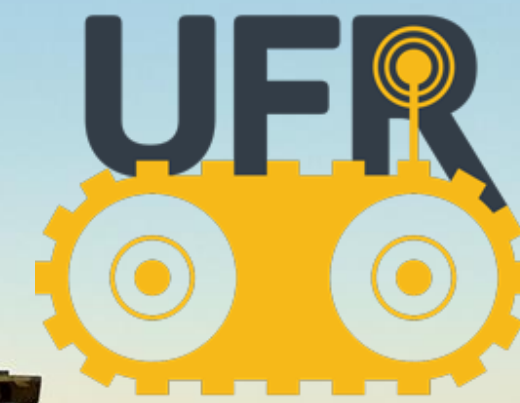




**Universal
Field
Robots**



Automation that Works in the Real World:
From Test Track to Operational Mine

Dush Wimal
Director – UFR

Our number 1 priority

Safety first



Emergency exit



Assembly point



Protective equipment



Emergency number



First aid kit



In case of emergency



Psychological safety



Health and well-being



Cyber security





Introduction

- Dush Wimal
- Director of UFR
- 20 years of Mining Tech



Agenda

- Who we are
- What we do
- Why Agnostic Automation
- Industry Challenges
- Case Study
- Key Success Criteria
- Lessons Learnt
- Questions





MADE IN
AUSTRALIA

UFR is now part of Sandvik, headquartered in Brisbane, Australia.

30

YEARS IN THE
MINING INDUSTRY

Over 9 years of experience in building robots for industrial applications



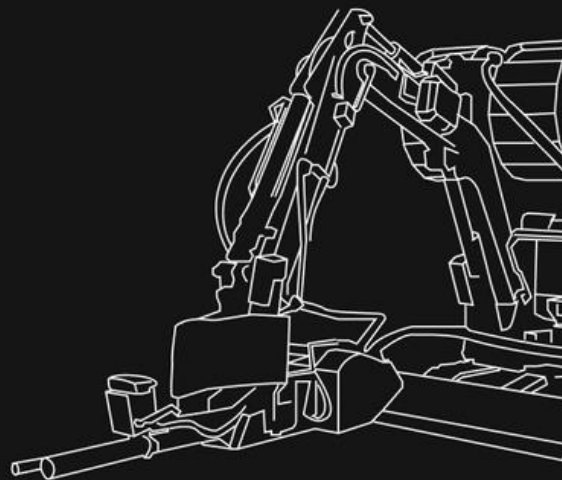
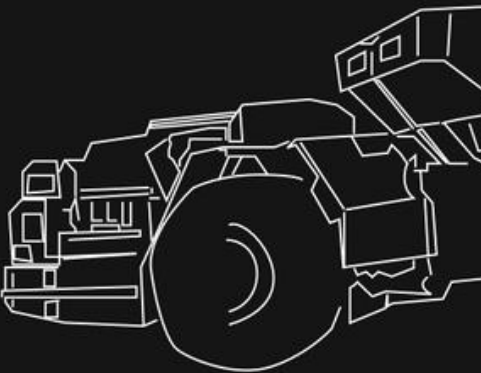
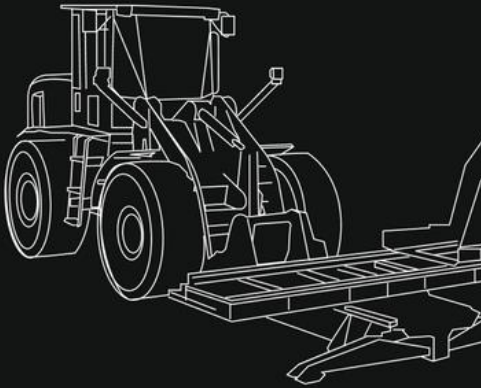
9 YEARS ROBOTICS
EXPERIENCE

