

Innovative Solutions For Guarding Large Scale Conveyor Operations

John Bout
FRCP Group
Project Manager

Terry Bray
Cadeng Pty Ltd
Managing Director



bhpbilliton

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FRCP 7 Plant & Equipment Safeguarding Requirements

INTRODUCTION / BACKGROUND

Fatal Risk Control Protocol 7 "Plant and Equipment Safeguarding" has been implemented to address the risk of injury caused by inadvertent contact with moving parts of plant and equipment.

FRCP7 guidelines state:

"Plant and equipment safeguards shall be designed and constructed to comply with relevant legislation, standards, codes of practice and relevant recognised leading industry practices whilst considering maintainability and operability."

FRCP 7 Conveyor Guarding Safety Solutions

- This presentation will detail the solutions developed by the project team and applied to the 2 primary risk areas identified on the 200 + site conveyors at Nelson Point , Port Hedland.

- Chute Door Module Guarding Design

- Conveyor Guarding

- Roller frames

- Pulley guards

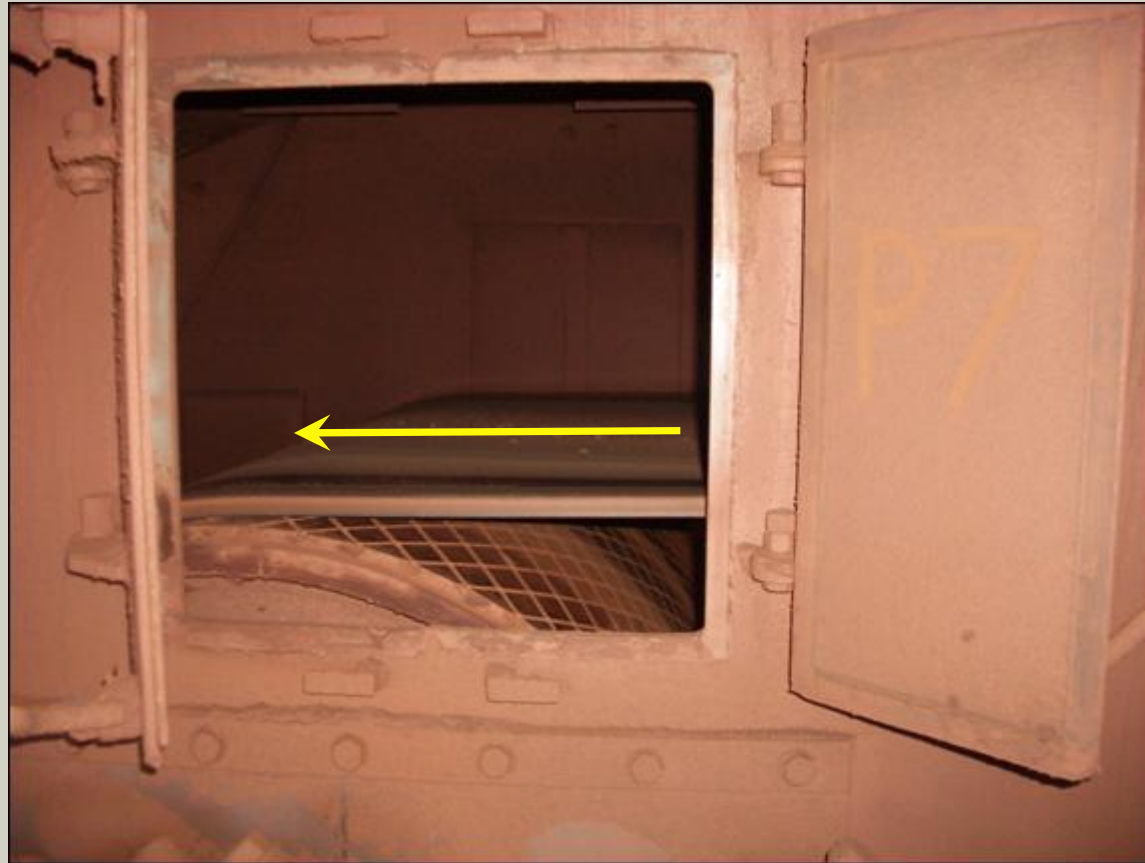
Background – why upgrade chute doors?

