



# People, Process and Technology

*Driving Workforce Optimization*

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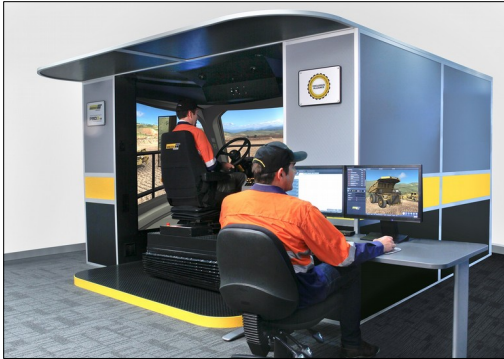
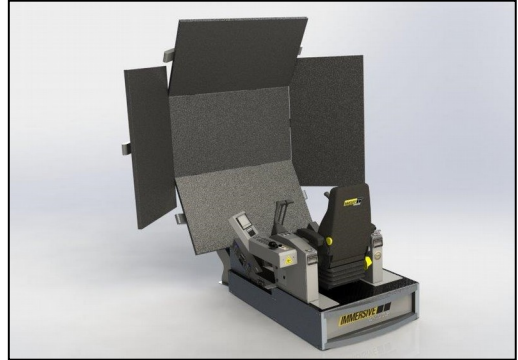


OUR MISSION IS TO MAKE RESOURCE COMPANIES MEASURABLY SAFER AND MORE PROFITABLE



# Simulation Platforms

TECHNOLOGY EXPLAINED



# Conversion Kits® - Simulator Modules

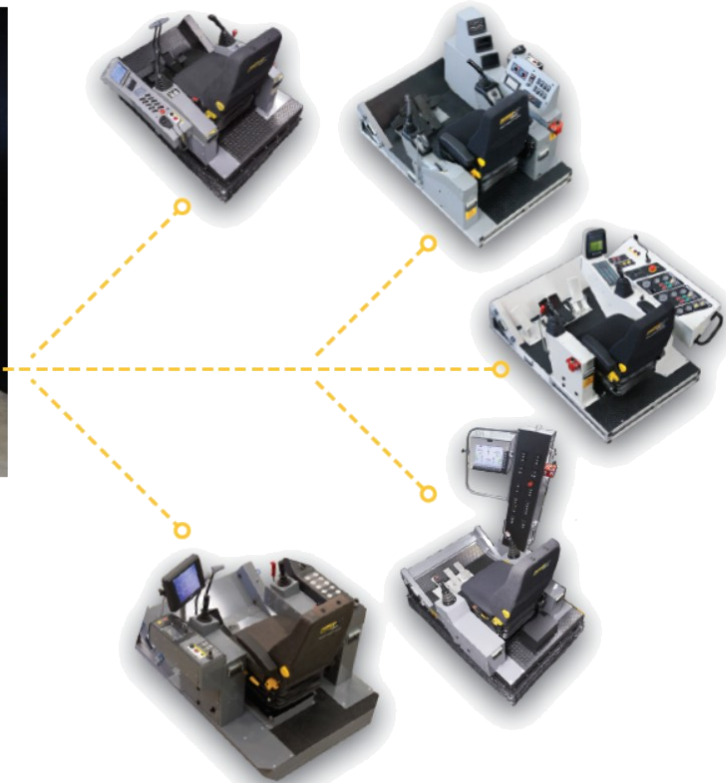
TECHNOLOGY EXPLAINED



## Conversion Kits®

Conversion Kits® are Immersive Technologies' interchangeable equipment modules that fit onto base simulator platforms allowing a range of different equipment to be simulated.