More than 30 years of engineering experience in the mining industry



40 EMPLOYEES AND
GROWING

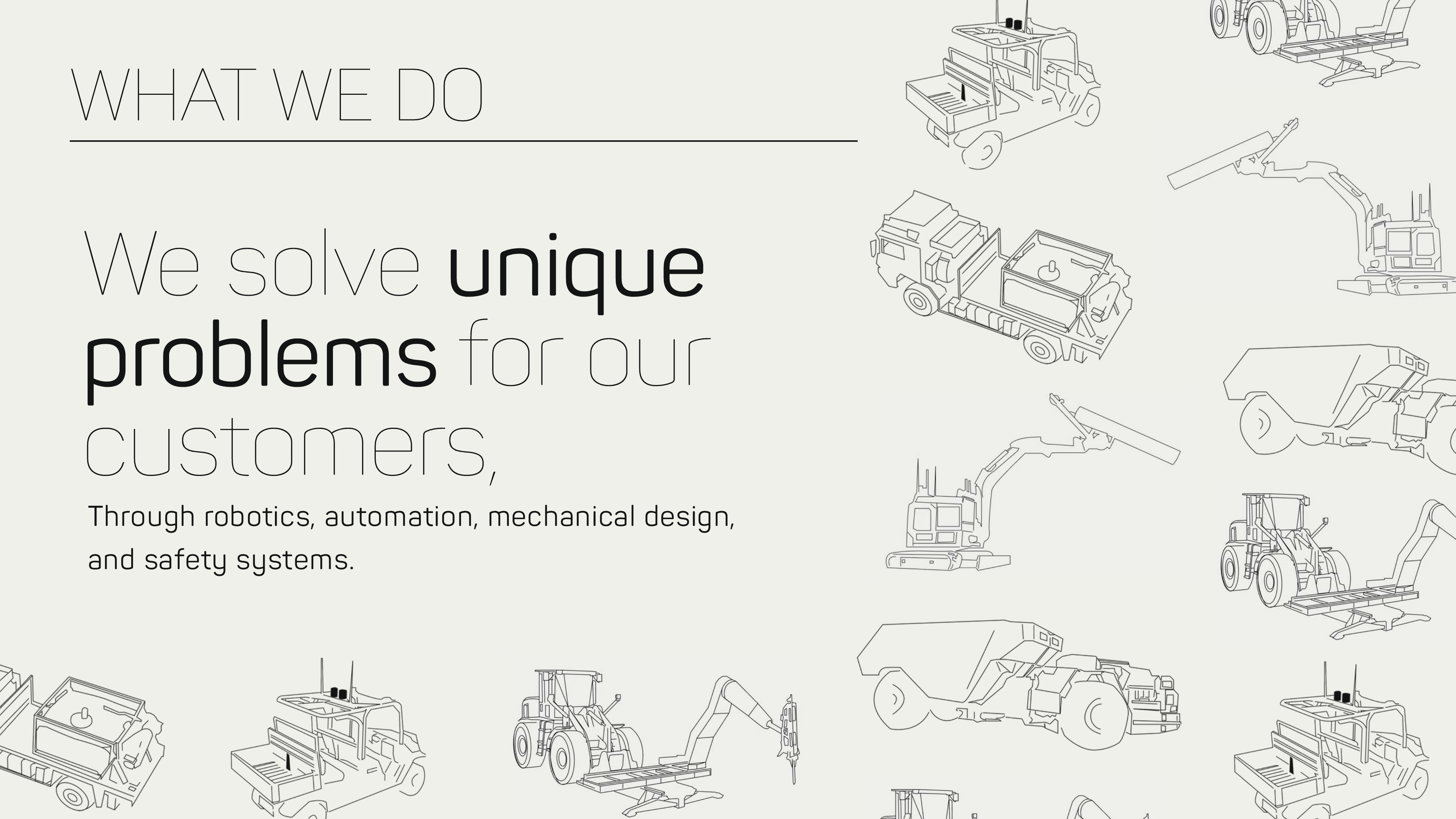
We employ more than 40 highly skilled individuals in a variety of professions



