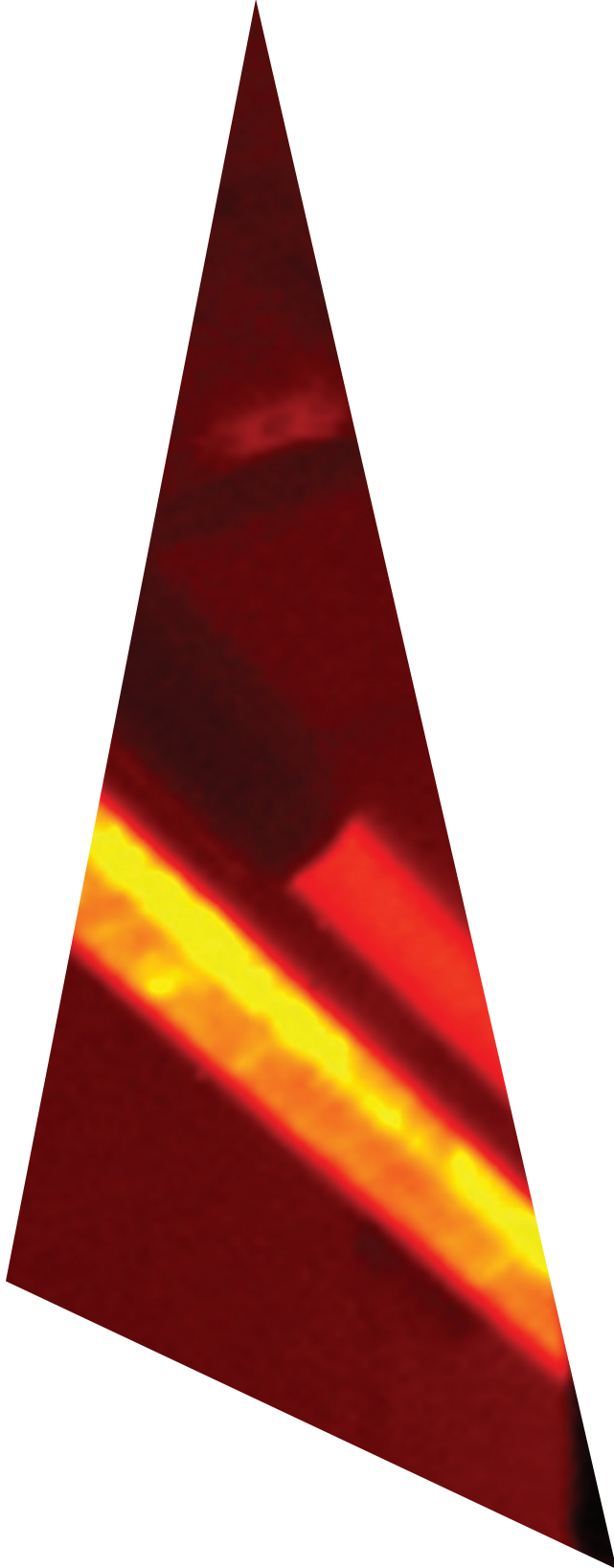


enercase

Thermal Imaging Insulation Audits



What's
a picture
worth?



uniongas

A Spectra Energy Company

Thermal
pictures –
followed by
insulation
repair –
can save you
hundreds of
thousands
of dollars.

SUMMARY

A thermal imaging insulation audit of the steam system at their Fort Frances Kraft pulp mill proved so beneficial that AbitibiBowater duplicated the process at its commercial printing paper mill. Features like simultaneous capture of both infrared and regular photo images plus web-based reporting of cost and payback information make this type of audit invaluable for planning and targeting energy-saving insulation upgrades.