*Changeover takes about 15 minutes.*



# Workforce Development Stages

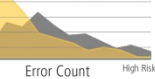
WORKFORCE DEVELOPMENT EXPLAINED



**Recruitment and Selection**



**New Operator Onboarding**



**Skilled Operator Profiling**



**Workforce Optimization and Maintenance**





# Workforce Development Priorities

WORKFORCE DEVELOPMENT EXPLAINED



## Zero Harm

- Safety
- Risk Analysis
- Compliance



## Productivity

- Workforce Development
- Production Levels
- Optimisation

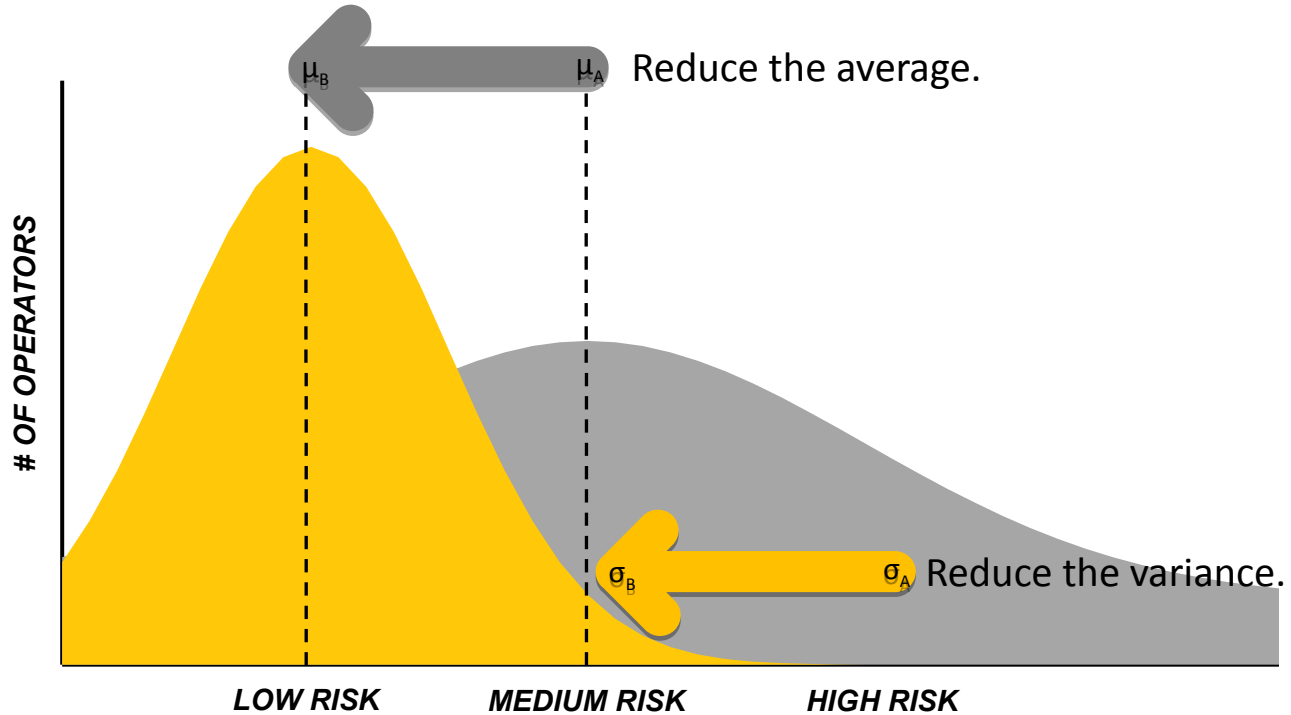


## Cost of Operation

- Unscheduled Maintenance
- Machine abuse

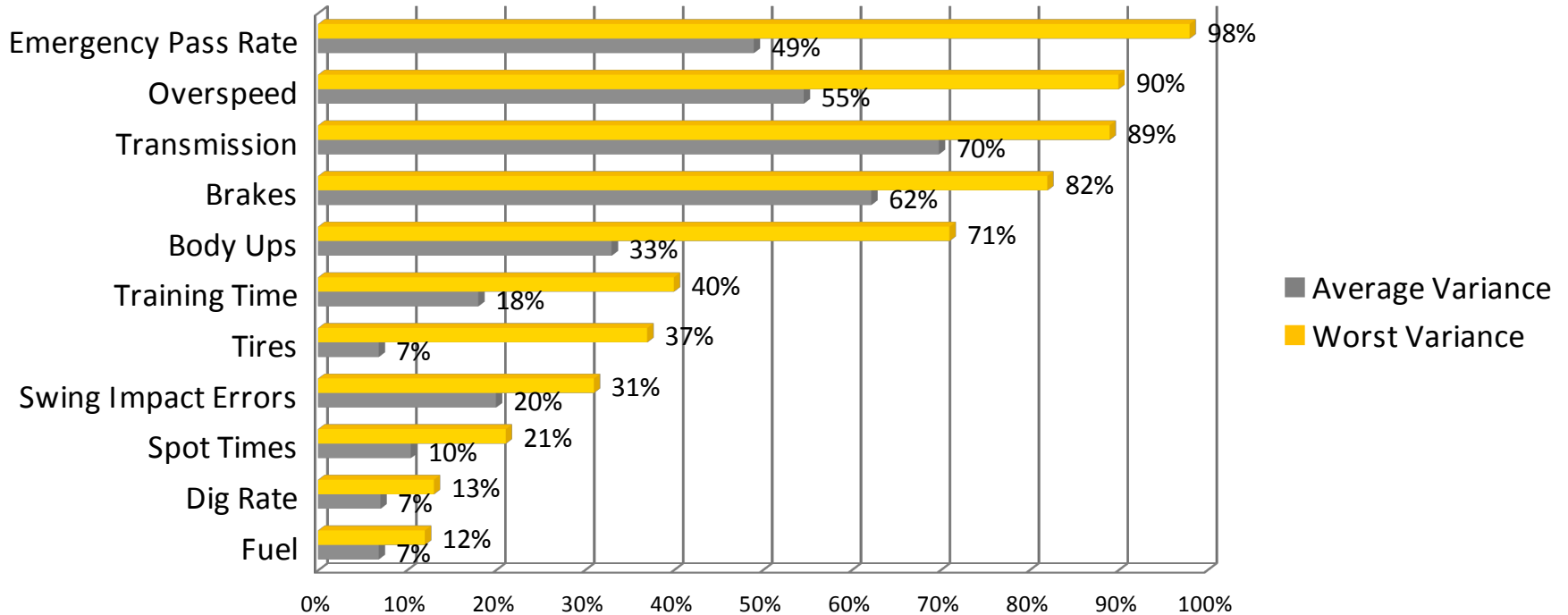
# Workforce Dev. is Risk Management

WORKFORCE DEVELOPMENT EXPLAINED



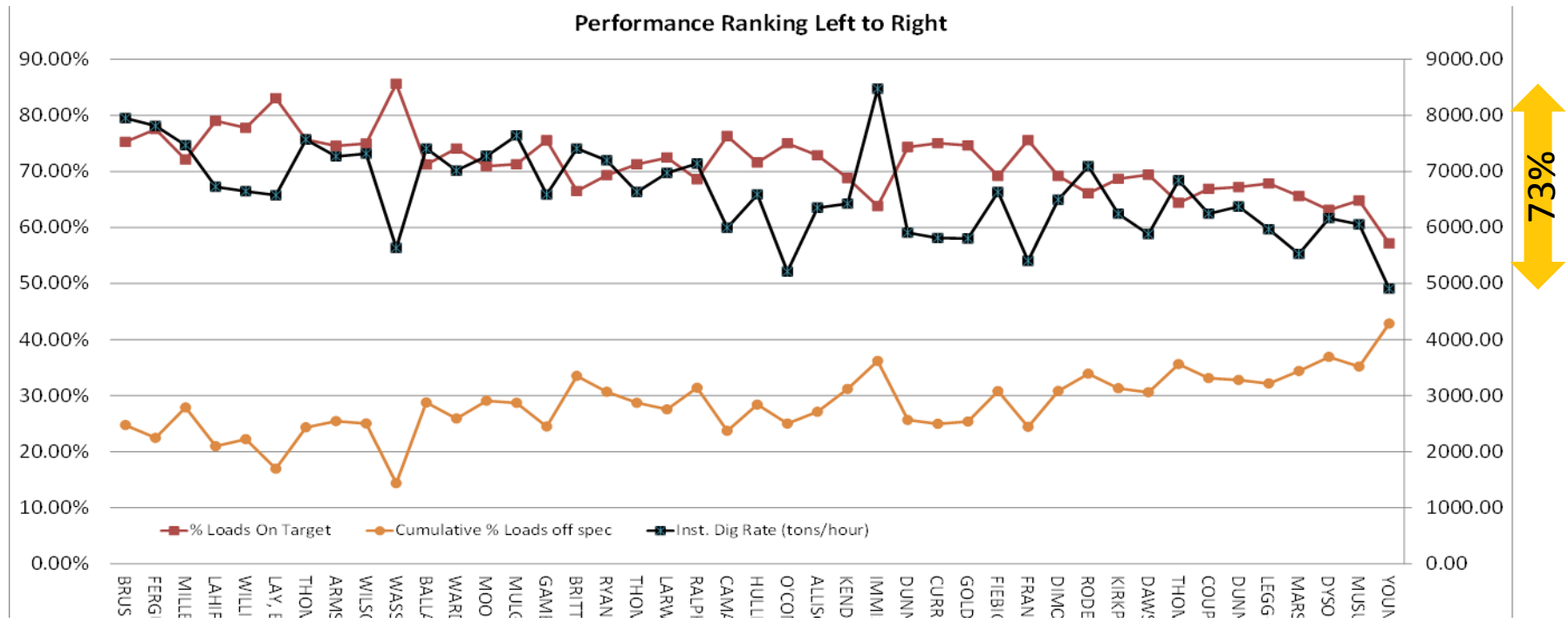
# Operator Variance is Massive!

