

## Production rationalization

### Monitoring machine utilization OEE and downtime

MES PATRIOT can clearly and accurately display machine availability, downtime and utilization data in precise numbers. It calculates and displays selected OEE indicators on-line; work-in-progress status and other data necessary for production rationalization. According to customer requirements it calculates and evaluates selected KPIs that arise during production.

The aim is to obtain accurate and objective data from production. The data are automatically retrieved via the **Data Collection** module for on-line monitoring and identification of downtime of selected machines or technological units and preparation of on-line reports from the obtained information.

In addition to monitoring downtime it is also possible to monitor and record actual production times at individual production sites and compare them with standardized times. A comprehensive overview of downtime and its causes and history is created including filtering and visualisation options. This allows subsequent analysis of the causes of downtime and losses as well as calculating overall OEE efficiency. Production information linked, to the PowerPlan planning module, refines production plan setup, inputting planned downtime and scheduled maintenance, and also serves to support standardization processes. The Production Tracking module also provides online data for management reports.

The screenshot displays the MES PATRIOT interface for machine monitoring. At the top, it shows 'Verze: 1.9.0'. The main section is titled 'Probíhá výroba' (Production in progress) and includes a green box with the production number '270.2506.351'. Key data points include:
 

- Stroj:** Mischer 170
- Výrobek:** TacoSol Circ ZR 1.5-6 l/min TacoFlow3 GenS+KFE3Weg
- Čas na 1 ks:** 58:00 min
- Čas:** 14:56:24
- Poslední odpis:** ---
- Dokončení operace:** 15:26:07
- Směna:** Odpolední
- Pracovník:** P. Kalivoda

 Below this, there are two columns for downtime: 'Plánovaný' (Planned) and 'Neplánovaný' (Unplanned). The 'Plánovaný' column lists: Plánovaná montáž, Plánované odstaveno, Požár na lince, Přestávka, Zahájení po přestávce, and Zahájení výroby. The 'Neplánovaný' column lists: Neplánovaná montáž and Nežadáno. At the bottom, there are navigation buttons: Prostoje, Plán výroby, Přehled výroby, Odesat výrobu, Odhlásit pracovníka, and Odhlásit všechny.

## Fast Reaction System

The FRS brings the ability to respond effectively to errors in production. This significantly reduces the frequency and length of unplanned production interruptions. The FRS uses a sophisticated system to alert responsible personnel to production failures, including escalation of unresolved events. It is an EFFECTIVE HELP for significantly reducing response time to production incidents (e.g., to identify and reduce downtime).

### The operator is able to:

- » Respond efficiently to malfunctions in production equipment
- » identify errors in the supply of the production line
- » identify manufacturing non-conformities and prevent damage by suspending production in a timely manner

### In case a fault occurs the following event data is recorded and evaluated in the context of the production plant:

- » Location of the fault and, if applicable, the type of fault
- » Time of the start of the fault
- » All escalation levels: when and to whom the SMS/Email about the failure was sent
- » Time when the acknowledgement of the responsible employee was recorded (e.g. confirmation SMS)
- » Response time of specialists or arrival at the place of needed solution (identification by ID)
- » Total time to resolve the fault by a specialist (until confirmed by ID)
- » Sum of workplace downtime, daily and weekly

In order to ensure a quick response to a fault by the responsible personnel the "Escalation Manager" functionality automatically passes information to a superior in case of non-compliance with the procedure. The "Escalation Manager" is configurable, allowing time limits to be defined for responses to events at each level of system administration. Behavior parameters are set from a web form and the behaviour scenario can be linear or progressive. The connection to other MES PATRIOT® modules such as the visualization module, maintenance management, downtime monitoring, etc., are the basic commonplace. The outputs from the FRS can be fed into the production plan and into the monitoring of downtime and deviations in production trends. The outputs also include event logs of fault occurrences and their resolution.

