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5 SIGNS YOUR PLANT HAS A COMMUNICATION PROBLEM

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SMARTER PLANT OPERATIONS

If you've noticed an increasing disconnect in information-sharing between shift teams at your plant, it would not be surprising. The lingering pandemic and additional pressure due to supply chain disruptions have led to some additional disconnects in the way manufacturing organizations communicate. But 24/7 operations have always been a challenge for communications. This is why communication protocols are an important layer of protection in chemical and pharmaceutical manufacturing.

However, there is relief. By considering the human factor and blending the best attributes of people, machinery, and AI it results in an even more resilient production. Accelerated digitization and IIoT initiatives have enabled further potential data waiting to be leveraged by people. To make use of this data, it must be actionable and get into the hands of the right people. To achieve this, the operation teams need to be equipped with better digital solutions to keep people in charge of mission control firmly in place 24/7.

Since 2005, Shiftconnector® has been helping chemical and pharmaceutical manufacturers worldwide to connect their operation crews and integrate existing IT and OT applications to ensure safety, improve quality, and increase productivity.

This ebook will give you and your teams an understanding of the common signs of information-sharing breakdowns between shift teams. We'll also discuss some proven solutions on how to successfully bridge these gaps.

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Sign #1

DAY SHIFTS AND NIGHT SHIFTS AREN'T FULLY ALIGNED.

If critical safety information is not shared reliably between shifts causing, for example, the night shift to respond to different priorities than identified by the day shift, there's a risk. Say a shift handover is at 6 pm and important facts like the Safety-System is partly disabled, there's maintenance work in execution, or changes done on the DCS, are not highlighted for the night shift, these are serious disconnects for the night ahead.

When handovers are missing defined standards and operation disciplines, accidents can happen. Remember the Texas City accident in 2005? After investigation, it was reported that "poor shift handover was a contributor to the explosion." Shift-to-shift communication errors have been implicated in many accidents over the years, mainly due to a lack of defined methods for handovers and/or the disciplines necessary to insure transparent execution. Another threat is not having the handover responsibility defined for each role and at each level. If the board operator does not fill out any shift log or handover document, it means the only handover occurs between the shift operators, disconnecting the board operators from the shared information. For example, if the day shift operator hands over to the night shift operator, it will create a more seamless transition.

"When handovers are missing defined standards and operation disciplines, accidents can happen."

In addition, crises increase the difficulty of communication. While COVID was a global crisis, even local issues like a power outage, raw material shortages, or extreme weather conditions may cause intermittent staffing reductions, excessive workloads, or even shortcuts to manage the supply chain. All of these incidents can be stressors for shift teams and distract from communications reliability between shifts.

Sign #2

ROUTINE COMPLIANCE TASKS OFTEN FALL THROUGH THE CRACKS.

If critical routine tasks like compliant-relevant inspections are not executed according to schedule, it's a problem. Without automated scheduling, it is difficult to visualize the cadence and thus identify any overdue tasks that have not been transferred to the next shift or to identify accountability for responsible teams.

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Another problem of standardization occurs if there are fundamental differences in rounds conducted by field operations or if shifts have different approaches.
This can cause disconnects on what needs to be checked and which risks must be mitigated. If you are EHS responsible, you may have shadowed several operators in the field and have experienced this already.
Effectiveness requires action. It could be that observations are simply forgotten on the long march from the field to the control room. This means important information doesn't lead to critical follow up action for the next shift. This may be of special concern if an observation is made on a Friday night and not transmitted to the weekend shift teams who then are unaware of potential issues to monitor over a two-day period.

Or another slip, after recording the observations, they are lost in paper piles, and thus not communicated properly or even escalated. But it is also a risk if the observations don't get the attention on the senior team arriving on Monday morning, because the escalation paths are not automated and not digitized.

Sign #3

MONTHLY PRODUCTION TARGETS KEEP GETTING MISSED.

If the plant is not running on speed. If mitigations are not aligned across shift teams. If production targets are not known, can't be explained by front line people, or if you're getting conflicting answers, it's clear that performance is not transparent to all people.

"Production accounting is too complicated... which leads to missing accountability among the shift teams."

The main problem would seem to be that production accounting is too complicated to be understood by everyone and that actual production numbers are not transparent, which leads to missing accountability among the shift teams. If the teams don't account for losses and are not involved in the accounting process, the observations from the line are not recorded. This means that the process engineers and scientists miss an important contributor – the operator and shift supervisor. Your frontline people are 24/7 in the process plant. As the eyes and the ears for process engineers and scientists, if they are not trained on performance accounting and CI initiatives, knowledge is lost. If communication between engineers and shifts as well as among shifts is interrupted and mitigations are not executed correctly, or not with the same level of effectiveness, frontline feedback does not reach the engineers and scientists, especially after a weekend or in the case of a plant disruption.

