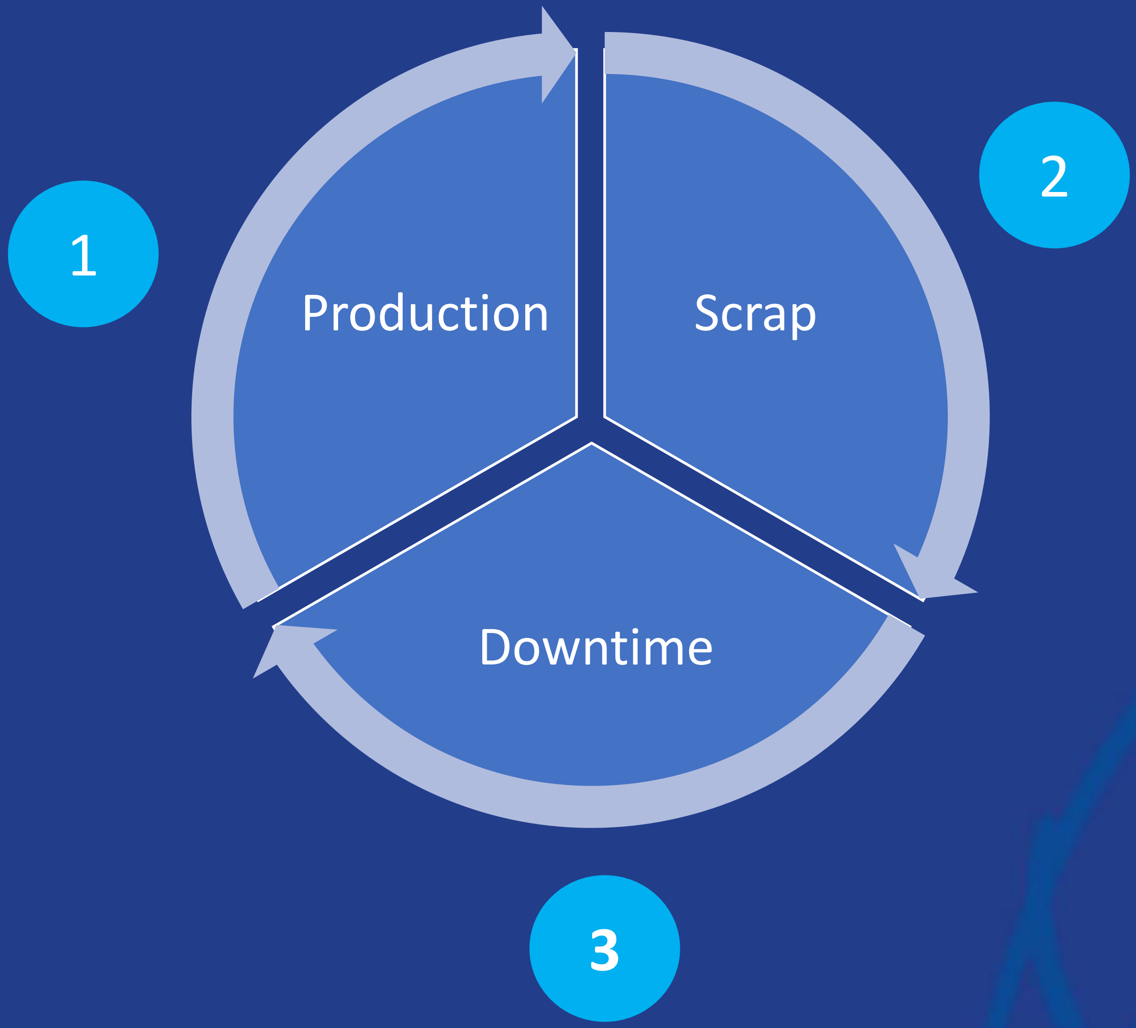
Proving Value: Aligning Learning with Business Results

PPI

PERFORMANCE PARTNERS INTERNATIONAL LLC

Identify key areas of productivity



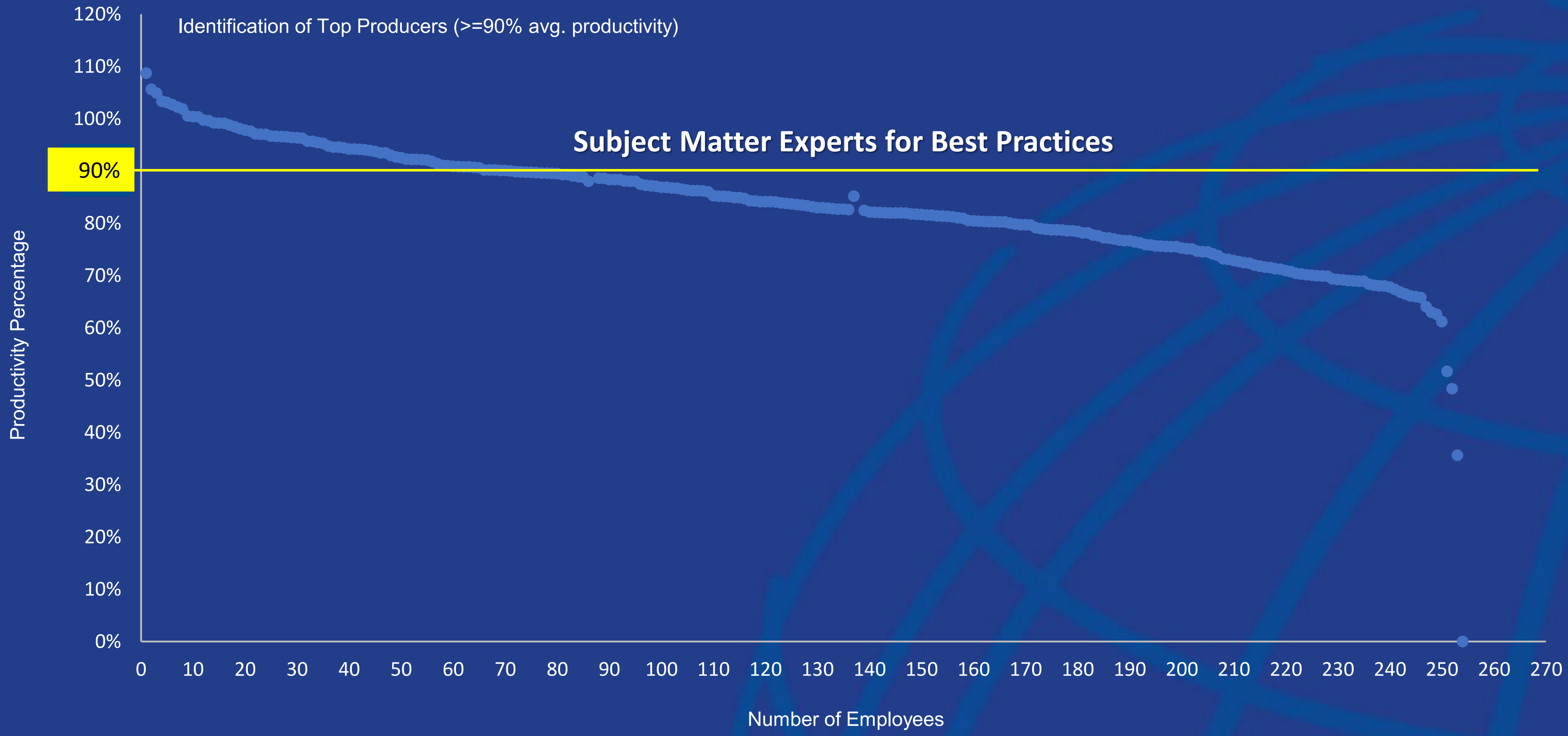
Each has a **Human Factor** that can be improved with training

