Has Mike Peters discovered something new growing in the Tailings area? Find out on page 11.

INCO
Triangle

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Inco acts now on Year 2000

Inco's Year 2000 Project is well underway in dealing with the great unknown of the new millennium.

Left unchecked, a potential computer doomsday is anticipated in virtually all industries and government agencies when two-digit year notations on most internal computer calendars go from 99 to 00.

Software programs and databases with two-digit year fields will incorrectly calculate dates when Dec. 31, 1999 becomes Jan. 1, 2000.

"A wide variety of problems may occur," said **Marc Beaulne**, Year 2000 Project Manager at the Ontario Division.

Without correction, it's possible computer glitches related to the year 2000 syndrome will cause computers to fail and make equipment throughout the Division shutdown or operate erratically.

That's why a team of Inco employees has made it a priority to solve problems before they may arise in two years.

To implement Inco's year 2000 strategy, the Company assembled a team of representatives from eight Divisions.

The mission of the project is to "Ensure the effect of the year 2000 causes no Divisional safety or environmental incidents, has no impact on our customers and has minimal impact on costs and production."

The high-tech problem originates, ironically enough, with the relatively low-tech beginnings of the computer age some 30-plus years ago.

"It used to cost millions of dollars for six gigs (billions of bits of information). But now laptops have that much," Marc explained.

Even saving two digits on a computer's internal calendar meant a considerable savings of memory and money.

"That's one reason why we have only two digits set aside for year fields. We also anticipated that applications we developed 25 years ago would be replaced well before the year 2000 – but here we are with those same applications."

Information stored pertaining to employees' seniority would also be affected if the problem were to be ignored.

For example, a person hired in 1970 would have 30 years of service in the year 2000, which should be calculated by a computer as 2000 – 1970 = 30. But because of the two-digit year field the computer could calculate that as 00 – 70 = -70.

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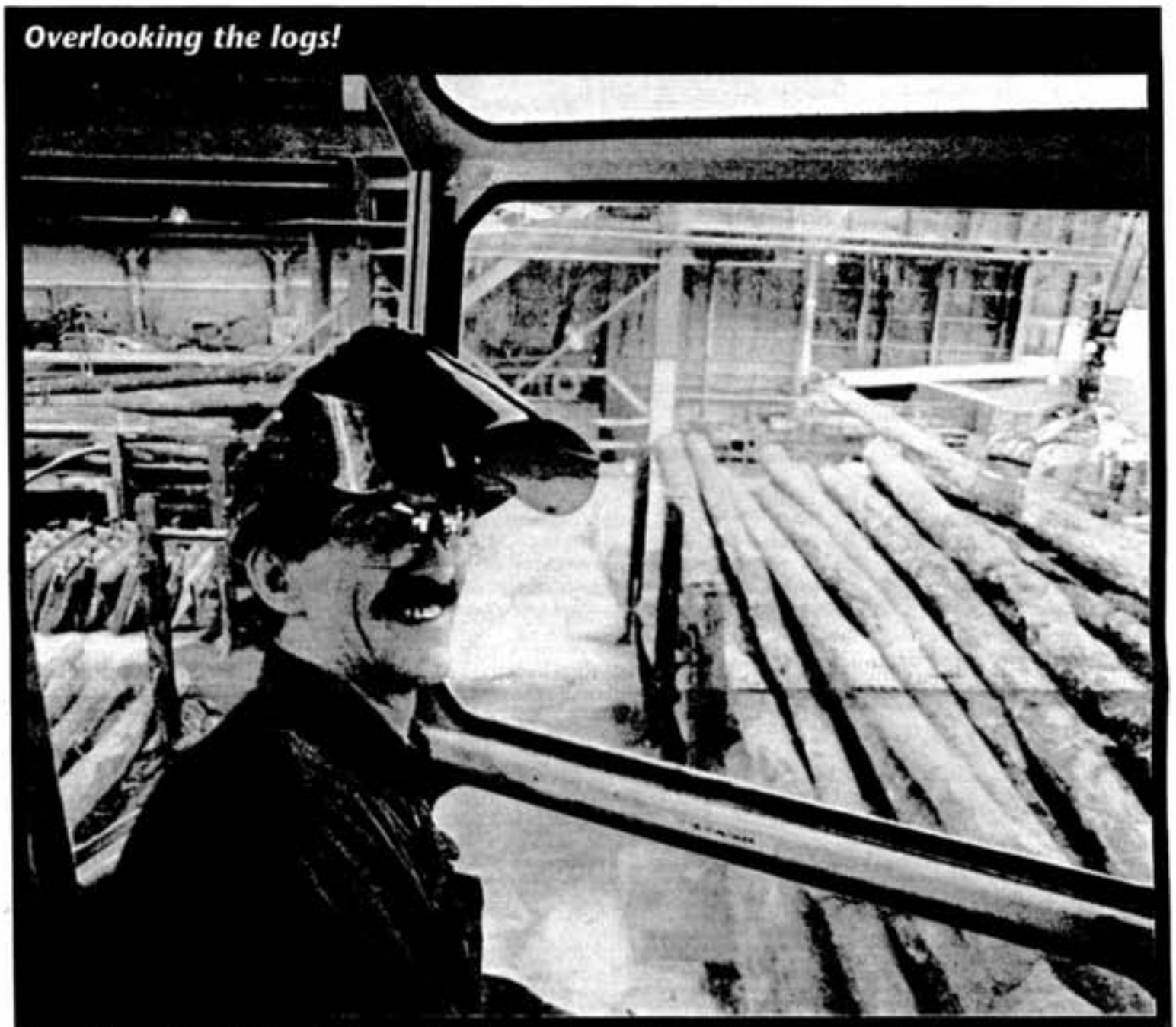
Overlooking the logs!