Data from 50+ Global Continuous Improvement Projects



# Individual Variability Example

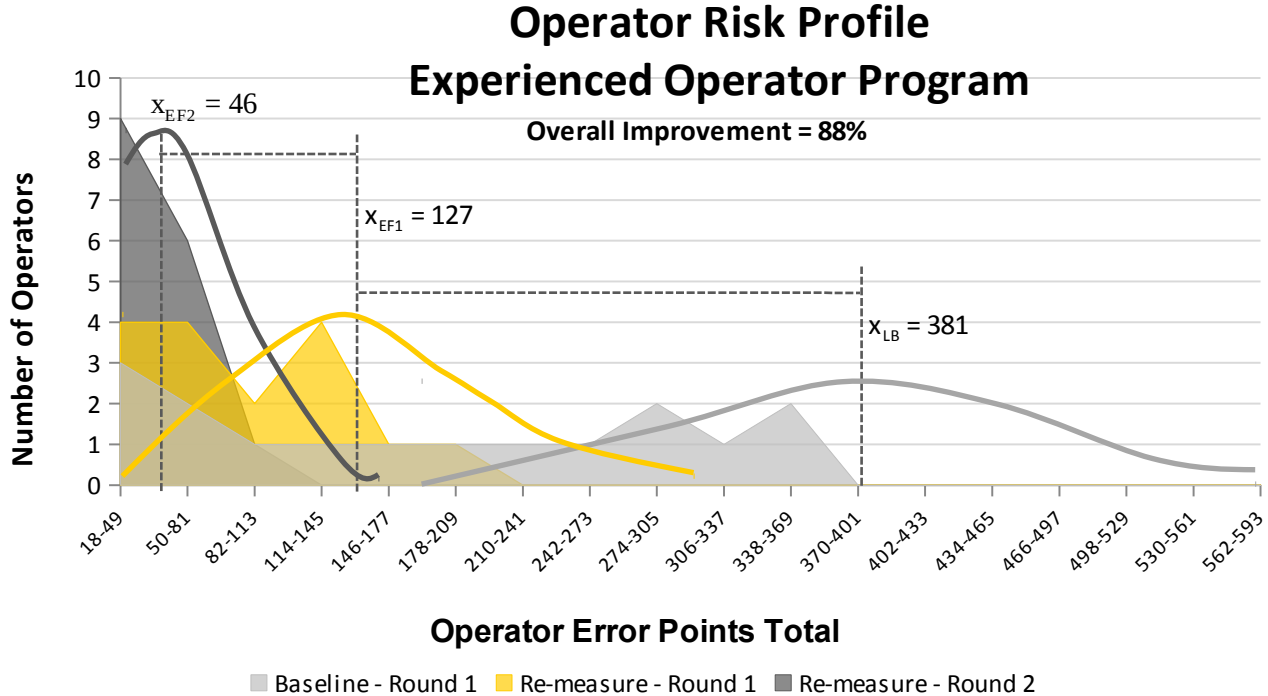
Hydraulic Excavator (Liebherr 996) – Tier 1 Miner (Australia)





