

GAS-SAFETY AND COMBUSTION-CONTROL MANUFACTURING

Machine Monitoring in Gas-Safety Component Manufacturing: Case Study

28.5% higher productivity with Novo AI WatchMen. A clearer view of machine activity helps production teams identify waiting, address recurring losses and use existing capacity more effectively.



Gas-control equipment in use. Industry illustration supplied by Novo AI.

118

Machines · build years 1998–2014

15 min

Typical sensor installation per machine

AVA + WatchMen

External sensing and platform

RESULTS AT A GLANCE

+121,068 h

Additional productive capacity¹

Per year across 118 machines

–63,720 h

Less idle time¹

Per year · 45% reduction

+28.5%

Higher productivity

Customer result supplied by Novo AI

THE CHALLENGE

Where was productive time being lost?

Order records showed completion, but not every delay along the way. Waiting for material, tooling or release and repeated short stops made it harder to understand why equipment was not producing.

THE NOVO AI APPROACH

Make losses visible. Give the team a next step.

External AVA sensors and WatchMen reveal machine states over time. With order and shop-floor context, teams can investigate recurring losses, improve preparation and handovers, and review the effect of each change.

ADDITIONAL PRODUCTIVE TIME PER MACHINE AND SHIFT¹

+72.48 min

Shift 1

+82.08 min

Shift 2

+91.68 min

Shift 3

¹ Calculated scenario using the supplied operating model. Annual capacity and idle hours are fleet totals; shift gains are per machine. Calculation basis on page 6.

THE PRODUCTION CHALLENGE

A machine can be available while an order is still waiting

Gas-control valves, pressure-regulation parts and related components depend on both production flow and specified quality checks. Material, tooling, changeovers and release decisions all influence how smoothly work moves through the factory.

Processing time is only part of the story

An order may spend time waiting even when its machining requirement has not changed. **Separating productive work from the gaps around it** gives production management a clearer starting point for improvement.

The questions WatchMen helps answer

Production question	What the timeline adds	Context for the decision
Is the machine producing?	Validated productive, idle and stopped states	The intended operation and its normal behavior
When did time go missing?	Event start, finish, duration and repetition	The affected job and the surrounding process
Why did it stop?	A precise event to investigate	Operator input, maintenance or a recorded reason
Why did the order take longer?	Machine activity over the order period	Planned work, setup and actual order records
Why do shifts differ?	A common basis for comparing machine time	Product mix, schedule and production conditions

Locate the interruption

A machine-state history shows whether a loss is one long gap or many brief interruptions. The pattern determines where the team should look first.

Give the event a cause

A physical signal does not explain a missing part, an approval or a maintenance decision. Production context turns the event into an actionable problem.

Protect the necessary process. Performing a required test is different from waiting for a test station. Improvement focuses on avoidable delay while keeping specified testing and release criteria intact.

IMPLEMENTATION

One monitoring approach for different machine generations

Novo AI's retrofit approach starts with the equipment already in production. External sensors capture physical operating signals; edge processing and WatchMen support a shared machine-state view without requiring PLC access for basic monitoring.



Gas-control equipment.
Industry illustration.

15 min per machine

Typical sensor installation · 118 machines · 1998–2014

Start with the asset and process. Group equipment by its operation and signal behavior.

Use a common time language. Define productive time, idle time, stops and required setup consistently.

Add context where available. Connect machine events with order records, reason labels and shop-floor knowledge.

01

Sense

AVA sensors capture physical behavior, including acoustic and vibration signals.

02

Interpret

Validate the signal patterns against actual machine operation and process pauses.

03

Add context

Review machine states with the order, material, setup and reason information.

From installation to useful daily reviews

Stage

What the team establishes

Scope and installation

Identify equipment, process boundaries, sensor positions and the comparison group.

Signal learning and validation

Check detected states against representative operations, pauses and setup.

Baseline review

Examine repeated idle periods, interruptions and differences under comparable conditions.

Action and follow-up

Assign a response, record the change and compare the same indicators afterwards.

Each process needs its own interpretation. Monitoring of assembly or test equipment starts with separate signal validation and a definition of what productive operation means there.

FINDINGS AND ACTIONS

Turn the timeline into a production response

The supplied case identifies productivity as the outcome and recurring losses as the focus for investigation. The following priorities show how Novo AI's machine visibility supports decisions on the shop floor.

01 Reduce waiting before the next operation

Long idle periods create a clear starting point: is the machine waiting for material, tooling, an order release or the next process?

Response: Review the longest recurring idle periods with their job context. Prepare the next operation earlier and give readiness issues an owner.

02 Make repeated short stops visible

Small interruptions can accumulate across machines and shifts. A recurring pattern deserves attention even when each event appears minor.