From his perch inside the cab of an overhead crane, Copper Refinery furnaceman Ray Morin has a good view of the logs destined for the anode furnaces where they are used to burn off oxygen in copper matte. A project to improve the quality of the logs has resulted in savings of $85,000 annually. Read more about the project in the story at the bottom of this page.

Pole project saves cash at Copper Refinery

Ray Morin and Bill Hannon wouldn't touch the anode casting furnaces with a hollow 10-foot pole.

That's why they use solid 25 to 30-foot ones.

And these days they use better quality hardwood logs as poker poles at the Copper Refinery. That's resulted in annual savings of $85,000 in wood consumption.

"What we've done is reduce the number of poles we use in the oxidization process – so we use them more efficiently," said Ray, a head furnaceman at the two anode furnaces.

"Before the poles are put into the furnace the copper matte looks like Swiss cheese because of the oxygen content. The poles burn it off so the copper becomes smooth," Ray said, explaining the basic function of the poles.

A bit of teamwork between the Copper Refinery and the Purchasing Department started things going in a more efficient direction.

"We got involved with the Purchasing Department to get the pole supplier here. Then we set up a process to identify substandard poles. Now we reject poles that are too small, crooked, too dry or hollow," said Bill, a production assistant at the anode furnaces.

Crooked ones just aren't suitable to hoist into the furnaces. Poles that are too dry simply burn too quickly. Hollow poles are rejected in the winter because snow or ice inside them can expand in the furnace and create a risk of explosion.

"So the new process doesn't

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Money-saving pole plan a team effort

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cost us as much, because we get replacement poles or a credit for the ones we reject at no extra cost," Bill added.

The logs, ranging from 11 to 22 inches in width, last only about 10 to 15 minutes in the furnaces at temperatures between 2,130°F and 2,200°F.

And thanks to the work of the employees, spearheaded by the Anode Casting Pole Quality Team, fewer poles are needed to do the job.

A monitoring system has also been put in place by the team.