WHAT WE DO

We solve **unique problems** for our customers,

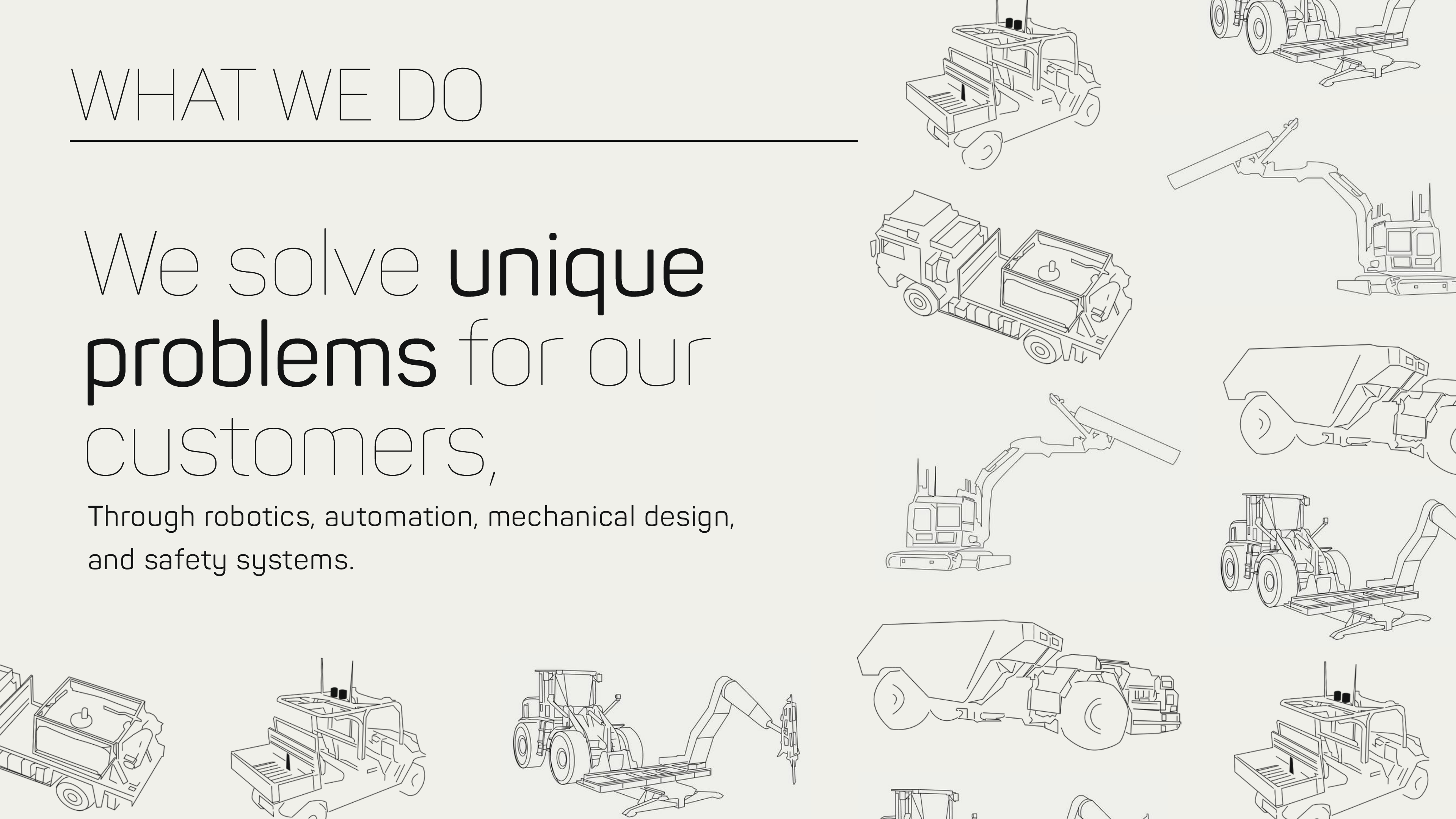
Through robotics, automation, mechanical design, and safety systems.

A collage of line-art illustrations of various industrial vehicles and robotic systems, including forklifts, trucks, and robotic arms, arranged around the central text. The illustrations are in a simple, clean line-art style, showing different types of heavy machinery and automation equipment. Some vehicles are shown from the side, while others are shown from a top-down or front-facing perspective. The background is a light gray, and the text is in a clean, sans-serif font. The overall composition is modern and professional, emphasizing the company's focus on industrial automation and robotics.

