TWI INSTITUTE
THE GLOBAL LEADER

TWI PROBLEM SOLVING

COMBINING THE POWER OF THE J PROGRAMS

WHY USE TWI PROBLEM SOLVING?

"Quickly resolve complex problems involving process and people to get rapid, sustainable business results."

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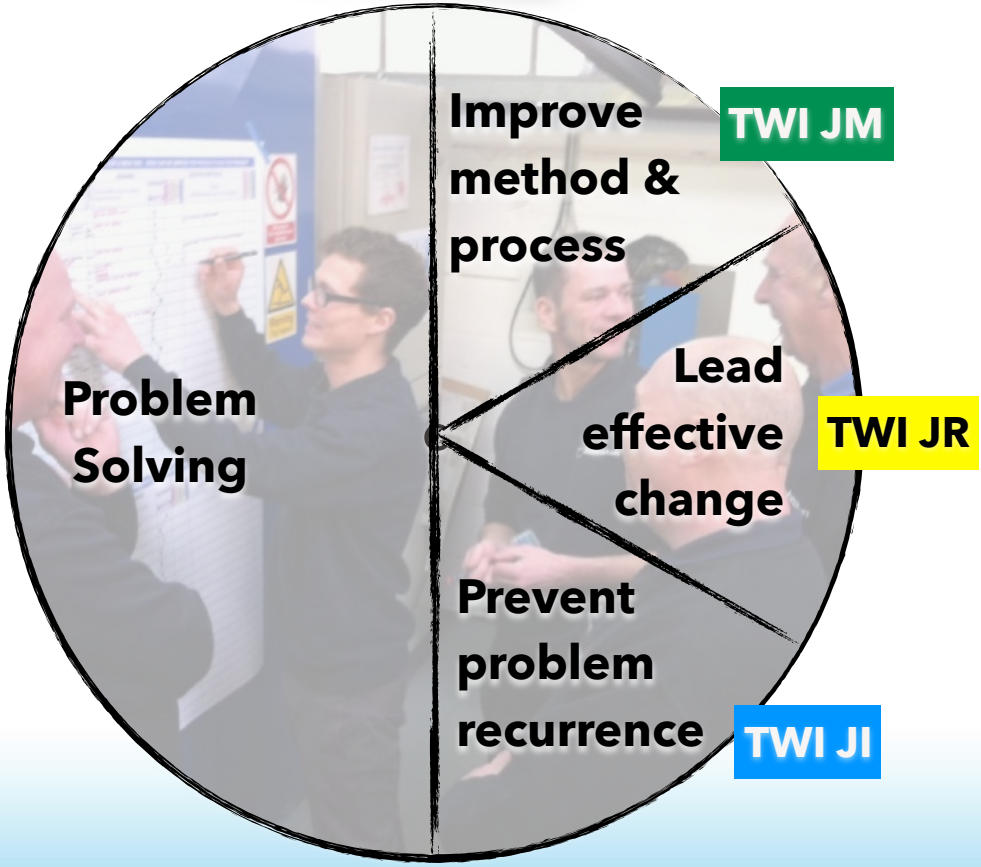
Combines sound industrial ***engineering*** *foundation with world-class* ***people skills***

Unleashes the full power of the three TWI "J" Programs

Fully integrates within ***A3 problem solving & Kata coaching*** *framework*

Delivers outstanding ***business results faster*** *by leveraging the full potential of operators and front-line leaders*



HOW DOES TWI-PS ACCELERATE PROCESS IMPROVEMENT?