BACKGROUND

To be stronger and more competitive in the global marketplace, Abitibi-Consolidated and Bowater merged in 2007 to become AbitibiBowater. The company's Fort Frances mill produces both commercial printing papers and market pulp. The large facility dates back to 1912 and has seen many expansions over the years. It currently contains three paper machines, a Kraft pulp mill, and a cogeneration plant. Peak production for commercial printing papers is 286,000 Metric Tonnes (MT) and for pulp 99,000 MT.

Pulp and paper is a highly competitive industry. Although paper prices strengthened in 2007, a stronger Canadian dollar (in the context of sales priced in U.S. currency) is putting continuing pressure on Canadian mills to contain their costs.

AbitibiBowater has a corporate-wide commitment to improving energy efficiency and environmental performance. From 2003 to 2007, it reduced energy consumption per metric tonne by 8%. Greenhouse gas emissions are down 10% over the last seven years and new projects like biomass generation are expected to drive further reductions.

CHALLENGE

The Fort Frances facility, like all pulp and paper mills, employs high temperature steam systems. This means that pipes and holding tanks will radiate a large amount of heat if not properly insulated.

The paper and Kraft mills featured mostly original insulation and over the years various pieces became worn or damaged or were removed to fix leaks. The result was a patchwork ranging from full insulation to bare pipe.

By 2006, AbitibiBowater was spending over \$50 million a year in energy and was eagerly looking for ways to reduce these costs. They formed an Energy Reduction Team with representatives from all mill operations. Their goal – save \$2 million in energy over the next twelve months. Locating and fixing insulation problems offered fast, low-cost paybacks – a good start to meeting that goal.

Piping system challenges included:

- Losing 59 billion BTUs annually at Kraft mill
- Losing 9.5 billion BTUs annually at paper mill
- Hot spots on pipes constituted a safety hazard in some locations



SOLUTION

Union Gas recommended using infrared piping and equipment insulation surveys to pinpoint heat losses and to identify a remediation strategy.

AbitibiBowater engaged IMAP Services Inc., specialists in insulation system audits, to conduct a mechanical insulation audit and appraisal at the Kraft mill in 2006. This project proved so successful that IMAP was brought back the following year to do the same thing at the paper mill. Brent Desrochers, a Certified Insulation Energy Appraiser from IMAP used a Fluke Ti 55 thermal imaging camera. It generates images and measurements used to assess the amount of thermal energy emitted from objects. Louis Tremblay of Union Gas assisted the Kraft mill audit with a similar camera owned by Union Gas. Each survey took around two weeks.

The web-based audit report includes a complete profile of the state of insulation for all steam pipes, condensate lines, vessels and tanks on the two sites. It includes matching sets of regular and infrared photos (for easy identification of sites) and information on potential energy savings from repairs and upgrades, along with estimated costs, benefits and paybacks for each piece of equipment and for the aggregate work areas. AbitibiBowater established industrial paybacks to prioritize the repair work. Rugged Air Systems Limited of Thunder Bay performed the insulation repair work for both projects.

AbitibiBowater took advantage of Union Gas incentives to cover up to two-thirds of the cost of the insulation audits as part of an overall steam program and 10% of repair costs.

BUSINESS BENEFITS

- \$216,855 annual energy cost savings for Kraft mill
- \$67,500 annual energy cost savings for paper mill
- Short paybacks – 1.3 to 2.2 years
- Maintenance and repair savings
- Union Gas incentives