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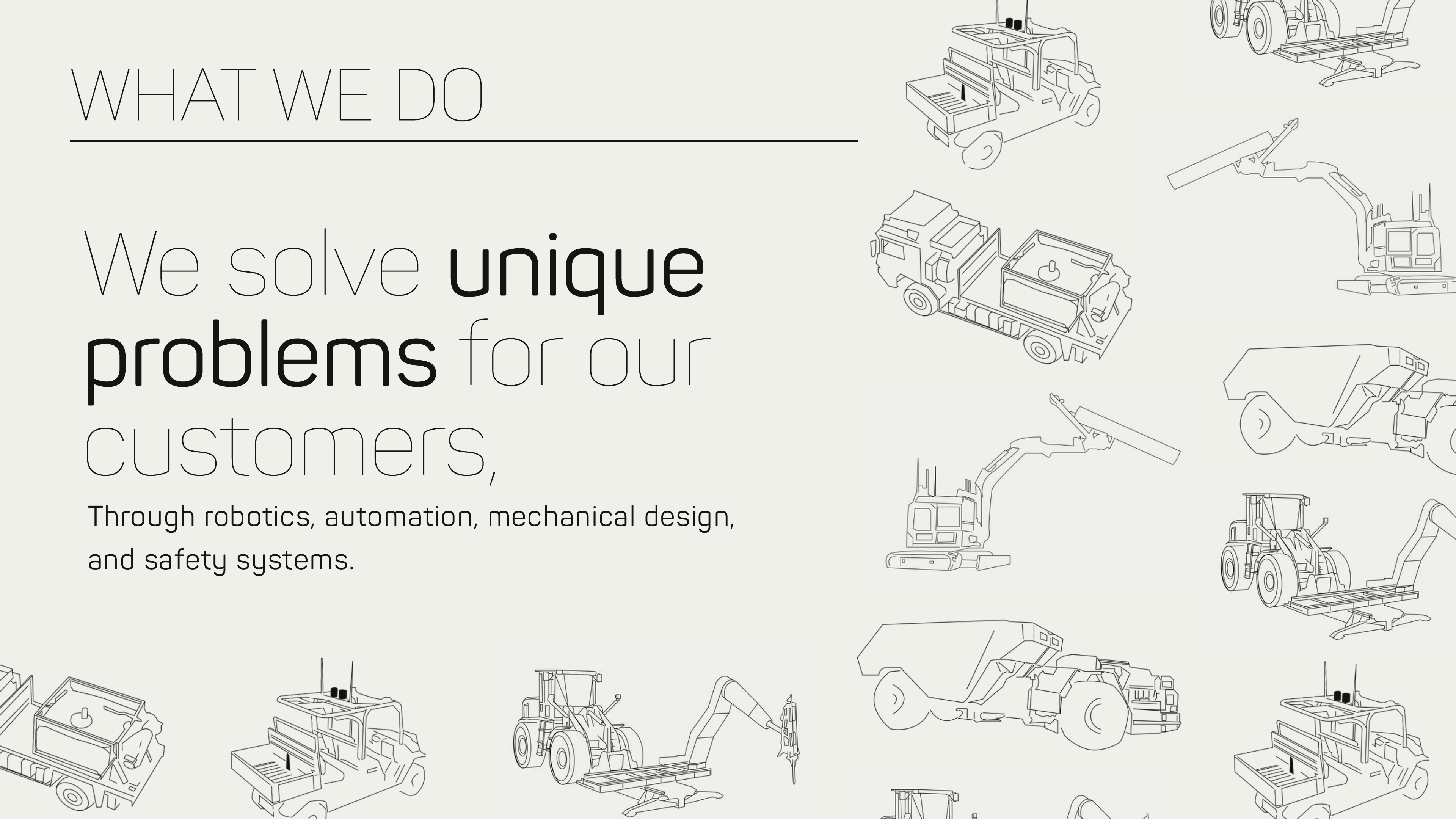
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OEM AGNOSTIC
AUTOMATION

RAPID
DEVELOPMENT

INTEGRATION

PRODUCTS

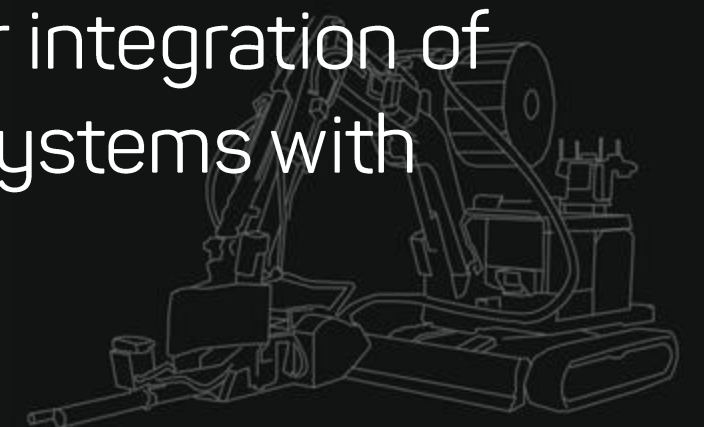
What is **UFR**.

UFR is a leader in OEM-agnostic mining automation.

We enable Zero Entry Mining & mixed fleet automation.

Automation solutions for underground and surface mining operations

And we can work seamlessly with Sandvik solutions, allowing further integration of Sandvik equipment and systems with other OEM's.



"To meet our net zero ambitions, we're going deeper—into hotter, more hazardous ground—in search of the critical minerals that power the energy transition. But depth comes at a cost. How do we scale extraction safely and sustainably?"

The critical role of automation as the enabler.
Agnostic automation and Interoperability can
change the game.