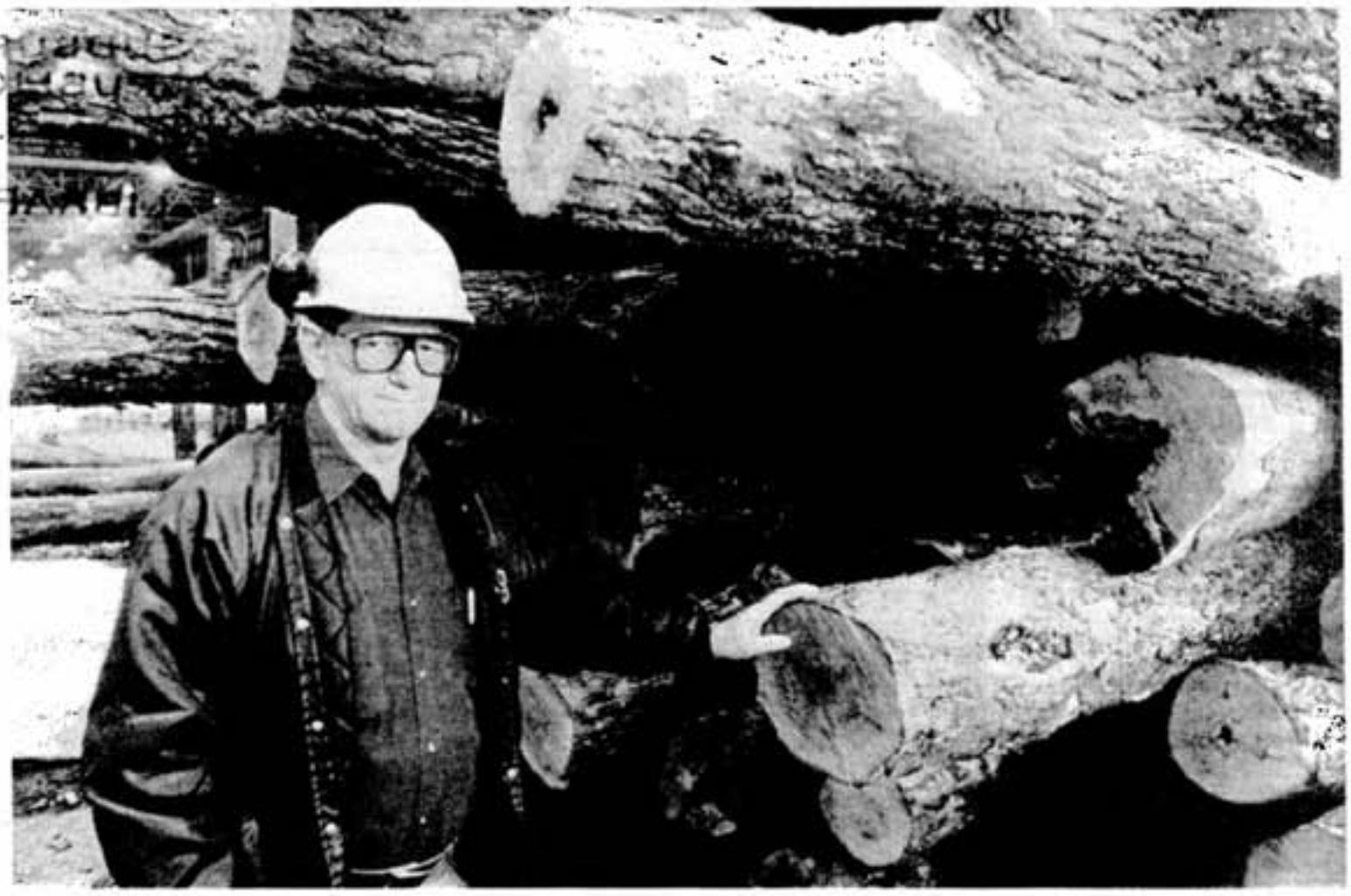
Before the new system was in place 25 to 30 poles were used every day. Now, with daily quality checks and the arrangement with the supplier, only 18 to 20 poles are required.

Putting the plan in place was a team effort, Bill stressed.

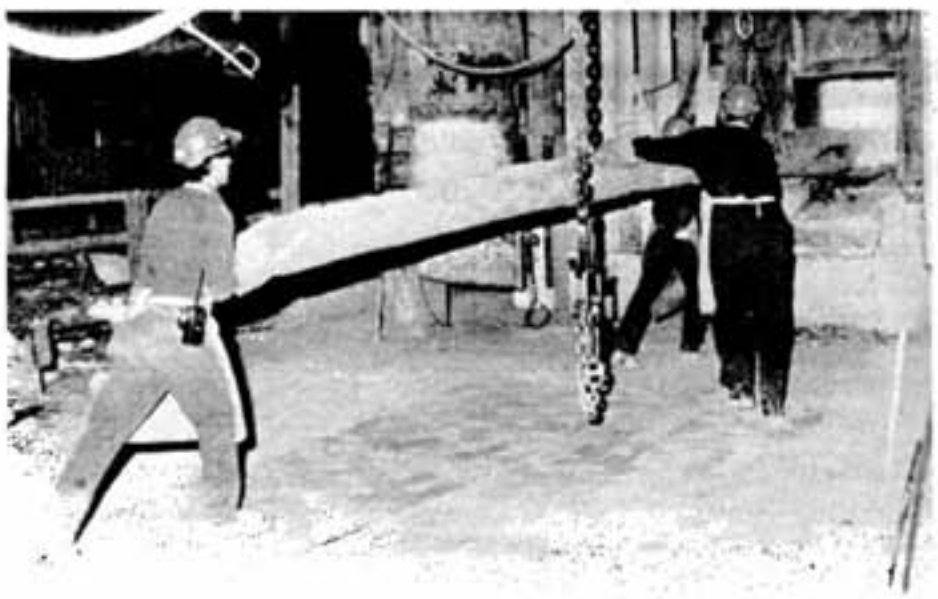
"We got input from furnace crews. We wanted them on board because they track the quality of the poles."

Ray added, "More heads are better than one."

On the team with Bill and Ray are anode helpers **Len McKerral**, **Jim Levac** and **Leo Gelineau**, head furnacemen **Bill MacDonald** and **Guy McLaughlin**, and the Purchasing Department's **Richard Rivers**.



Bill Hannon, production assistant, said in his 29 years at Inco he's learned that getting all employees in a department involved in improving efficiency is the best way to ensure success. As part of a new efficiency system, anode furnace crew members at the Copper Refinery inspect logs, stored in a pile, for defects that would make them unsuitable as poles used to burn off oxygen in copper matte.



Furnace crew employees, including Ray Morin, right, position a hardwood pole for placing into one of two anode furnaces at the Copper Refinery. The poles are submerged about two feet into the copper matte and burn quickly in temperatures of about 2,200°F.