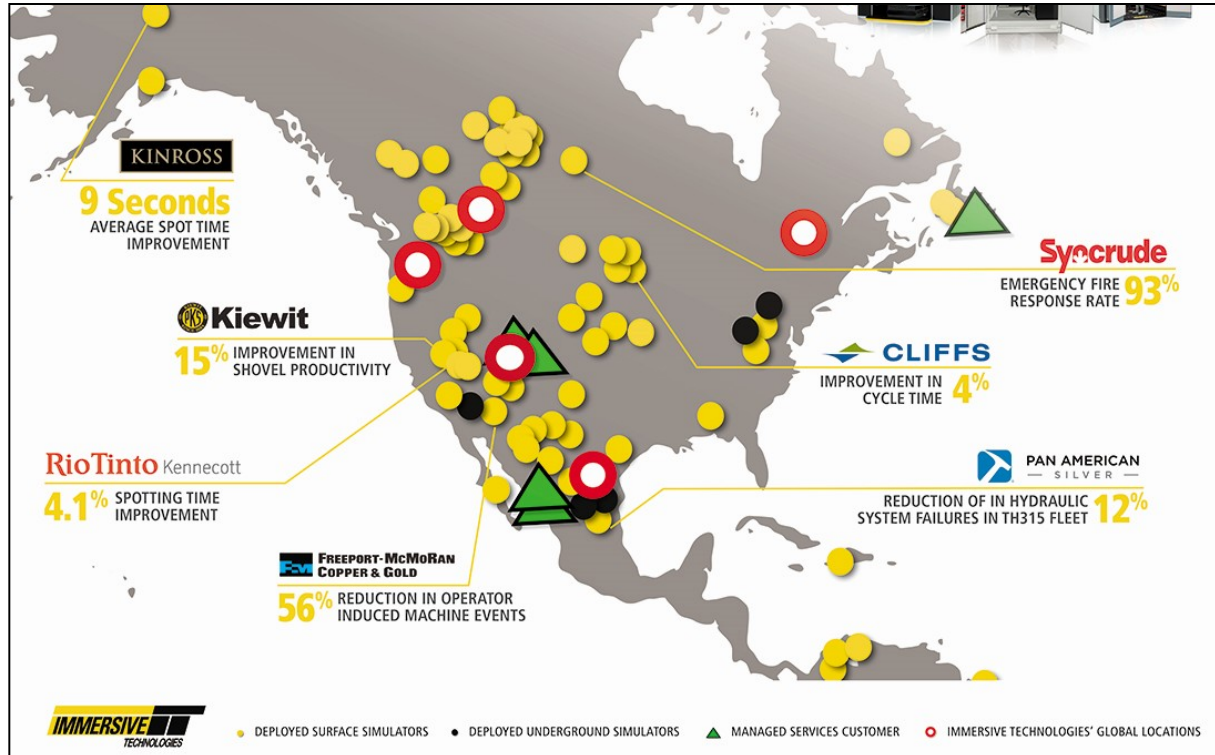
# Iterative Variability Response

Underground Truck (Sandvik) – Silver Mine (Mexico)



