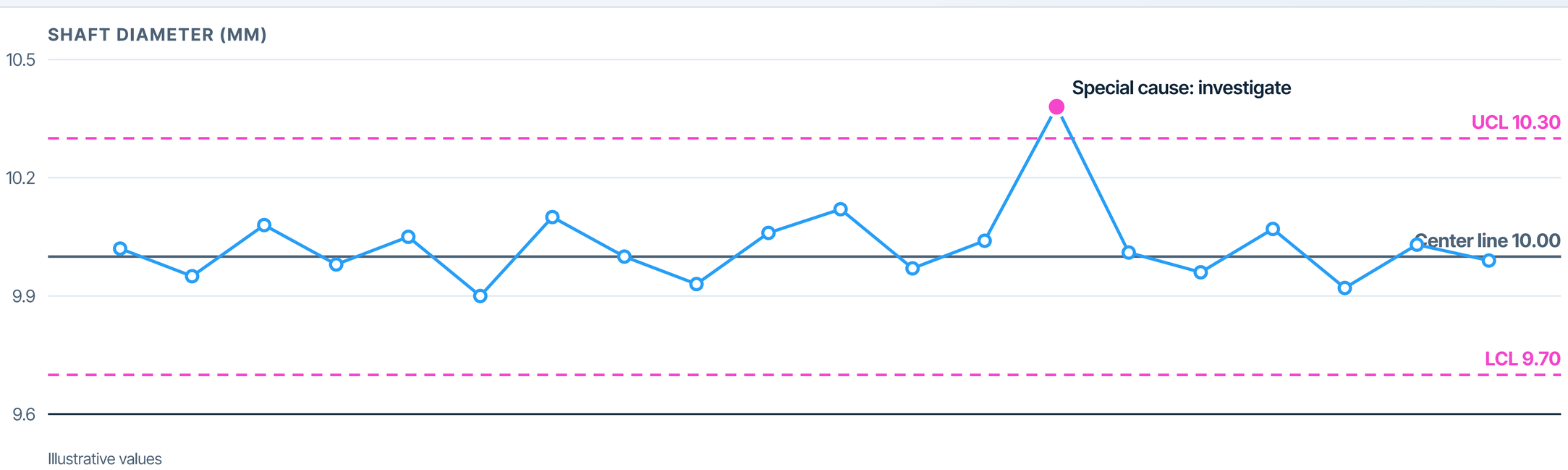
QUALITY MANAGEMENT

SPC and Control Charts

Statistical process control (SPC) uses control charts to separate the normal, common-cause variation of a stable process from special causes that signal something has changed.

01 THE CORE MODEL

CONTROL CHART · COMMON VS SPECIAL CAUSE



Center line

The process average, calculated from stable historical data.

Control limits

About three standard deviations from the center; they describe the process.

Special cause

A point or pattern beyond random variation, with a findable reason.

02 REACTING CORRECTLY

Adjusting for common-cause noise makes a process worse, not better.

TAMPERING — CONTROL

OVER-REACTING

- Adjusting after every single reading
- Confusing control limits with spec limits
- Variation grows through tampering

USING SPC

+ Act only on special-cause signals
+ Reduce common cause by changing the process
+ Judge capability on a stable process

03 WORKED EXAMPLE

SHAFT DIAMETER, NOMINAL 10.00 MM · ILLUSTRATIVE

SIGNAL
Point above UCL
sample 14: 10.38 mm

→

INVESTIGATE
Chipped insert
found at the machine

→

ACTION
Replace insert
and log the event

→

RESULT
Back in control
points within limits

04 MANAGEMENT TAKEAWAYS

01
Plot at the process, in real time

The chart helps only if the operator sees it and reacts at once.

02
Keep limits and specs apart

Control limits describe the process; specs describe the customer need.

03
Use run rules

Trends and runs can signal a change before any point leaves the limits.

05 COMMON MISTAKE

LIMITATION
Recalculating limits every shift

Constantly updated limits absorb real shifts in the process and hide the very signals SPC should show.