Ray Morin, head furnaceman with 28 years service at Inco, operates a crane to unload the logs from a pile before they are inspected by employees and hoisted into the anode furnaces.

Furnace operator Joe Couvrette and Bill Hannon look over a record of the number of poles used and the number of those rejected as part of the new cost-saving system arranged with the supplier.

Year 2000 team tackles potential problems

Marc Beaulne, Year 2000 project manager, is part of a company-wide team working to identify and correct any potential problems the new millenium may bring long before the date itself arrives.

continued from page 1

In this example, there are a few possible outcomes. Applications could:

Function as normal.

Fail because the negative number might not be recognized by a computer.

Read out a person's seniority as 70 years of service.

Not recognize 00 as a valid entry and fail.

Another good example of challenges faced in the Division are fire alarm systems. Without the intervention of Inco's Year 2000 Team, it's possible some or all wouldn't activate when needed because the internal calendars with their two-digit year fields would read anything after 00 as an old alarm rather than as a current one.

For the same reason environmental monitoring of emissions could be affected leaving Inco with few resources to show its daily compliance with legislation.

"These are a few of the reasons why we're taking such a pro-active stance on this issue," Marc said.

In the Ontario Division the project is being addressed by six separate sub-projects with their own scope, approach and timing. The six components are legacy systems, industrial equipment, user community, supplier chain, infrastructure and communications.

A high-level assessment of the year 2000 problem has been conducted at several Inco locations – including Sheridan Park, P.T. Inco in Indonesia, Manitoba Division, Ontario Division and Corporate Offices in Toronto and New York.

With this complete, it was agreed that Inco proceed with a detailed assessment of the problem to define costs, as well as deploy an execution plan.

The detailed assessment phase was completed in the third quarter of this year and an execution plan initiated in the fourth quarter.

The main goal of the execution plan is to repair identified sources of the year 2000 problem, test, then implement the desired solution.

It is anticipated that all the mission-critical processes will be repaired in 1998, with 1999 as a contingency year to address low-impact areas.

In Toronto, **Linda Schulz**, manager of Corporate Office Information Technology, said the corporate office is in good shape.

"We have identified one major group of confidential legacy applications in the Human Resources and Payroll Departments that need to be fixed, perhaps even replaced," Linda said.

"Shareholder systems, meanwhile, have been outsourced and financial systems are being replaced."

Further efforts will consist of deploying the execution plan and tracking approved information technology projects to ensure year 2000 compliance.

Marc said his project team has identified 41 mission-critical applications that have a year 2000 problem.

A detailed assessment of these applications has been completed and the conversion will begin in December 1997.

"By December, we'll have completed a mini-pilot in the Smelter to give us a more detailed indication of the scope of the problem, the types of issues we can expect and how best to address this component which is critical to the Ontario Division."

Although extensive, Inco's year 2000 problem is being brought under control by thorough and careful planning, he said.

"Even so, we are facing an enormous task to correct this problem before the year 2000 deadline which is only 25 months away. We will need the support and cooperation of everyone in the Ontario Division to ensure success in this endeavor."

More medals for Division first aid champs

It's been a very good year for the Ontario Division First Aid Team which captured several honors at a recent St. John Ambulance event. Team members from front to back are Scotty Stewart, Dermott Kinsella, Bob Stacknik, Norm Marcil, Gilles Roy, Rick Chamberland and J.P. Coutu.

Well they did it again. The Ontario Division's First Aid Team brought home several medals from the recent 27th Annual St. John Ambulance Ontario Open First Aid Championships in Toronto.

"We trained hard and we had the management support. That's what did it for us," said **Bob Stacknik**, team captain.

Overall, 1997 has been a very good year for the team.

Earlier this year they defeated eight other mining companies to win the prestigious provincial McCrea First Aid Competition.

At the St. John Ambulance event they competed against a wide array of teams from fire departments, police forces, Ontario Hydro and many other companies.

Here's what the Ontario Division team won:

Gold – in the Industrial Accident Prevention Association (IAPA) competition.

Silver – for team member **Scotty Stewart** in the Men's Single Open competition.

Bronze – in the Senior Men's Open competition among 27 teams.

The team includes:

- **Bob Stacknik**, a support miner at Stobie Mine with five years service.
- **Scotty Stewart**, an electrician at Creighton Mine with nine years service.
- **Gilles Roy**, an industrial mechanic at North Mine with 22 years service.
- **Normand Marcil**, a heavy duty equipment mechanic at South Mine with 23 years service.
- **Dermott Kinsella**, an electrician at Coleman Mine with 26 years service.
- **Richard Chamberland**, an electrician at North Mine with 13 years service.
- **Jean Paul (J.P.) Coutu**, team coach and welder specialist at the Smelter with 28 years service.

Scotty said the team has many Inco people to thank for its success.

