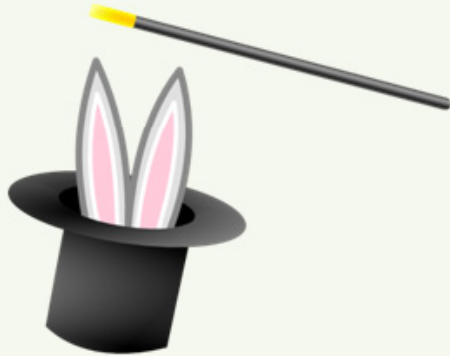


Outline of Presentation

How do we run our plants – by Magic, Art or Science?



Magic, Art or Science

How do you operate your plant?

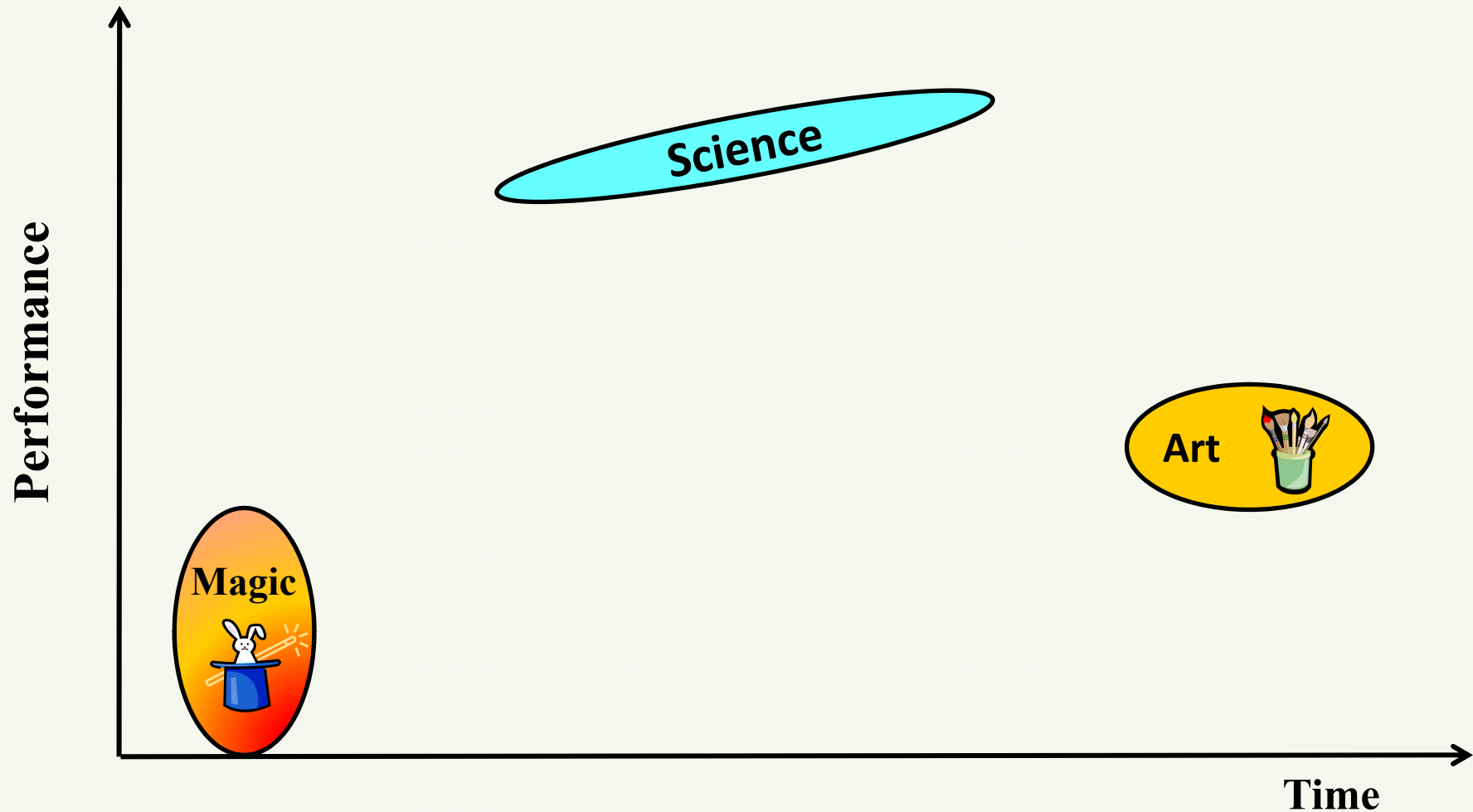
Is Operator training and SOPs enough?