- Potential safety issues
 - Head injuries when looking through door
 - Falling into chutes while cleaning
 - Contact with moving conveyors and sample cutters
- Operational cleaning hazards
- Fatal Risk Control Protocols
- Australian Standards
- Current BHP Billiton design could be improved

Background – mesh worn away by iron ore



Background – high risk nip point



Background – more than 3000 chute doors on site

A site audit has identified the following

- **Nelson Point**
 - Total of approximately **2,850** chute doors
 - **550** openings < 400mm x 400mm
 - **2,300** openings > 400mm x 400mm
- **West Yard**
 - Total of approximately **350** chute doors
 - **120** openings < 400mm x 400mm
 - **230** openings > 400mm x 400mm

Associated tasks involving chute doors

- Maintenance cleaning
- Maintenance repairs
- Operational cleaning
- Inspections

Additional hazards related to chute doors

- Conveyor access identification issues:
 - Which conveyor space will people be exposed to when they open doors?
 - Which conveyors need to be isolated?

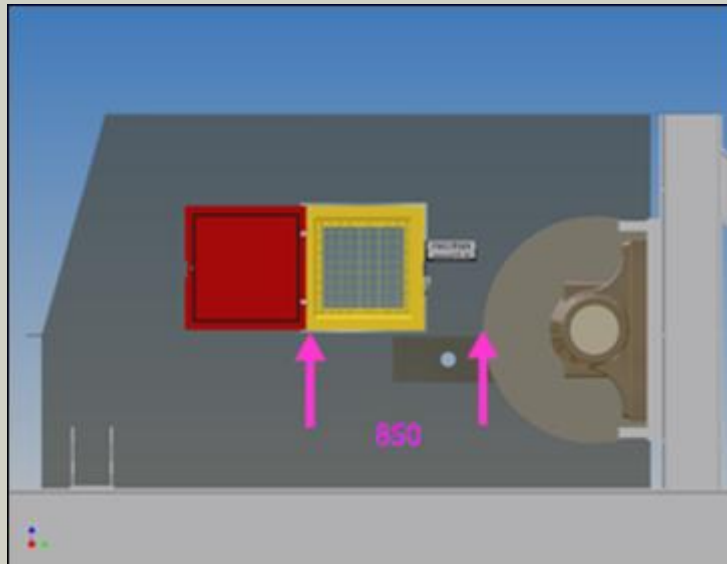


Design concept



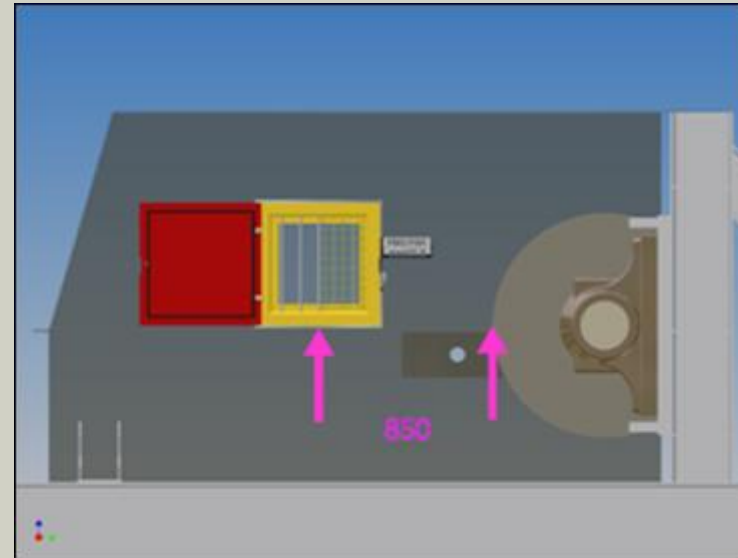
Design proposal 1 or specific hazard – contact with moving parts on conveyor

Design: 50mm mesh or smaller depending on proximity of conveyor



Design proposal 2 for specific hazard – contact with moving parts on conveyor

Design: Combination of 50mm Mesh / Jail Bars at 90mm spacing



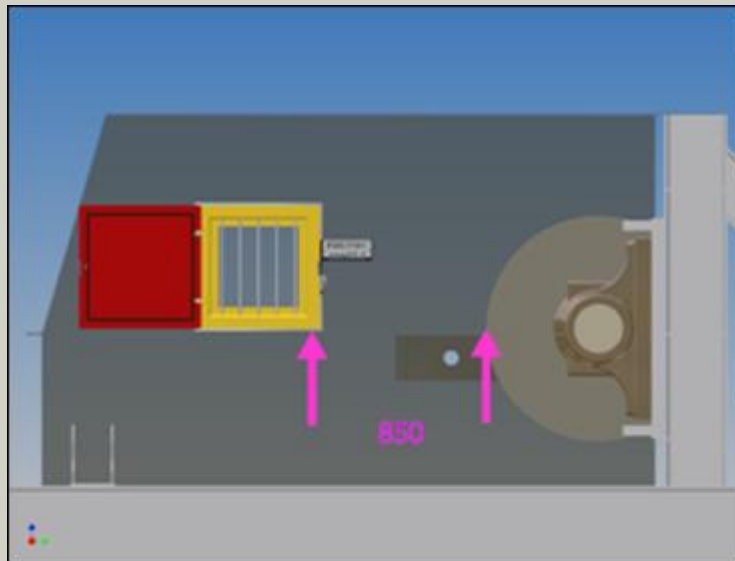
Design proposal 2 for specific hazard – contact with moving parts on conveyor - more examples

