Man / Machine Interface
Dale Church
Man / Machine Interface

- Background
- Behavioural Study
- Awareness Training ("Zone In")
- The Next Steps
Background

- Plant and people remain one of the most significant fatal risks within Balfour Beatty
- Great progress on the use of technology for plant to improve visibility etc.
- A number of issues associated with behaviour

- Unsecured moving part 22%
- Ergonomics/design & people 28%
- Hit by vehicle 17%
- Lack of attention 22%
- Other 11%

Complacency
Lack of risk awareness
Taking a short cut
Behavioral Study

- Filming of common work activities on M4M5 Project
  - erection of gabion baskets
  - profiling of an embankment
  - loading and removal of spoil
  - drainage works
  - general materials handling within a compound

- Over 140 hours footage taken and analysed
- Sample data validated by project monitoring and trend analysis
Plant Safe Zones
Terminology - Plant Zones

• **Zone 2 ‘at risk’** – entry is not permitted at any time. This is the location of greatest risk to individuals, and is usually the area immediately around the plant/vehicle

• **Zone 1 ‘at risk’** - is where the individual is positioned within zone 1 but has not made contact with the plant/vehicle operator and/or the plant/vehicle is moving or in operation

• **Zone 1 ‘safe’** - is where an individual is positioned within zone 1 but contact has been made with the plant/vehicle operator and the plant/vehicle is secured from movement
Example Analysis - Excavators

**Zone 1 at risk**
- Erecting gabion baskets - 30 seconds
- Profiling and embankment – 4 minutes
- Loading/removal of spoil – 1½ minutes
- Drainage works – 1 minute

**Zone 2 at risk**
- Erecting gabion baskets - 30 seconds
- Profiling and embankment – 1 minute
- Loading/removal of spoil – 30 seconds
- Drainage works – 2 minutes

**Not near plant**
- Erecting gabion baskets - 57 minutes
- Profiling and embankment – 34 minutes
- Loading/removal of spoil – 49 minutes
- Drainage works – 56 minutes

**Zone 1 safe**
- Erecting gabion baskets - 2 minutes
- Profiling and embankment – 21 minutes
- Loading/removal of spoil – 9 minutes
- Drainage works – 1 minute
Purpose of Behaviour

- **Access** – the individual ‘walked through’ the zone as an access route with no other intent observed.

- **Communication** – the individual communicated to other persons whilst in the zone e.g. plant operator, vehicle driver, members of the work gang etc.

- **Place of Work/Task** – the individual was positioned in such as manner to carry out their work activity e.g. vehicle marshal, slinger/signaller, surveyor etc.
Recommendations

- **Eliminate**
  - Review technology to give signal when plant is in operation/safe to pass
  - Review communication technology and implement

- **Minimise**
  - Continue to train, communicate, apply and enforce plant standards
  - Develop safe systems of work to identify safe positioning
  - Enhance training for vehicle marshals, plant operators etc

- **Mitigate**
  - Equip individuals to identify and manage change
  - Raise awareness of consequences of at risk behaviour
  - Support individual decision making to address complacency, short cuts and lack of risk awareness
“Zone In” Workshops

What is “Zone In”?

- Presentation & DVD
- Footage from the behaviour study
- Practical demonstrations
- Risk awareness

Why?

- There have been a number of fatalities & life changing injuries due to man / machine interface
- The footage taken on our project showed our people at risk

Who’s involved?

BB Health & Safety Advisor
BB Construction Manager
BB Works Manager
MJ Church – Site Agent
Zone – Plant Operator
“Zone In”
“Zone In”
Feedback

“Makes you think”
“Good session - eye opener”
“It would be nice to involve the work force when coming up with different ideas to minimise PPI in each operation”
“Enjoyed the session will make me think when I walk past plant in future”
“I like the idea. Let’s look forward”
“We could use cameras for machine ops more.. ”

“Would like to see more demonstrations using the materials we would use on site i.e. placing manhole lids and biscuits into position”
“You should have less space between Variogard and machine to make it more realistic”
The Next Steps

• Share “Zone In” with Balfour Beatty and our delivery partners
• Follow up on feedback received from “Zone In” sessions
• Develop a behavioural training module for Man / Machine Interface:
  – Include human factors techniques to target individual safety decision making
  – Carry out pilot on M4M5 project
  – Provide final training resource pack to the business in early 2013
  – Support available via train the trainer sessions

• Continue to develop “Raising the Bar” documents for Plant and Equipment, together with visual standards for plant safe zones
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Thank you for listening