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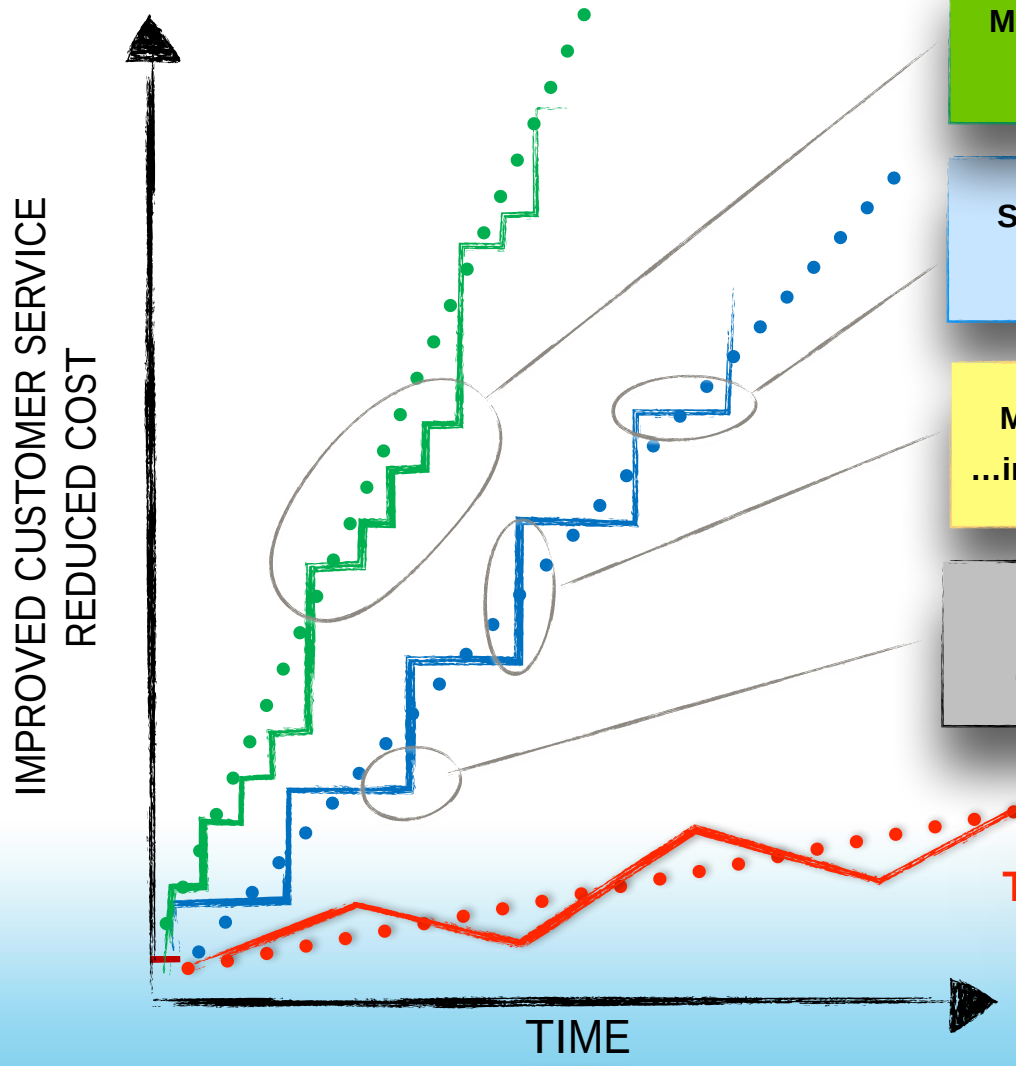
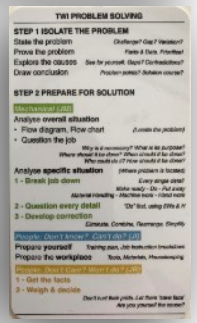


MORE IDEAS & FREQUENT STEPS WITH JM
…improvement accelerates

STABILISE PROCESS WITH JI
… improvement "sticks"


TWI PROBLEM SOLVING
STEP 1 ISOLATE THE PROBLEM
State the problem
Prove the problem
Explore the causes
Draw conclusion
STEP 2 PREPARE FOR SOLUTION
Analyse overall situation
• Flow diagram, Flow chart
• Question the job
Analyse specific situation
1 - Break job down
2 - Question every detail
3 - Develop correction
Prepare yourself
Prepare the workplace
1 - Get the facts
2 - Weigh & decide

MOTIVATE PEOPLE WITH JR
…improvement is easier & faster

ISOLATE PROBLEM IN TWI-PS 'STEP 1'
…to focus on most critical problem points

TYPICAL IMPROVEMENT
…slow & slipping back

WHAT IS A PROBLEM?

