



Customer Profile Xstrata Copper and Xstrata Zinc

Lubrication practices improvement driven by education and technology

Xstrata Copper operates mines and processing plants in Australia and Argentina.

Xstrata Zinc operates mines and processing plants in Australia, Spain, Germany and the UK.

Both Xstrata Copper and Xstrata Zinc operate mines and processing plants at Mt Isa in North Queensland



In 2003, Mount Isa Mines hoisted 5.2 million tonnes of copper ore and 3.1 million tonnes of lead-zinc ore. The mine and processing plants operate 24 hours a day, 7 days a week, 365 days a year.



Multiple fleets of trucks, loaders, jumbos and ancillary equipment are operated and maintained for the underground mining operations. Fixed plant equipment operated and maintained include multiple conveyors, mills and cranes with associated mechanical drives components, many of which are lubricated.

A maintenance workgroup of approximately 500 personnel keeps Xstrata Copper and Xstrata Zinc's operations in north Queensland running.

The Challenge of Achieving Component Life Extension and Reduced Oil Consumption

Mining in Mount Isa has been going on since 1924 and operational improvements have not always kept up with best condition monitoring practices. There was recognition by senior management that condition monitoring was being done but that the data gained was rarely used to drive maintenance actions. Often condition monitoring data was only used to confirm the reasons why a component went into catastrophic failure rather than as a tool for preventing failure.

Glen Croft, General Manager Maintenance for Xstrata Copper said "significant financial returns are capable of being achieved through extending existing component life and reducing the

amount of oil used. However, we had to focus on the basics first”.

The Solution

Glen knew that the first steps in achieving these objectives were to

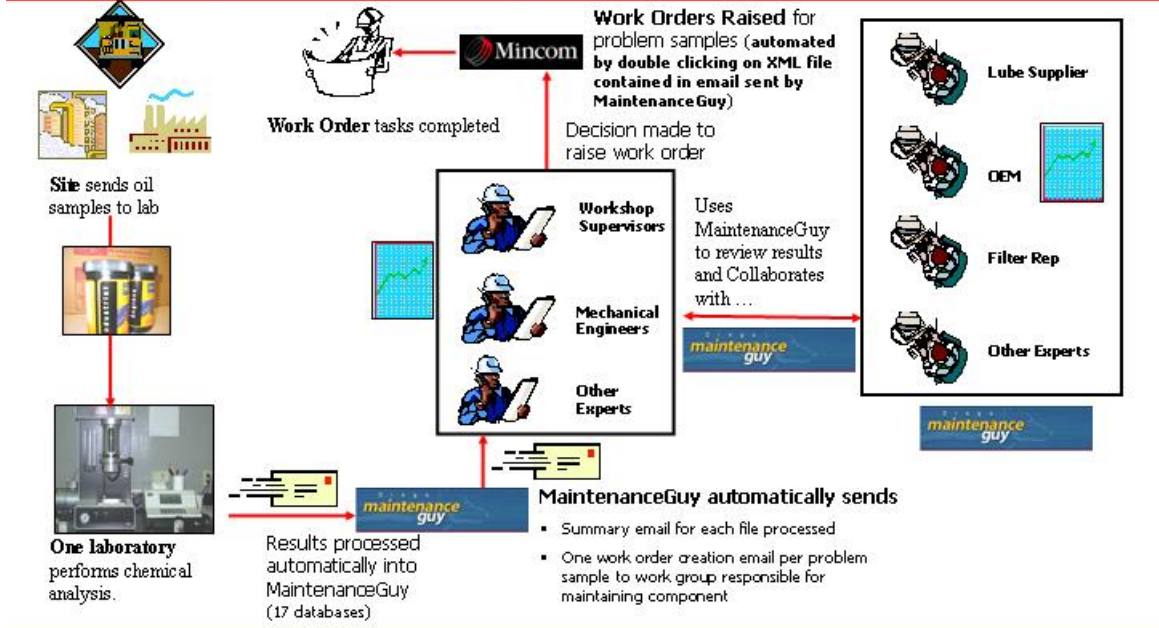
1. Lift the awareness of maintenance personnel of lubrication best practices. E.g. Contamination control.
2. Educate personnel on how to interpret an oil sample result.
3. Provide maintenance personnel with easy access to sample test result data from multiple geographical locations to aid in analysis, trending and reporting of component condition.
4. Provide external experts such as Tribologists with quick and easy access to sample test result data

so as to assist Mount Isa Mines maintenance personnel identify root causes on components that have chronic problems.