Design: 50mm Mesh / Jail Bars



Design proposal 3 for specific hazard – contact with moving parts on conveyor

Design: Jail Bars



Design proposal 4 for specific hazard – falling objects



Design: Jail Bars

Design proposal 5 for specific hazard – fall into chute



Design: Horizontal safety rails & inner door

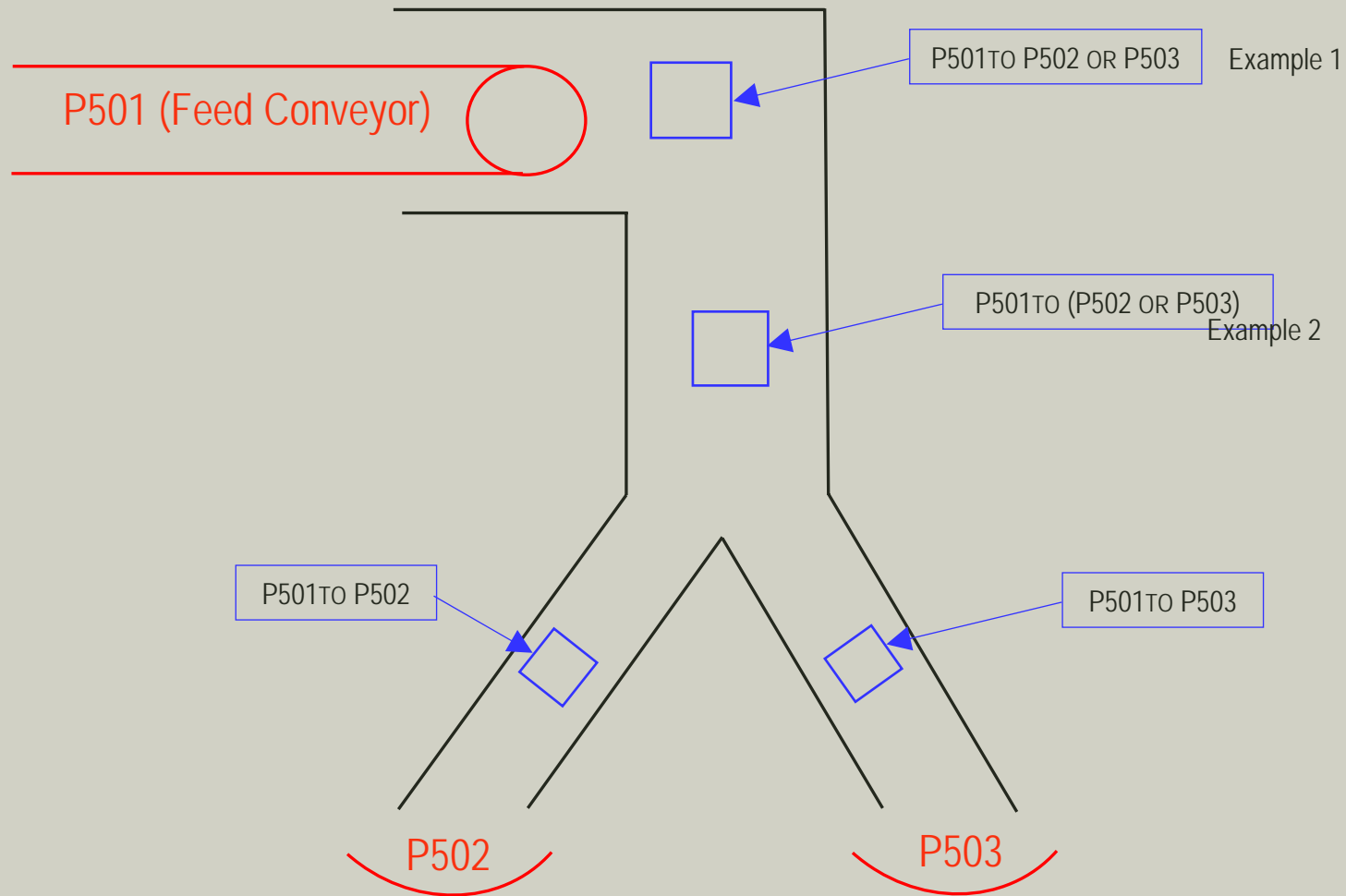


Chute door identification

Labels visible at all times – even when door is open to confirm risk area



Proposed chute door identification protocol



Hazard Identification and Control Signage

Example 2: Chute door accessing a sample cutter




Chute door design database

Microsoft Access - [Chute Door Details]