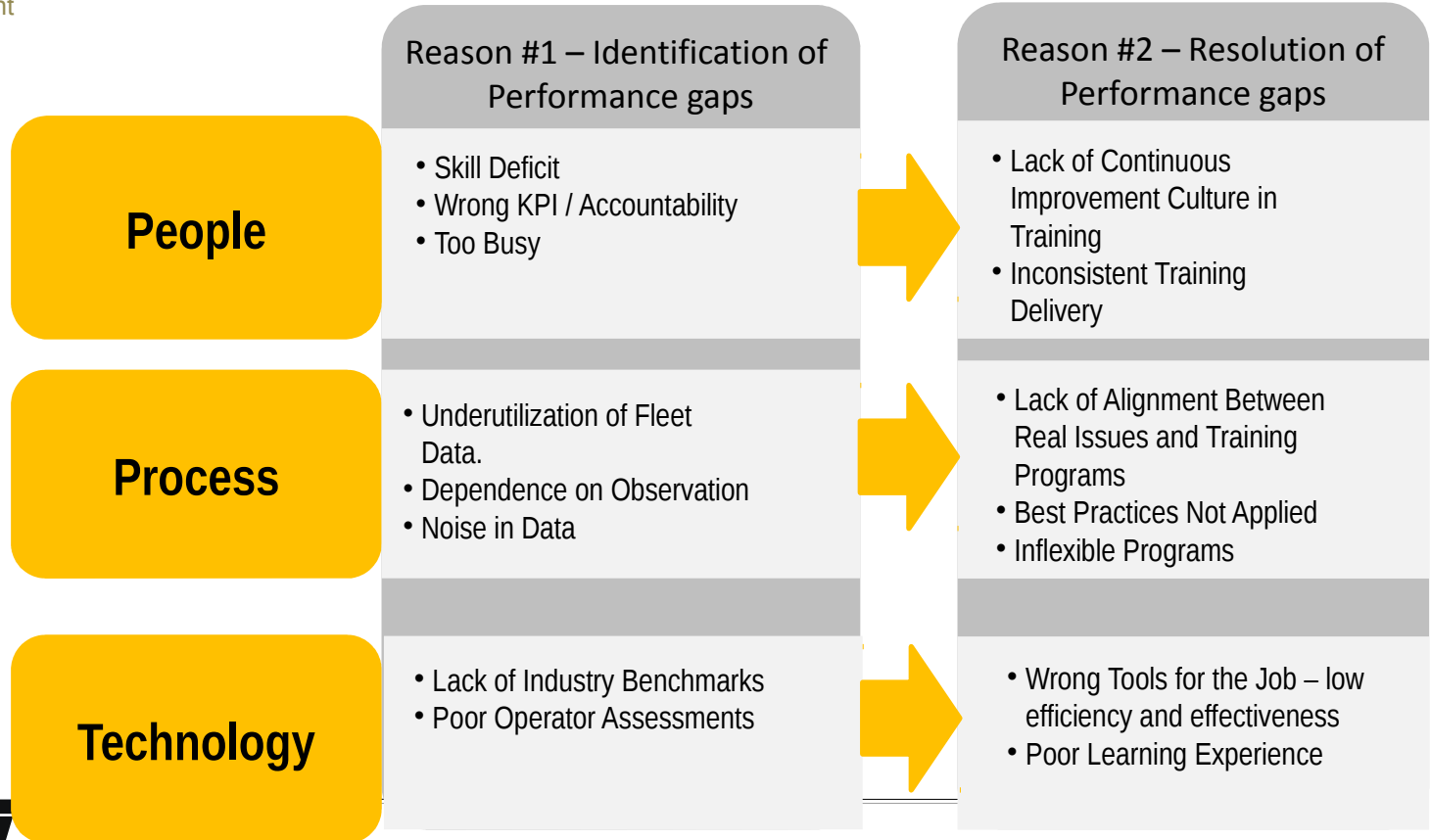
# Variance Common in North America

North American Variance Examples



# Why Performance Variance Exists

Self Assessment



# Results Takes More Than Technology!

The Pitfalls of Incomplete Solutions



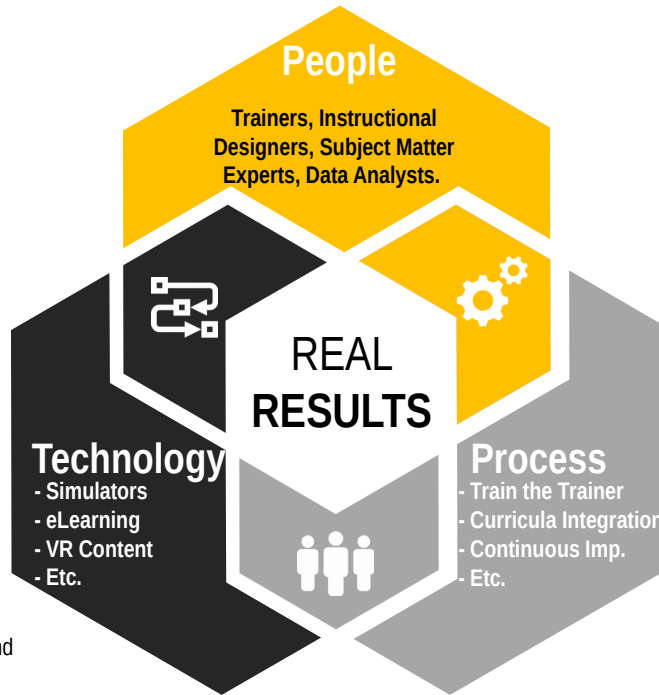
## Wrong People

Without the right people, there is an absence of skills to perform activities, no stakeholders to set the strategy, no champions to manage the process, and no specialists to execute the plan.

## Results

Project success means:

- 1 – reduction of operator variance;
- 2 – reduction of operational risk; and
- 3 - sustainable implementation.