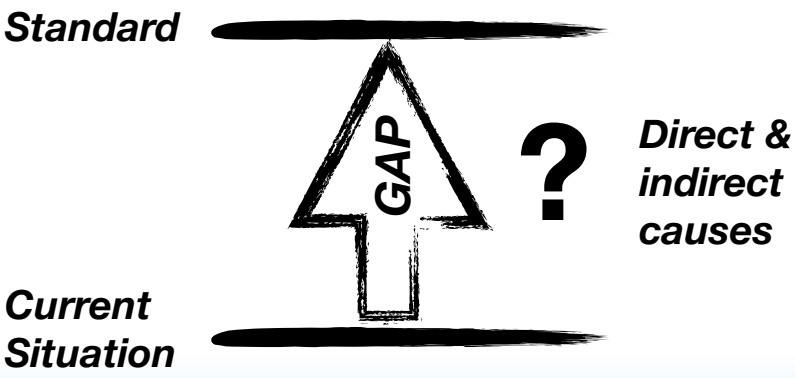
*A supervisor has a **problem** when the **work assigned** fails to produce the **expected results**.*

*A problem is a **gap** between what **should be** happening (standard) and what **is actually** happening (current situation).*

The elements of a work assignment

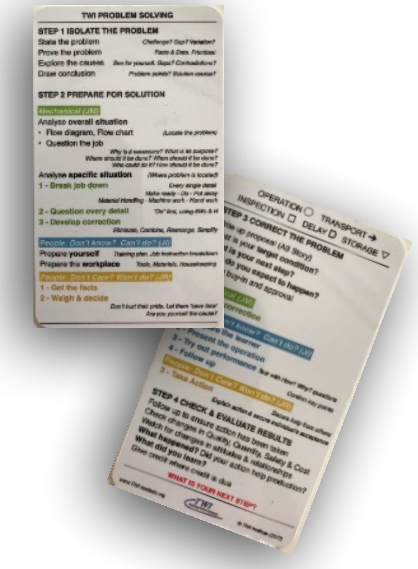
4 Ms

- MATERIALS
- MACHINES
- METHOD
- MANPOWER



TWI PS - 4 STEP METHOD

Step 1: ***Isolate*** *the problem*
Step 2: ***Prepare*** *for solution*
Step 3: ***Correct*** *the problem*
Step 4: ***Check*** *and evaluate results*



Isolate the problem points
Identify the ***direct & indirect causes***
Use the appropriate ***solution course: JI, JM, JR***
… to close the GAP

FIRST, ISOLATE THE PROBLEM...

1. STATE THE PROBLEM

(Gap, variation)

2. GIVE PROOF OR EVIDENCE

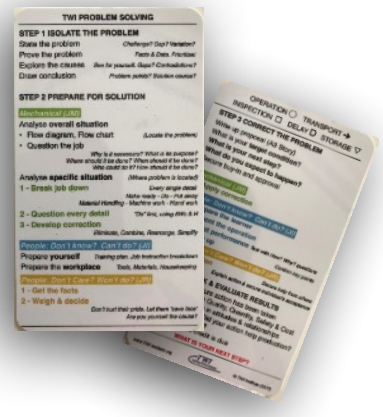
(Facts & data)

3. EXPLORE THE CAUSES

(Direct & indirect causes)

4. DRAW CONCLUSION

(Problem Points? Solution Course?)



EXPLORE THE CAUSES

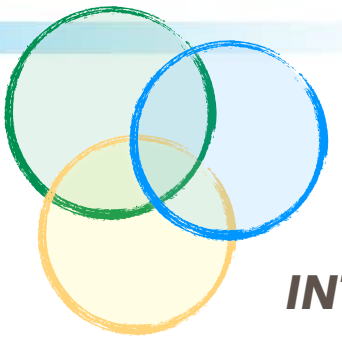
CHAIN OF CAUSATION

INDIRECT CAUSES WHAT IS HIDDEN FROM VIEW	DIRECT CAUSES WHAT WE CAN SEE	EVIDENCE	PROBLEM	IMPACT
Change of setting done during break, operator unaware Supervisor asked everyone to raise output to make targets Setter did not know spindle speed affects hole size	Parts with oversized holes, inspector stopped move Operator drilled holes at higher spindle speed Setter increased machine spindle speed	1000 parts made 600 stuck in aisle Many plates with oversized holes	When operator drilled angle plates as usual, he drilled many oversized holes, and inspector stopped 3 pans of plates from being moved to Dept. 'B'.	Finger injured and operator in pain Production at risk