Glen said, “After 12 months of educating maintenance personnel on the foundations of running a best practice condition monitoring program we’re almost ready to implement component life extension and oil consumption reduction programs”.

Xstrata Copper and Xstrata Zinc use Dingo’s Internet based MaintenanceGuy™ software system to analyse, report and trend an average of 500 oil samples a month. Over 30 Mount Isa Mines personnel have either full or read only access to the system and depending on access rights are able to see between 1 and 17 separate location databases. Read only access is provided

Xstrata Copper Sampling & Reporting Process



by Xstrata Copper and Xstrata Zinc to selected external contractors to provide remote support on a needs basis. The diagram below demonstrates the process flow of oil sampling.

Tony Campbell, Maintenance Planner at the Mount Isa Copper mine said

“Dingo’s MaintenanceGuy™ program is the most user friendly oil analysis program I’ve used. I receive an automated summary email from MaintenanceGuy™ whenever a new sample result for the underground mine has been posted by the lab. The email tells me which components I need to focus on. I then simply log onto MaintenanceGuy using a link in the email.

The hierarchy set up in MaintenanceGuy™ makes it easy for me to search for and review the problem component(s). For each caution or critical result I look at the raw data and also selected graph views that have been set up.

The process of creating work orders has been made easy with MaintenanceGuy sending out a work order creation email for each caution and critical result. The email is sent to an Xstrata post office email account which forwards the email to me. To create a work order all I need to do is double click on the XML file attachment and the MIMS work order creation window is populated with all the appropriate fields. All I then do is click the OK button to create the work order. It’s so easy!!”



The Results

Through the provision of a combination of process improvement, education, state of the art systems and external expert support there has been a significant turn around in the attitude and culture of oil condition monitoring at Xstrata Copper and Xstrata Zinc’s Mount Isa sites.

Examples of improvements include:

- Sample turn around time improving from 15 days to 2 days
- Work orders are entered into MIMS for ALL caution and critical results. Previously many were not even entered into the system for a decision to be made on whether to do the work or not.
- Personnel are now focused on reducing contaminant levels within oil whereas 6 months ago they were focused on fixing up failures.
- The number and cost of failures are reducing from historical averages.

Mount Isa Mines has been using Dingo MaintenanceGuy since December 2003.

Attachment A

MaintenanceGuy Summary Email

MaintenanceGuy - Lab Result: Completed - Message (HTML)

File Edit View Insert Format Tools Actions Help Type a questi

Reply Reply to All Forward

From: MaintenanceGuy [labresults@dingo.com] Sent: Mon 1/11/2004 7:
To: pkasten@dingo.com; nbroking@xstrata.com.au; lmumford@xstrata.com.au; gcroft@xstrata.com.au; ACampbell@xstrata.com.au; BDearling@xstrata.com.au
Cc: labresults@dingo.com
Subject: MaintenanceGuy - Lab Result: Completed

ICM Copper Mine

You have received results from Industrial and Technical Services.

Summary of Results

Sample Results: 19
Exceptions: 13
Duplicate Results: 0
Unmatched Results: 0

Click [here](#) for definitions of summary results.

Summary of Critical Exceptions

IME1893-5050 "Continue sampling @ recommended intervals. low viscosity level (Image Reference: 15560.jpg)"

Summary of Warning Exceptions

IME1893-3150 "Continue sampling @ recommended intervals. High silicon level. Chromium level is elevated . Level 1 wear. Oil cleanliness rating exceeds indust recommended limit. (Image Reference: 15561.jpg)"
IME1893-3258FR "Continue sampling @ recommended intervals. Viscosity within limits. Critical iron level. High silicon level. High chromium level. Level 2 wear (: wear particles present). Oil cleanliness rating exceeds industry recommended limit. (Image Reference: 15562.jpg)"

MaintenanceGuy Work Order Email

MaintenanceGuy - Lab Result: File Received - Message (Plain Text)

File Edit View Insert Format Tools Actions Help Type a quest

Reply Reply to All Forward

Extra line breaks in this message were removed. To restore, click [here](#).

