



Development of training and learning modules for operators at Glebe

Grant Kaczorowski



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Discussion points



- Overview of Sugar Australia – Glebe Island
- Learning and training concepts
- Training through Operator Equipment Management – clean for inspection
- Setting up the training structure - objectives
- Development of training material -> learning opportunity
- Next steps
- Conclusions
- Questions



Discussion points

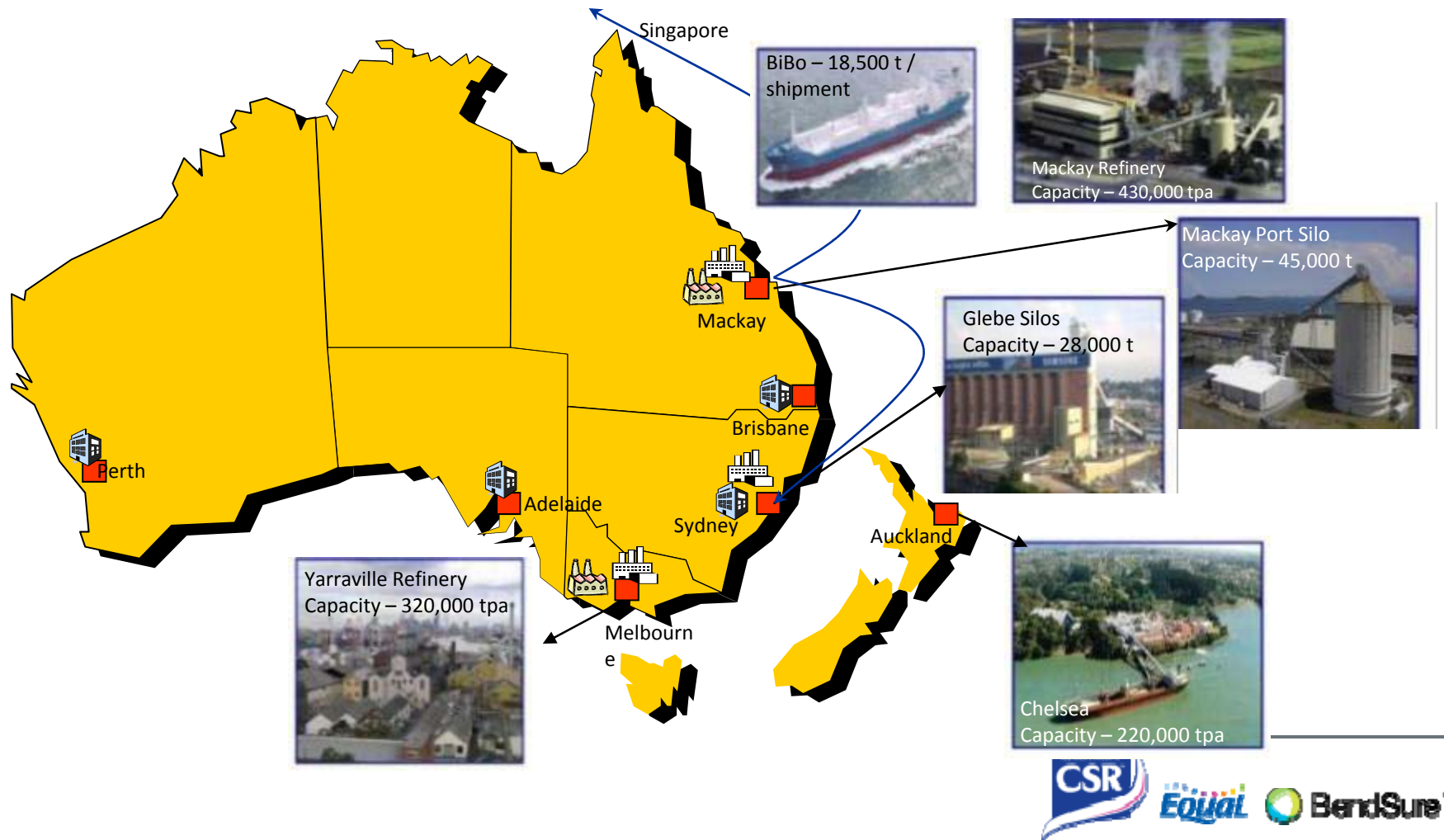


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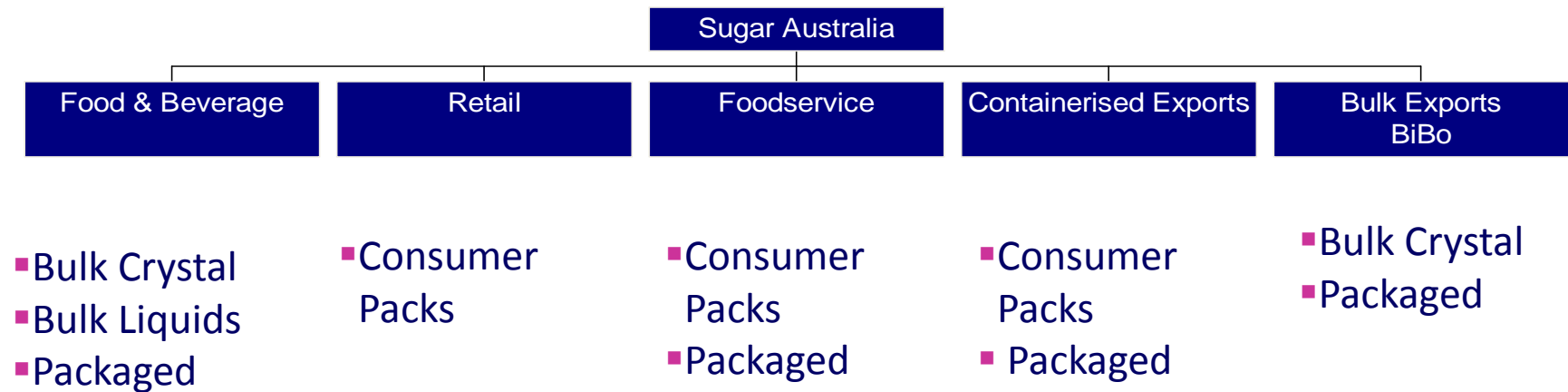


Refining Supply Chain- ANZ



Sugar Australia Sales Channels

The Glebe Site
 60,859 Tonnes – Bulk Crystal
 54,541 Tonnes (dry) – Liquid
 36,030 Tonnes (palletised)










The Glebe Site has delivered a total of 151,430 Tonnes of sugar for the year 2010