INDUSTRY CHALLENGES



Increase in depth,
heat, radiation and
risk to humans



OEM Agnostic
Automation



Ventilation costs



Interoperability



Haulage
bottlenecks



Sustainability

Setting the Vision for Automation – Gold Fields

- Automation of the existing fleet - Eliminate vendor lock in
- Interoperability – Allows coordination of mixed fleets
- Integration with 3rd party systems - ABB Operations Management System (OMS)
- Operational Readiness
- Change Management
- Dedicated Autonomous Decline
- Enabling **Zero Entry** Mining

Case Study – Gold Fields Granny Smith

Journey to date

- **Truck Fleet** : Epiroc MT66 with 3000 working hours
 - **OMS**: ABB
 - **Loaders**: CAT2900
 - **Loader Automation**: RCT
-
- 1st Truck Tele-remote in 5 weeks
 - Fully Autonomous Truck on customer site 2023
 - First Autonomous Truck commissioned to production early 2024
 - 3 x Trucks operational in 2024 (Shift Change)
 - 6 x Trucks in currently in operation (Shift Change)





**Autonomous Haulage
With MT65**



**USE OF UNPRODUCTIVE
TIME - SHIFT CHANGE**

+5%

**PROVIDES UP TO
5 % INCREASE IN
TONNES HAULED
DURING 14-HOUR
WINDOW**

15%

**UP TO 15% MORE
TRUCK UTILISATION
DAILY**



**TRULY AGNOSTIC AND
INTEROPERABLE**

APPLICATION BENEFITS

Roadmap for Automation Maturity – Granny Smith

Immediate Focus

- Embedding the 6 x Autonomous Trucks

Near – Term

- Expand the fleet to 10+ Trucks
- Expand to tele-remote loader integration
- Traffic Management system – Orchestration