Prioritize areas in need of improvement

Increase
Productivity

1a

Identify Top Producers by comparing individual productivity



1b

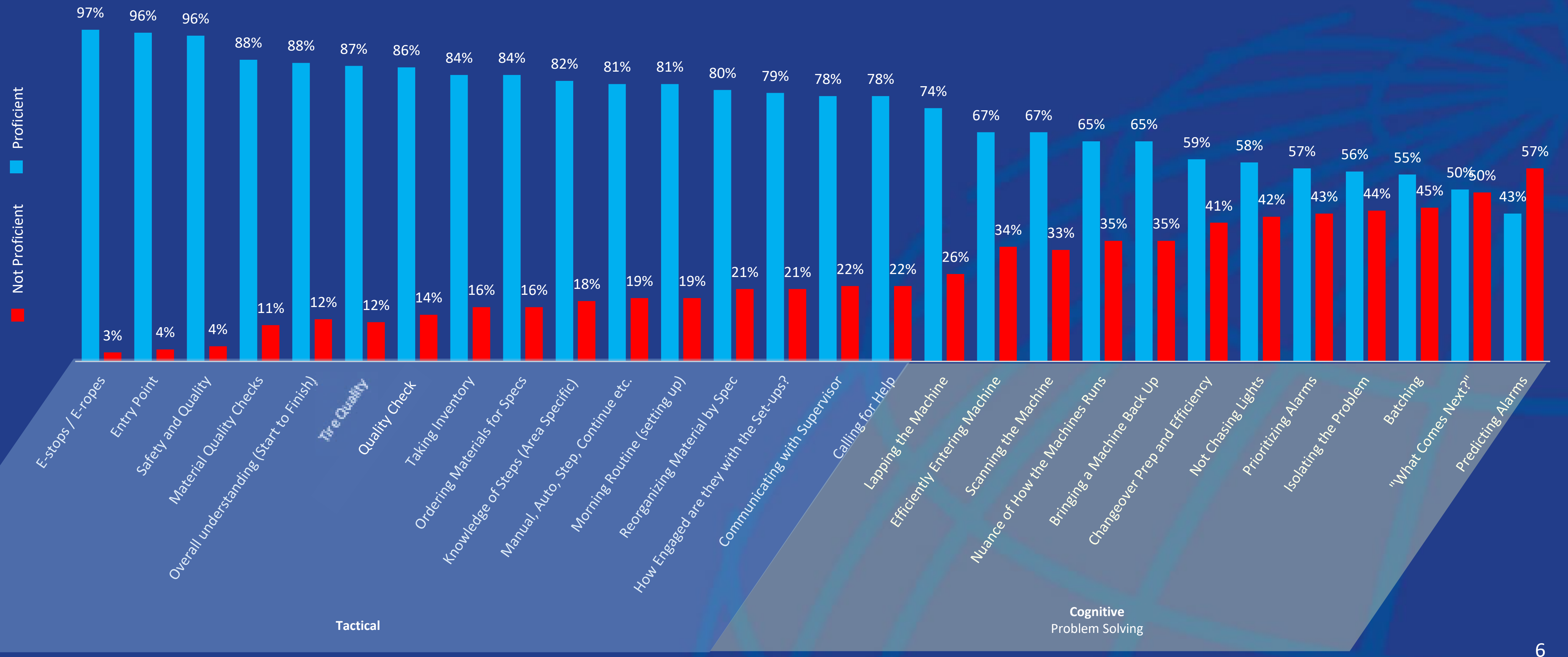
Extract Best Practices from a series of Top Producer workshops and use them to develop skill assessments and coaching

Describe your daily routines:

- Start of Shift
- Changeovers
- Operating/Running
- Troubleshooting
- Maintenance/Set-up
- End of Shift

1c

Assess underperforming operators against best practices to **identify individual skill gaps**



1d

Performance assessments revealed that most proficiency gaps centered on the problem-solving aspects, particularly in **understanding the connections among multiple events**

Levels of Work	Responsibility	CMP (Complexity of Mental Processing)
Manager of Business (MoB)	• Translating strategy into operational objectives • Communicating the Vision • 7-yr planning horizon	• Conceptual Parallel (What if-and-if)
Manager of Managers (MoM)	• Achieving operational objectives through asset maximization • Operationalizing the Vision • 5-yr planning horizon	• Concrete Parallel (if-and-if)
Manager of Functions (MoF)	• Executing collective improvement & productivity • Managing the Vision • 1-yr planning horizon	• Concrete Serial (if-then-then)
Production Supervisors	• Executing effective work unit practices, productivity & quality • Front-line executing the Vision • Monthly planning horizon	• Concrete Cumulative (and-and)
Machine Operators	• Excellence of task • Connected & engaged by the Vision • Daily to weekly outputs	• Concrete Declarative (or-or)

Problem-solving Competencies Applied

Abstract Systems Analysis: Plugging What If into multiple plant constraints and business-line strategies, while managing the Corporate relationship (Business-Line level)

Parallel Event Systems Analysis: Multiple departmental serial variation if's in parallel with plant capacity, efficiencies, and order fulfillment optimizations (Plant Level)

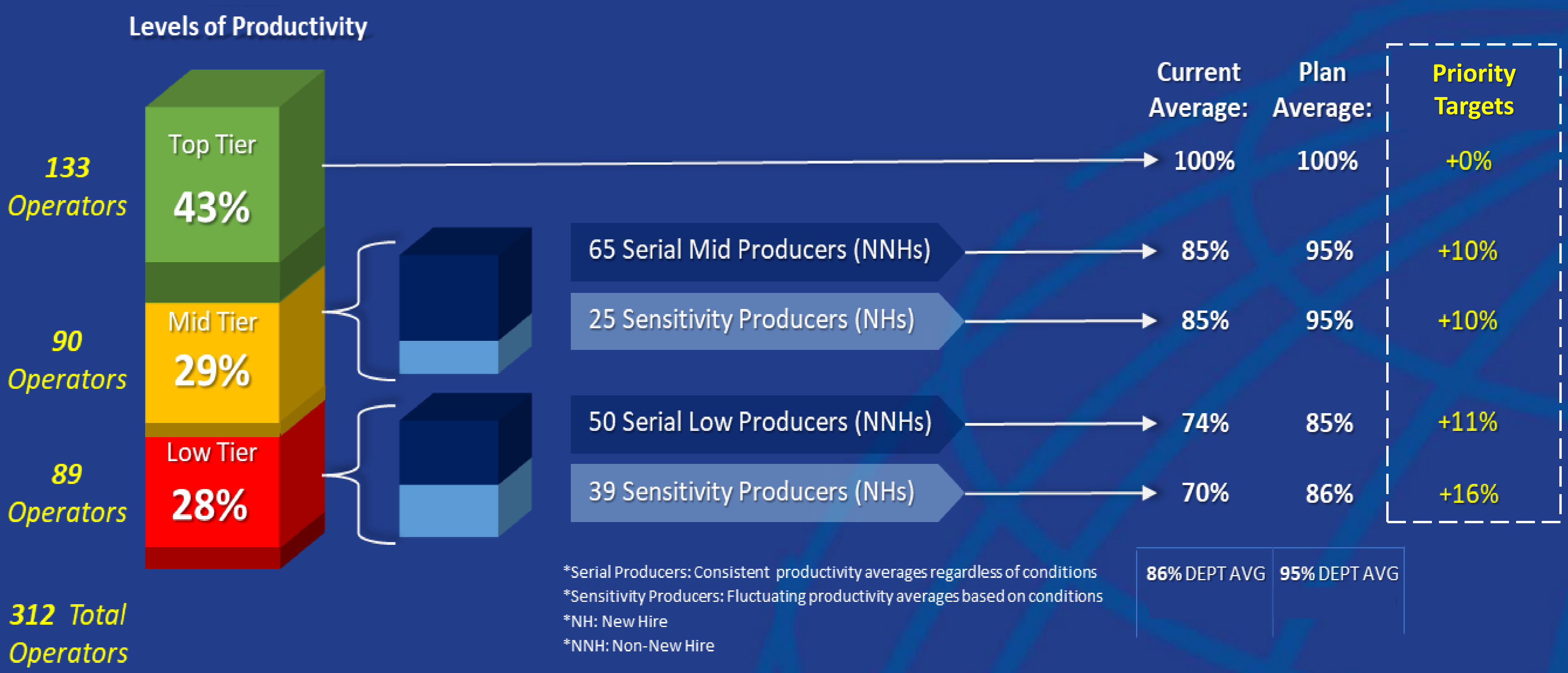
Serial Event Cause & Effect: Which variation if's are causing mis-feeds, machine alarms, material returns, downtime, and when combined with staffing and skill variation if's, causing reduced productivity (Department Level)