5



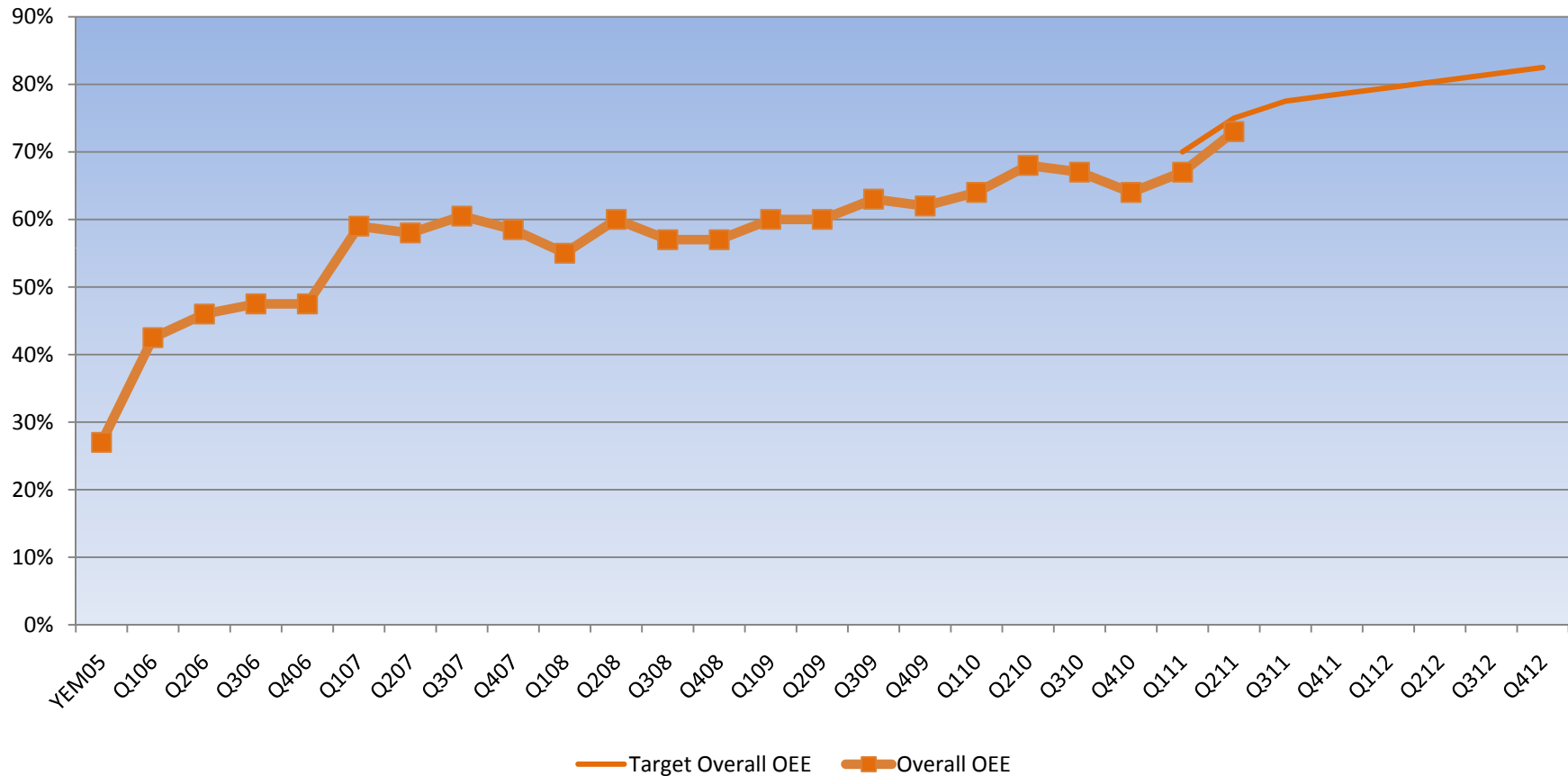
Site Information

-  We have 2 packaging lines: Retail (1,2 & 3kg) and Industrial (15 & 25kg)
-  IBC Filling station packing off 650kg up to 1200kg/Liquid Pallecons.
-  Facility is operated by 23 persons on a 24 x 6.5 day continuous shift roster.
-  4 production teams covering the shifts, with daytime maintenance support
-  We have operated for over **9.5 years without an LTI.**
-  DIFOTIS YTD is 99.52%.
-  ISO 9001:2008, HACCP certified and BRC accredited.