Long – Term

- Fully autonomous decline

Making Automation Work in the Real World

KEY SUCCESS FACTORS



**INNOVATIVE
CULTURE**



**DEDICATED
PROJECT
MANAGER**



**MANAGEMENT
BUY-IN**



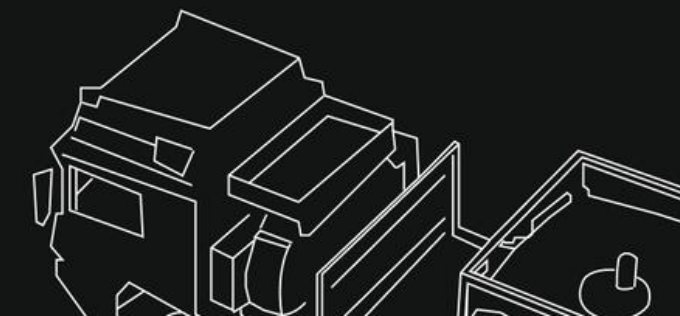
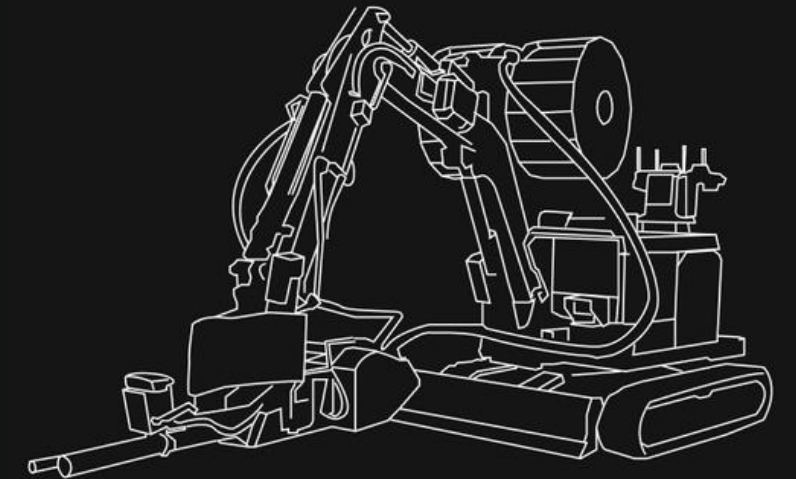
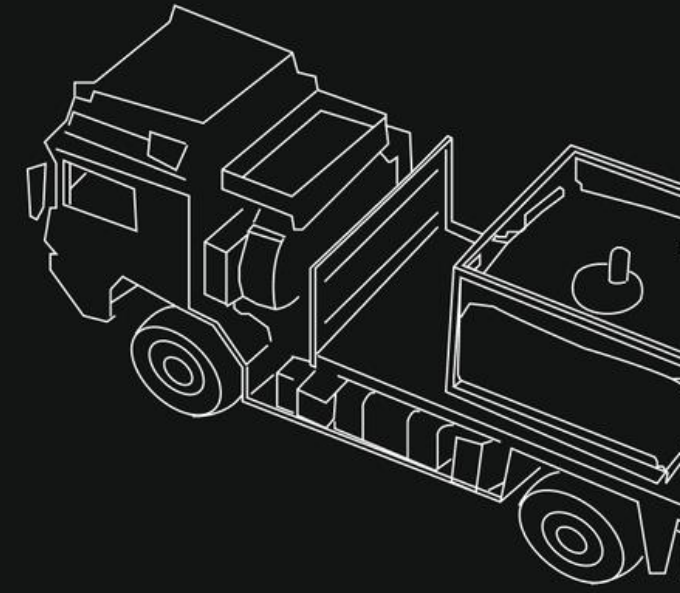
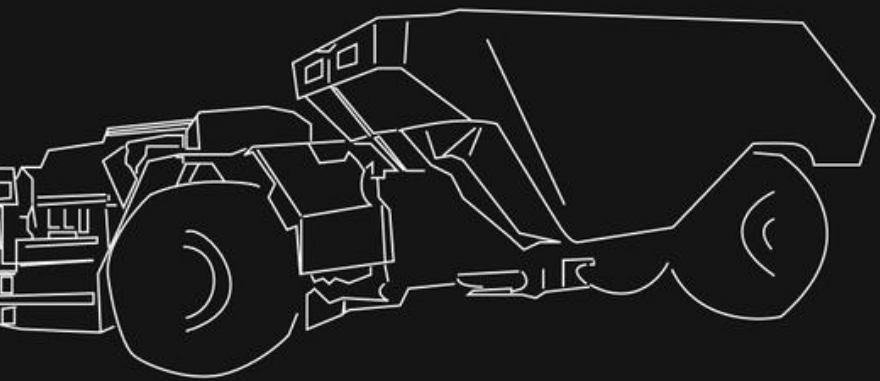
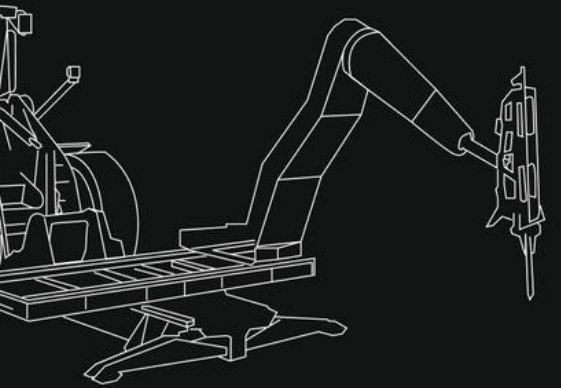
**AGILITY AND
FLEXIBILITY**