PROBLEM POINTS: *Most significant or influential causes, direct or indirect.*

2 BROAD CATEGORIES OF PROBLEMS

2 CATEGORIES OF PROBLEM
- *PHYSICAL / MECHANICAL*
- *PEOPLE*



... OFTEN INTERTWINED

PHYSICAL

Method, Layout, Tools

PEOPLE

Doesn't care
Won't do

PEOPLE

Doesn't know
Can't do

...THEN, PICK SOLUTION COURSE TO DIG DEEPER & SOLVE PROBLEM

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Change process
Improve method

Improve knowledge
Develop skill

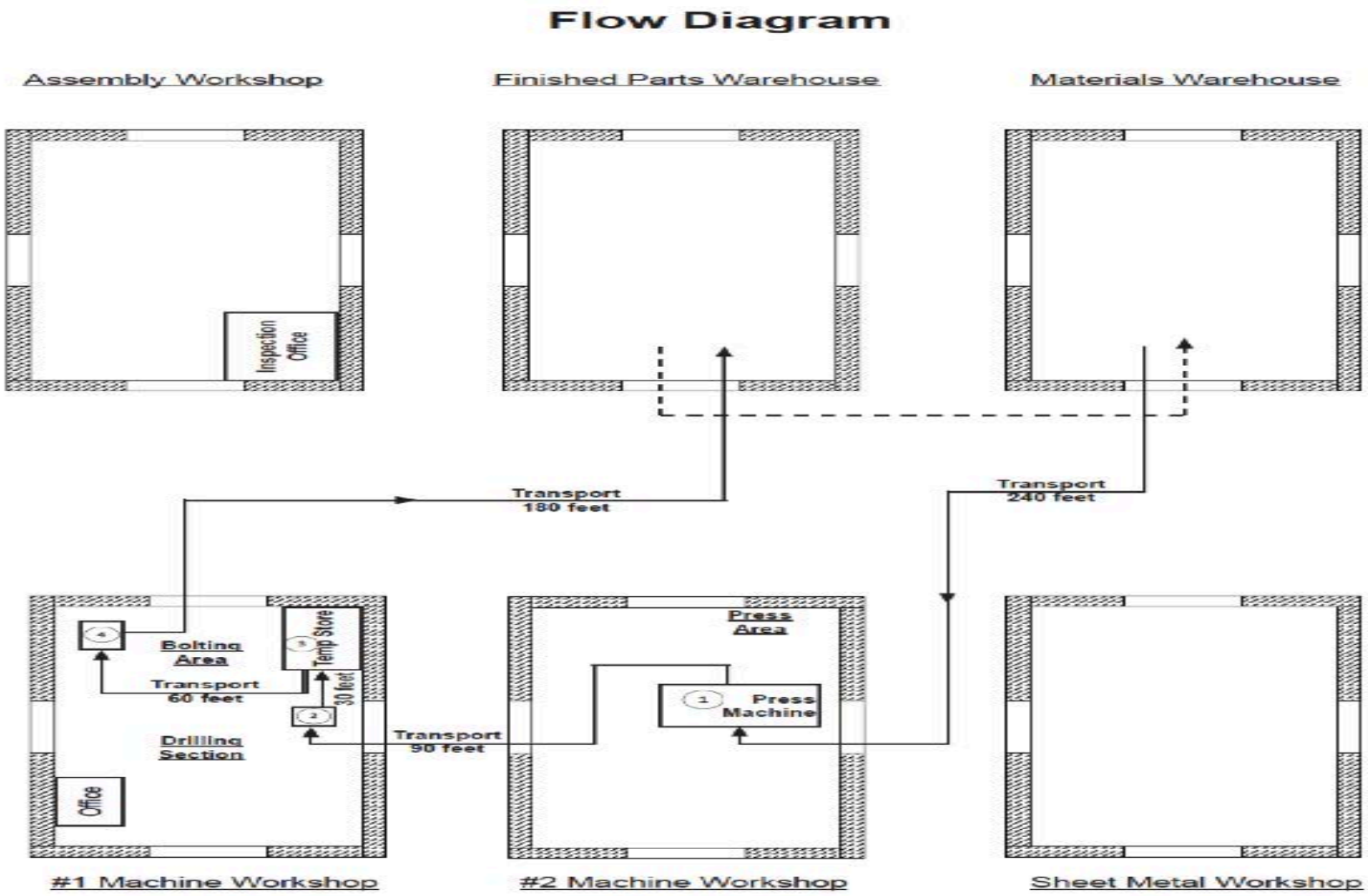
Modify behaviour
Improve relationships

PHYSICAL PROBLEMS: ANALYSE OVERALL SITUATION (FLOW CHART)