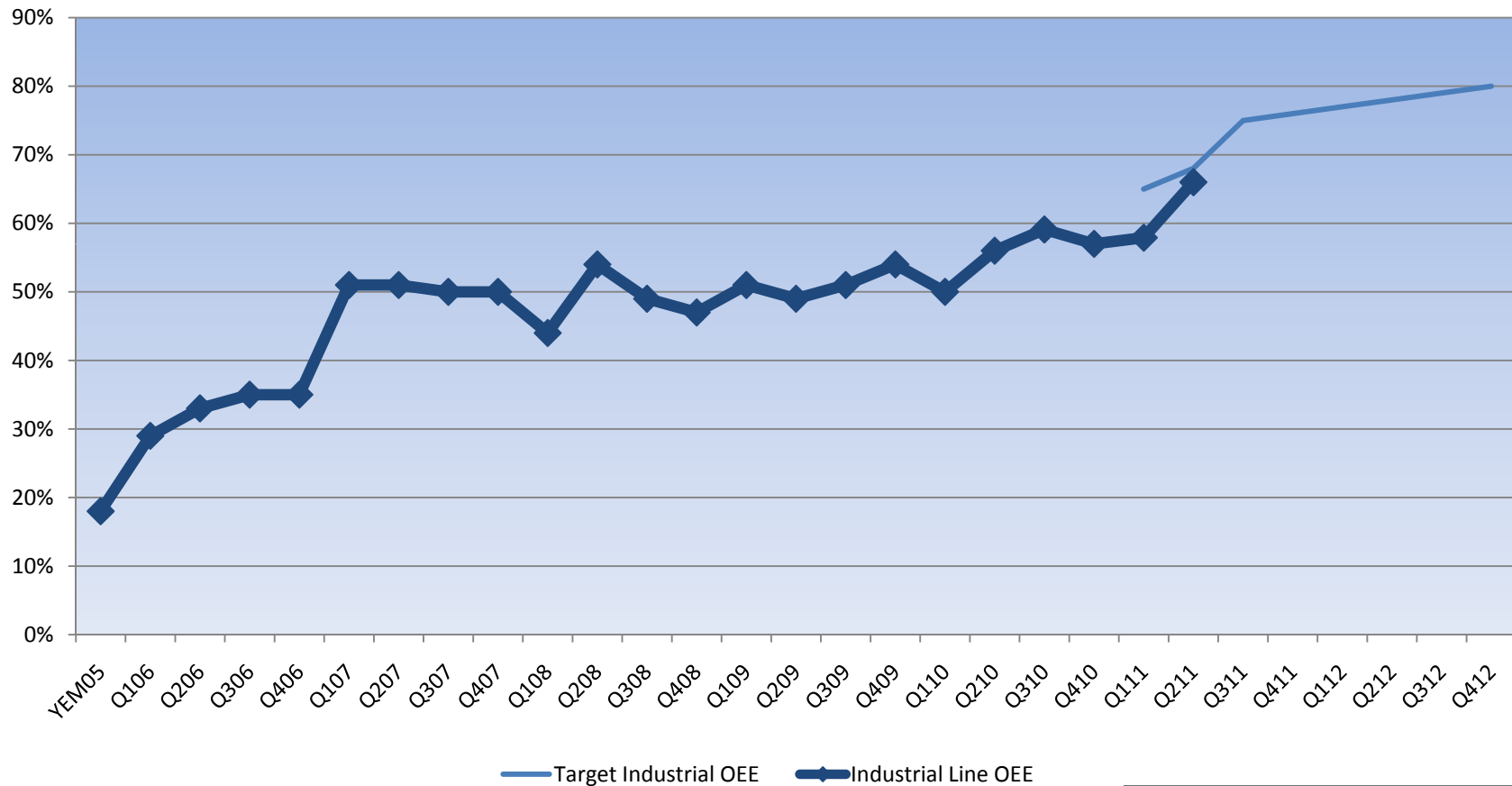


Site OEE evolution from 2005



Industrial line OEE evolution from 2005

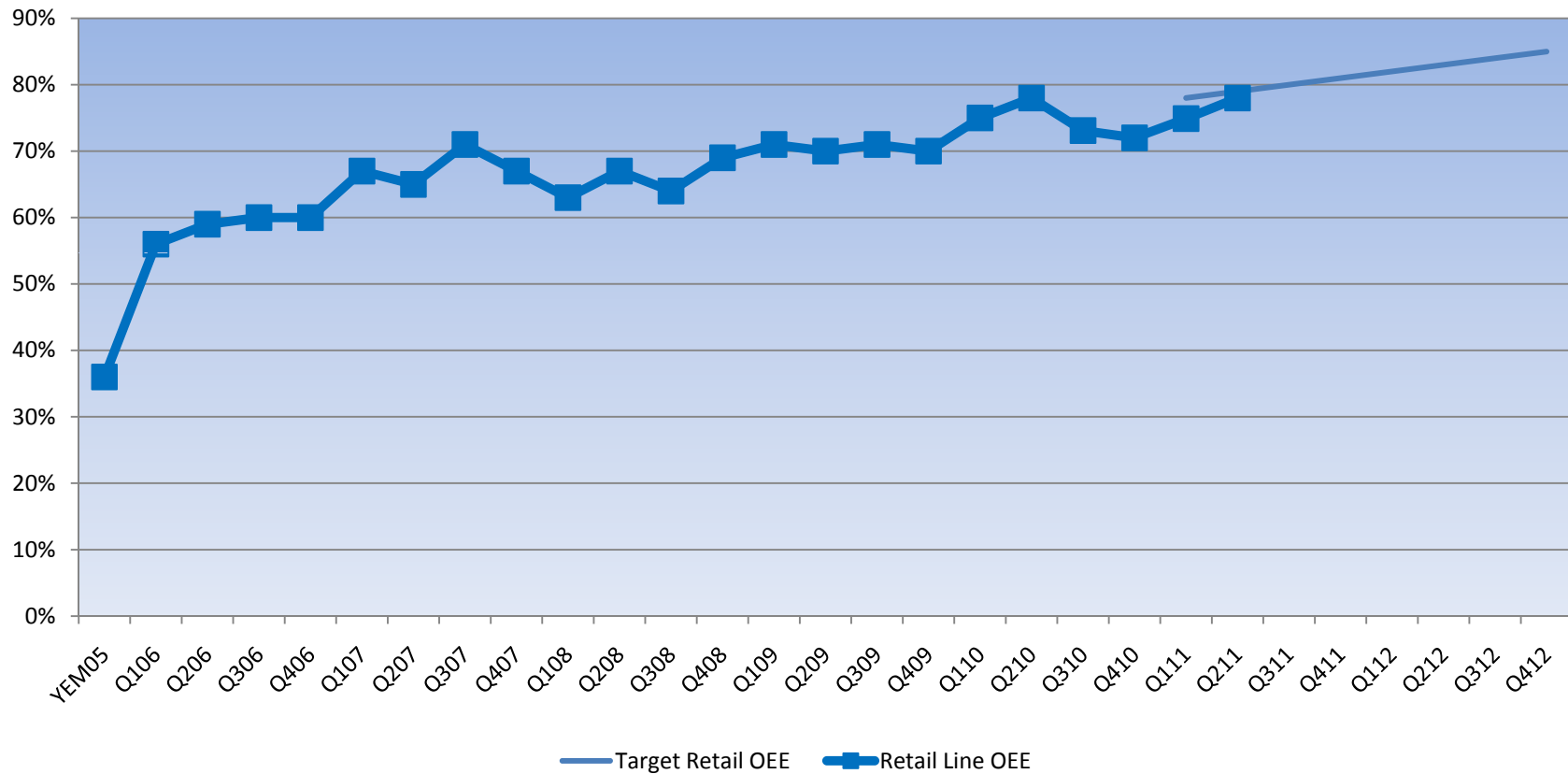
Industrial Line OEE Run chase



Retail line OEE evolution from 2005



Retail Line OEE



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Learning and Training concepts



- Training is delivering information
- Learning is the retention of that information
- Only 10% of information is retained during a training exercise
- Even less is retained after the first 30 minutes
- Understand your employees are different and will learn via different methods -> use variety and set up your plan accordingly
- Learning by doing -> clean for inspection activities as a training tool
- Use the development of training material as a learning exercise
- 'Learning to drive a car'
 - theory learning
 - Practical training
 - Practice, practice some more



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Time needs to be dedicated for improvement activities



Area	# teams per cycle	Time allocation per week
Team Meetings	5-6	30
OEM 1/2 cleaning and defect ID (no set meetings)	3	60