Does experience overcome shortfalls?

What has a F1 driver got to do with being an Operator?

How do we Operate our Plant?

by Magic, Art or Science?



Using Magic, Art & Science to Operate Equipment

My first Car: 1958 FC Holden 6 cylinder, 3 speed manual – column shift (3 on the tree)



Magic

Learning to Drive



Art

**Double Shuffle
of the gears**



Science

Functioning of the clutch

How do we Operate our Plant?



Magic: we employee operators, train them on how all the buttons & knobs work using Standard Operating Procedures and Checklists, and provide examples (standards) of expected performance.

Performance is often average and quite variable.



Art: after many years of experience (provided we don't move them all over the place) our operators develop the understanding of relationships between problem and required action (when this happens, if I do this, I should solve the problem).

Performance improves with less variability.

How do we Operate our Plant?

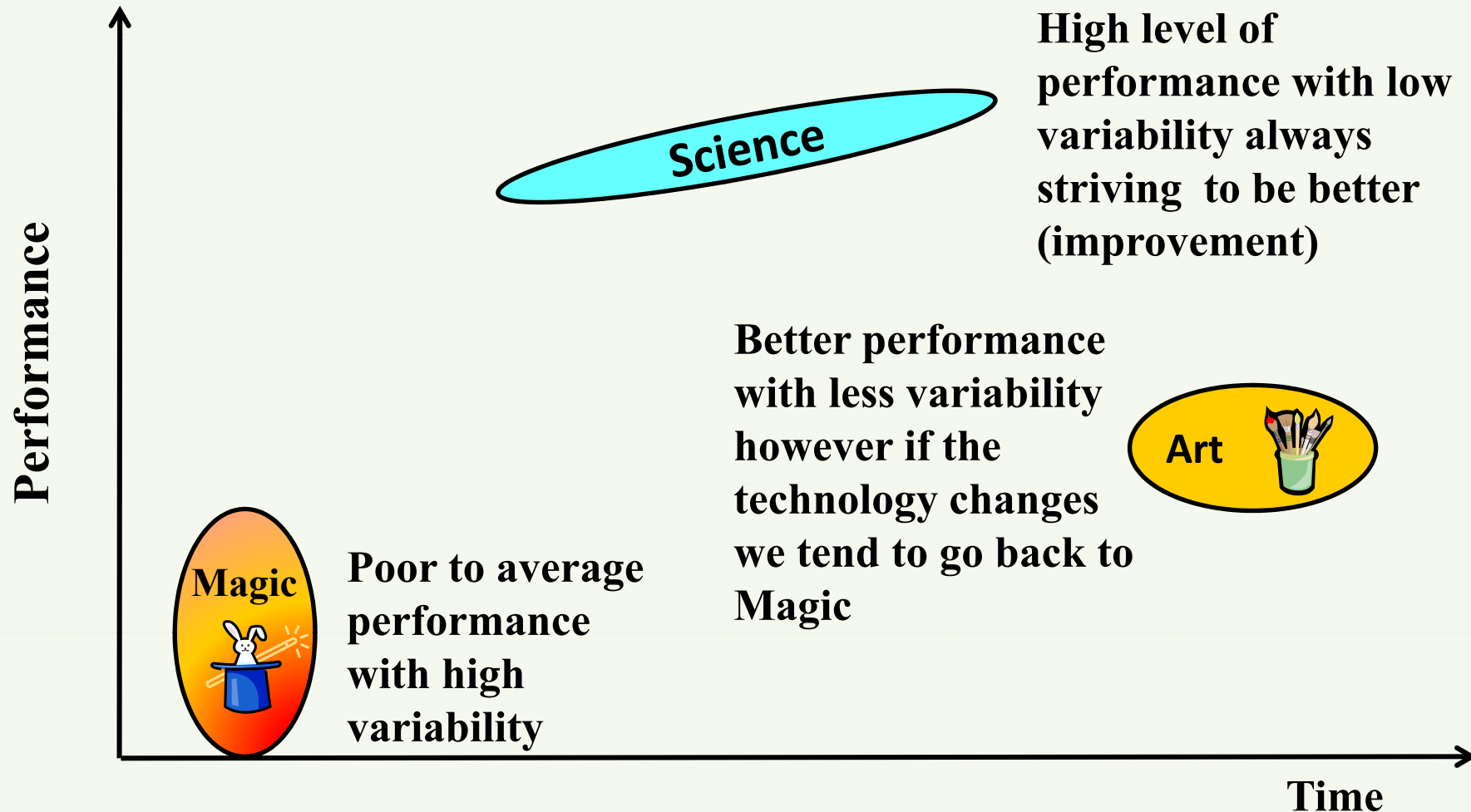
Science

Science: through regular weekly focused improvement activities our operators learn how to care for their equipment and most importantly how it functions (as opposed to just operate) so they can diagnose problems at the earliest possible time to root cause. In parallel through Frontline Problem Solving they develop a greater understanding of the process they are responsible for, so again they can identify problems at the earliest possible time when they are easy to fix.