ANALYSE OVERALL SITUATION / SPECIFIC SITUATION

	DETAILS OF METHOD Product flow chart: *What does the PRODUCT do?* Job Methods breakdown: *What does the WORKER do?*	TIME, DISTANCE	OBSERVATIONS Conditions or acts that add to the gap? *Method, Variation, Machine, WIP, Defects, Ergonomics …*	FLOW CHART *Does the PRODUCT flow?* ○ → □ D ▽
1	Materials Warehouse			
2	Move to Press Workshop	240'		
3	Cut and Stamp			
4	Move to Drilling Section	90'		
5	Cut Hole			
6	Move to temporary storage	30'		
7	Wait for inspection	25min		
8	Inspect			
9	Move to Bolting Area	60'		
10	Bolt on			
11	Move to Finished Parts Store	180'		
12	Finished Parts Warehouse			

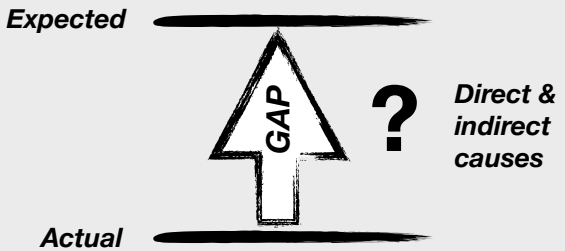
PHYSICAL PROBLEMS: OVERALL SITUATION (FLOW DIAGRAM)



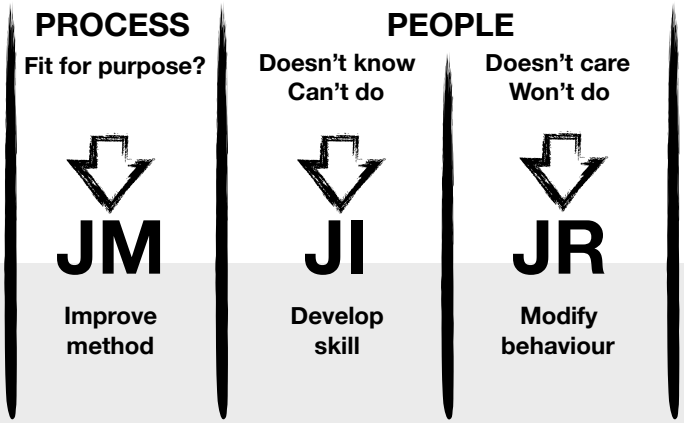
SUMMARY: TWI PS - 4 STEP METHOD

1. ISOLATE THE PROBLEM

Proof & evidence
Identify Problem Points
Select SOLUTION COURSE

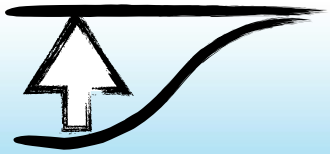


2. PREPARE FOR SOLUTION



3. CORRECT THE PROBLEM

4. CHECK & EVALUATE RESULTS



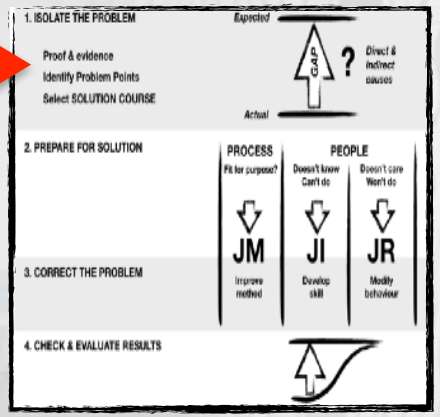
TWI-PS EXAMPLE - QUALITY LABORATORY

BACKGROUND & BRIEF

- *Quality lab **headcount reduction by 2** (incl. micro biologist) affecting day & night shift. 24/5 operation.*
- *Some tasks done previously **only by micro biologist***
- *Team members **complain about excess** workload & appear demotivated & anxious*
- *Need to **ensure continued smooth operation***

EXAMPLE - ISOLATE THE PROBLEM

NOT QUITE WHAT WE THOUGHT… AND MORE COMPLEX



Physical/ Mechanical:

