Lessons Learned

27th March 2009

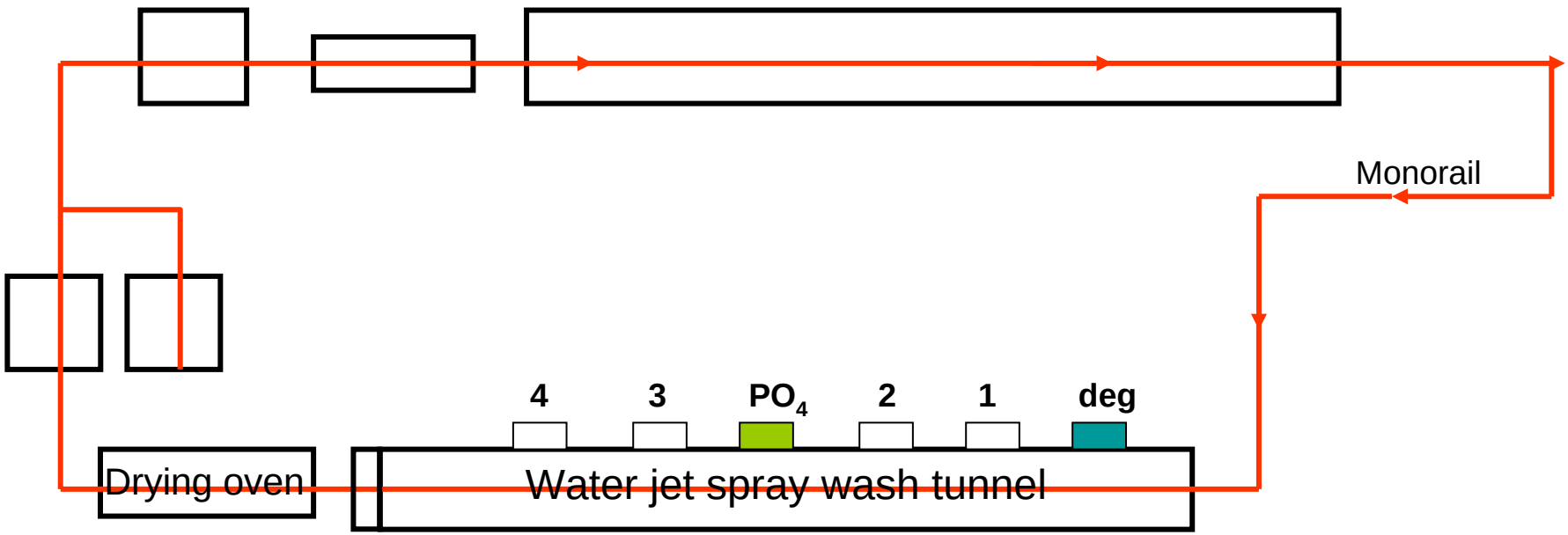
Lessons learned

- Types of plant
- What happened next and what the outcomes were
- Risk assessment & water companies
- Plant manufacturers

Plant

- 8 different designs of paint plant
- Various ages some over 20 years
- Over 100 years of plant/years operation
- Drained 4 times a year, varied level of cleaning of sludge

Refresher of plant plan



Tunnel

Spray nozzles

Vapours

Tanks

Tanks

What happened next.

- All plants drained down, cleaned. Chlorinated where LP tests positive.
- 4 out of 5 powder paint plants tested positive for LP at some stage.
- Biocide dosing regime and monitoring
- Reviewed risk assessment and management plan

What we found- Initial draining

- Restrictions on ability to discharge those volumes of water.
- Recycling due to environmental/water use concerns

What we found- cleaning

Practical issues e.g.

- Design for cleaning
- Methods of cleaning- e.g. jet washing
- Expert advice conflicting or lacking
- Corroded tanks and pipe work.

To biocide or not to biocide

Raise temperature?

Lower temperature?

Insulate?

Non chemical sterilisation?

Which biocide……corrosion and process?

Biocide dosing

- Unplanned experiment of different dosing regimes.

Frequently added biocides

- Hypochlorite based.
- Isothiazolone based.

Moved to continuous dosing regimes

Monitoring of Dip Slides (daily) and LP tests (weekly).

Biocide choice

- Isothiazolone

Brief half life, variable response. Had to add silver peroxide in addition.

- Hypochlorite

Regular monitoring- popular with employees.

pH issues

Showed some tanks very difficult to maintain.