Performance continuously improves with little variation.

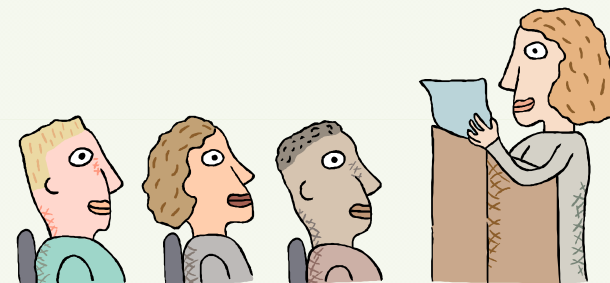
How do we Operate our Plant?

by Magic, Art or Science?





Ask the Audience



How should we Operate our Plant?

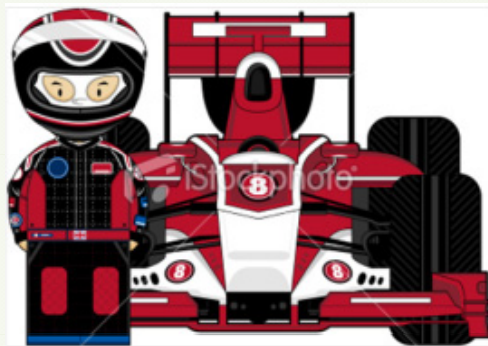
Learning

Operators don't want to be Scientists:

“I would have gone to school longer if I wanted to be a scientist”

Hence we need a better analogy that defines what Operator Excellence is:

The best analogy so far is a Formula 1 driver



They understand the functioning of their equipment (as well as being excellent operators) and diagnose problems on the run relying on a highly skilled and motivated support crew to create a winning team

Tandung Mayang Open Cut Coal - Indonesia



500 Production
200 Maintenance
200 Other

Initial Training: May 2006

Start: May 2007

Level 1: Sept 2008

Level 2: August 2009

Level 3: June 2010

Level 4: June 2012



Tandung Mayang Open Cut Coal - Indonesia



Start: May 2007

Level 4: June 2012

TPM³ Impact at time of Level 4 Audit

Some of the results reported during the Level 4 verification audit included:



233	Cross-functional Teams completed
2,555	One Point Lessons created
1037	Improvement Sheets
25 %	Increase in Large Excavator Output
39 %	Increase in Small Excavator Output
15%	Reduction in Fuel Consumption

