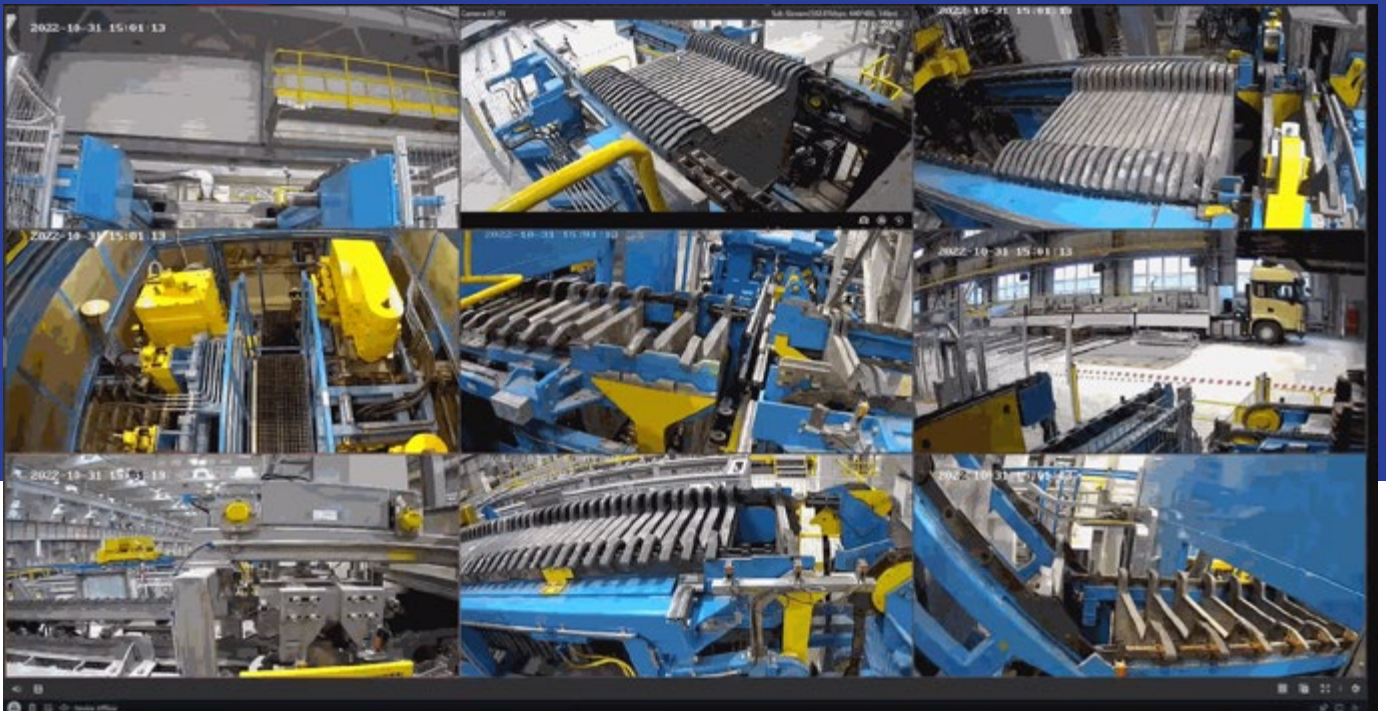
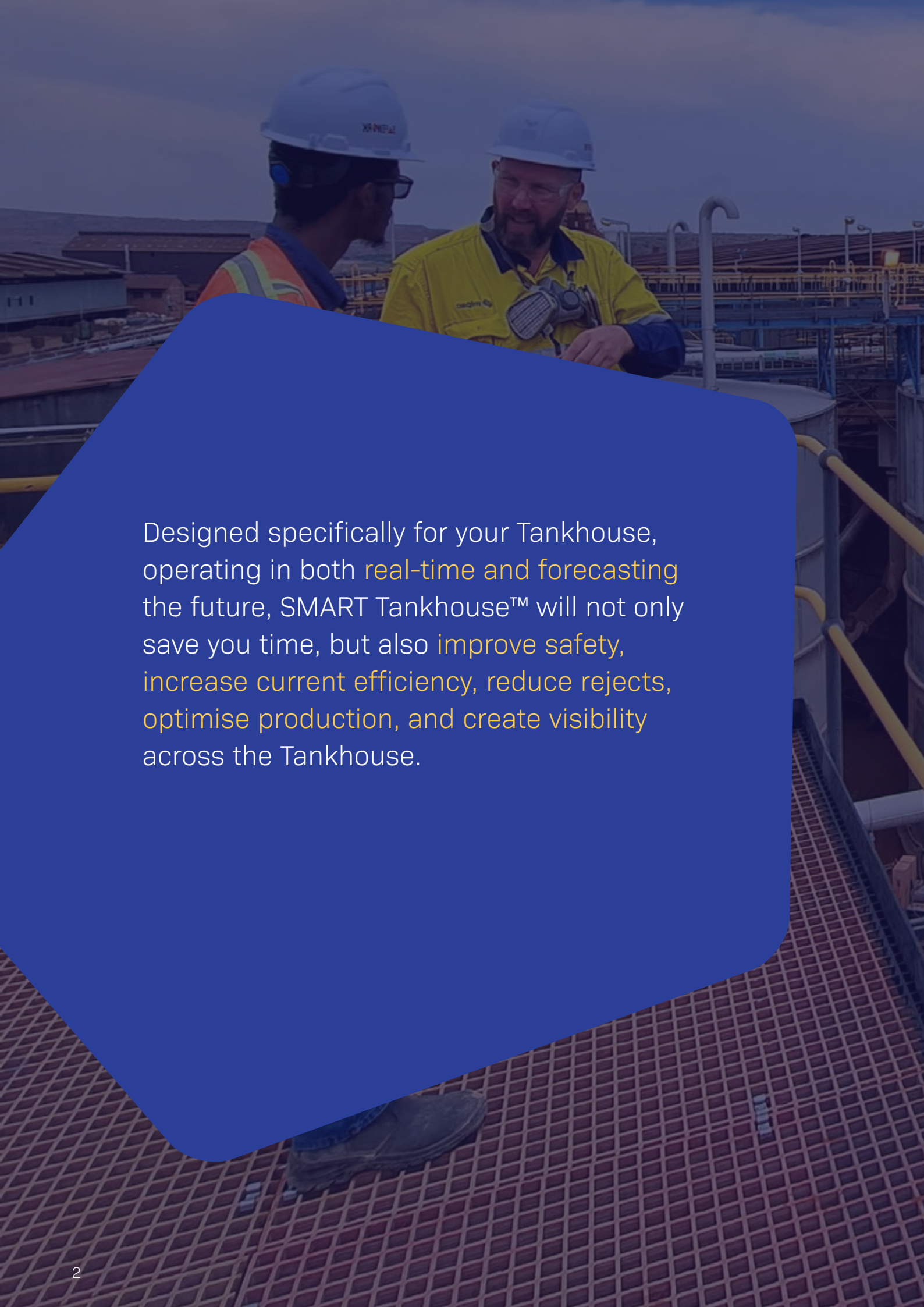


