



MANUFACTURING SOLUTIONS

DUGA

REFERENCE CASE

DUGA – Makes stop time worth waiting for.

Unplanned stoppages are reality in assembly line production. However, while a machine may break down, this is usually not due to insufficient maintenance. This has been demonstrated with the introduction of the DUGA supervisory system, which has also proved to be a powerful tool for improving productivity.

About DUGA

DUGA is a part of the **Process Quality Control** area in Volvo IT Manufacturing Execution System (MES). MES is a collection of tools for improving manufacturing operations through real time management of production processes, product quality and customized decision making support.

But let's start from the beginning...

In the late 1990s, a system was introduced that could show how frequently machines broke down. At that time, this was blamed largely on Maintenance. The result was DUGA, which was introduced initially on the D9 Block and D9 Cylinder head lines in Skövde, Sweden.

The systematic working methodology used in Volvo Powertrain's Skövde plant – known as TPM (Total Production Management or Total Pro-

ductive Maintenance) – consists of seven stages. DUGA was installed at stage three.

The system does not store machine information, but indicates where the losses are. Many production losses are sustained for natural reasons, such as toolchanging. Other causes may be failure to deliver a part to a machine or a machine breakdown. The system reports the losses, stating the outcome in OEE (Overall Equipment Efficiency). The result turned out great. The OEE for cylinder blocks increased from industry average to world class, and is still growing.

It's both automatic and manual

DUGA records information on the status of all of the machines, and stores it in a database for subsequently processing and automated analysis. About 40 different automatic signals, as well as alarm messages and alarm codes, are recorded. In addition, the operatives input additional explanatory items for manual shutdowns, using a choice of 22 different codes. These codes categorise the losses more clearly in OEE.

Manual codes may be required, for example, if the machine has stopped due to a mechanical fault (which will be recorded automatically) and the opportunity is then taken to change tools. In this instance, the operative will enter the code for toolchanging since the machine will be 'aware' only of the original fault, not of the toolchanging operation.

Warned by a beep

When a machine stops, an SMS is sent automatically to the telephone of the operative responsible for the operation. The persons and the number of people to whom alarms are sent may vary, and differs from line to line depending on how production is organised.

DUGA runs on the Volvo intranet, enabling the user to see in real time which machine that is stopped and requires attention at a particular moment in time. In addition, all analyses are started from this point.

Every stop is an opportunity to get better

The system identifies bottlenecks – or the particular machine that is limiting the rate of production. The program plots perfect charts that enable you to see which machine needs your attention. The goal is to continue to increase the hourly rate, and to reduce unnecessary waiting time.

The database provides the supplier with information regarding the precise requirements and is also extremely useful in warranty cases. Considerable numbers of extra people would be required to do manually what DUGA does automatically.

The bottom line

In DUGA, you have a reliable friend. Analysis and monitoring gives you a total overview of your problems. You can make decisions based on clear facts, and you get the control over the machines, not the opposite.



Sören Zackari (at the computer) is one of the production engineers who uses DUGA in the his department's ongoing improvement activities – which is naturally appreciated by Leif Krantz.

VOLVO

Volvo Information Technology AB

www.volvoit.com