A lack of centralized data is an issue. Handovers maybe happening between shift supervisors but if they are not transmitted to various roles on each level of the production process there's no transparency across the enterprise. There is no single source of truth.

Sign #4

IT TAKES TOO MANY SHIFTS TO SOLVE PROCESS UPSETS.

Process upsets are endemic to plant operations within the chemical industry, in spite of all the latest AI technologies meant to keep operations stable and predictable. An upset can have several forms. One example is a minor, slow burn upset - such as an incremental temperature increase over time - which can lead to out-of-spec product. A major upset, such as an out-of-control reaction, can compromise the health and safety of the entire plant. If not quickly and decisively addressed upsets, whether major or minor, can consume the time of plant management and operations, and negatively affect production schedules.

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Since a chemical plant has a high latency, mistakes and inconsistencies in the operation can only be corrected with a significant time delay.

Often the problem is that there are no reliable communication processes in place that allow communications about the unplanned mitigations and priorities. For those who have been off-site, say for a long weekend, catch up is difficult. They have to generate a mental model of the production situation in the shortest possible time in order to make optimal decisions – ideally in the 15 minutes handover conversation. They miss a single source of truth where updates can happen quickly and efficiently, and they can consume latest instructions from senior team members and respond with their acknowledgement and add comments during the upcoming shift. A standardized communication process is key to cover for non-standard situations, process upsets, or crisis management.

Sign #5

THERE IS A CONSTANT DISTRUST BETWEEN DEPARTMENTS AND TEAMS.

If neither individuals nor teams are taking the responsibility for problems and there's finger-pointing and dissention, organizations cannot react quickly on unplanned issues, particularly when senior management is not available. Distrust makes it difficult to find root causes of complex problems.

When there are communication silos between departments like operations, maintenance, or quality control, production is compromised and safety is at risk. Say you're a production manager and are concerned about avoidable losses due to maintenance issues, or the lab doesn't understand the importance of a particular sample, you probably realize that friction is caused by lack of communication.

"Distrust makes it difficult to find root causes of complex problems."

Low morale is often triggered by miscommunication or simply a lack of information sharing between departments and/or between shifts. Even communication conducted face-to-face in a 9 to 5 scenario can be challenging but it becomes more difficult when people don't see each other as working in shift patterns to operate smoothly 24/7. We learned the importance of face-to-face contact when the pandemic put constraints on this human interaction with social distancing and off-site working requirements. The convenience of randomly popping into a control room, for instance, was off-limits. But these constraints can also be true during a local crisis when senior management is distracted with other tasks and conversations are skipped or shortened. And when people aren't visible such as working night shifts, individual contributions may not be as easily recognized or appreciated. If accountability is missing, because people feel they are not being heard or seen by senior management teams, the aspiration to contributes to team efforts is deflated.

ROOT CAUSES OF POOR PLANT PERFORMANCE.

Communication is not as easy as it sounds.

Communication is critical to manufacturing. But it is not always easy, even in normal times, and it becomes far more difficult in a crisis. „Face-to-face communication is always best and we rely on informal, chance encounters more than we may realize," according to Andy Brazier, a risk consultant specializing in human factors and process safety. Being in the same room as someone you are communicating with is always the best option because it gives us the opportunity to use lots of different mechanisms to make sure the correct messages are understood. Discussion creates a give and take dynamic where messages can be delivered until the meaning is clear for all.
Of course, this can happen via radio or telephone but certainly not with an email or written report.

Face-to-face gives us a number of other mechanisms to enhance communications. We can point to a report, show a physical item like a damaged piece of equipment or a chemical sample. Being able to experience multiple sources of information at the same time can be valuable in demonstrating the scale or complexity of an issue. Non-verbal communication is also important in face-to-face encounters. You'll know when someone is alert, interested, confused, or worried. These factors all make a difference to the way someone understands what they are being told and ensures messages are conveyed and understood.

HOW DO WE COPE?