OEM 3 Lubrication activities	3	30
Front line problem solving	N/A	30
Training mats / SOP's / SPL	5-6	45
Total time allocation for CI and TPM		8.5%





Checklist can be used to learn to look for defects

	Visual
	Remove
	Listen
	Clean
	Adjust

Correct Isolating procedures must be followed

Date of clean:

Operators:

Item: Newlong Bag Magazine

Date Developed: 17/10/2007

Developed by: Carmine Caruccio

Date Reviewed:

Reviewed By:

Signed Off:

Pages: 2 of 3

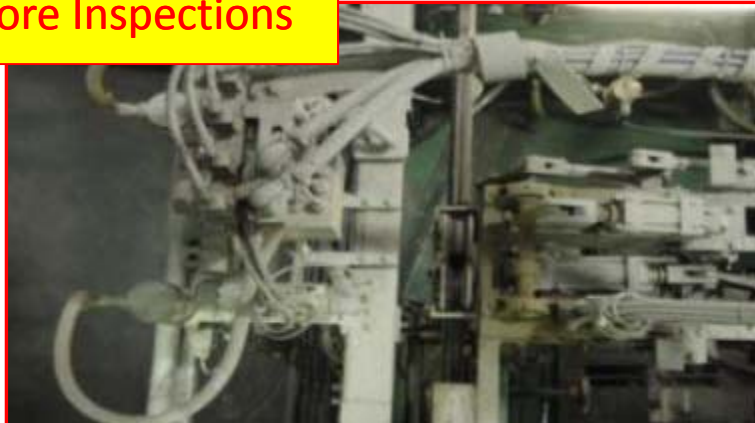
Item	Standard	Target Time	Action	Completed	
1. Clean & check the stay bars	Clean, No cracks visible	2 mins		Yes	No
2. Check & clean photo sensors	Clean, No damage to sensors	2 mins		Yes	No
3. Inspect all cylinders	Clean, no air leaks, nuts & bolts all tightened	2 mins		Yes	No
4. Check & clean air lines, inspect for air leaks	Clean, No air leaks in hoses	2 mins		Yes	No
5. Check & clean rollers	Clean, operates freely	2 mins		Yes	No
6. Check all electrical cables & wipe down	Clean no Frade or loose wiring	5 mins		Yes	No
7. Clean & check support frame for cracks broken welds	Clean, No cracks visible, nuts & bolts all tightened	5 mins		Yes	No