Response: Compare events by machine and product. Check feeding, fixtures, material presentation and maintenance conditions, then review the pattern after a change.

03 Improve changeovers and shift readiness

Required setup work and avoidable waiting need different responses. Tools, components and order information should be ready when the process needs them.

Response: Use the timeline alongside setup and order records. Clarify preparation and handover responsibilities, then compare equivalent work across shifts.

04 Link repeated downtime to a consistent response

A detected stop provides a time and duration. Reason labels and maintenance input explain which recurring problems require attention.

Response: Standardize stop reasons, assign escalation responsibility and review repeat events. Keep required checks separate from avoidable waiting.

Keep quality and production flow aligned. Faster completion counts as useful improvement when the required operation, inspection and release criteria are still met.

A REPEATABLE IMPROVEMENT CYCLE

1 Measure

Record machine states.

2 Investigate

Review events and causes.

3 Act

Change the relevant routine.

4 Verify

Compare the same metrics.

RESULTS

More productive capacity within the same annual schedule

+121,068 h

Calculated additional capacity per year¹

The supplied **28.5% productivity gain** is applied to a fixed schedule for **118 machines**. In the model, productive time rises from **424,800 to 545,868 hours per year**.

Where the time is recovered

Annual fleet measure ¹	Before	After	Change
Productive time	424,800 h	545,868 h	+121,068 h
Idle time	141,600 h	77,880 h	-63,720 h -45.0%
Unexpected downtime	56,640 h	35,400 h	-37.5%
Microstop time	28,320 h	17,700 h	-37.5%
Setup time	42,480 h	24,072 h	-43.33%
Other nonproductive time	14,160 h	7,080 h	-50.0%
Total nonproductive time	283,200 h	162,132 h	-121,068 h -42.75%

¹ Annual calculation scenario based on the supplied operating model and the corrected fleet size. The five loss categories sum to total nonproductive time. Basis on page 6.

-63,720 h

Less idle time across the fleet annually

Per machine and shift, idle time falls from 96.0 to 52.8 minutes. That releases 43.2 minutes on average in the model.

-42.75%

Total nonproductive time

The nonproductive share falls from 40.0% to 22.9%, a reduction of 17.1 percentage points (pp).

What the result means for daily production

Lower idle time provides **about 53% of the calculated capacity gain**. Preparation, material readiness and response ownership are therefore priorities. The remaining gain comes from reduced downtime, microstops, setup and other losses.

WatchMen makes losses visible so teams can act. Using released capacity also requires work, material and downstream capacity to be ready.

SHIFT PERFORMANCE AND APPLYING THE FINDINGS

Make improvement repeatable across shifts and machine groups

The three-shift comparison highlights different starting points. Use the machine timeline to investigate readiness and recurring losses, then compare like-for-like work after a change.

Per machine, per 8-hour shift ¹	Shift 1 Before → After	Shift 2 Before → After	Shift 3 Before → After
Productive time	5.12 → 6.33 h	4.80 → 6.17 h	4.48 → 6.01 h
Idle time	76.8 → 43.2 min	96.0 → 52.8 min	115.2 → 62.4 min
Additional productive time	+72.48 min	+82.08 min	+91.68 min
Relative productivity gain	+23.6%	+28.5%	+34.1%

¹ Equal-hours shift scenario from the supplied model. Shift 3 has the largest calculated gain. Compare product mix and operating conditions when investigating the differences.

Bring these inputs to a practical review

Review input	How it helps the team
Comparable machines and products	Separate technically different processes before comparing performance.
Order targets and quality criteria	Distinguish required work and testing from avoidable waiting.
Shift context and event reasons	Connect the timeline to material, setup, maintenance and release decisions.
One recurring loss and an owner	Agree on a response and review the same indicators after the change.

Start with one useful production decision

Review a repeated loss with the people who know the process. Agree on a practical change, record when it happens and check whether the same loss declines. This turns monitoring into a routine for managing production.

CALCULATION BASIS AND KPI INTERPRETATION

Project inputs: 118 machines, build years 1998–2014 and a customer-reported 28.5% productivity increase. **Operating model:** 3 × 8-hour shifts × 250 days = 6,000 scheduled hours per machine, or 708,000 fleet hours. A 60.0% productive baseline × 1.285 gives 77.1% after improvement. The annual gain is 708,000 × 17.1% = **121,068 hours**.

Annual hours, individual loss reductions and shifts are illustrative model outputs, assuming unchanged processing rate, product mix and quality, and productive use of released time. The loss allocation is one scenario consistent with the overall gain. **OEE combines availability, performance and quality; it is separate from productive-time share.** Capacity and reduced losses represent the same released time.

See where your existing machines lose productive time.

Discuss a suitable machine group and WatchMen pilot with Novo AI.
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