"Without the commitment of Dave Derochie (Inco first aid trainer and team coordinator) we wouldn't have had a team. Management commitment was also strong – especially from Creighton Complex manager **Fergus Kerr**, because he had four of the seven members of the team from his complex."

J.P. added, "It was a great honor. Everybody there was well trained. We went up against the very best."

Stobie TQI team finds savings and safety in wet shotcrete

Conrad Larocque

Stobie Mine has its own hat trick in the works, but it has nothing to do with hockey.

Employees at the mine have found that the paradigm of rock bolting isn't the only safe means of ground control.

A Total Quality Improvement (TQI) Team at Stobie Mine has quadrupled efficiency, lowered costs and improved safety in ground control with their wet shotcreting technique.

The wet, steel fibre-fortified, cement-like substance is sprayed on mine walls instead of traditional rock bolting and screening methods as a means of securing rock and preventing loose from falling.

A total of $700,000 a year in savings is forecast in reduced ground control costs as the program proceeds.

"Wet shotcreting started to replace bolting and screening as a means of ground control here at Stobie about three years ago. We're seeing the benefits of that now," said **Conrad Larocque**, a wet shotcreter.

The TQI Team also found that by moving forward with the newer technique there were efficiencies and safety improvements to be gained.

Two employees bolting and screening advanced about 12 feet per shift at Stobie Mine, Conrad estimated.

But now those two employees do the same distance in about two hours.

"It's a lot more efficient."

Lawrence Dagenais, quality coordinator at Stobie, pointed out that the shotcreting method is also safer for employees applying the material.

When shotcreting the employees are much farther away from the unsecured rock than they were while performing rock bolting and screening, he said.

A robotic arm dispensing the shotcrete extends 26 feet giving the shotcreters an extra buffer zone from unsecured areas.

Conrad said, "It's much safer to do a heading with wet shotcrete than bolting and screening because the men aren't exposed to loose on the back."

Mike Doniec, datasolo drill operator, said wet shotcreting has improved his job.

"As a driller, I notice we don't have to worry about hitting a bolt. You could ruin a drill bit and lose rods before we used this technique. At about $350 a bit, there's a good cost saving right there."

But that's just the beginning of the cost savings in wet shotcreting.

"In terms of cost savings, now there's no scrap metals from bolting and screening going through the circuit leading to the mills," Conrad said.

The scrap metal, left in the ore after blasting and scooping, would damage the conveyor belt adding to production costs.

Lawrence explained that employees who used to have to weed out as much of the scrap metals as possible are now in production-related work.

"Another cost saving is that we don't need a guy to handle bolting and screening supplies. Now he's in production. He's been redirected to more value-added work," Lawrence said.

The total cost of ground support with shotcrete is less than the cost of supporting the ground with bolts and screen.

"Shotcreting is costing less now than the old system because of the continuous improvements to the process by the TQI Team," said Lawrence.

Other members of the Wet Shotcrete TQI Team are:

Rodney Campbell — wet shotcreter

Normand Charbonneau — wet shotcreter

Maurice Scott — wet shotcreter

Dennis O'Donnell — ground control specialist

Collin McAnulty — engineering supervisor

Larry McLaughlin — first-line supervisor

Wayne Quinn — operating general foreman

Dave Duncan — first-line supervisor

Conrad said the success of the Stobie Mine TQI Team is promising for the entire Ontario Division.

"I can see wet shotcreting spreading throughout the Division."

Costs drop and accuracy rises with new drills at Stobie

Automation and a little old-fashioned teamwork will achieve lower drill costs per foot and improved safety at Stobie Mine.

"We put a TQI Team together to increase footage and reduce costs," said datasolo driller **Mike Doniec**.

"Now the 1060 Drills need less maintenance so there's more drilling time available."

In the last four years, the team replaced older, high-maintenance drills with new, high-tech drills capable of drilling accurate holes with the flexibility to move onto other levels more easily.

The three 1060 Drills are currently operating on three levels, at the 2,060-foot, 1,700-foot and the 1,800-foot level of Stobie.

All three are run by one operator working from a control room on surface – so safety has also been improved.

"It's a lot more environmentally friendly in the control room for the operators," Mike said.

The robo-drills, as they are nicknamed, also reduce production costs — partly because one operator can run three at the same time, but also because they are more efficient.

"Compared to the older machines. They can drill a longer hole more accurately with fewer re-drills. So there's less rework."

There are more tonnes broken per blasting ring as a result of the accuracy of the new robo drills.

The new drills allow the blasting of 4,000 tons per ring compared to 1,500 tons per ring blasted in the past.

New 1060 drills at Stobie Mine will allow drillers like Mike Doniec to increase footage and reduce costs while operating remotely from surface.

