the company to standardize their KPIs/PIs and to easily benchmark between their sites and find best practice.

Another suggestion made to the company is to change the way the OEE is visualized in order for it to be easier to understand. Only using the information already gathered today it is possible to visualize and direct relevant information to the departments that can affect that measurement. For instance the machine related downtimes and its' effect on the OEE is relevant to the operators, maintenance department and the development department. This new way of visualizing the OEE will hopefully make it easier to work with and to understand the needs of the production better.