- *High variation in week startup workload*
- *Week startup registrations incomplete during peaks*
- *Periodic tasks often not on time*

People - Doesn't know/ Can't do

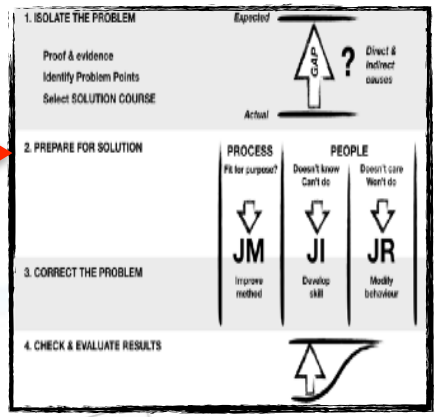
- *Performance variation across team*
- *Team member skill limits collaboration*

People - Doesn't care/ Won't do

- *Poor cooperation between sub-teams*
- *One operator reluctant to take on new tasks*

EXAMPLE - PREPARE FOR SOLUTION

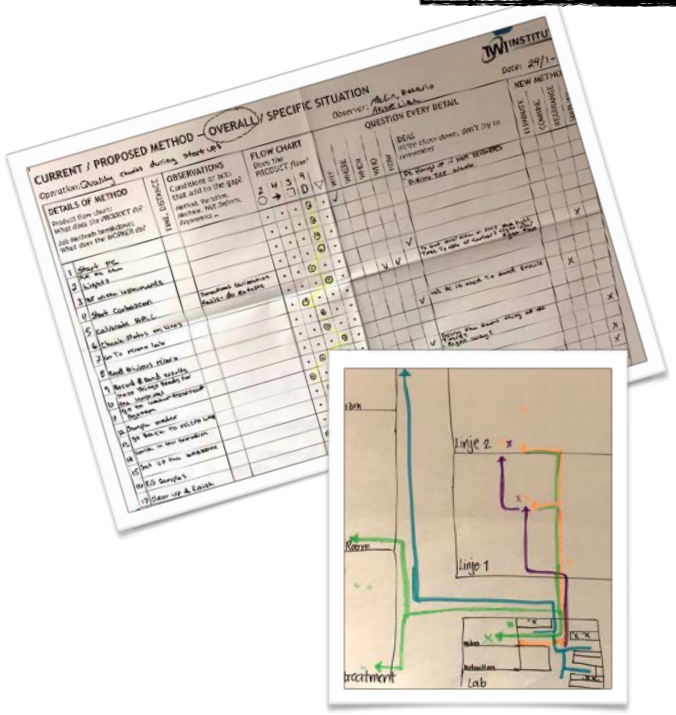
FOCUS ON: WHAT MUST WE DO?



Physical/ Mechanical: *Detailed study of overall situation*

Start-up workload OK for 2 ops, if organised correctly.

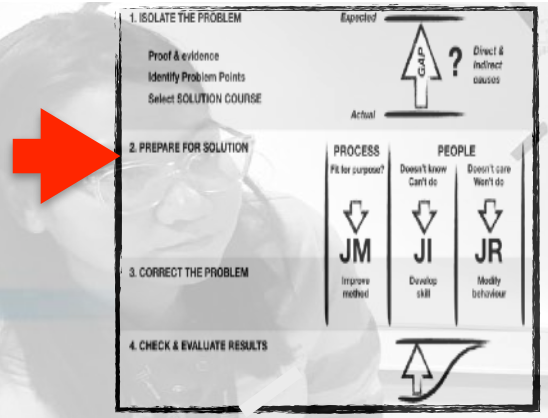
Often non-essential activities done on Friday, whilst urgent ones (prep) left for Sunday.



- *Detailed method for Friday, other tasks: mid-week*
- *Visualise task schedule & completion*

EXAMPLE - PREPARE FOR SOLUTION

FOCUS ON: WHAT MUST WE DO?