Communication errors have been implicated in many accidents over the years, reinforcing the notion that communication can be a complex and error prone activity. But we actually cope most of the time. There are usually lots of opportunities to notice and correct our errors. Also, protection is often in place that means even if an error is not discovered it does not result in an accident. For example, if you start a task based on information received from a colleague you may double check the information at the work-site. If something is not as expected, you may rethink the information or return to the colleague for further clarity. Or you may perform the task incorrectly due to your misunderstanding. This may trigger a safety system which avoids an accident. Production might be interrupted, but at least no one is hurt. The multiple opportunities to recover errors like this are sometimes known as 'layers of protection.' Each layer reduces the likelihood that the error will result in an accident. However, none of these layers are perfect and so every now and then, no matter how many layers there are, an accident will occur. This explains why accidents do occur only infrequently, even though communication errors are happening all of the time.

Short cuts in times of crisis.

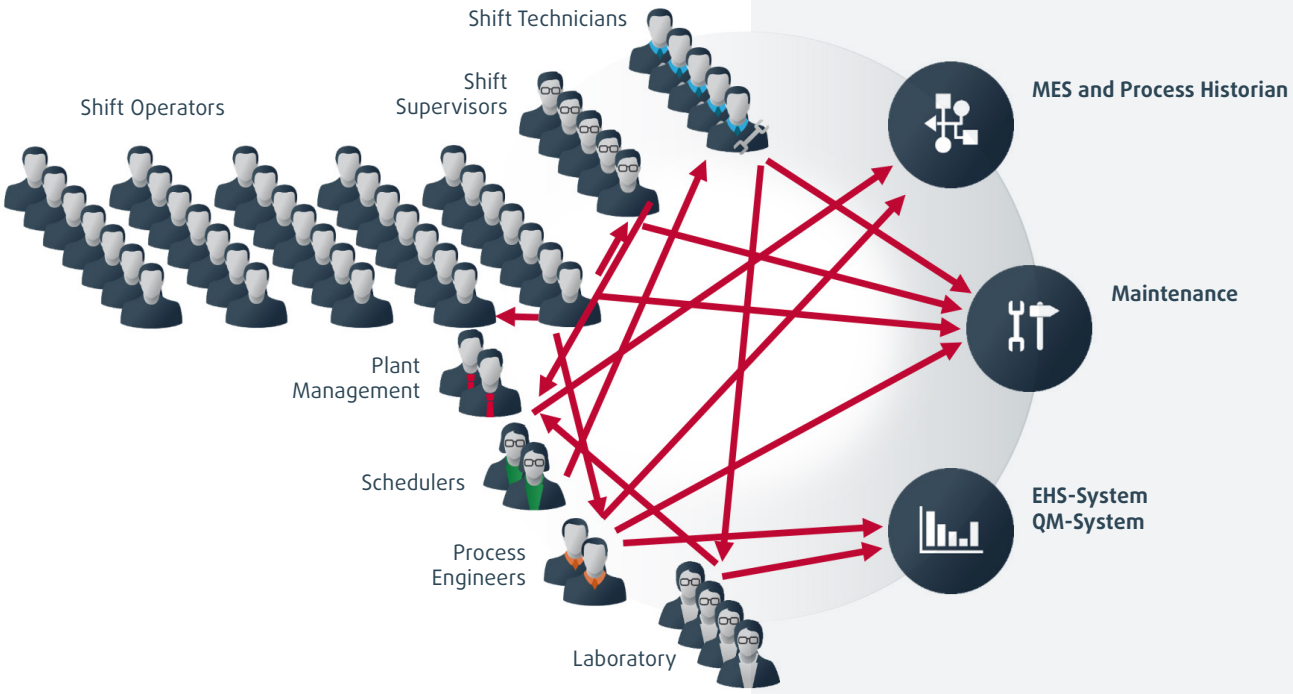
All systems need to be maintained. Communication is critical in making sure maintenance is carried out effectively. Operations must notify maintenance teams about work that needs to be done. Better quality information allows maintenance to be properly planned and implemented. Maintenance personnel need to keep the operations teams informed about what they are doing on site, the impact it may have on operations, the status of equipment, and when the equipment is likely to be returned to service. This communication normally takes place face-to-face at the worksite. While maintenance may appear to be an activity that can be postponed or even cancelled in a crisis if the process is still operating, it can be counterproductive in the long run. If maintenance is omitted in, for instance a crisis, the unavailability of equipment can make operations more complex. This may be possible to manage in normal situations, but when under pressure, serious problems can result with processes operating under more challenging conditions and personnel under greater pressure. According to Andy Brazier, „If safety and other back-up systems are not being maintained, they may fail when needed most, leading to greater consequences."

Not everyone is on the same page.

There is a lot of communication between all the departments and shift teams in a manufacturing plant. For example, the process engineer pops into the control room to have a quick chat with the board operator about the actual happening trial run. Those observations are relevant for allshift teams, even for persons who are at the moment at home and will relief the shift on duty in 12 hours.