Resulting in over \$25m in Cost Reduction

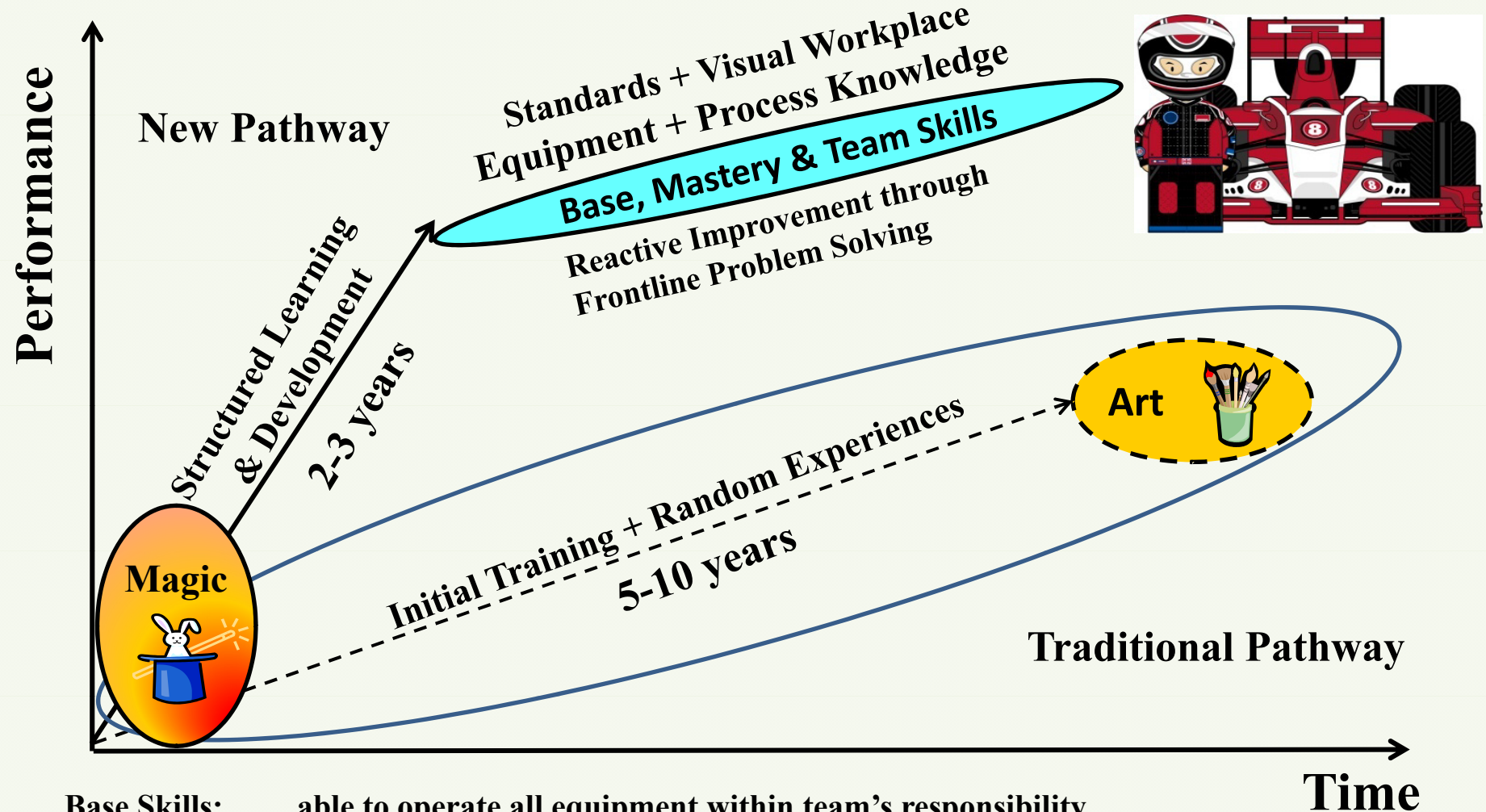
Tandung Mayang Open Cut Coal - Indonesia



Re-fuelling Pit Stop

How can we develop our Operators?

Half-hour lesson each week with encouragement and time for practice



Base Skills: able to operate all equipment within team's responsibility
Mastery Skills: able to diagnose safety, quality and equipment problems at the source
Team Skills: integral player in team achieving synergy

TPM³ Framework for TPM & Lean

incorporating 10 Improvement Activities supported by the Leadership Base

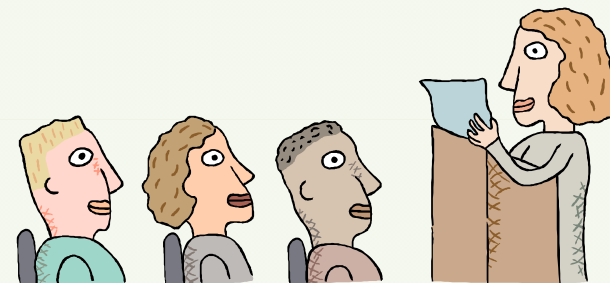
1. Safety & Environment Management
10. Process Quality Management



P = Production Activities; PS = Production Support Activities CF = Customer Focus Activities