SMART Tankhouse™

A customised web-based platform that provides production planning and an operational suite of tools for complete oversight and visibility of your Tankhouse.





Designed specifically for your Tankhouse, operating in both **real-time and forecasting** the future, SMART Tankhouse™ will not only save you time, but also **improve safety, increase current efficiency, reduce rejects, optimise production, and create visibility** across the Tankhouse.

Contents

- About SMART Tankhouse™ 5
- Module 1 - Production Scheduling 6
- Module 2 - Inventory Management. 9
- Module 3 - Cathode Plate Tracking.10
- Module 4 - Crane Scheduling13
- Module 5 - Short Detection14
- Module 6 - Electrolyte Correction17
- Module 7 - Task Management.18
- Why Mipac20



About SMART Tankhouse™

SMART Tankhouse™ connects multiple systems and allows for a common interface of your plant. The plant dashboard represents a live view of your plant together with calculated metrics based on your needs.

SMART Tankhouse™ integrates closely with the AVEVA PI System suite, the leading data historian in the world. Key features of the PI system are high speed archiving and retrieval of data, efficient use of storage and provision of a range of user tools.

Built as a modular system, the SMART Tankhouse™ provides you with the flexibility to customise and grow the platform at your pace. It also allows plant engineers the ability to further customise or leverage current infrastructure by integrating with multiple systems and platforms.



Module 1

Production Scheduling

The Production Scheduling module creates the production plan for the cathode harvesting cycle of the Tankhouse. It can be scheduled as far into the future as desired.

Typically, the production plan will provide information by day as to which sections are being stripped, stripped and scrapped, and re-loaded. Once published, the plan presents a web scheduler which is accessible to operators and supervisors simultaneously and is accessible on any device with sufficient network access and the capability to run a Google Chrome browser (printable daily or monthly versions are also available).