File Edit Insert Records Window Help

Type a question for help

Chute Door



Date: 13/08/2006

Site: Nelson Point

Plant Type: **Stadiers:**

Plant #: 3

Feed Conveyor: P106

Receiving Conveyor: P100

or

or

Level: 2

Door: B

Dimensions (W): 585

Dimensions (H): 430

Existing:

Current Door Type: Single

Door Angle: Vertical

Height from floor to base of door: 1400

New Door to be Hinged: LHS

Can Bar be Fitted:

Chute Door Installed:

Sign Ordered:

Signage Complete:

Verified:

Fab Comments:

Hazard Analysis

Wear Plates Present:

Door Located in Ore Stream:

Sample Cutter Present:

Sample Cutter Within 850mm:

Diverter Gate Present:

Diverter Gate Within 850mm:

Proximity of Conveyors: "x" 100

PARALLEL:

"y" 125

Temporary Sign Fitted:

Recommended Door Type:

Additional Mods Required:


Comments:

Photo ID: 1. 2189 3. 2191
2. 2190 4.

Location of Stiffeners

150
500 60
65

17/08/2006	P208 to (P209)3F	TS205	P208
16/08/2006	P205 to (P208)2A	TS204	P205
16/08/2006	P205 to (P208)2B	TS204	P205
16/08/2006	P205 to (P208)2C	TS204	P205
16/08/2006	P205 to (P208)2D	TS204	P205
16/08/2006	P206 to (P207)2A	TS204	P206
16/08/2006	P206 to (P207)2B	TS204	P206
16/08/2006	P202 to (P203)3A	TS250	P202
16/08/2006	P202 to (P203)3B	TS250	P202
16/08/2006	P202 to (P203)3C	TS250	P202
16/08/2006	P202 to (P203)3D	TS250	P202
1/08/2006	P099 to (P102)4A	TS21	P099
1/08/2006	P099 to (P102)4B	TS21	P099
1/08/2006	P099 to (P102)4C	TS21	P099
1/08/2006	P108 to (P110)4A	STK3	P108
1/08/2006	P108 to (P110)4B	STK3	P108
1/08/2006	P108 to (P110)4C	STK3	P108
31/07/2006	P104 to (P106)2A	TS13	P104
31/07/2006	P104 to (P106)2B	TS13	P104
5/09/2006	P202 to (P203)1B	TCB2	P202
2/08/2006	P124 to (P126)5B	SS102	P124
1/08/2006	P124 to (P126)5C	SS102	P124
1/08/2006	P124 to (P126)5D	SS102	P124
1/08/2006	P125 to (P101)3A	SS102	P125
1/08/2006	P130 to (P125)1A	SS102	P130
31/07/2006	P521 to (P522)8A	SS501	P521
31/07/2006	P104 to (P106)2C	TS13	P104
13/08/2006	P106 to (P108)2A	STK3	P106
13/08/2006	P106 to (P108)2B	STK3	P106
13/08/2006	P106 to (P108)2C	STK3	P106
13/08/2006	P106 to (P108)2D	STK3	P106
13/08/2006	P106 to (P108)2E	STK3	P106
13/08/2006	P106 to (P108)2F	STK3	P106
1/08/2006	P107 to (P109)4A	STK4	P107
1/08/2006	P107 to (P109)4B	STK4	P107
1/08/2006	P107 to (P109)4C	STK4	P107
1/08/2006	P103 to (P105)2A	TS12	P103
1/08/2006	P103 to (P105)2B	TS12	P103
1/08/2006	P100 to (P101)4A	TS21	P100
1/08/2006	P100 to (P101)4B	TS21	P100
1/08/2006	P100 to (P101)4C	TS21	P100
13/08/2006	P105 to (P107)2A	STK4	P105
13/08/2006	P105 to (P107)2B	STK4	P105
13/08/2006	P105 to (P107)2C	STK4	P105

Photo: 

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Guarding Conveyors

Terry Bray
Cadeng Pty Ltd
Managing Director



bhpbilliton