Also on the TQI Drill Team at Stobie are:

Bob Stacknik — solo driller

Rick Bertrand — solo driller

Steve Richer — solo driller

Dan Plante — solo driller

Lawrence Dagenais — quality coordinator

Collin McAnulty — engineering supervisor

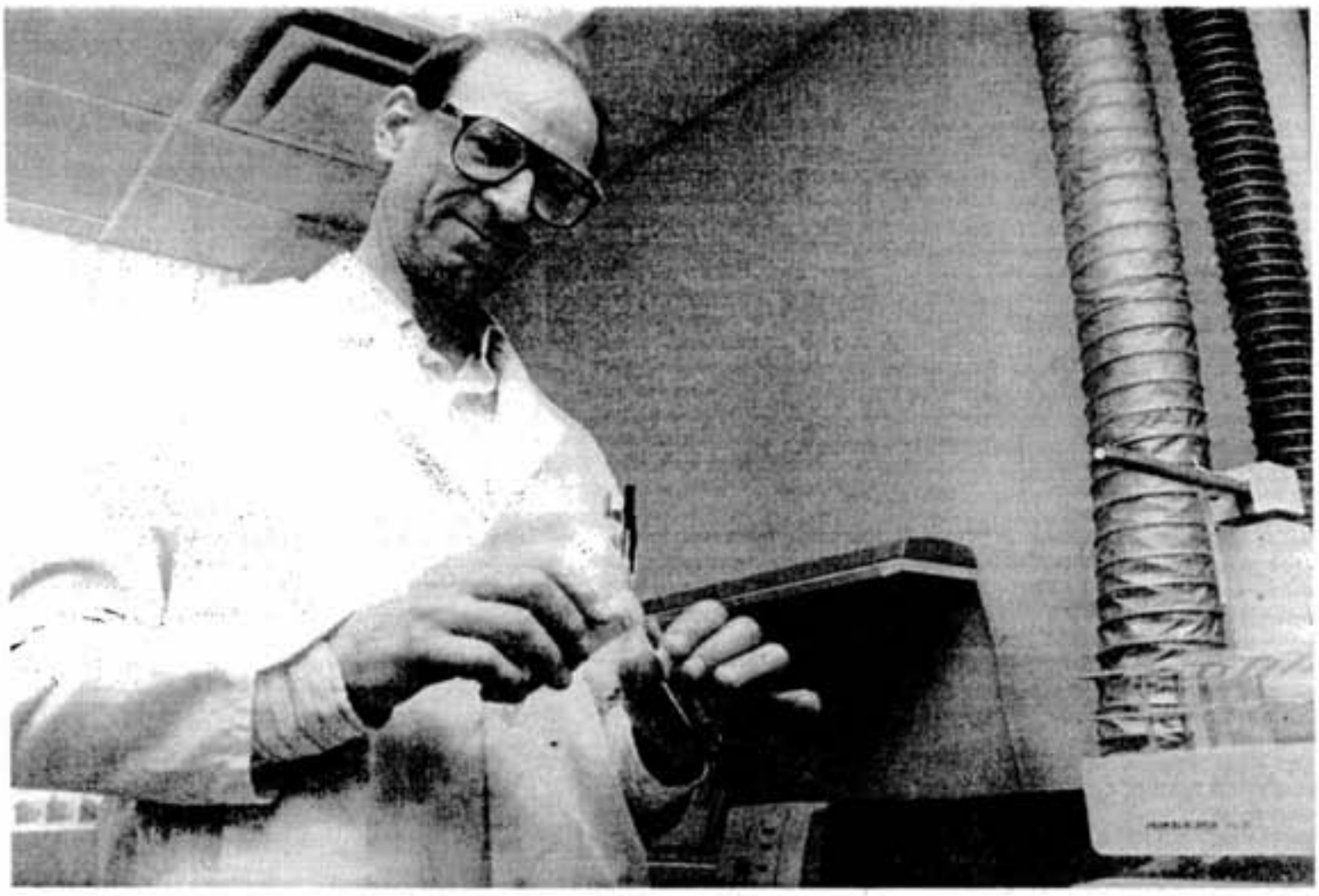
Murray Cotnam — first line supervisor

Wayne Tonelli — team leader

Peter Golde — Mines Research

Wayne Quinn — operating general foreman

Inco chemists worldwide share expertise



Development chemist Zbig Waszczylo pours a copper cathode solution for precious metals analysis using the ICP Mass Spectrometer at the Process Technology lab in Copper Cliff.

Many an e-mailed message has been exchanged since the Inco Analytical Chemists Conference was held in Copper

John Bozic

Cliff earlier this year.

That's just one way technological information and problem solving methods are being shared among Inco operations worldwide as a result of the conference.

The more information is shared the more efficient Inco operations can become, said Process Technology chief chemist **John Bozic**, who helped organize the conference.

John said the conference centered on technological change and its applications. But getting the Inco chemists familiar with each other was perhaps the most important aspect of the meeting.

It was an easy way to open valuable lines of communication, he said.

"Really the main thing is to keep on top of the technology to improve productivity through the introduction of automated analysis."