**COLLABORATION
WITH THE
SITE TEAM**

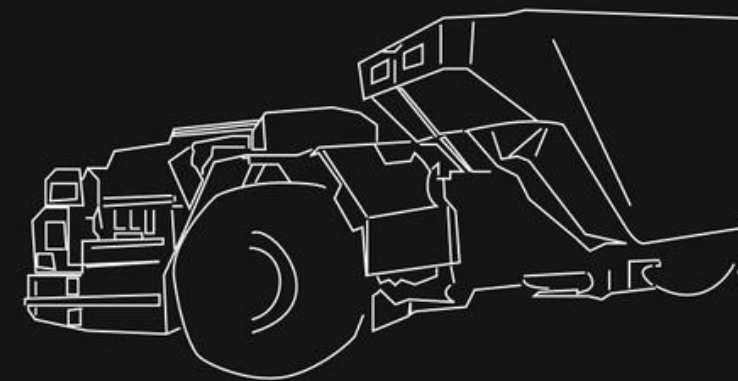
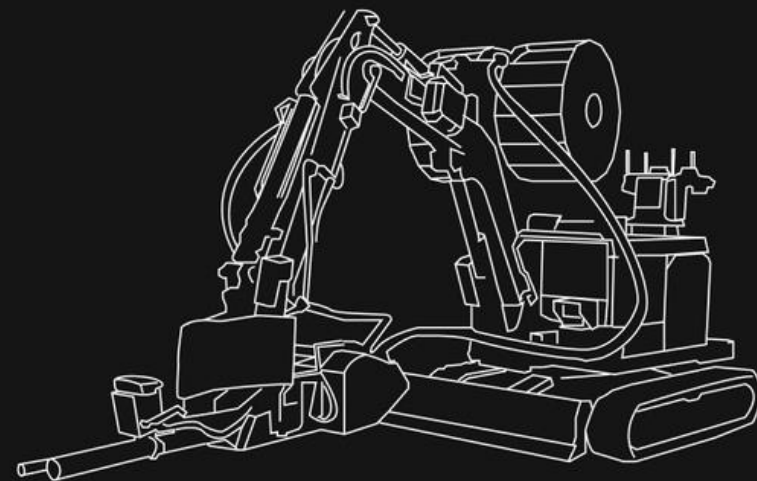
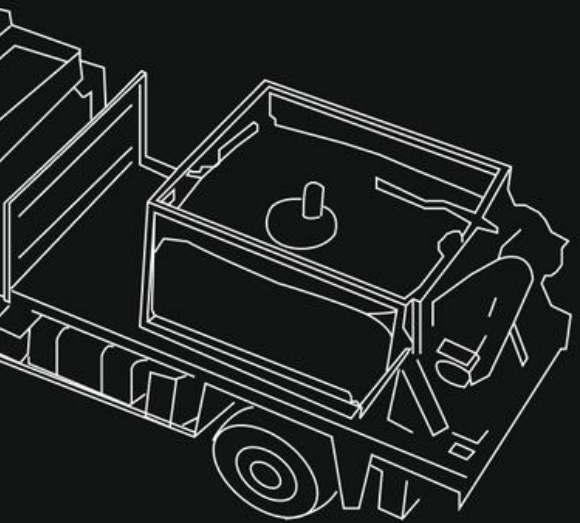
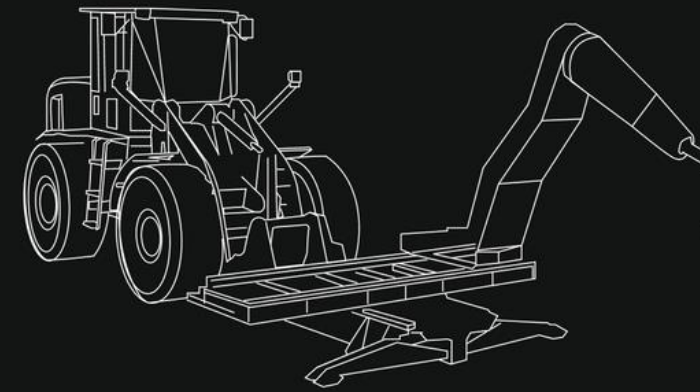
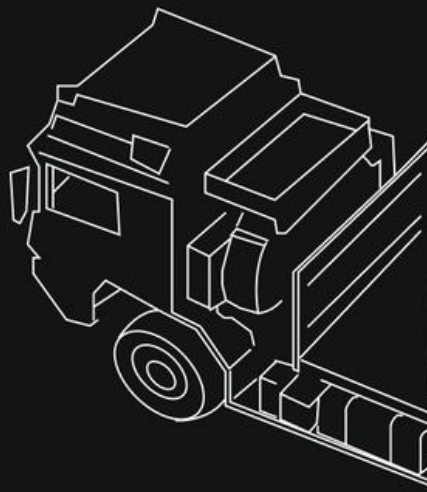


**OPERATIONAL
READINESS**



Lessons Learned

- People and process are just as critical as hardware and software
- Plan for the last mile of integration and commissioning