Industrial Line - Before & After inspections



Before Inspections



After Inspections





Benefits gained from OEM activities



Tangible benefits



Easier to find and remove defects



Equipment operates more effectively -> increased OEE



Improved GMP



Improved safety



Learning benefits



Learning by doing



Operators understand a clean machine makes their job easier



Learn to look and identify defects -> normal vs abnormal



Discussion points

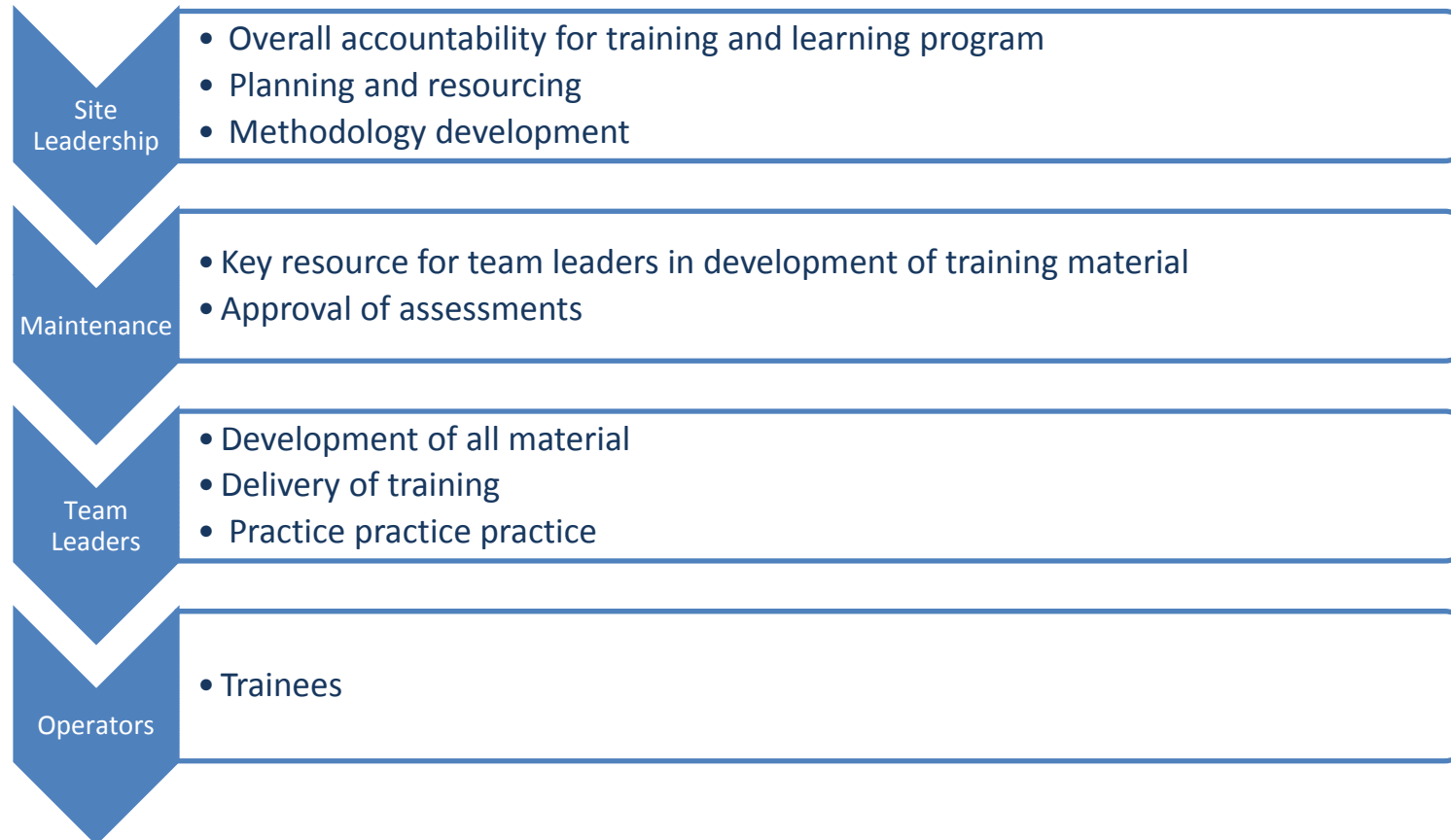


- Overview of Sugar Australia – Glebe Island
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- **Setting up the training structure – planning & objectives**
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Site training and learning responsibilities





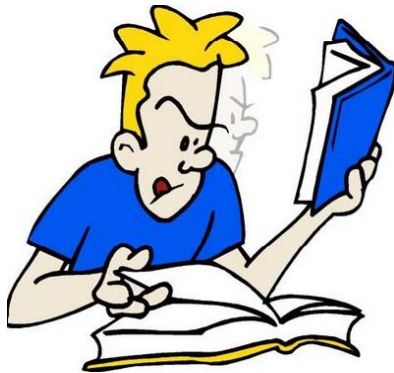
Setting up a training program

-  At Glebe 3 months dedicated to planning the training program and structure (still ongoing)
-  Be very clear on the outcomes your program will deliver
 -  Only 10% of information is retained
 -  Make the training sessions short <15 minutes
 -  Standardised times so the training becomes autonomous
- 'Learning to drive a car'
 - Theory learning
 - Practical training
 - Practice, practice some more





Learning to drive a car



Theory



Practice
Practice
Practice



What are the implications of not training operators?



