Communication between control room and field operators in the process industries

We extracted reasons why control room operators contact their counterpart in the field and vice versa. In order to illustrate our findings we created a communication scenario. Additionally, subject's opinions on technical support of this communication are displayed.

Method

Five 90-minute interviews were conducted with control room operators and field operators of a chemical process plant. In preparation for this, a standardized questionnaire including some broad questions on the operator’s work tasks and communication issues was sent to the interviewees two weeks beforehand.

Results

“As a control room operator, my job is to „keep the plant running“ using the panels and interfaces in the control room which is manned day and night.”

Potential for technical support of remote communication

Despite some fear of automation, interviewees generally favoured suggestions of technical assistance:

- portable radio sets inside the helmet (clearer communication, both hands available)
- visual display of parameters out on the field (pressure, level of fluids, etc.), so that the control room operator does not have to be contacted every single time
- scanning device to unambiguously identify pumps (especially in bigger plants)
- color- and sound-coded alarms (in order to prioritize because the same sound and color over a longer period of time will eventually be ignored)

Discussion

It is necessary to consider that the control room of the plant investigated in this study was situated relatively close to the actual plant. Because of this, the course of action was at times agreed upon beforehand in the control room which made remote communication unnecessary. Plants of varying architecture should be investigated in order to allow for general statements.

Whereas some interviewees listed certain actions they undertake without communicating with their counterpart (e.g. sample-taking), others stated that nothing should be executed without communication. We had the impression that these contradictory statements originated from difficulties to access suitable examples. Therefore, interviewers should use suitable interview techniques and have solid knowledge of the plant investigated.

“Nothing should be done without communication, because everything has an impact on the process which could eventually lead to a breakdown of the plant.”

A Communication Scenario

The field operator walks through the plant when suddenly he notices an irregularity such as evaporating steam or a liquid dripping on the floor. He cannot identify the source of the problem right away so he investigates the machines concerned and the surrounding area.

However, certain information such as whether the fill level of a tank is rising or sinking is not available to him. The control room operator has access to such information on his interface but obviously does not see, hear or smell aspects of the plant environment, e.g. a puddle on the ground.

The field operator then calls the control room operator in order to tell him the problem and maybe he even makes assumptions on the root of the problem and suggestions on how to solve it: “Listen, there is water dripping from pipe xyz, maybe this is because of...”. The control room operator is able to check certain parameters and find out whether they have changed over the last few minutes. Thereby, certain errors can be excluded.