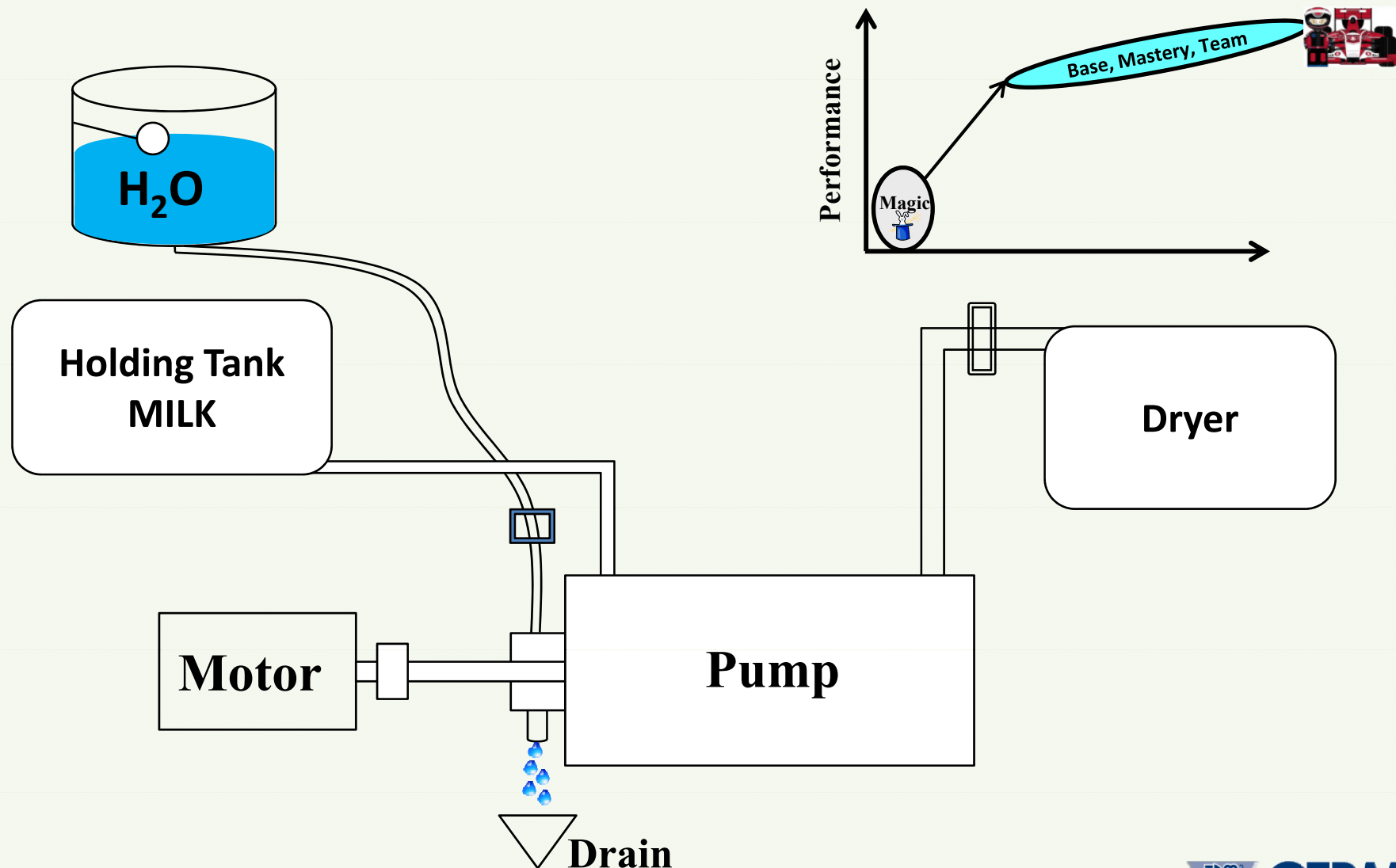


Ask the Audience



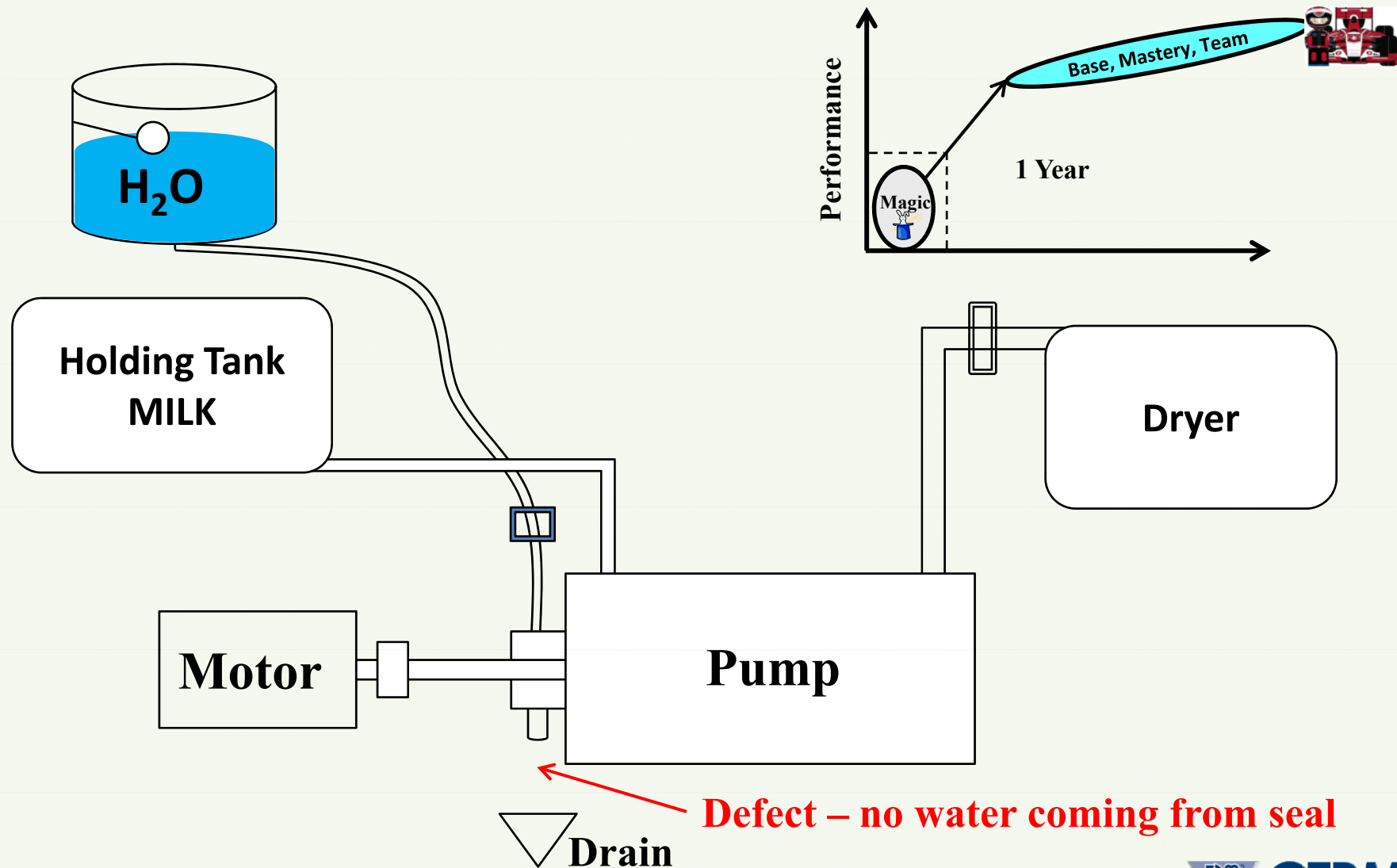
Understanding Base and Mastery Skills (1 of 4)