From: labresults@dingo.com Sent: Fri 12/12/2003 8:
To: ISALeadingMineKeyUser@xstrata.com.au; dingo@tprojx.com; pkasten@dingo.com
Cc: labresults@dingo.com
Subject: MaintenanceGuy - Lab Result: File Received
Attachments: WorkOrder.wfa (1,014 B)

IME1843-4050RR (Critical): "Drain and refill with correct oil. Very low viscosity level. Insignificant wear levels (cutting wear particles present). (Image Reference: 1

Double click the email attachment to create a work order for this item.

Incoming mail is certified Virus Free.
Checked by AVG anti-virus system (<http://www.grisoft.com>).
Version: 6.0.786 / Virus Database: 532 - Release Date: 29/10/2004

Data View

Dingo MaintenanceGuy (ITS Edition) - ICM Copper Mine

File Edit View Actions Help

Alarmed Marked Refresh Search Details Graph History Reports Imports

ICM Copper Mine

OSP-IME1893-3258FR History

| Status | Sample Date | Meter Reading | Sample Number | La | Hours on Oil | Oil Changed | Oil Added | Al | B | Ca | Co | COND |
|--------|-------------|---------------|---------------|----|--------------|-------------------------------------|-----------|----|----|------|----|----------|
| | 9/03/2004 | 3262 | 11162 | In | 0 | <input type="checkbox"/> | 0 | 19 | 3 | 4172 | 0 | Critical |
| | 23/01/2004 | 2914 | 10537 | In | 0 | <input type="checkbox"/> | 0 | 36 | <1 | 0 | <1 | Critical |
| | 17/10/2003 | 1923 | 50194 | C | 907 | <input checked="" type="checkbox"/> | 0 | 90 | | 4076 | | |
| | 29/08/2003 | 1494 | 49583 | C | 484 | <input type="checkbox"/> | 0 | 7 | | 3751 | | |
| | 19/07/2003 | 13015 | 49014 | C | 1000 | <input checked="" type="checkbox"/> | 0 | 7 | | 4047 | | |
| | 13/07/2003 | 1016 | 48929 | C | 0 | <input checked="" type="checkbox"/> | 0 | 42 | | 4095 | | |
| | 4/06/2003 | 547 | 48361 | C | 500 | <input checked="" type="checkbox"/> | 0 | 2 | | 4057 | | |

Inspection recommended. Low viscosity level. Critical level of water in system. Critical iron & silicon levels. High copper level. High wear level wear particles present). Oil cleanliness rating exceeds industry recommended limit. (Image Reference: 11162.jpg)

Graph View

Dingo MaintenanceGuy (ITS Edition) - ICM Copper Mine

File Edit View Actions Trending Help

Alarmed Marked Refresh Search Details Graph History Reports Imports

Contaminants

OSP-IME1893-3258FR Integrated Trending

| Date | Al (ppm) | Fuel (%) |
|----------|----------|----------|
| 3/04/02 | 200 | 50 |
| 30/06/02 | 100 | 50 |
| 28/01/03 | 100 | 50 |
| 4/06/03 | 100 | 50 |
| 13/07/03 | 350 | 50 |
| 29/08/03 | 100 | 50 |
| 17/10/03 | 580 | 100 |
| 23/01/04 | 100 | 50 |
| 9/03/04 | 200 | 50 |

Al (ppm)

Fuel (%)

Glycol (%)

Si (ppm)

Soot (Abs/cm)

Water (pass/fail)

MGV016R0045 | 154 bytes in 1552 ms.

Start | Demon... | Xstrat... | Untitle... | Mainte... | Dingo ... | 3:02 PM