The difficulty in reaching the whole crew of 50 people is significant. It could easily be that somebody is missing relevant information before executing a critical activity, thus making a wrong decision.

Typical communication challenge on just one single day, because a chemical plant requires many shifts and departments to be aligned.



Complexity of 24/7 shift operation, many handovers and scattered information.

Chemical and pharmaceutical production plants must operate 24/7 independent of single persons. All information needs to be organized for those in place or to cover for those people out ill, on vacation, or otherwise not available.
Recognizing the volumes of scattered documents in the diagram, it is difficult to have all information at hand in a just a 15-minute handover. Considering there are 2 handovers each day, these are critical moments in the daily schedule of a manufacturing organization.

Corporate processes such as supported by dedicated applications (CMMS, EHS, LIMS) for each work-process, make many things even more problematic for a shift person to smoothly take over responsibility, causing vital information to „fall through the cracks." Senior personnel such as process engineers or maintenance managers are often not available during nights and weekends (which means during maybe 5 handovers between Friday evening and Monday morning). Shift crew are the eyes and ears in a 24/7 operation. If information like the latest plant status, results of special tasks, or any observations are not communicated to the responsible, safety and productivity is imperiled.

Reporting requirements leads to duplication of data.

Reporting demands of corporations and management can be overwhelming particularly in a paper-based environment. Even with applications like word processing of spreadsheets, they don't support adequate workflows. Therefore, it is almost impossible to escalate one relevant item as part of a full-page report, paper, or word file without copying this item.

Data duplicated in different systems can't kept updated, which may lead to erroneous decisions that could have serious consequences for the safety of the people and productivity of your plant. Even if information is shared via email and can't be pulled back, it could pop-up as an outdated instruction to someone who came back from vacation and doesn't recognize that the information is obsolete.
Think about a driving parameter which is communicated with a unique instruction. If that specific information is not shared from one shift to another, it could create a financial loss and even cause fatal consequences for life and environment that not only impacts the plant and its people, but also the reputation of the company.
Inconsistencies in reports and documents are also subject to verification by auditors for regulatory authorities. Those inconsistencies can lead to significant deviations, which are time-consuming and reduce trust of the auditors in the manufacturing organization and it may become a threat to the operating license.

Information is lost in single files, paper stacks or scattered applications. Those data are not usable for people, not actionable for the next shift and also not usable for other applications such as artificial intelligence.

HOW A PLANT PROCESS MANAGEMENT (PPM) SYSTEM CAN HELP.

Transparent Documentation brings a single source of truth.

„PPM is about more than managing shift handovers, but these critical transitions are a key focal point for essential human communication to keep the core processes running well. Knowledge management and maintaining the integrity of any knowledge capital are essential when continuous processes are in place. The need to maintain production at its optimal state, holding the 'magic recipe,' should not be impacted by workforce members handing over to one another," 451 Research.

Plant Process Management (PPM) leverages technology from the IT and OT ecosystems to support production activities. One such activity is managing shift operations, which includes the workforce, production assets, and processes in a plant to enable a smooth transfer of operation information, continuously and at key points, such as shift changes. Yet another is production loss accounting, which correlates lost production to their root cause, be it people, process, or production assets. PPM does not require alterations to process but documents them more efficiently through application of the processes, thereby offering a low-risk and high-impact digital investment.

Solutions for Plant Process Management.

Plant Operations	Process Safety/ EHS	Asset Performance	Product Quality
Shift Handover	Work Permit Tracking	Loss Accounting	Process Control Charts
Shift Notes & Logs	Incident Reporting	Emergency Repair Orders	Product Movement/ Tracking
Morning Meeting	Management of Change	OEE / AU Reporting	Out of Spec Reporting Tracking
Night Instructions	Safeguard Tracking	Activity Planning	Special Sample Tracking
Plant Status	Routine Actions & Inspection Mgmt	Continuous Improvement Tracking	Corrective Action & Preventtive Action
Operator Readings			
Training Distribution			

One use case of PPM is shift handover.

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To find out how to future proof your industrial plant and improve team communication, reach out to us below.

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About eschbach and Shiftconnector®

With U.S. operations in Boston and headquartered in Germany, eschbach develops software for plant process management.

Shiftconnector® provides a new level of team communication to ensure safety and improve plant effectiveness. The award-winning solution is trusted worldwide by leading manufacturing companies such as Bayer, DuPont, BASF and Roche.

For more information visit shiftconnector.com.