The scheduler has the following customisable options:

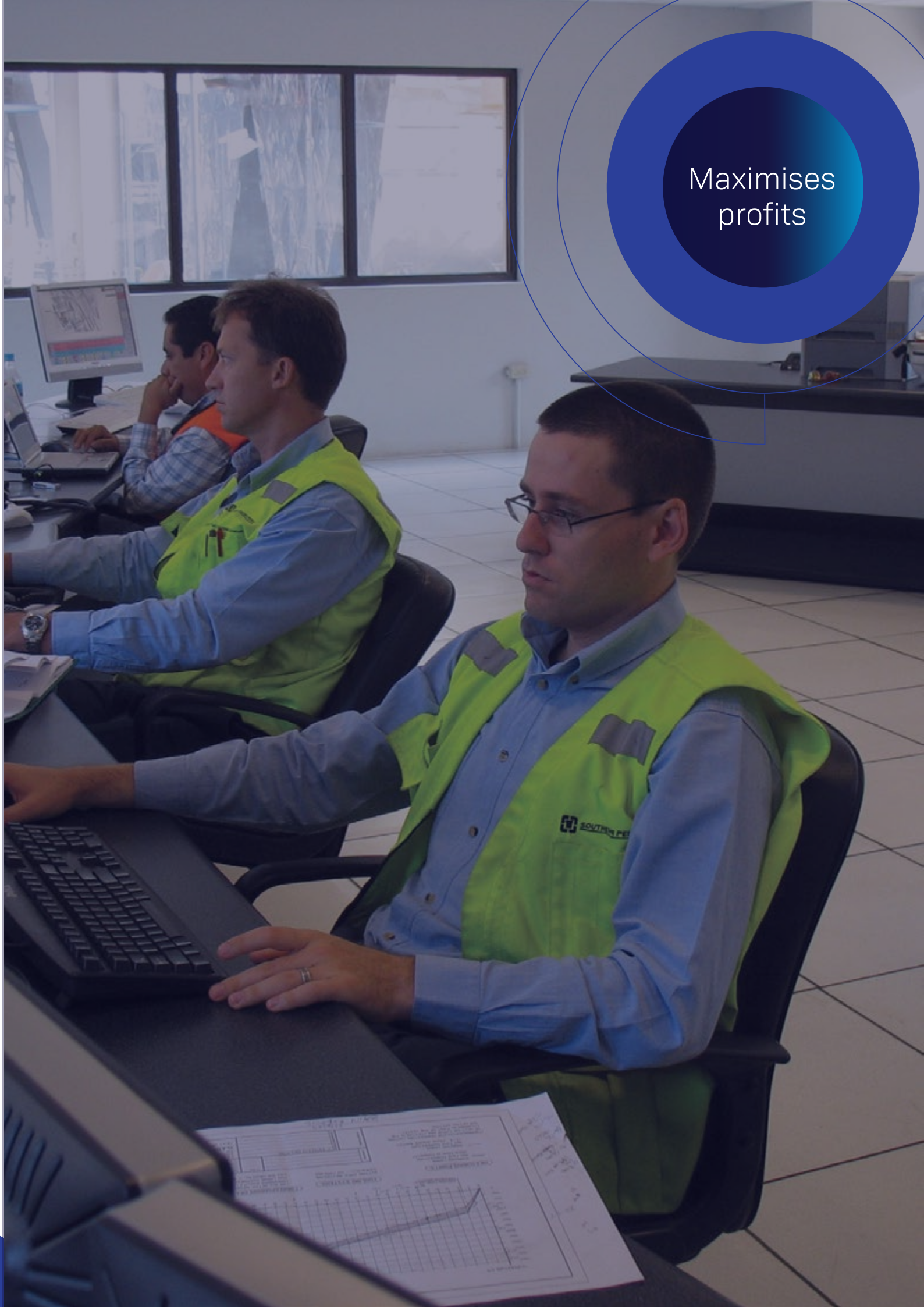
- ✓ Capturing production data (automated or via manual entry)
- ✓ Tracking anodes in sections (automated or via manual entry)
- ✓ Tracking crane progress against plan
- ✓ Section/cell availability
- ✓ Anode/cathode inventories (automated or via manual entry)

The Production Scheduling module has the capacity to link to existing databases (customisation as required) to make use of existing information.

Furthermore, the Production Scheduler can be used for budgeting, forecasting, or 'what if' analysis by creating alternate production plans. These do not interfere with the current published plan and can be run separately while incorporating available historical data.