By only completing a section of training, what would be the implications for your site?

 Poor OEE?

 Poor quality?

 Accidents?



Training Development Schedule



Training for the site

GEM 4 training development schedule

	Q1 2011	Q2 2011	Q3 2011	Q4 2011	Q1 2012	Q2 2012	Q3 2012	Q4 2012	Q1 2013	Q2 2013
Site methodology development										
Emergency Stops										
Lubrication										
Filter Regulation										
Intensifier										
Air Cylinder										
Light Curtain										
Safety Switches										
Vacuum Pumps										
Belt Drives										
Chain Drives										
Belt Tracking										
Machine Vibration										
Improving insulation										
Insulation										
Switches										
Hand guarding										
Confined Spaces										
Permit to work										
Hot work Permit										
Lock out - tag out										
Pneumatic system devices and components										
Cabling and wires										
Computer equipment										

Training for Inspection – material timeline



		Schedule for training Modules											
Task required to complete training module		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
1	What it looks like	■	■										
2	What the purpose	■	■										
3	How it functions		■	■	■								
4	How it's used		■	■	■								
5	Safety implications					■	■						
6	Failure modes					■	■						
7	Trouble shooting					■	■						
8	Powerpoint validation							■					
9	Theory demonstration session							■	■				
10	Practical workshop session									■	■	■	
11	Competency based assessment									■	■	■	
12	Set up folders, place on the intranet												■

Mid point presentation

Final presentation



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Team Leaders develop standard training modules



- ❖ Key Learning outcomes from each training module.
 - ❖ What it looks like.
 - ❖ What is the purpose.
 - ❖ How it functions,
 - ❖ How it's used.
 - ❖ Safety implications
 - ❖ Failure modes.
 - ❖ Trouble shooting.

- ❖ Why develop standard modules using team leaders?
 - ❖ Research is one of the best learning tools
 - ❖ Modules developed to the same standard each time
 - ❖ Quicker to develop
 - ❖ Higher retention of information by operators





Emergency Stop Category 3 Packing plant

Raj Rao , Kyaw
March 2011



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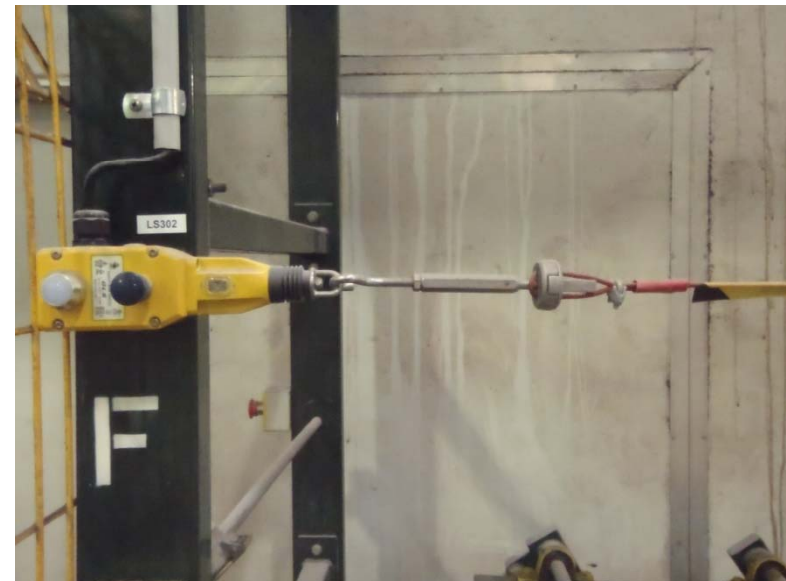


What does it look like ?



Red Mushroom shaped button with a yellow background colour surrounding E-Stop

Production area



E-Stop Lanyard is encased in a yellow rectangular box with a reset button coloured blue

Production area



What is it and what's the Purpose?



The Purpose of the Emergency stop is

- to protect people and equipment
- dissipates all energy sources for the equipment (electrical/pneumatic/stored)

Category 3 emergency stop system is

- A system with a monitored safety relay.
- The safety circuit is constantly monitored to prevent failure of the system.
- A failure of system will result in lock out of the area monitored.



How does it function?



