Digitizing Operator Rounds

The Final Maintenance Mile

What are operator rounds?

There are many assets on a typical industrial site that are not monitored continuously by a SCADA system or the DCS. Many of these assets are critical and must be running correctly for production to meet its targets. Most companies schedule inspections of these assets regularly by sending skilled operators to the field who take notes using paper and a clipboard. These paper notes may be transferred later to a spreadsheet or another digital format. This process is known as operator rounds or inspection rounds.

Disadvantages of paper-based operator rounds

There are many disadvantages of using paper and clipboards to record operator rounds data. Consistent information collection is difficult and the transcribing of the data to a spreadsheet is error prone and tedious (and a daily frustration for operators). Additionally, the data — when recorded on both paper and spreadsheets — is seldom analyzed or, in many cases, rarely looked at. These issues are now well-recognized in the process industries.

Paper-based operator rounds have a substantial negative effect on the maintenance of assets. Often, key readings are not routed to the relevant maintenance people, or are simply missed because they are hidden in reams of numbers. Additionally, the data collected at the point of measurement is scant since the paper forms only require a number without background information.

Digitizing operator rounds

There are many advantages related to the digital transformation of operator rounds. In particular, the collection process is supported by digital prompts and the data — once it is collected — is automatically routed to a database and made readily available to all the software applications and stakeholders that need it. This new visibility of the data — for all concerned — is a major step forward.

The impact of digital operator rounds on maintenance

With digital operator rounds, the maintenance procedures can be connected tightly. This results in more accurate, faster problem diagnosis and reduces the time to repair the equipment.

The following steps show a typical maintenance procedure that can be part of digital operator rounds.

1. The functional locations are synchronized with the CMMS, and this means that any information entered during the operator rounds is connected to the assets defined by the CMMS.

2. The operator records the information using a mobile device and creates a work request notification to the CMMS. This process can be optimized when using digital technology, for example:

   a. Key assets or assets that are approaching a repair milestone can be measured more often;

   b. When an out-of-specification reading is taken, the operator can be prompted to enter additional background information;

   c. The operator can also be better informed about the specific issue by providing trends and background information from the engineering data;

   d. In cases where there is Wi-Fi present, the operator can see additional real-time information coming in from the DCS or Data Historian (such as the OSIsoft PI System®);

   e. Digital operator rounds can be used to automatically correlate the values collected from the Data Historian with the operator entered values. Inconsistencies can be automatically routed to the instrument or maintenance engineers.

3. The work request notification is validated by a responsible person — often a supervisor — and routed to maintenance personnel via the CMMS. The supervisor receives this data automatically when the operator returns to areas covered by Wi-Fi. The data also appears automatically in the shift handover report, which is typically escalated to area controllers. At this stage, the supervisor validates the work request notification by checking there is no duplication, possibly adding further relevant data such as urgency information, and sends the validated work request to the maintenance department.

4. The maintenance department creates the work order and permit to work (PTW) requirements and sends this back to the operations team. This process is much simpler because the diagnostic data can now simply be copied from the work request into the work order. Additionally, the work order is tied to the work request, providing the continuity of flow. Often, the PTW and associated isolation certificates can also be created with digital PTW software.

5. The work order is processed, and the completion status is sent back to the maintenance department.

Benefits of digital maintenance work requests

Digital operator rounds provide many benefits, but essentially add the last mile of digitization to the whole maintenance cycle — doing this very efficiently. There are benefits in each step of the maintenance cycle, as shown below.

Field collection of asset data

Benefits of digital operator rounds	Outcome
The operator is guided so that they only record asset data when it is necessary	More efficient labor usage
The frequency of asset value recording can be dynamically controlled to view assets that are close to maintenance milestones more often	Reduction in unplanned breakdown maintenance
The operator receives prompts to ensure they follow the right procedures. Also, an operator is alerted to out-of-specification readings and must follow the prompted procedure	Consistent procedure execution ensures out-of-specification readings are acted upon
Trend visibility and — if under Wi-Fi coverage — real-time data visibility	Difficult to diagnose issues become apparent so reducing unplanned breakdown maintenance
Ability to record photographs, sound recordings and videos	Clearer diagnostic information results in better actions
GPS information, time of recording and operator data recorded	Improved auditing and compliance
Ability to write notes that appear in the operations logbook and shift handover records	Important context information is available to everyone who needs it
Automatic routing of work requests that contain key field data to the relevant person on the site	Fast access to maintenance issues sent automatically to the relevant person

Validation of work requests

Benefits of digital operator rounds	Outcome
Comprehensive data including images and other media received automatically in the control room as soon as the mobile devices connects back to the Wi-Fi	Fast comprehensive information available to the authorized person
No requirement to transcribe information from paper to a digital format	Fewer errors and no tedious double entry
Ability to easily check historical data both from previous operator rounds and from the real-time sources such as Data Historians and the DCS	Improved context information means improved decisions
Access to previous work requests and work orders	Avoids work order duplication
Simple, consistent routing of the validated work requests to the maintenance department	Fast processing means shorter time to repair

Creation of work orders

Benefits of digital operator rounds	Outcome
Comprehensive information related to the work request delivered faster to the maintenance team	Better context enables a more confident carrying out of the work order
Context information can be automatically attached to the work order	Context will help the contractors carry out the job more effectively

Carrying out the work orders

Benefits of digital operator rounds	Outcome
Faster, more comprehensive information received by the work order processor	Faster time to repair
Automatic association with digital PTW software is possible	Safer work environment

Status information sent to the CMMS

Benefits of digital operator rounds	Outcome
Maintenance and operations staff receive status updates as the work progresses	Maintenance and operations teams are aware of the jobs being undertaken

Digitization summary

This document has explored the difficulties encountered by the maintenance department as a result of paper-based operator rounds. To counter these difficulties, many corporations are now moving to digital operator rounds recorded on mobile devices. This document also highlighted how digitizing operator rounds removes many of the problems of using paper, and has outlined the substantial benefits of digitization.

In conclusion, the move from paper-based to digital operator rounds provides quick-time-to-value and can add extra value to the overall maintenance cycle.

There is little reason not to digitally transform crucial processes that affect human and environmental safety.

Contact Hexagon to find out how j5 Operator Rounds can digitize your paper-based operator rounds, drive shift excellence and reduce operational risk.

About Hexagon

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 3.9bn EUR. Learn more at hexagon.com and follow us @HexagonAB.