Event Connecting the Dots: Multiple machine alarms, and material variations, and reduced productivity (Shift Level)

Event Trail & Error: Machine alarms- is it material or mechanical (Machine Level)

1e

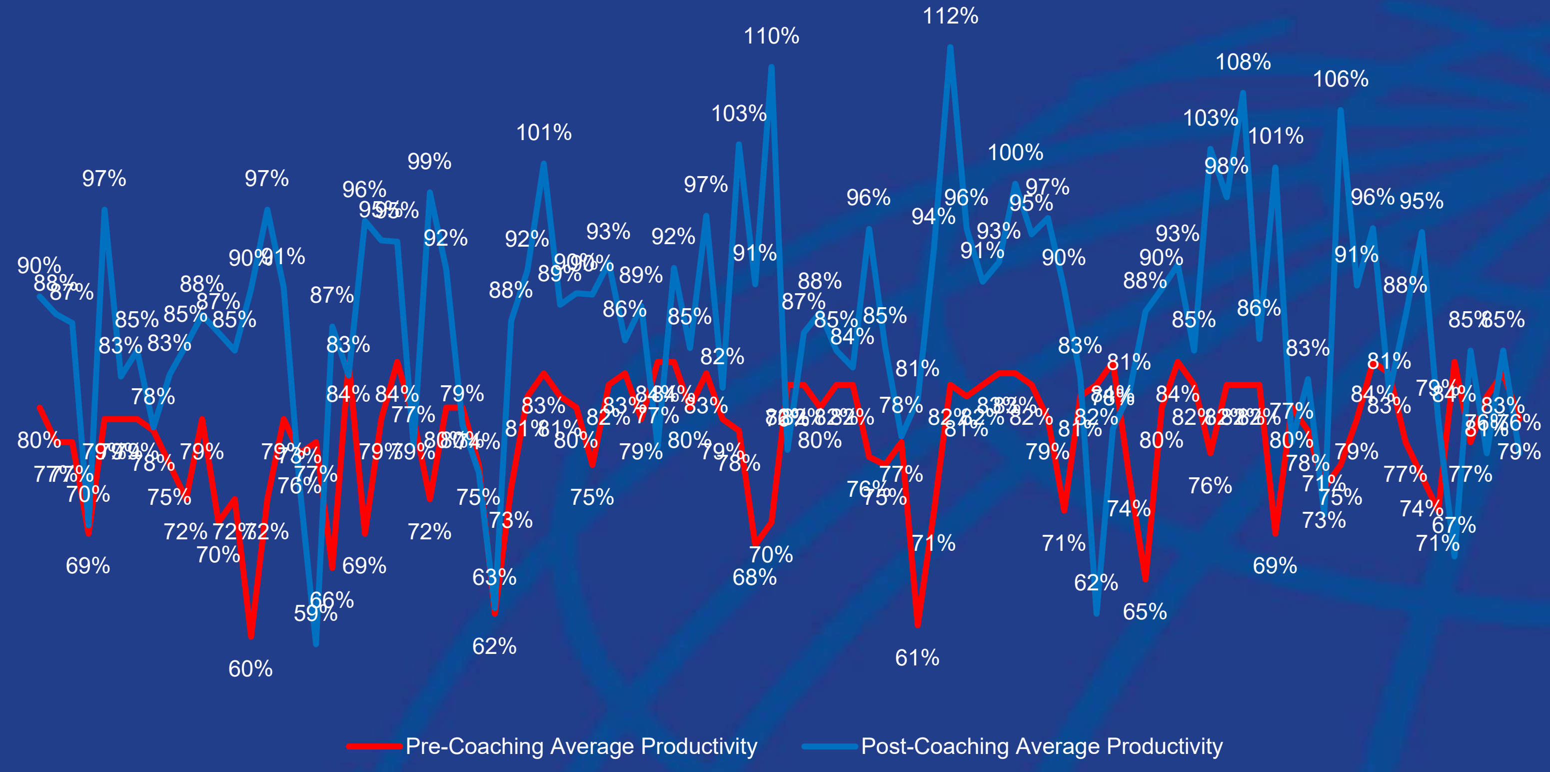
Operators are evaluated for productivity and categorized to **assign targets for achieving plan**



1g

Build a **“Critical Mass”** of improvement by assessing and coaching individual operators with productivity below 85%: Population= 90

91% of operators w/ productivity below 85% experienced coaching gains, with an average increase of +12%

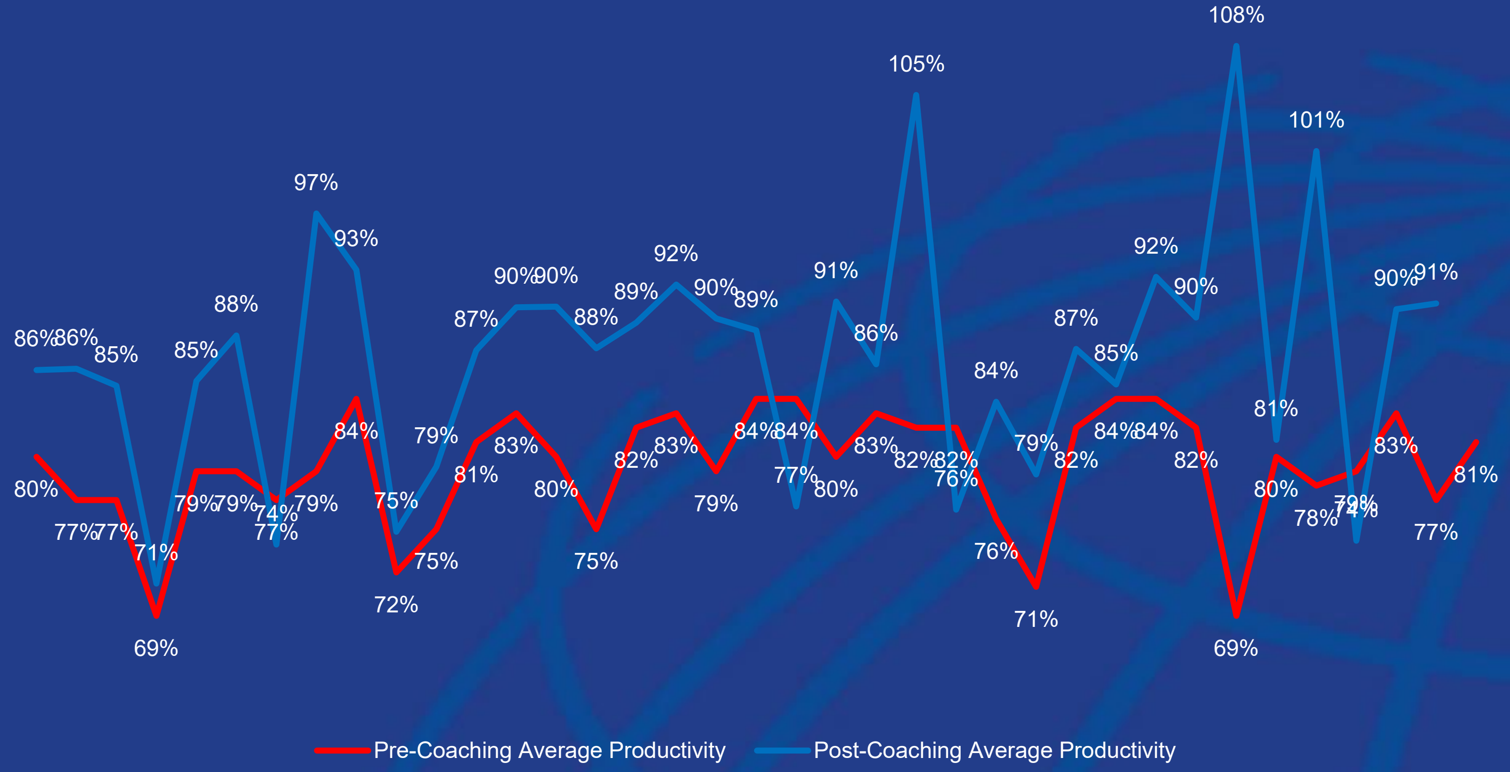


- Building a “Critical Mass” of high achievers is facilitated by assessing and coaching all operators under 85% productivity, which included senior operators.