Discussions also focused on how to obtain a representative sample from a mill, smelter or refinery and preparing the sample in such a way that it truly represents what is at the plant.

The conference, hosted by the Ontario Division, did that by allowing Inco chemists from Indonesia, London, Wales, Manitoba, Sheridan Park in Mississauga, Port Colborne and Sudbury to get together and talk.

One of the many topics discussed was Inductively Coupled Plasma (ICP) Mass Spectrometry, used by chemists at Copper Cliff's Process Technology lab.

For two years the ICP Mass Spectrometer has allowed chemists to study the quality of Inco's nickel in greater detail. The level of that detail is so great that it has enabled the company to promote the highest level of product purity in the mining industry.

"We can boast the highest quality of our nickel because we can prove it with the ICP Mass Spectrometer," said John. "It measures down to parts per billion and even parts per trillion. Before we used to say lead was less than one part per million, for example. Now we can say it's less than .01 parts per million – which it was anyway. We just didn't have the ability to confirm that."

Ontario Division development chemist **Zbig Waszczylo** said the ICP Mass Spectrometer has also reduced the time it takes to examine purity of products.

"It used to take weeks to detect elements. Now it can be done overnight."

As a result of the conference, Zbig said the Port Colborne Refinery sent a sample of its effluent to Copper Cliff's laboratory for a faster study and report. Copper Cliff's lab is the only one within Inco that has the ICP Mass Spectrometer.

Zbig was also impressed by Inco experts from Acton, in London, England, who advised delegates on how to dissolve rhodium in a solution for study.

Rhodium, a platinum group metal, is not easy to break down and examine, Zbig explained.

But the greatest benefit from the event, he also said, was simply gathering so many Inco chemical experts in one place at one time.

"We're going to share more technology with Inco chemists worldwide as a result."

Gord Bacon, vice-president of Inco Technology, based at the J. Roy Gordon Research Laboratory, was among the 20 people attending the conference.

He too was interested in meeting the chemists all at once.

"I came away with a good perspective of where we are in the area of demographics," he said.

Gord said while Inco has many senior chemists and those hired in the last several years, there's a gap in chemists with mid-range experience. That's largely a result of a lack of hiring industry-wide in the 1980s, he pointed out.

"We have to fill that gap."

He also noted the conference's value for simply having Inco chemists from around the world meet.

"It was a great interchange of technology and expertise between Divisions."

The wealth of knowledge among the experts is considerable, he added.

"They're solving problems that haven't been identified yet in any textbooks."

Sam Marcuson, manager of Process Technology and Production Planning in Copper Cliff, said the ability to share knowledge is crucial to future cost reductions at all Divisions of Inco.

"We can have an analytical technique here that could be useful at another operation. We have to share techniques and problem-solving."

Getting the experts together is the best way to share information, Sam said.

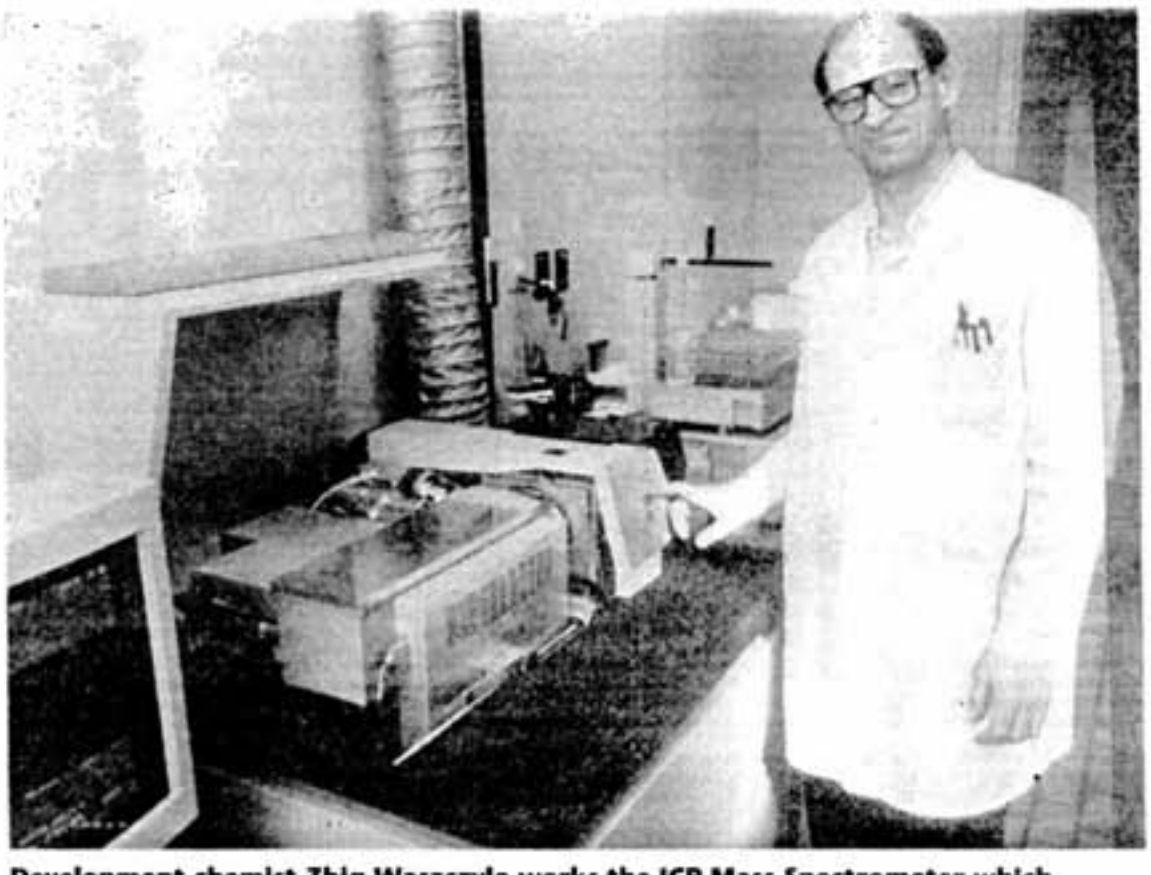
John said the conference also encouraged more benchmarking.