Base Skills: Able to operate the plant



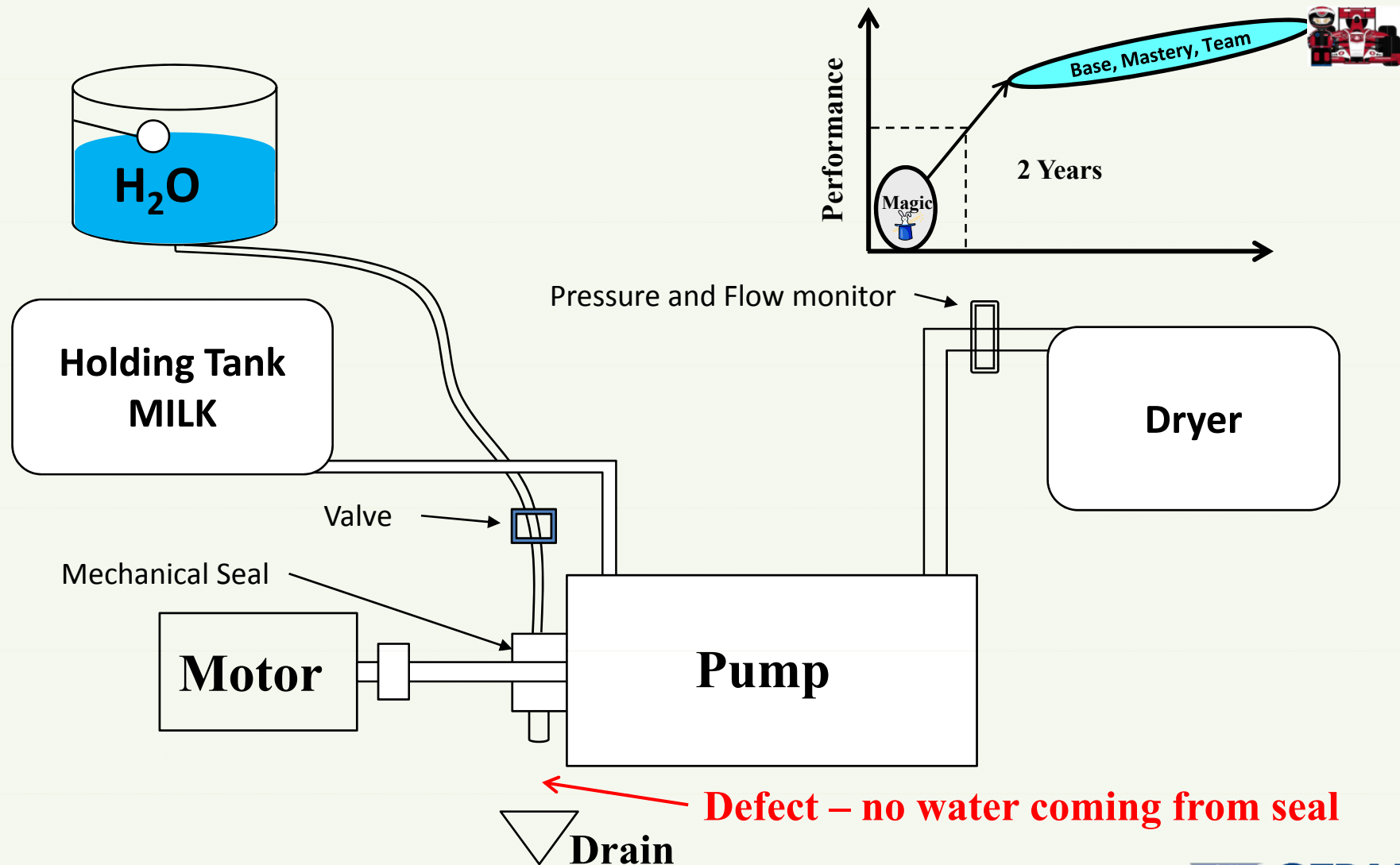
Understanding Base and Mastery Skills (2 of 4)