1h

Build a “**Critical Mass**” of improvement by assessing and coaching individual operators with productivity below 85%: Population= senior operators

85% of senior operators w/ productivity below 85% experienced coaching gains, with an average increase of +9%



- Representing 41% of operators with productivity levels under 85%, they are essential to building the “Critical Mass” of high achievers needed to make the plan.
- Senior operators experiencing coached productivity gains validate their ability to improve.

1i

A "**top heavy" productivity** distribution is exhibited, presenting the opportunity to advance productivity beyond historical levels

- The gap between shift productivity averages, and the productivity average of operators below the shift average, illustrates an uneven distribution of achieved productivity between operators.
- As of this analysis, approximately one half of operators (49%) constitute the uneven productivity distribution, representing a productivity opportunity of +14% beyond current and historical levels.

2

Prioritize areas in need of improvement

Decrease [illegible]
Scrap Generation

Moving the big rocks first

Top 50% Scrap and Downtime Issues Traced to Human Factors

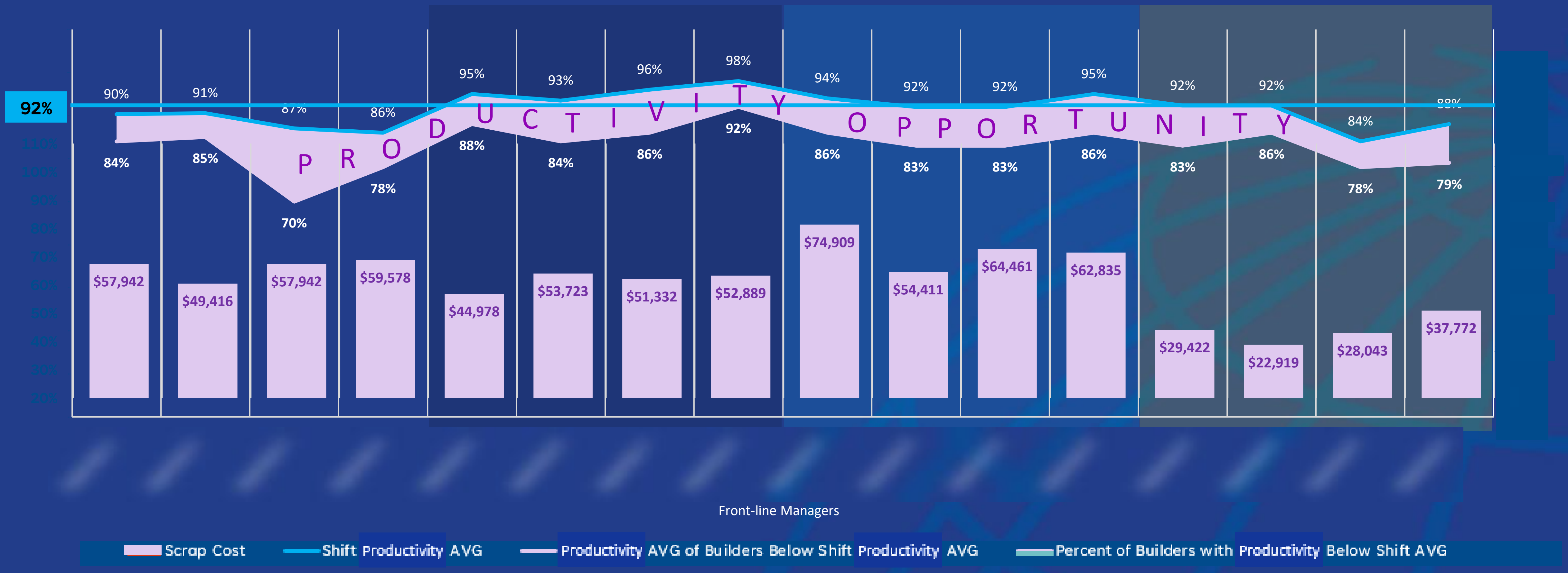
2a

Reducing scrap begins with identifying the **top 50% of scrap causes**

Top 50% Scrap Causes	Scrap Values
Cap Misswind (MATL)	$72,840
SB Removed Joint Parts	$70,755
Input Pressure Error	$69,002
Changeover	$55,385
Cap Misswind (MACH)	$48,863
Application Fail	$36,209
SB Measuring Errors	$30,327
Index Error	$27,206
Folded/Wrinkled PLY	$20,852
Cassette Change	$19,491
Poly-5S (on/around MACH)	$17,458
Total	**$468,388**

1st Qtr. 2024
Total Scrap Value = $820,378

2b Managing scrap begins with identifying the top 50% of scrap causes by front-line managers