## Wrong Process

Without the right process, there is no guidance for streamlining and validating training needs, consistency in training application, standardization of communication, or validity of continuous improvement.

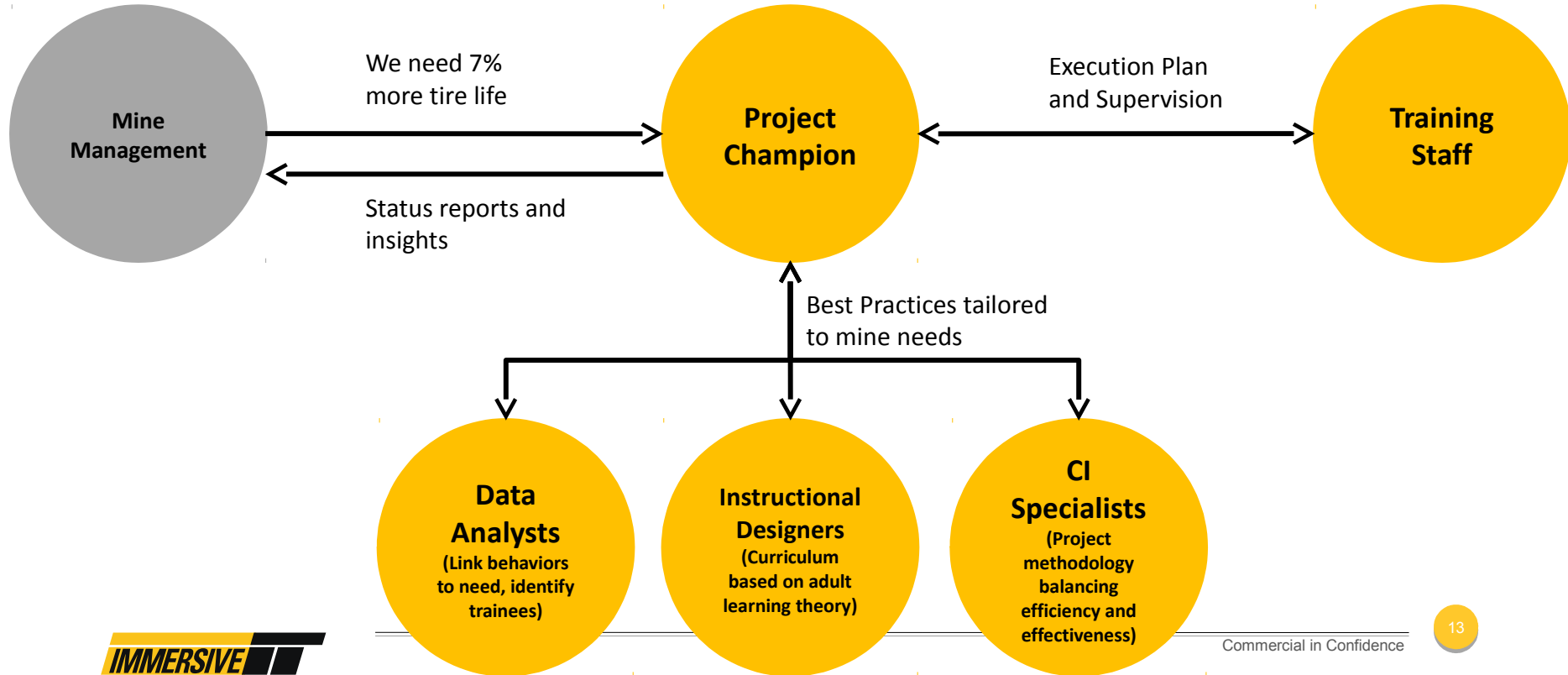


## Wrong Technology

Without the right technology, processes and people are less effective and less efficient.