Initial Mastery Skills: OEM Steps 1-3 (Cleaning for Inspection)



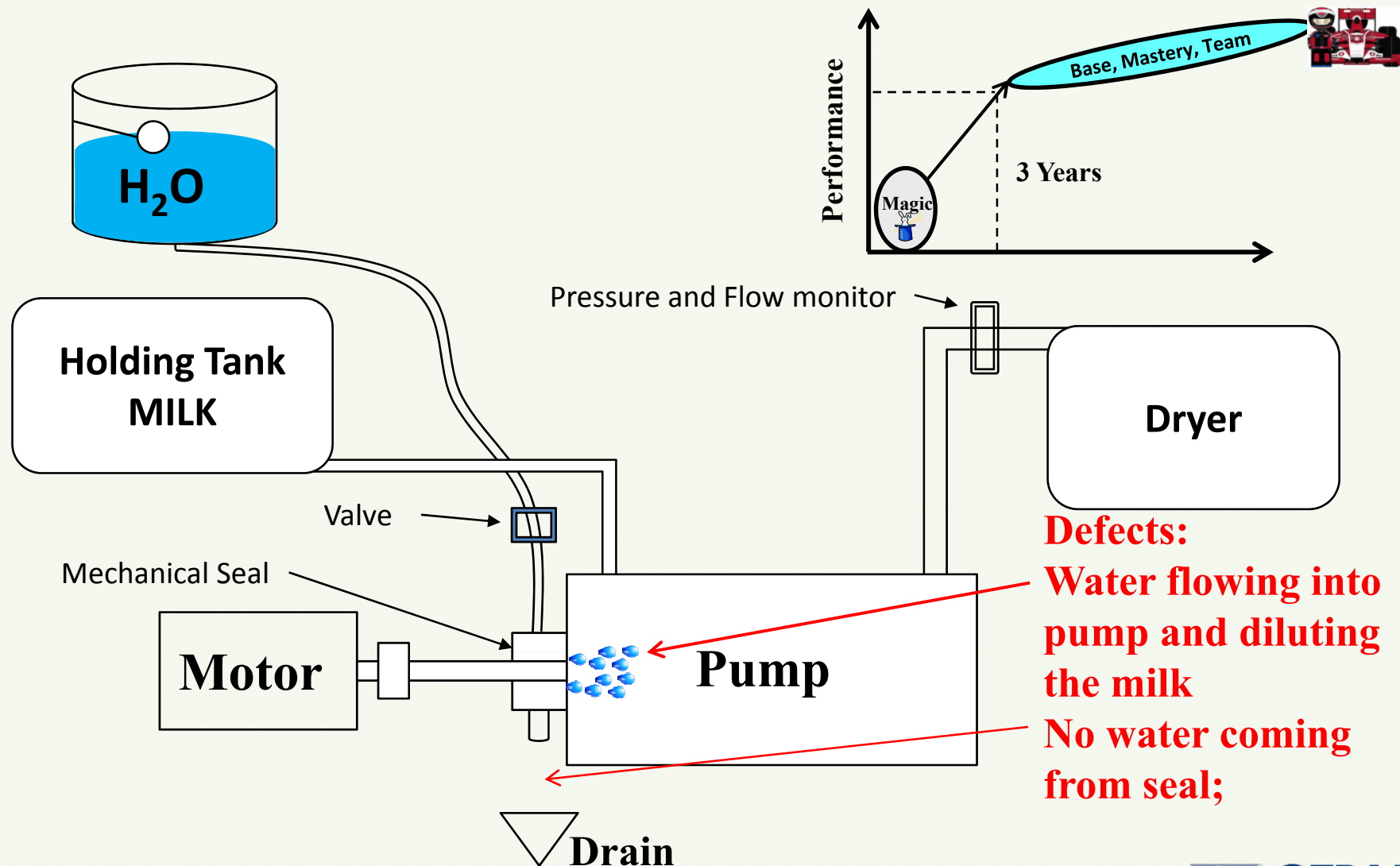
Understanding Base and Mastery Skills (3 of 4)