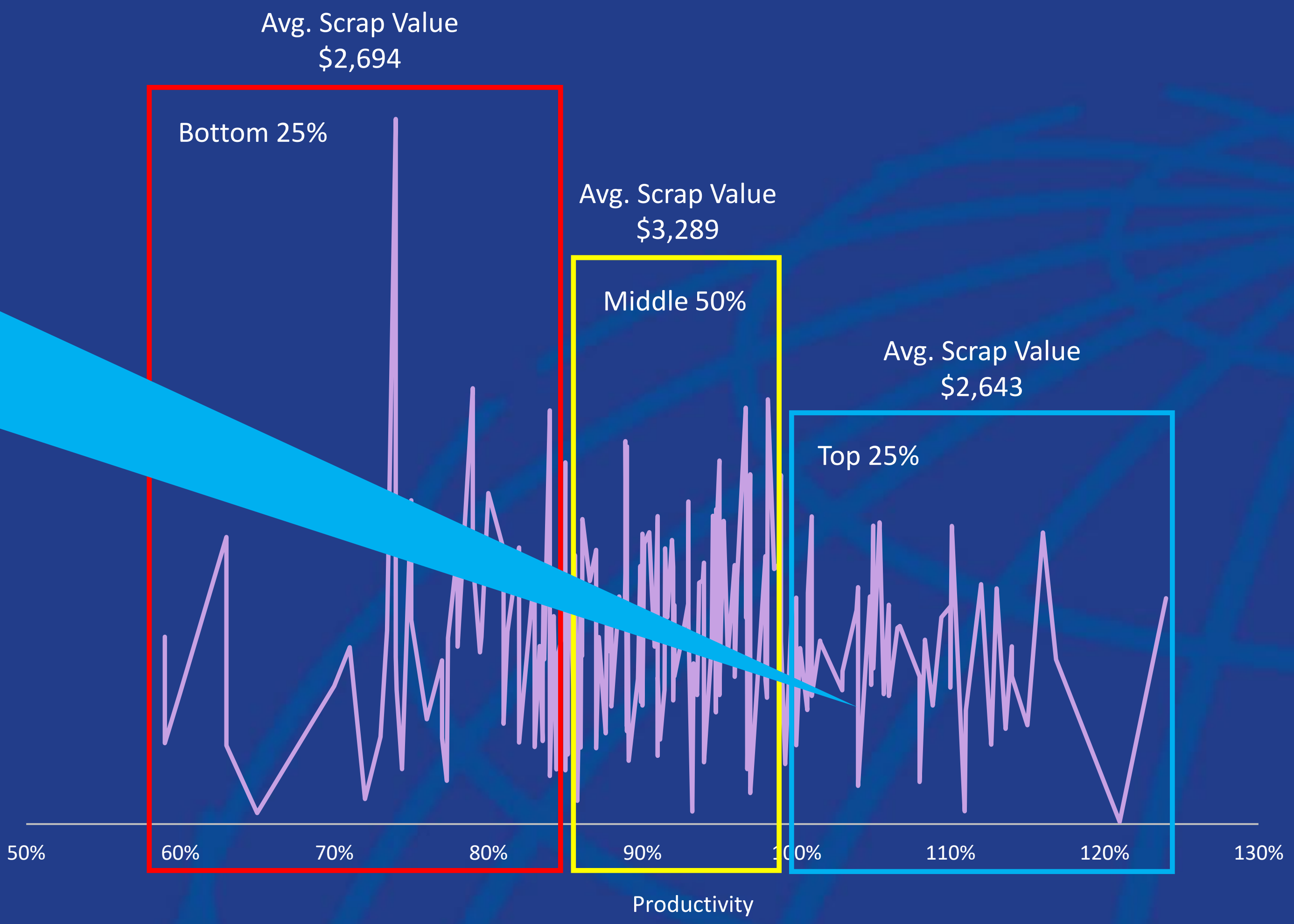


- During the first quarter operators generated scrap valued at over $820,000.
- Relative consistency of scrap generation is a function of consistent operator routines—routines whose improvement has been validated through best practice coaching.

2c

Top producers demonstrate a best practice routine of high productivity and **less scrap generation** per operator

Front-line Manager	Total 1st Quarter 2024
[illegible]	$26,130
[illegible]	$20,259
[illegible]	$18,116
[illegible]	$15,560
[illegible]	$12,897
[illegible]	$10,237
[illegible]	$9,365
[illegible]	$8,197
[illegible]	$8,101
[illegible]	$5,980
[illegible]	$4,738
[illegible]	$4,610
[illegible]	$3,959
[illegible]	$3,564
[illegible]	**$151,713**



- Top producers are distinguished by high tire productivity and an operating routine that generates less scrap per operator.

2d

Causes of scrap are categorized by **Machine**, **Material**, and **Operator**

Drill Down to First Level Causes

1. Application Fail
2. Input Pressure Error
3. PLY Misswind
4. Changeover
5. Lost Last Carcass
6. Lost Last Tread
7. Application FSB Removed Joint Parts
8. Cap Misswind (MATL)

1. SB Removed Joint Parts
2. Cap Misswind (MATL)
3. SB Measuring Errors
4. Rubber Break Down @ Die of Extruder
5. POLY 5S (on & around MACH)
6. Rubber Chafer Misswind
7. Index Error

1. Cap Misswind (MATL)
2. SB Removed Joints Parts
3. Changeover
4. Cap Misswind (MACH)
5. Folded/Wrinkled PLY
6. SB Measuring Errors

1. SB Removed Joint Parts
2. Zip Error
3. Folded/Wrinkled PLY
4. Cap Misswind (MACH)
5. Input Pressure Error
6. Cap Misswind (MATL)

Drill Down to Second Level Causes

1. Material
2. Operator
3. Material
4. Operator
5. Machine or Material
6. Machine or Material
7. Normal Process
8. Material

1. Machine
2. Material
3. Machine or Material
4. Operator
5. Operator
6. Operator
7. Machine or Material

1. Material
2. Material
3. Machine or Material
4. Machine
5. Material
6. Material

1. Material
2. Machine or Material
3. Material
4. Machine
5. Operator
6. Material

Third Level Drill Down of Machine and Material Causes to Operator Factors

2f

Top scrap causes linked to human factors are selected for **best practice coaching** to improve daily routines

1st Qtr. 2024
Cost of Scrap equals
$72,840

Cap Miss Wind (MATL)

- Not cleaning die head
- Using bad material
- Dismissing errors without attempting to fix

2g

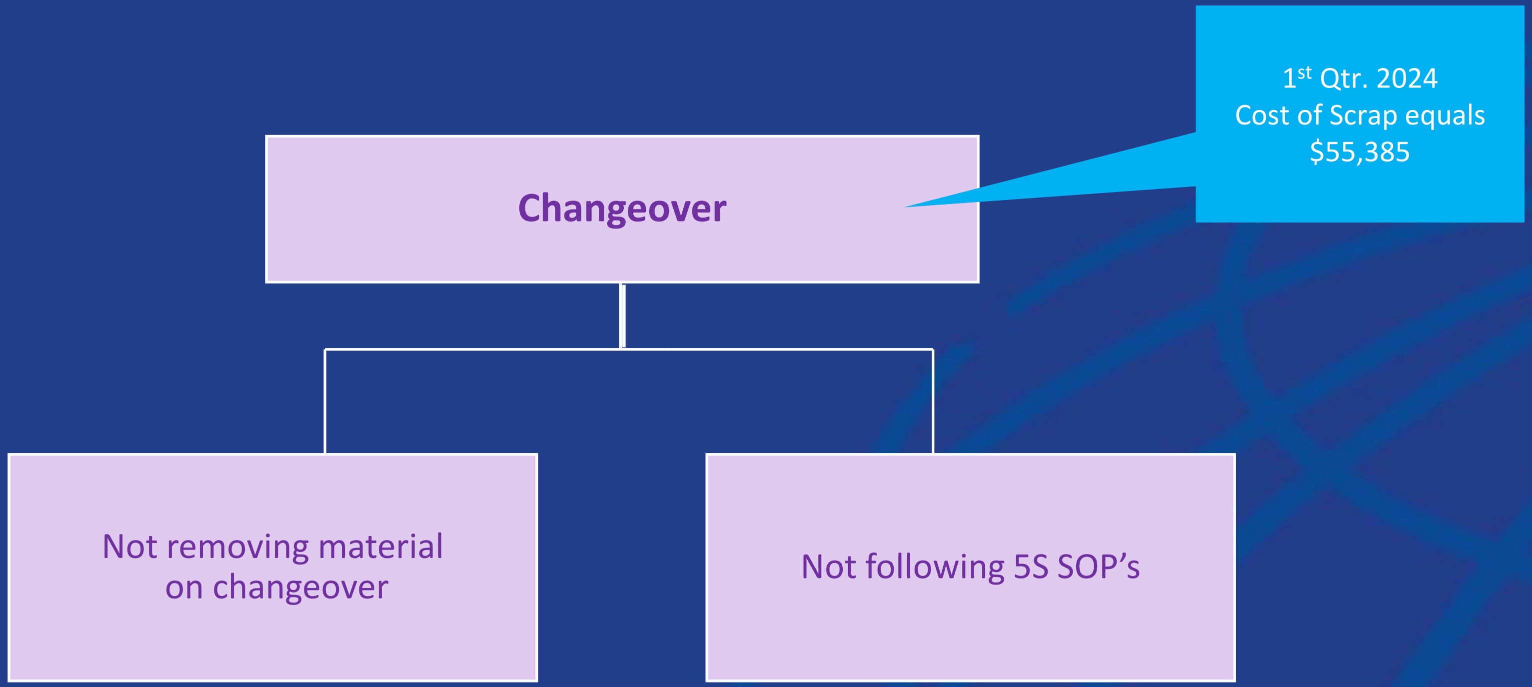
Top scrap causes linked to human factors are selected for **best practice coaching** to improve daily routines

1st Qtr. 2024
Cost of Scrap equals
$69,002

Input Pressure Error

- Not staying ahead of the machine
- Not lapping the machine and taking mental inventory of material getting low
- Not inspecting material before loading into machine

2h Top scrap causes linked to human factors are selected for **best practice coaching** to improve daily routines



2i

Top scrap causes linked to human factors are selected for **best practice coaching** to improve daily routines

