



TenStep Supplemental Paper

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Remote Process Control!

Do you have control of your manufacturing plant at your fingertips?

Key Learnings:

- Understand the concept of Remote Process Management (RPM)
- Review the key features of RPM
- Recognize the benefits of RPM

A lot has been said about the efforts that manufacturing companies are making to remain competitive in today's global economy. Cutting costs is no longer the remedy as the margins for both suppliers and manufacturers have dwindled sharply. Other areas with scope for improvement include innovation, customer service and enhanced productivity.

Introducing RPM

Of the several ways to increase productivity, one of the finest methods is process management. A process can be formally defined as 'an organized group of related activities that work together to create customer value'. Process management, thereby is a vital business objective. And now, enhancing its scope further is the concept of Remote Process Management (RPM).

RPM is a set of technologies that utilizes microphones, video cameras and remote control relays to monitor and control processes remotely. It enables shop-floor managers, engineers and other personnel to run manufacturing processes unattended. They could attend to their processes from home, from a far away location and even when traveling.

The components...

RPM involves the firm integration of monitoring and control devices like remotely controlled cameras with Internet technologies. Broadband Internet connections provide the capacity for live video monitoring. The cameras used for RPM have different aiming/zooming capabilities and illumination sensitivity. Besides these key characteristics, RPM provides thermal imaging capabilities that help to inspect thermal properties of cutting tools and surfaces. An Internet accessible digital recorder provides flexible visibility into all time periods. Hence, RPM enables users to review events that have occurred in their absence. Digital storing and indexing helps the user to quickly identify that part of the process, which is of immediate importance. Moreover, these RPM systems have custom-built protective enclosures. These enclosures allow cameras to be mounted inside machines operating in harsh environments with chips and coolant splash.

RPM systems have input and output controllers like remote-controlled lights that enable camera operation in darkness. A relay system can reset/turn off machines. Similarly a wiper/compressed air blast can perform two functions. It can clean a window view into a machine or blow chips away from a cutting edge. Such customized RPM applications give the most value.



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With such specialized detection capabilities, RPM alerts users to issues that call for immediate attention. Such issues include non-conforming parts, broken/dull tools, tool jams, coolant/lubricant issues, and absence of parts or excess finished parts.

RPM's potential and the impact on productivity

Think of the potential of RPM. A typical shop- floor has several screw machines, bar-feeding lathes, pallet-feeding machines and the like capable of unattended operation. However, they are shut down at the end of the day, when shop- floor employees leave for home. This is because management is hesitant to take the risk of running them unattended due to safety and quality concerns. RPM helps eliminate such risks by allowing shop- floor machines to be periodically monitored and controlled. Hearing, seeing and controlling machines on a real-time basis from outside the plant is a boon in today's fast-paced environments.

Here are some simple calculations. Say a plant works on a single shift for eight hours a day, six days a week. This leaves it with about 2500 available manufacturing hours in the entire year. To increase this productivity, the company has to add machines, employees and facilities like power, heating and air-conditioning. If RPM is used and integrated with automation, the capacity would be enhanced significantly using the same equipment, facilities and operators.

A look at RPM in action!

Consider a basic RPM application for a bar-feeding screw machine or lathe. The machine is capable of unattended operation and duration of operation is limited by bar/chip capacity and tool wear. The basic RPM system would be a revolving zoom camera positioned to capture cutting area and machine control panel. An operator can leave the machine running and its operation can be monitored from any Internet device. The operator / production manager can be outside the premises yet check on the machine operations periodically. He can log into Web address for this camera using a home computer, laptop and even a cell phone. The camera can be zoomed in and out as desired by just a click of a button. The remote user can monitor control panel for alarms and view machining area to ensure everything is functioning well. The user can also view finished parts and observe /listen to the machine to check for abnormal sounds. If necessary he can shut down the machine with the click of a button.

Such abnormal conditions (be it a sound, process step or image) can be recorded for future analysis.

The advantages!

The biggest advantage from RPM is increasing available operating time of machines, by simply monitoring them during unsupervised conditions. RPM also helps in effective management of employees on the shop- floor. It can highlight areas of potential personal injury. In case of high-value assets, losses due to theft, vandalism or equipment misuse can be minimized thanks to RPM cameras.



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It happens to many of us, many a time on the shop- floor. Everything is working normally and suddenly, something goes wrong somewhere and a machine crashes or a tool breaks. The result...considerable loss of precious production time! Often it takes a long time to figure out what went wrong. During such situations, how often did we long desperately to scroll back in time and see what happened and why. RPM fulfils this wish by allowing us to move back in time and see for ourselves what happened. Much better than believing an eyewitness account, isn't it? So are you set to man your machines remotely?