

Hoist Rope Inspection Automation: A Research Project to Automate Visual Rope Inspection

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February 2007



Hoist Rope Inspection Automation

HRIA research project started in 2004

Project sponsors included

- Inco
- C-CORE
- WMC Resources
- AMIRA members
 - BHP Billiton, WMC Resources, Xstrata
- DMRC members
 - Agnico-Eagle, Barrick Gold, Falconbridge, Goldcorp, Inco, Placer Dome, Rio Tinto (and others)

Visual Rope Inspection Problem

Safety

- Men near ropes

Ergonomics

- Boring job
- Long and tedious
- Usually, no problems
- Limited reporting

Business

- No muck hoisted



Visual Rope Inspection Problem



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Headframe conditions

- Cold and snow

First Research System

Inco - Garson

- Canadian test site
- Headframe mounted



Proved concept works

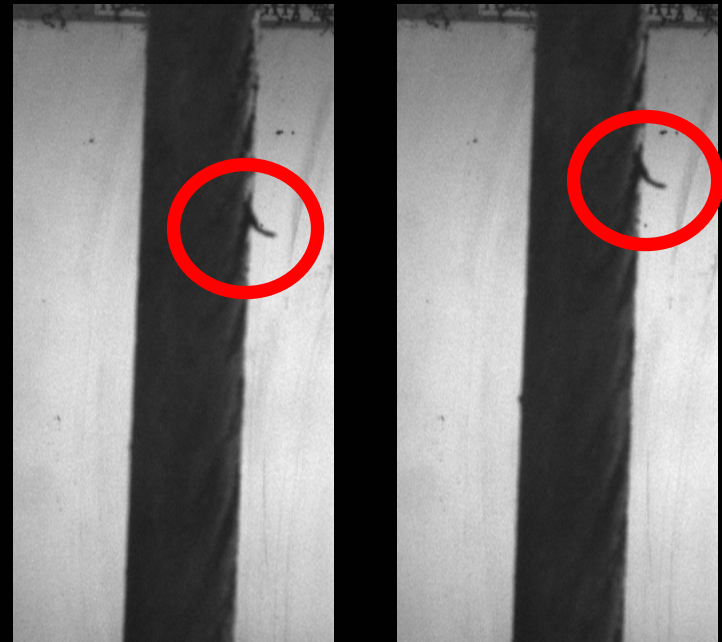
- Hardware tested
- Software developed
- Data managed

Second Research Prototype

BHP Billiton - Leinster

- Western Australia
- Headframe mounted
- Full speed operations

Captured broken wires



Projected System Benefits

- Increased safety
 - No one near rope during inspection
 - 360° rope coverage
 - Potential defect captured in fine detail
 - Capture a complete rope run

Projected System Benefits

- Increased safety
 - No one near rope during inspection
 - 360° rope coverage
 - Potential defect captured in fine detail
 - Capture a complete rope run
- Inspect at up to 20 m/sec
 - Potential for increased production
 - Potential for increased maintenance
- Human inspector
 - Make defect determination off line
 - File a daily report (electronic as well)

Increased Revenue Calculation

value of increased production

=

value per skip

X number of working days per year

X number of inspection minutes

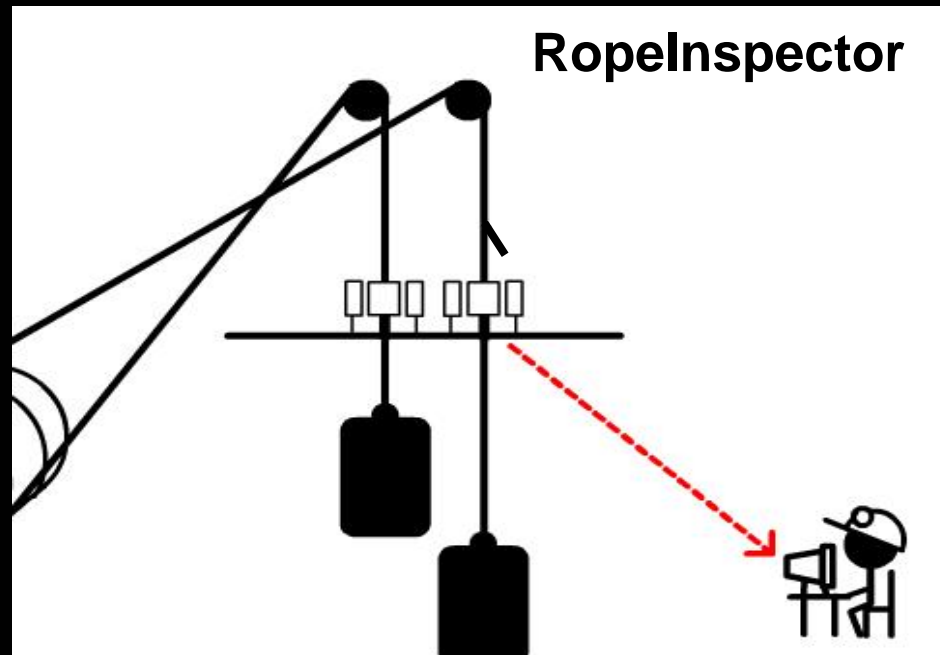
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skip hoisting cycle minutes

Research is Now Complete

- Research project was successful
 - Both research prototypes worked
 - Technology successfully transferred
- Commercialization has begun
 - System is now user friendly
 - Product has been named 'RopeInspector'
 - Xstrata Kidd mine first installation

How RopeInspector Works



System installed under sheave wheels allows mines with no men near the rope to automatically detect potential defects while hoisting muck at full speed. . Offline, human inspectors can electronically file reports which include defect images



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