Maximises profits





Optimises
stock

Module 2

Inventory Management

Anode and cathode count and location of counts can be tracked inside the plant with the Inventory Management module.

Inventories can be tracked upon receipt of anodes to shipment of cathode. Where available, data is tracked automatically, but manual entry screens are also available. Laboratory data (where available) can also be associated with anode/cathode data.

Inventory levels and associated production, consumption, and transfers can be tracked for:

- √ Anodes
- √ Reject Anodes
- √ Spent Anodes
- √ Cathode (by grade where available)
- √ Reject Cathode

Standard reporting is available which users can access via the web-portal.

Module 3

Cathode Plate Tracking

The cathode plate tracking module tracks performance and movements of cathodes through the Tankhouse. This allows users to identify underperforming plates, or plates which continuously require maintenance to improve the overall Tankhouse operation.

Cathode plate data information is stored historically as part of a custom database within the SMART Tankhouse™ and holds a maximum of 2 years of cathode plate production information. The module utilises barcodes, QR codes or RFID technology to identify and track cathode plates. Readers are placed on the Cathode Stripping Machine and can also be placed in certain locations within the Tankhouse.


The Cathode Plate Tracking module includes:

- ✓ Cathode production by plate
 - ✓ Plate rejection identification
 - ✓ Performance reporting (cathode production)
 - ✓ Plate rejection (auto/manual rejection of cathode plates, note that this capability must be included in the Cathode Stripping Machine PLC application)
 - ✓ Plate maintenance tracking - workshop personnel manually update plate maintenance information via wireless portable readers
- The Production Scheduling module has the capacity to link to existing databases (customisation as required) to make use of existing information.



Reduces rejects
and optimises
production





Increases safety
and optimises
production

Module 4

Crane Scheduling

The Crane Scheduling module enables crane automation. It receives tasks from the SMART Tankhouse™ and creates movement orders for the crane with a specified priority and schedule.

It also includes basic visualisation of the crane scheduling and work order priority definition. In the event SMART Tankhouse™ is not available, it can be used as a backup crane management system.

Module 5

Short Detection

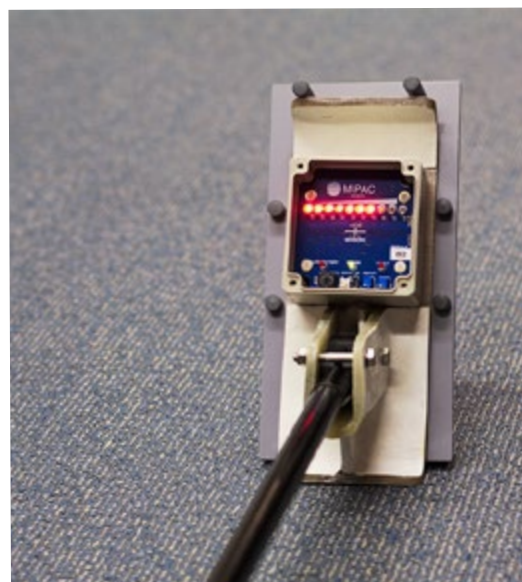
The Short Detection module utilises CellView® to enable cell voltage and temperature monitoring in real-time, detecting short circuits and allowing early intervention for maximum current efficiency.

In combination with CellView®, ShortMeter™ is a hand-held, easy-to-use monitor (Gauss meter) to target the exact location of the short circuit and dead plates.

Cell voltage data is analysed to determine the state of the cell (normal or shorted). The SMART Tankhouse™ platform retrieves this cell state information for reporting purposes and allows users to input data after they have corrected a short.



CellView®



ShortMeter™



Improves safety and maximises current efficiency

10
TON

Maximises
current efficiency



Module 6

Electrolyte Correction

The Electrolyte Correction module utilises Copper Monitor® to provide continuous, online monitoring of metal concentration in electrolytic solutions. Mipac's Copper Monitor® reduces the need for manual chemical analysis during electrorefining.