- **when the emergency stop is pushed**
- **The emergency stop will remain in**
- Power is cut to a safety relay
- The safety relay cuts power to the machine and associated machines.
- The electrical power is cut in two places.
- Compressed air supplies are removed by disconnection of the electrical control.
- **How does it reset ?**
- The emergency stop must be released by turning the button until it pops out.
- or in case of a lanyard pressing the reset button.
- The system reset (blue) button needs to be pushed to reactivate the safety relay
- The safety relay will then restore power to the machine.
- The equipment control power push button is pressed.



How it's used ?



- To actuate : Press the red emergency stop, the emergency stop stays in, the entire line stops. The red light will be ON, on the control panel. Yellow light flashes.
- To reset: The red button has to be turned clockwise and the spring return brings it back to normal position. Red light turns OFF after pressing the blue master reset.
- Equipment start turns Yellow light OFF.
- Green Indicator ON, System OK.



Safety implication



- **In the event of an emergency stop being purposefully activated the team leader must ,**
 - **Determine the cause of the event**
 - **Complete an investigation report**
 - **Ensure the equipment is in a safe condition before restart.**
- **After an activation of an emergency stop**
 - **the equipment may still move**
 - **there may be stored energy (gravity)**
 - **isolation procedures are to be followed.**





Failure modes

- **Sugar dust can prevent it functioning**
 - The sugar dust and moisture can cause the emergency stop to be sticky or jam.
 - if an emergency stop has jammed then clean it with a damp rag
 - Report it to maintenance.
- **A emergency stop system fault occurs**
 - the safety relay will lock out and cannot be reset
 - the equipment will not be able to restart.
 - Report to maintenance
 - Raise a work order
- **If the emergency stop does not react ,**
 - Report to maintenance
 - Raise a work order
 - Isolate the equipment using LOTO procedures.





Trouble shooting

Issue	Cause	What to do or check
The emergency stop does not reset	-the button could be jammed and require cleaning from sugar	-Twist and pull the button out & clean the emergency stop - If the above is not successful call maintenance
The emergency stop does not work or stop the line.	- There are broken contacts inside the emergency stop	- Stop the line and isolate the machine - Call maintenance
The line stops for no reason	- An emergency stop has been accidentally activated	-Go to the control panels and check the red indicator lights. This will show the area the emergency stop has been activated. - Check all emergency stops in the area by activating and resetting them. -Reset the emergency system and Restart the control power
The emergency stop system does not reset	- Internal system failure	-The red light will be on, the emergency stop are all reset. The system will not restart when the master reset is pushed. -Call maintenance
lanyard will not reset	-Rope tension is to high or low	-check the tension indicator on the switch -ensure that the lanyard is not caught or broken. -Call maintenance

Practical training/testing



Emergency Stop Category 3 Packing plant

- Show examples of e stops
- Show examples of lanyard
- Show Cat 3 safety relays (Electrician only)
- Show activation, reset, and indicators of both e stops and lanyards.
- Practical testing
 - Trainer to activate an e stop or lanyard and trainees to identify and reset line for re start.



Assessment – open book



Name.....

Date.....

Question	Answer	Passed successfully (Y / N)
Explain how an emergency stop is activated	push the e stop button, or pull a lanyard	
Explain how an emergency stop button is reset	E-stop button needs to be twisted to pop out lanyard needs the button pressed	
Explain what happens if an emergency stop is activated	all power is removed, red light comes on	
If a red indicator on the control panel is showing, what does that mean?	emergency stop in this area has been activated and the system has not been reset the system has an internal fault.	
Explain what you would do if an emergency button is pressed purposefully	inform the team leader team leader to investigate and complete incident report.	
What would you do if the emergency stop system does not reset	check the red indicators to see which area is the problem. activate and reset all the e stops and try to reset again. Then call maintenance.	
Trainers signature.....		

Key points in material development & delivery



- ❖ Make the training sessions short -> 15 mins or less
- ❖ Use pictures / videos and examples from your site
- ❖ Trouble shooting guide
- ❖ Open book exam -> training to study
- ❖ Assess what you want the operators to know and understand





Next steps

- ❖ Continue training material development
- ❖ Standard training times per week
- ❖ Use operators to start to develop material to increase learning
- ❖ Development of machine trouble shooting guides
- ❖ Change from presentation to 'study mode' and assessment for operators
- ❖ Update clean for inspection standards
- ❖ Ongoing methodology development and update





Conclusions

- ❖ Ensure you understand the outcomes of your training modules
- ❖ Use a variety of training options -> learning to drive a car
- ❖ Use cleaning for inspection to start your learning development program
- ❖ Material development is also a learning experience
- ❖ Practice, practice and practice some more





Questions



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