ENVIRONMENTAL & SAFETY BENEFITS

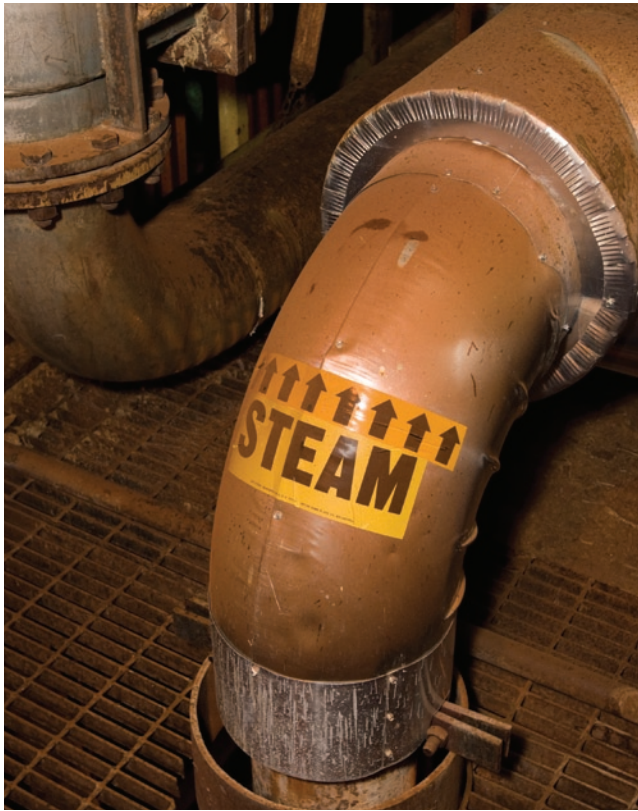
- 722,850 m³ natural gas savings at Kraft mill
- 225,000 m³ natural gas savings at paper mill
- 1,800 tonne total reduction in CO₂
- Safer and more comfortable workplace

Any business that uses large amounts of process steam – particularly under high pressure – can benefit from a thermal imaging insulation survey. Other businesses that can benefit from a thermal imaging insulation survey include:

- **Chemical plants**
- **Oil refineries**
- **Food manufacturers**
- **Board and carton makers**
- **Fuel alcohol refineries**
- **Power plants**
- **Colleges and universities**
- **Hospitals**



28" Diameter high pressure steam pot (operating temp 650°F) located in the kraft mill. Real photo on left, thermal image on right. Bright yellow indicates the temperature of the vessel and can help determine any radiant heat loss.



wins&highlights

- ✓ Heat losses down from 68.5 billion BTU to 2.6 billion – a 96% reduction
- ✓ \$284,355 in total energy cost savings
- ✓ Combination of thermal and actual photos makes for easy targeting of repair work
- ✓ Web-based planning tool
- ✓ Union Gas incentives of \$54,401

Thermal imaging is a valuable diagnostic tool that allows you to see what the naked eye cannot detect.

- Calibrates the amount of energy loss from bare or poorly insulated surfaces
- Identifies areas of potential corrosion underneath insulation, making preventative maintenance possible



“ Union Gas has given our Energy Reduction Team critical support for many energy efficiency projects. They provided over \$100,000 in rebates for engineering analysis, audits, and various upgrade projects in 2007. Equally important, they helped us spread the energy efficiency message, helping us organize a Fall Energy Fair and providing energy kits, prizes and information. This had a big impact, significantly raising awareness of energy efficiency among our mill workers.”

David Beach, P.Eng.
Kraft Mill Services Superintendent
AbitibiBowater, Fort Frances

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Union Gas – For the profit in conservation

Both AbitibiBowater and IMAP give credit to Union Gas Project Manager Louis Tremblay for his role in the insulation survey projects. Union Gas recommended the thermal imaging audit and Tremblay provided hands-on assistance with the Kraft mill survey -- locating critical process drawings and equipment and even providing some backup photography with Union's own Ti 50 camera. Tremblay also verified savings and made sure that the projects qualified for all possible energy efficiency program incentives.

Union Gas provided incentives of \$9,325 toward the Kraft mill audit and \$13,327 for the survey at the paper mill. Union also supported the insulation upgrades at both facilities with equipment repair incentives of \$23,216 and \$8,533. These incentives reduced the overall payback for the Kraft mill projects to less than one year and for the paper mill to less than two years.

Union Gas is committed to helping industrial energy users make energy efficiency part of their business planning. If you'd like to learn more about our financial support for plant energy audits, feasibility studies and installation of energy efficient equipment, contact your Account Manager, email energywise@uniongas.com or visit our web site: uniongas.com/energywise.