# People

Ensuring Technology Benefits are Realized



# WFD Stages Require Unique Processes



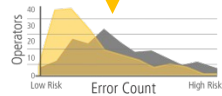
**Recruitment and Selection**



**New Operator Onboarding**



**Skilled Operator Profiling**



**Workforce Optimization and Maintenance**





# Field Tested Processes

## Operator Workforce Development



**Data and Analytics**

- FMS and Sim Data Analysis
- Operator Profiling
- Performance Reporting
- Business Improvement Reporting

**Training and Optimization**

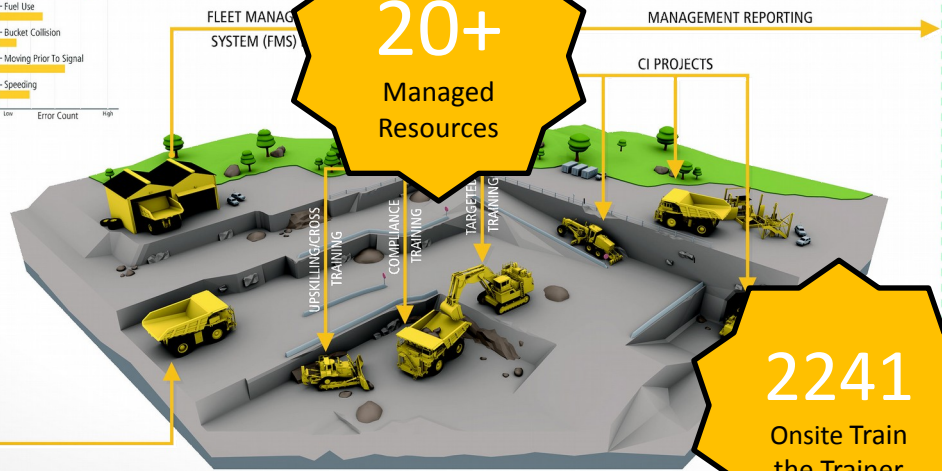
- Compliance Training
- Skills Training
- Targeted Training
- Continuous Improvement

**Global Operator Benchmarking**



**225 Curricula Integration Projects**

**20+ Managed Resources**



**2241 Onsite Train the Trainer**

**Mine Manager**

- Progress Against Objectives
- BI Recommendations
- etc...

**Safety Management**

- Safe Machine Operation
- Emergency Event (Pass/Fail)
- etc...

**Operational Management**

- Fill Rates
- Spot Time
- Cycle Times
- etc...

**Maintenance Management**

- Brake Abuse
- Transmission Abuse
- etc...

**BUSINESS IMPROVEMENT**

Identify key areas of business improvement; Analyse mine data and operator performance benchmark; Communicate objectives with department managers

**Objectives**

- Increase Machine Availability to XX%
- Emergency Event Training
- Reduce Tire Wear by X%

**Measures**

- Unscheduled Maintenance Costs
- Production Rates
- Tire Replacement

**47 Continuous Improvement Projects**



# Only Complete Solutions Deliver Results

MAKING RESOURCE COMPANIES MEASURABLY SAFER AND MORE PROFITABLE



## REAL RESULTS MEAN IMPROVEMENTS

- 7%** Underground Production **↑**
- 40%** Traffic Incidents **↓**
- 14%** Spot Time **↓**
- 4%** Cycle Time **↓**
- 15%** Load Time **↓**
- 5%** Bucket Fill Factors **↑**
- 62%** Brake Abuse **↓**
- 70%** Transmission Abuse **↓**
- 55%** Engine Overspeed **↓**
- 10%** Tyre Life **↑**
- 7%** Fuel Use **↓**

\* All results are average in-field improvements, documented and verified by external parties.

Commodity	Objective	% Improvement	Savings	Measure
Oil Sands	Tire Life	+37%	\$1,037,000	Tire Vendor
Oil Sands	Tire Life	+27%	\$365,000	Tire Vendor
Gold	Tire Life	+12%	TBD	Maintenance
Coal	Abusive Shifting	90%	TBD	VIMS
Copper	Abusive Shifting	39%	TBD	VIMS
Gold	Abusive Shifting	89%	TBD	VIMS
Copper	Spot Time	4%	\$1,198,610	Dispatch
Gold	Spot Time	12%	\$1,026,000	Dispatch
Iron Ore	Spot Time	10%	\$408,096	Dispatch
Oil Sands	Spot Time	20%	~\$3,100,000	Dispatch
Oil Sands	Spot Time	25%	\$5,017,437	Dispatch
Coal	Park Brake Abuse	61%	TBD	VIMS
Coal	Over-speed	90%	TBD	Modular
Copper	Over-speed	19%	TBD	VHMS
Coal	Fuel	7%	~\$500,000	Fuel records
Coal	Fuel	6.2%	\$1,302,000	Fuel rate

# Thank You & Questions