Further Mastery Skills: OEM Steps 4-5 Training for Inspection



Understanding Base and Mastery Skills (4 of 4)

Mastery Skills: OEM Step 6 Consolidate Quality Assurance



Defects:
Water flowing into pump and diluting the milk
No water coming from seal;

Benefits of developing Operator Mastery Skills

- ✓ Early identification and rectification of defects lead to less frustrations from equipment problems
- ✓ Better relationships (more respect and support) between Production and Maintenance departments
- ✓ Maintenance can often respond quicker due to nature of problem being more clearly explained
- ✓ More knowledge by Operator leads to greater ownership and care of their workplace
- ✓ Time Lost by Maintenance significantly reduced when attending to equipment problems identified by Operators
- ✓ Encourages greater understanding of the equipment by the Maintainer so they can teach Operators
- ✓ Less Quality loss due to unexpected equipment failure or deterioration
- ✓ Less Maintenance repair costs due to early intervention by Maintenance
- ✓ Promotes On-going Improvement

Site Operator Excellence Vision

A Site Operator Excellence Vision should be established to support your TPM & Lean (TPM³) journey by outlining: What do we want to achieve, and by when?

Within 5 years, by using a structured development process, all current Operators will be:

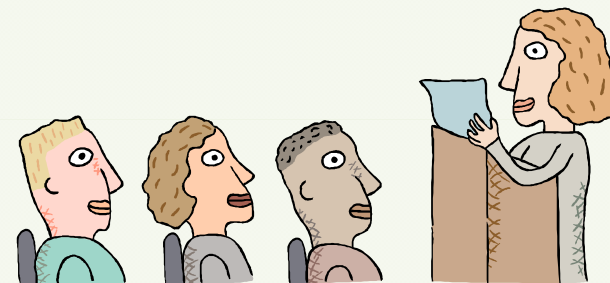
- Competent within their Area Based Team's Area of Responsibility in their required:
 - **Base Skills:** able to operate all equipment to Level 3 competency utilising standardised work practices;
 - **Mastery Skills:** able to diagnose safety, quality and equipment problems at the source at the earliest possible time through excellent equipment and process knowledge
 - **Team Skills:** being an integral player in their team achieving synergy
- Capable of maintaining agreed standards for their work area and equipment conditions based on a visual workplace
- Effective at Reactive Improvement through Frontline Problem Solving

So as to be able to:

- Monitor daily performance and instigate corrective actions to any losses or wastes
- Realise and maintain optimal Work Area and Equipment (Workplace) conditions by setting, recording and monitoring the rules, standards & procedures and records
- Analyse above records to prioritise action to further improve workplace performance
- Conduct regular (daily) self-assessments of team member behaviours to promote Zero Breakdowns, Zero Process or Output Quality Problems and Zero Accidents or Incidents



Ask the Audience



If we want to be serious about developing Operator capability, we need to invest the time and make it a regular activity

The next question then becomes – why bother?

What results have we seen:

Maintenance Costs: Down 30% - 50%

Capacity (OEE): Up 25% - 50%

Quality: Scrap & Rework eliminated

Safety: Zero Accidents or Incidents

Key Learnings



- 1. If necessary create regular weekly time for Operator Equipment Care through Cross-functional Team improvement activity**
- 2. Establish ownership in the workplace with properly structured Production Area Based Teams**
- 3. Use a structured stepped process spanning 12-14 week cycles**

Question Time