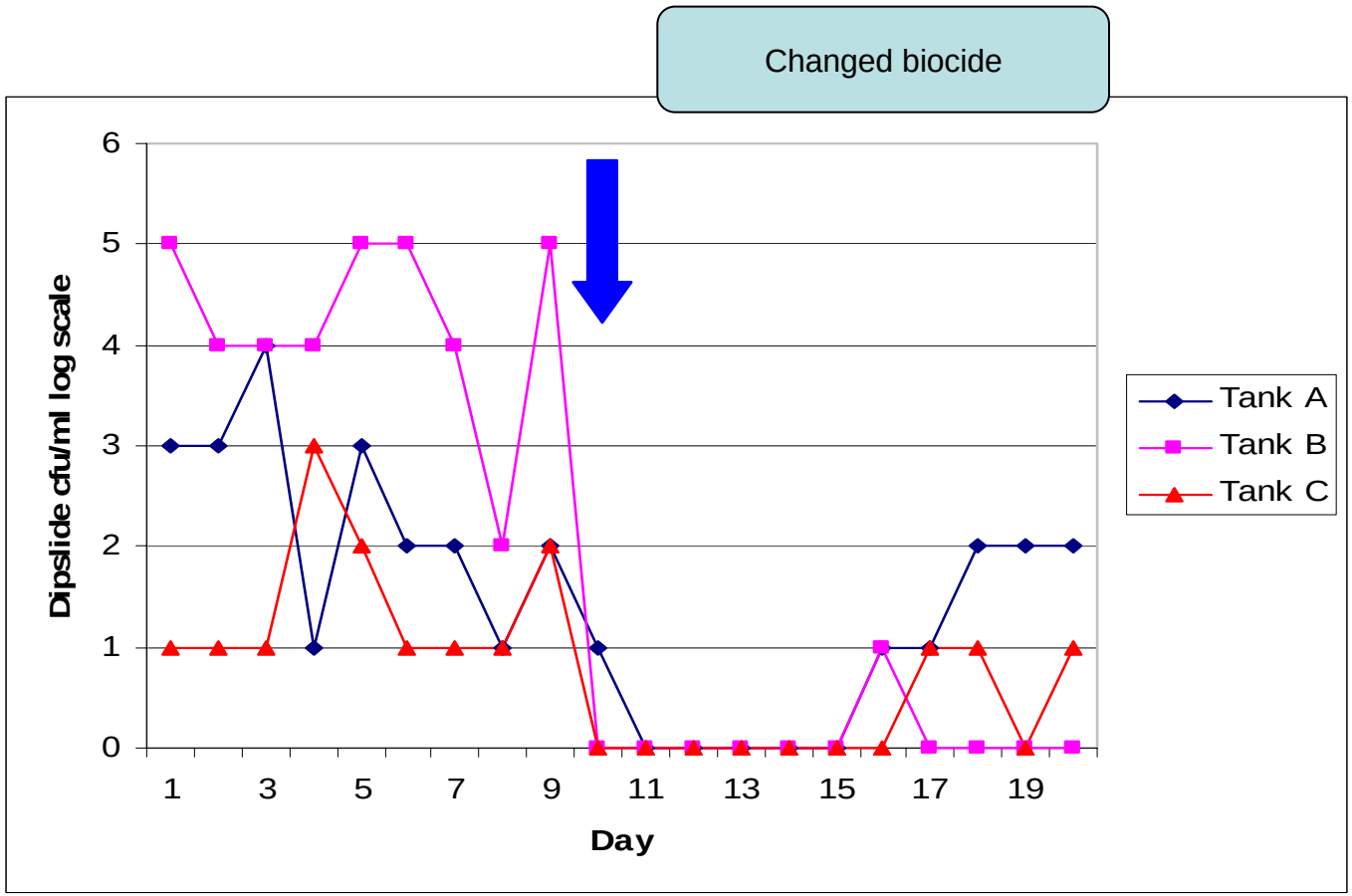
Biocide choice

Bromination units- fitted at one facility.

Trichloroisocyanuric acid tablets

- Popular and easy to use
- No issues with half life
- Excellent results

Result of changing biocide



Risk assessment and management plan

- “Mmmm….you might want to clean it…”

- General reference to L8

Plant manufacturers, process suppliers

- No handbook information
- No guidance from process chemical suppliers

Management plan

Shutdowns x4 a year

- Chlorination and clean

Weekly at some plants (deionised water)

- Drain and general clean.

LP tests

- Was weekly, then monthly, now mainly quarterly

Dip slides

- Daily, now reducing.

Clean and chlorination

- 2 eventualities

A. All dip slides clear or very low counts…..no change

B. Dip slides higher…..no change either.

Effects of cleaning-chlorination >50ppm

Week Before		Week 1	Week 2	Week 3
10^5		0	0	10^3
10^5		10^3	10^3	10^3
10^5		10^3	10^5	10^5
10^5		10^3	10^3	10^5
10^3		10^5	10^5	10^3

Future

- Legionella control group to review progress.
- Move to best practice
- Move to ambient temperature degreasing processes.

Thank You

Any Questions