SUSTAINABILITY IMPACT



**ELIMINATE HUMAN
PRESENCE IN HIGH-RISK
UNDERGROUND ZONES**



**EXTENDS THE LIFE
OF THE EXISTING FLEET**



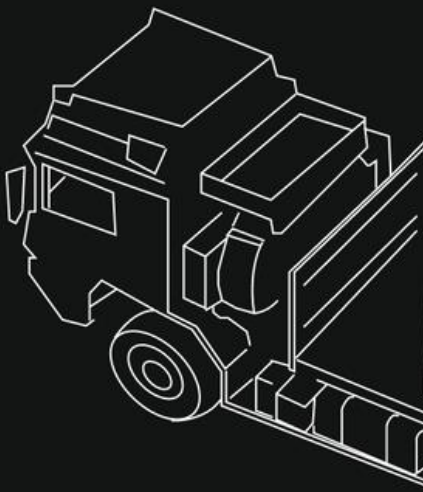
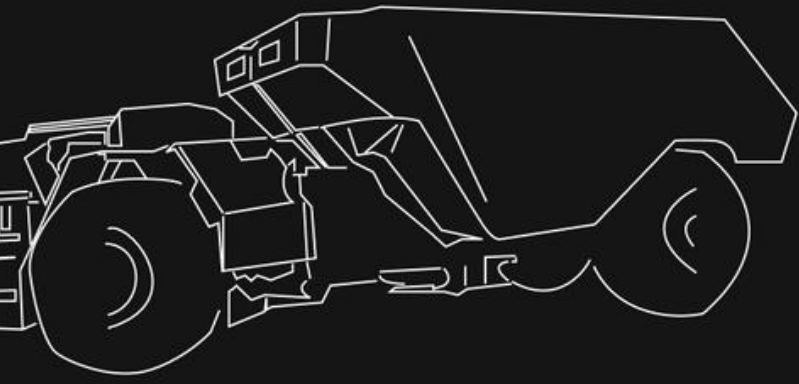
**REDUCTION IN
VENTILATION
COSTS**



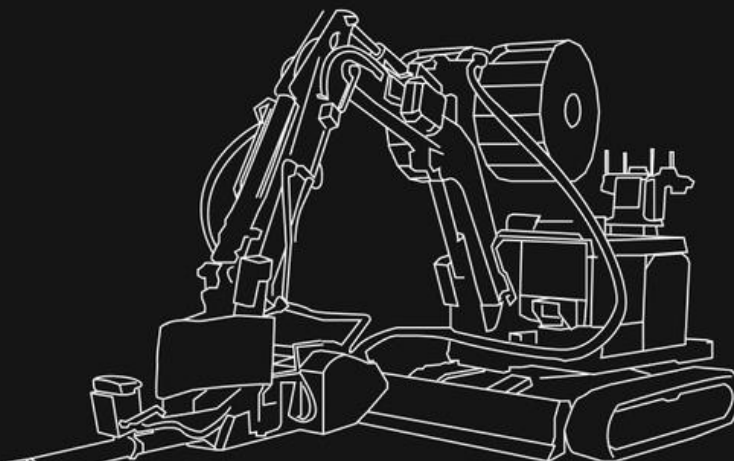
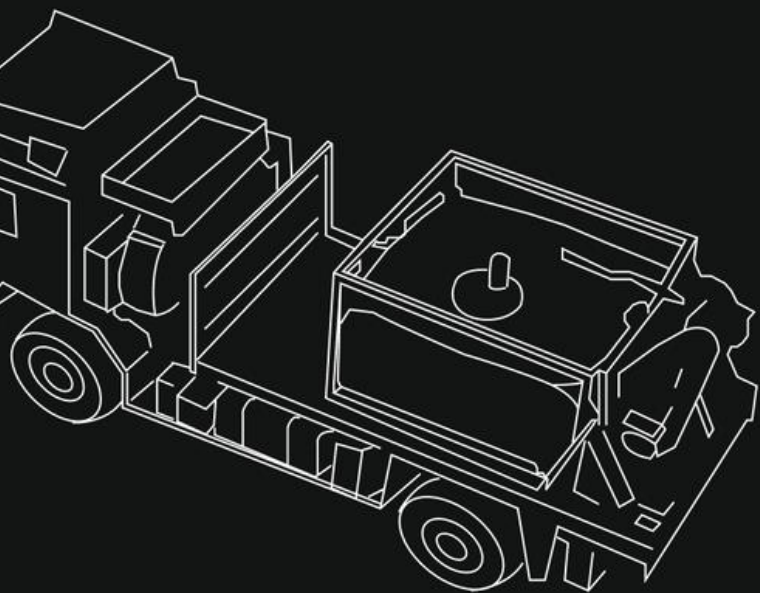
**QUANTIFIABLE
BENEFITS:
REDUCED EMISSIONS,
DOWNTIME, AND MANUAL
LABOUR**



**PATHWAY TO
NET ZERO**

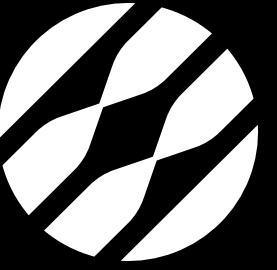


If we're serious about sustainable mining, we need to go beyond pilots—and build the systems underground that can carry us there. The autonomous decline is not just a concept. It's running ore to the surface right now.



Thank you!

Questions?



Dush Wimal

Direct – Universal Field Robots

Email: dush.Wimal@sandvik.com

SANDVIK