When integrated with SMART Tankhouse™, the monitor helps improve safety, reduce operational costs, increase productivity and ultimately



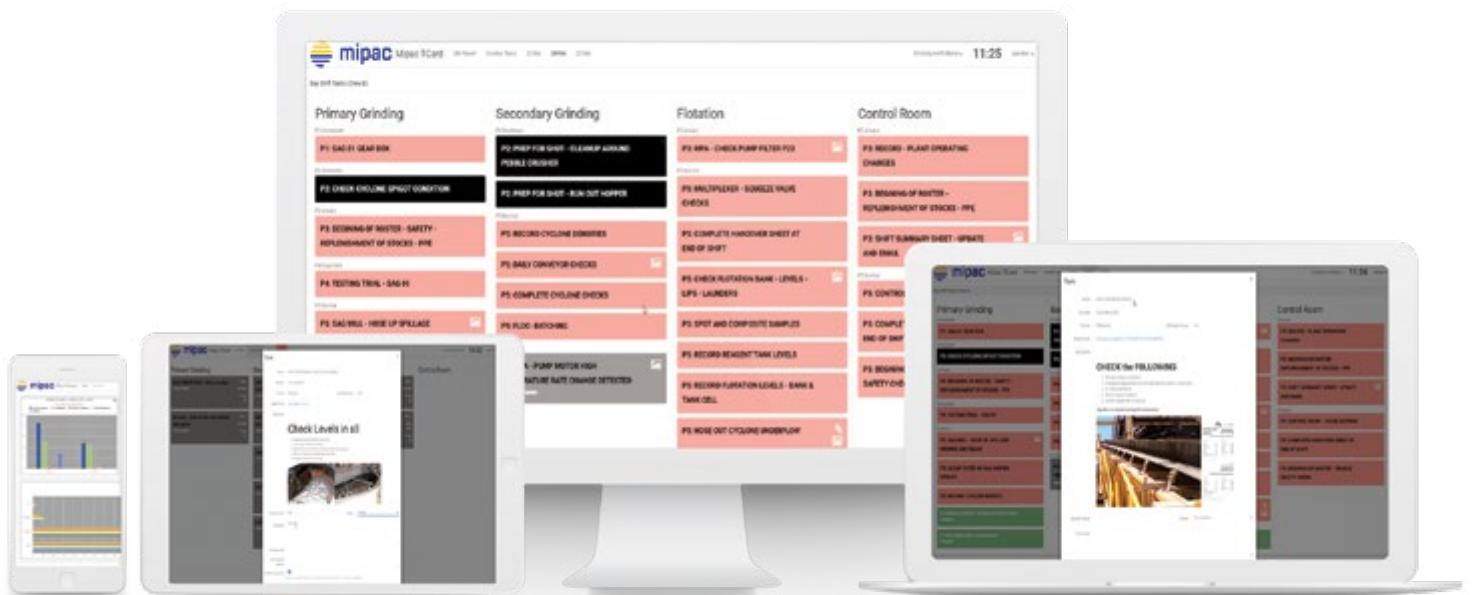
Copper Monitor®

Module 7

Task Management

The Task Management module utilises Mipac's task management system created specifically for 24x7 industrial plant operations.

TCard has been designed to help plan, schedule and manage tasks easily and efficiently, facilitating two-way communication and providing clear visibility of the status of tasks. Our innovative solution provides enhanced communication and engagement, greater transparency and increased operational awareness.



TCard



Enhances employee engagement





Why Mipac

Global leaders in operational technology, control systems and engineering services, Mipac is the perfect partner in driving operational performance.

Our team of trusted advisers includes knowledgeable senior engineers and creative, skilful innovators in technology.

We partner to provide early-stage consultation and continuous optimisation strategies to whole-of operations. From the solid foundations of control systems, software, and engineering, to the latest digital technology advancements, we're committed to pushing boundaries to create innovative, flexible solutions that consistently fulfil our clients' commitment.

We embrace complex challenges and solve problems in the areas of performance, productivity, and safety by enhancing existing infrastructure systems and technology and providing reporting and decision-making solutions.

We do this by drawing on our extensive on-site experience and unparalleled knowledge of comparative solutions on the market to bring real value and insights to maximise the potential for success.

Our solutions

We work across various industries to realise the total value of your operation and recommend solutions and services that produce optimal outcomes and increased performance.



Building new operations



Optimising existing operations



Modernising existing operations



Main automation contractor



With more than

420

projects delivered
worldwide

More than

23

years in
business

Working in over

50

plus countries
globally

More than

100

clients across
the globe

More than

60

experts
dedicated to
your project

Our services

From solid software and engineering foundations to the latest innovative advancements in digital technology, Mipac are your trusted advisors for all aspects of an operation.

- ✔ Control system and industrial software engineering
- ✔ Operation technology, business intelligence and decision making
- ✔ Specialist consulting
- ✔ Health checks and actionable roadmaps
- ✔ Instrumentation engineering
- ✔ Electrical engineering
- ✔ Procurement
- ✔ Commissioning and support



We believe in working together
with our clients and partners
to achieve their goals.

At Mipac, we go

beyond the solution.

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