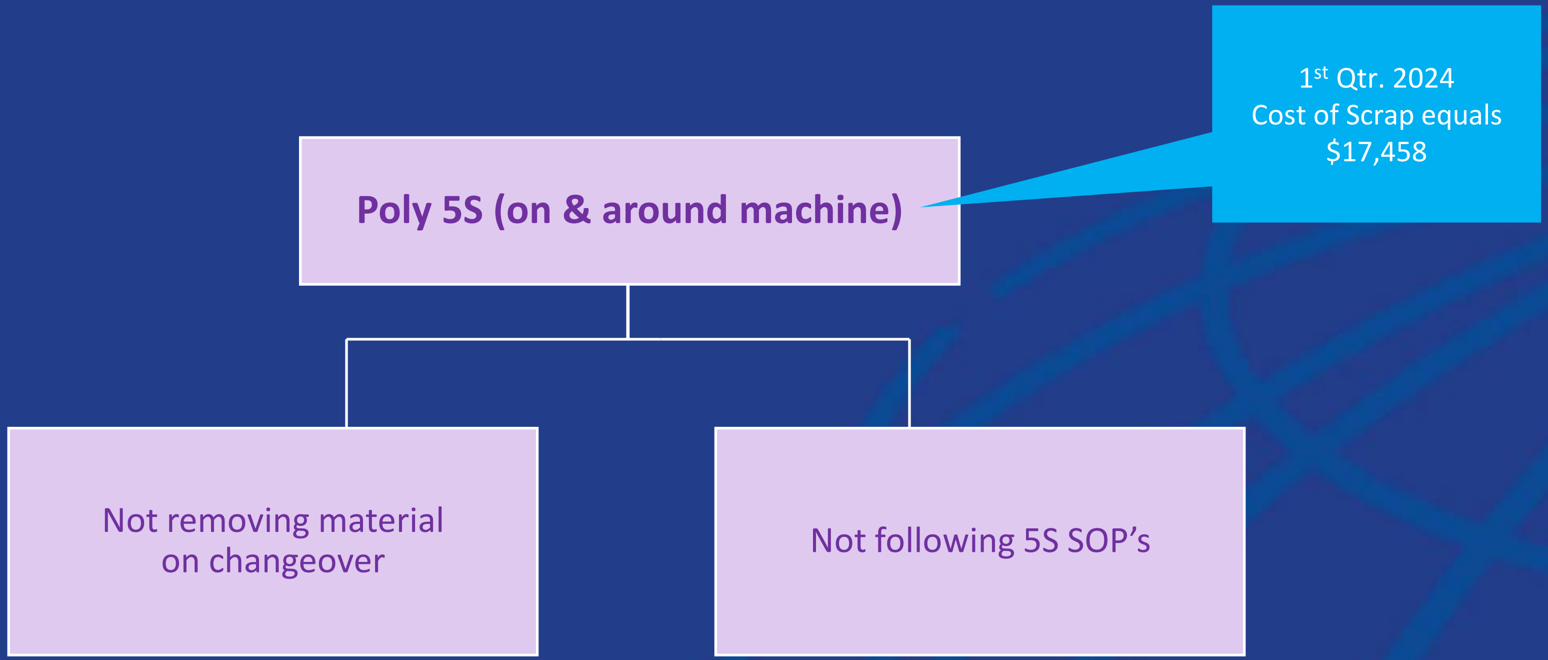
Cassette Change

1st Qtr. 2024
Cost of Scrap equals
$19,491

Not using the excess material at the end of the cassette

2j

Top scrap causes linked to human factors are selected for **best practice coaching** to improve daily routines



2k

Top scrap causes linked to human factors are selected for best practice coaching to improve daily routines, **measured by two management metrics**

	Cap Misswind (material related)	Input Pressure Error	Changeover	Cassette Change	Poly-5S (found on/around machine)
Best Practice	Significantly Reduced	Significantly Reduced	Zero	Significantly Reduced	Zero
Target Top 25% Performers	$110	$65	$0	$20	$0
P R O D U C T I V I T Y O P P O R T U N I T Y					
Benchmark Population Average	$258	$241	$184	$78	$81
1st Qtr. Costs Over Target	$64,291	$62,117	$51,098	$17,697	$16,687

- "Target" equals the average of the top 25% of operators who produce the least scrap. This is the best practice goal.
- "Benchmark" refers to the average scrap across the entire population, used to measure the initial trends of scrap reduction efforts.
- When compared to scrap "Targets", our first-quarter results presented a $211,890 scrap reduction opportunity, or 90% of scrap cause totals.

2I

Build a **“Critical Mass”** of scrap reduction by assessing and coaching enough individual operators to impact company results: Population= 203

- During the first quarter of 2024 scrap causes with links to human factors generated an estimated cost of $234,000, accounting for half of the top 50% scrap causes.
- Identification and root cause analysis may require tracing causes backward through the process supply chain.

3 **Prioritize** areas in need of improvement

Decrease
Downtime

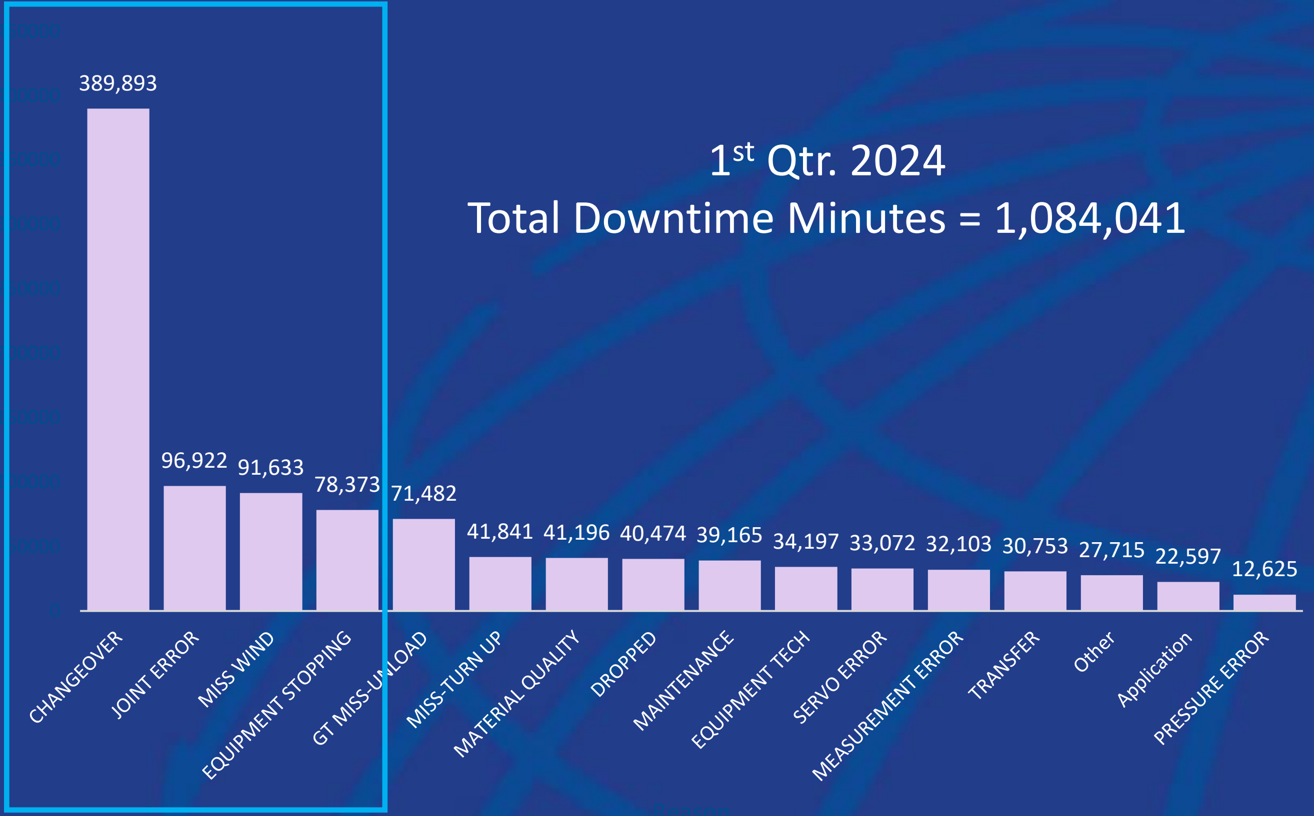
3a

Reducing downtime begins with identifying the **top 50% of downtime causes**

Top 50% Downtime	Downtime Minutes
Changeover	389,893
Joint Error	96,922
Misswind	91,633
Equipment Stopping	78,373
Total	**656,821**