People - Doesn't Know/ Can't Do:

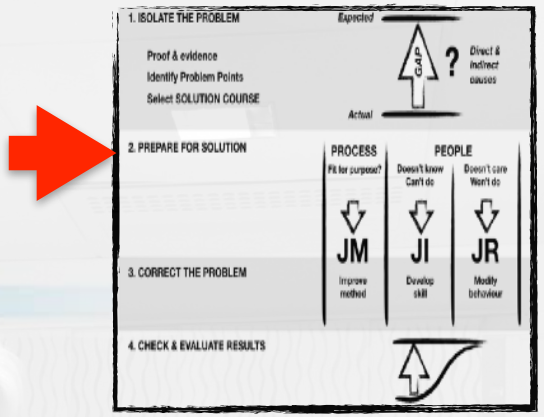
Training Timetable

Only half of operators can do micro testing (many samples = high work content)

- *Train team on new method (Friday)*
- *Cross-train team: micro*

EXAMPLE - PREPARE FOR SOLUTION

FOCUS ON: WHAT MUST WE DO?



People - Doesn't Care/ Won't Do:

Detailed JR analyses for team and individuals

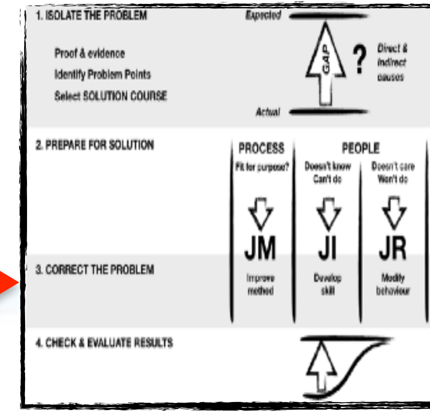
2 sub-teams perpetuated by specialised tasks & meetings.

Poor collaboration on some shifts.

- *Joint team meetings to drive improvement*
- *Individual development plans for 2 operators*

EXAMPLE - CORRECT THE PROBLEM

INCLUDING TWI JOB INSTRUCTION

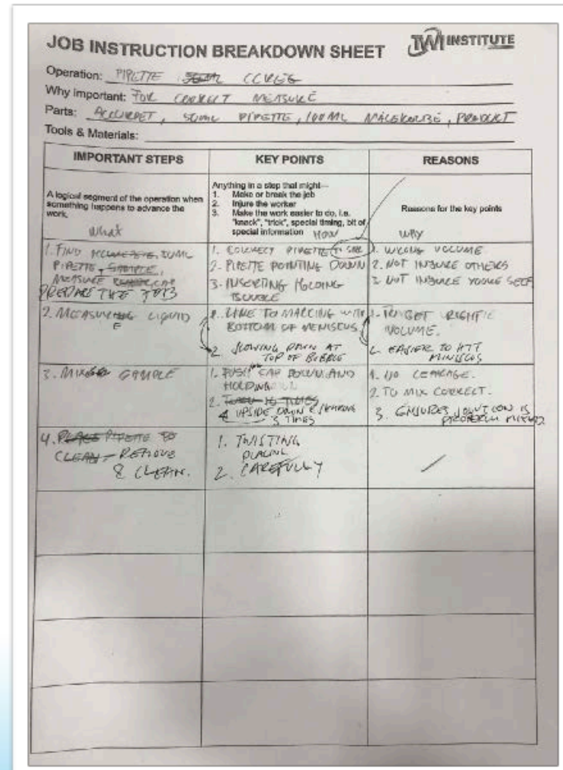


New Friday schedule tested, timed & improved with input of whole team

Visual boards designed & introduced

JI Breakdowns written & operators trained

New leadership routines implemented



JOB INSTRUCTION BREAKDOWN SHEET — TWI INSTITUTE

Operation: [illegible]

Why important: [illegible]

Parts: [illegible]

Tools & Materials:

IMPORTANT STEPS	KEY POINTS	REASONS
A logical segment of the operation when something happens to advance the work. What	Anything in a step that might— 1. Make or break the job 2. Injure the worker 3. Make the work easier to do, i.e. "knack", "trick", special timing, bit of special information How	Reasons for the key points Why
[illegible]	1. [illegible] 2. PIPETTE POINTING DOWN 3. [illegible]	1. WRONG VOLUME 2. NOT INJURE OTHERS 3. NOT INJURE YOURSELF
2. MEASURING LIQUID	1. [illegible] BOTTOM OF MENISCUS 2. [illegible]	1. [illegible] VOLUME. 2. [illegible]
3. MIX SAMPLE	1. [illegible] 2. [illegible]	1. [illegible] 2. TO MIX CORRECT. 3. [illegible]
4. [illegible]	1. TWISTING [illegible] 2. CAREFULLY	✓

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