1st Qtr. 2024

Total Downtime Minutes = 1,084,041



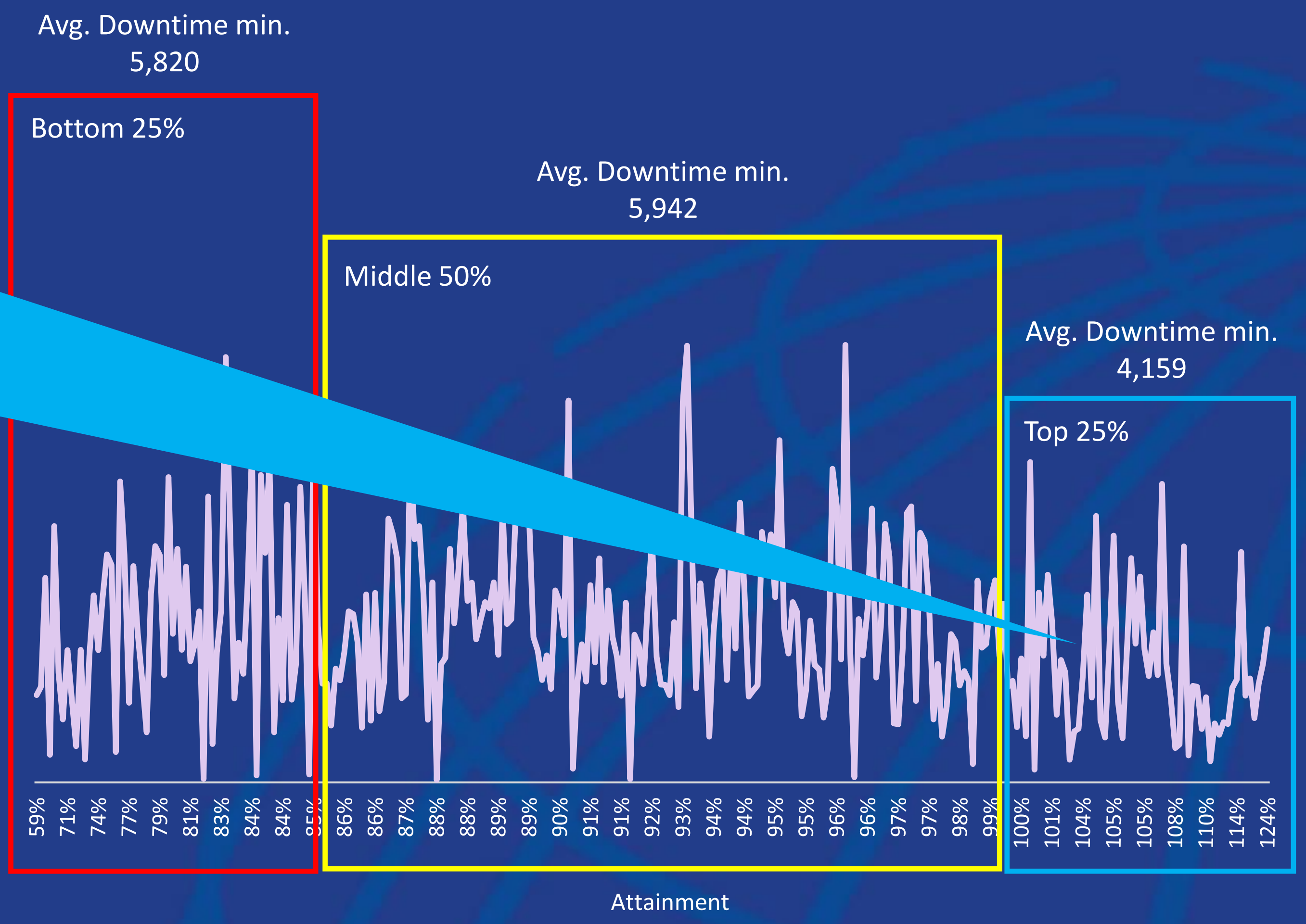
3b Managing downtime begins with identifying the top 50% of downtime causes by front-line manager

- During the first quarter of 2024 the department generated downtime of over 1 million minutes.
- Variations of downtime within shifts are a function of the number of changeovers and size of new hire and top producer populations within those shifts.

3c

Top producers demonstrate a best practice routine of high productivity and **less downtime** per operator

Front-line Manager	Total 1st Quarter 2024
[illegible]	33,961
[illegible]	28,875
[illegible]	26,648
[illegible]	24,711
[illegible]	23,822
[illegible]	20,880
[illegible]	18,496
[illegible]	17,017
[illegible]	16,647
[illegible]	11,207
[illegible]	6,798
[illegible]	6,179
[illegible]	5,878
[illegible]	3,507
[illegible]	772
[illegible]	**245,398**



- Top producers are distinguished by high productivity and an operating routine that generates less scrap and downtime than the majority of operators.

3d

Causes of downtime are categorized by **Machine**, **Material**, and **Operator**

Drill Down to First Level Causes

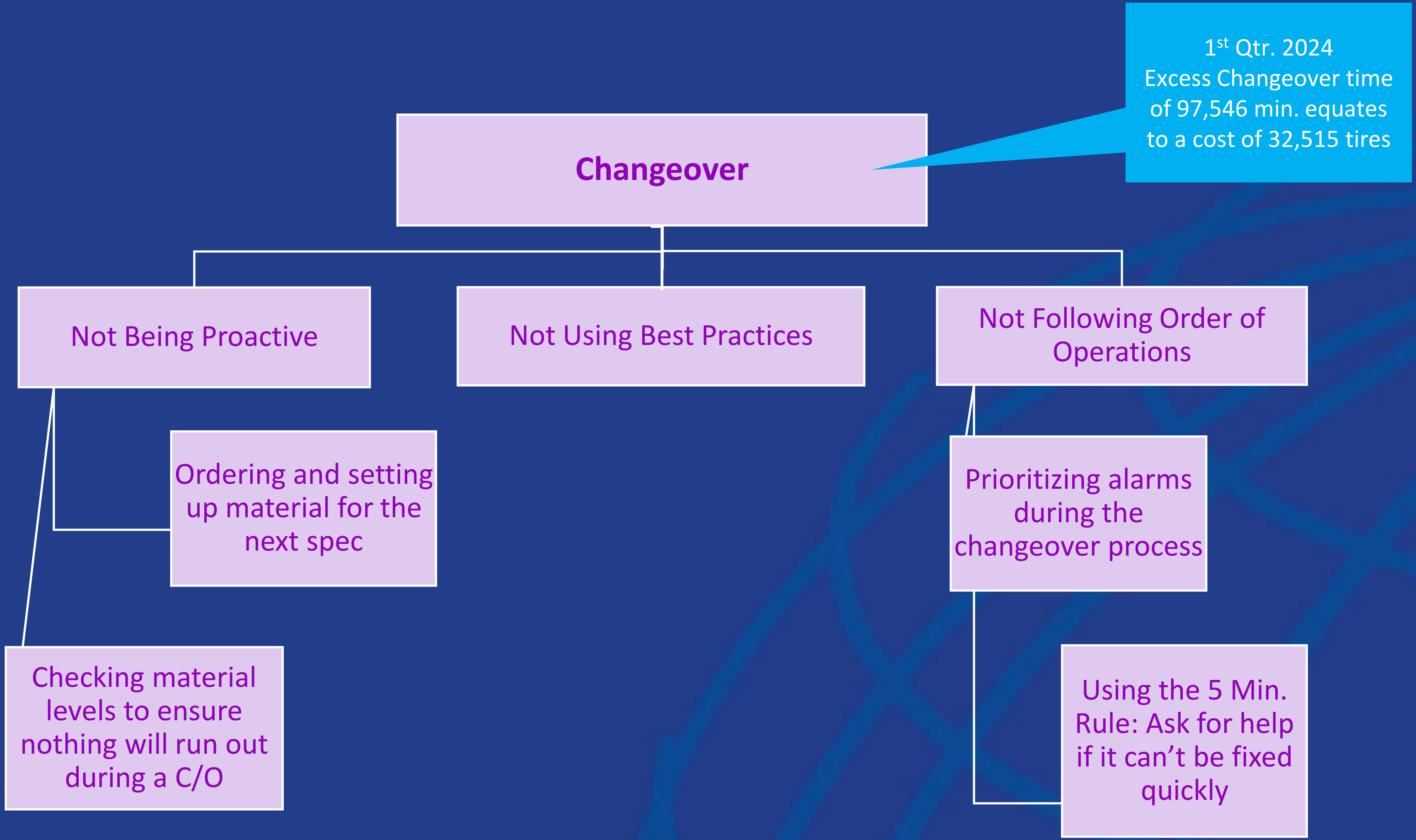
1. Changeover	1. Changeover	1. Changeover	1. Changeover
2. Joint Error	2. Dropped	2. Joint Error	2. Joint Error
3. Equip. Tech	3. Equip. Stopping	3. Misswind	3. Equip. Stopping
4. GT Miss-Unload	4. Maintenance	4. Equip. Stopping	4. Misswind

Drill Down to Second Level Causes

1. Normal Function and Operator	1. Normal Function and Operator	1. Normal Function and Operator	1. Normal Function and Operator
2. Machine or Material	2. Machine or Material	2. Machine or Material	2. Machine or Material
3. Machine	3. Operator	3. Operator	3. Operator
4. Machine	4. Machine	4. Operator	4. Operator

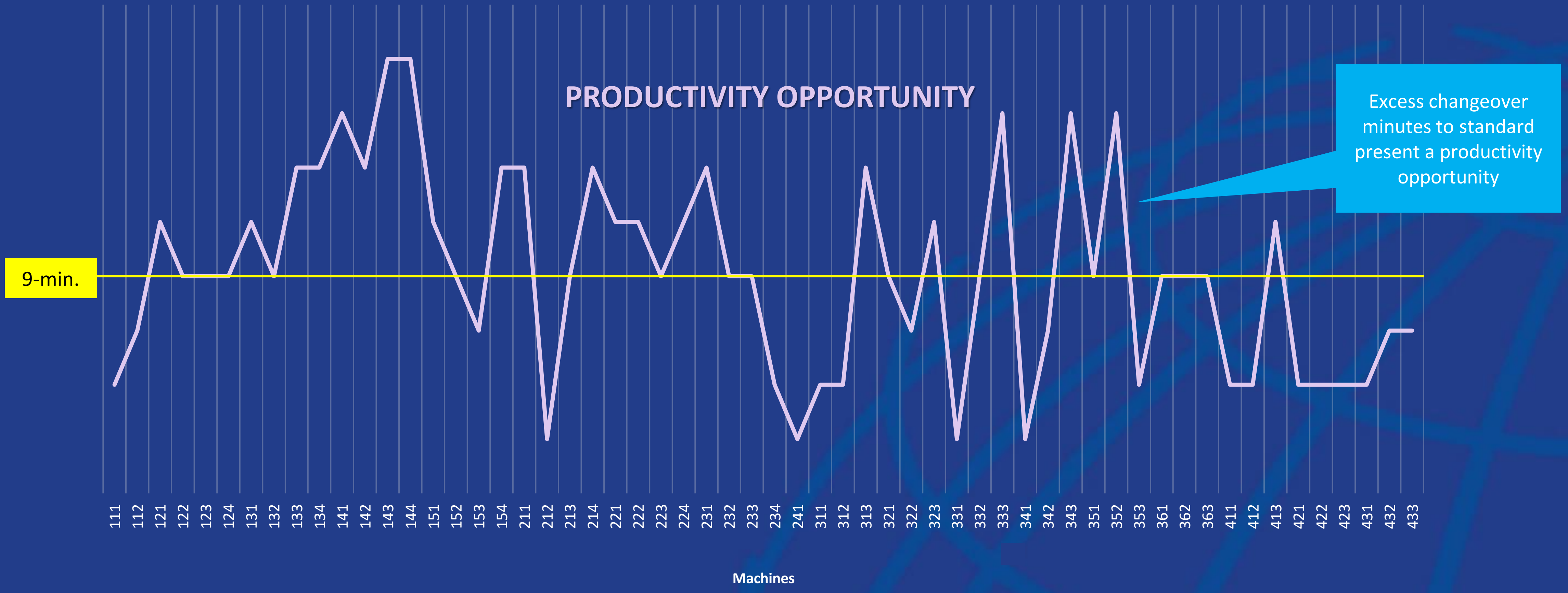
3e

Top downtime causes linked to human factors are selected for **best practice coaching** to improve daily routines



3f

The top downtime cause of “changeover” is compared to a **standard of 9 minutes for excess variances**



- Average combination changeover time, adjusted for anomalies and including series changes, equals 9 minutes.
- Excess changeover minutes compared to this standard present a productivity opportunity.

Top downtime causes linked to human factors are selected for **best practice coaching** to improve daily routines

1st Qtr. 2024
91,633 min. associated with Misswind equates to a cost of 30,544 tires

Misswind

- Not cleaning dies
  - Daily die cleaning
  - Flushing material through the die after cleaning it
- Using (obviously) bad material
  - Checking material quality before it enters the machine
  - Take the cart out of the machine and replace it with a new material cart
- Dismissing an error without an attempt to fix it
  - "Clearing an alarm" without cleaning the die, or taking material out

3h

Top downtime causes linked to human factors are selected for **best practice coaching** to improve daily routines

1st Qtr. 2024
78,373 min. associated with Equipment Stopping equates to a cost of 26,124 tires

Equipment Stopping

- Not lapping machine
  - Scanning the machine to ensure that everything is moving smoothly, and nothing has been interrupted (i.e., light curtains)
- Leaving area before it starts up
  - Watching steps thoroughly and making sure every step has been put back in "Auto"

3i

Build a "**Critical Mass**" of downtime reduction by assessing and coaching enough individual operators to impact company results: Population= 203

- During the first quarter of 2024 downtime causes with links to human factors cost an estimated 190,000 hours, or the equivalent of 63,000
- Improvements from targeted coaching, informed by cause drill downs, are tracked through operator, department, and company downtime reporting.

1st Qtr. 2024 Program Benchmarks

Influenced by Human Factors

Productivity Increase	[illegible]	**Opportunity Gain = $8,306,675**
Scrap Decrease	[illegible]	**Opportunity Gain = $210,890**
Downtime Decrease	[illegible]	**Opportunity Gain = $5,429,000**
Total		**$13,946,565**

1st Qtr. 2024 Program Key Observations

Influenced by Human Factors

- Our program of best practice assessment, training, and coaching resulted in operators achieving higher productivity while generating less scrap and downtime.
- Performance assessments revealed that most proficiency gaps centered on cognitive problem-solving aspects of machine operation.
- Analysis revealed that machine complexity and aging require the ability to recognize a series of cause-and-effect relationships, specifically conditional (if) statements.
- Underperforming new hires (NHs) were most receptive to improvement as they are using operating routines that are less entrenched than those of more senior (NNHs) operators.
- Underperforming Mid Tier non-new hires (NNHs) needed only minor refinements to their problem-solving routines.
- Underperforming Low Tier non-new hires (NNHs) were found to have inadequate initial training or motivation issues.
- Despite losing 60% of operators over the 16-month period, the training program was successful in increasing productivity to target levels.
- Operators trained in best practices experienced a higher retention rate than the department as a whole.

PPI

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PPI is a partnership in leading human capital management practices.

Our collaborations span all industries and business functions, guiding clients toward optimum organizational effectiveness through their people— **where strategy meets performance…**

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