"We've decided to start benchmarking our labs with labs at other companies in the industry around the world. It's a way to compare ourselves and improve our labs."

The conference will also help Inco chemists work toward what John calls his own "ACT" program, not to be confused with Inco's emergency awareness program (Always go indoors. Close all doors and windows. Turn off furnaces and air conditioners.)

"My ACT is Accurate, Cost-effective and Timely assays."

There was also an immediate cost-saving aspect to the conference. A list of surplus equipment has been drawn up for Divisions to share, which will help reduce spending on technology already available in separate Divisions of Inco.



Development chemist Zbig Waszczylo works the ICP Mass Spectrometer which allows chemists to study the quality of Inco's nickel in greater detail — even as low as parts per trillion.

Ventilation and alternative fuel research

The concern of occupational exposure to diesel exhaust emissions is an important workplace issue for the mining industry.

During the last three decades of diesel operations at Inco, a significant amount of research has taken place and improvements made in the area of work environment and effective diesel operation.

This has been possible through the use of modern engines, improved fuel quality and exhaust control technology, coupled with adherence to proper maintenance and ventilation design and practices.

The first diesel-powered machine at Inco was put into operation in March 1966 at Frood Mine.

Currently, there are more than 830 diesel-powered units operating at Inco's Ontario Division mines.

The major method of controlling environmental conditions in a mine is by airflow. The total volume of fresh air supplied to Ontario Division mines is 8.5 million cubic feet per minute. There are 100 main surface and underground fans distributing this volume of air at these mines.

The primary role of underground ventilation is clear and simple. It is to maintain a workplace suitable for miners to work in. Ventilation is often depicted as the life blood of a mine.

Mine ventilation control, mine fire detection and firefighting are inseparable, since a ventilation system can spread deadly products of combustion just as effectively as it does life-sustaining oxygen.

At Inco, the fundamental rule for safeguarding personnel against the effects of mine fires is based on:

- Sound ventilation design – dedicated and isolated, fire-proof airways for both fresh and return air.
- Fire prevention.
- Early fire warning system, both for conveyor belts and spontaneous combustion, and rapid extinguishment.

"At Inco, ventilation is considered a primary installation and, as in the past, reflects long-term demand," said **Joe Stachulak**, chief mines ventilation engineer in the Ontario Division. "The trend in metal mining during recent years towards mechanization, high-tonnage production methods and mining at greater depths has greatly increased ventilation requirements. The flow of air must quickly dilute and carry away diesel exhaust fumes, dust created by mining operations, fumes of the explosive used in blasting and remove heat and humidity.

"Foresight and ingenuity in ventilation design have permitted the productivity of our mines to be very much enhanced," said Joe.

Consider, for example, Creighton Mine, where the phenomena of heat storage capacity of a large mass of broken rock is utilized to provide a near constant temperature of air to reach the deeper workings of the mine throughout the year, eliminating the need for mechanical refrigeration. At Stobie Mine, on the other hand, the heat liberated by the formation of ice is used to heat the air during winter. These innovations were laid out by the now-retired general mines ventilation engineer at Inco **James Rutherford** in the early 1960s.

"We recognize that there is always room for improvement," said Joe. "Considering the overall picture of present-day mining, the expenditure required to provide a proper system of mine ventilation should be regarded as a sound investment that pays back in the form of enhanced productivity, improved safety and the health of miners.

"Neither the first powered machines nor the latest electronically controlled LHD (load-haul-dump) equipment could have been employed underground without an adequate supply of air to minimize miners' exposure to diesel emissions," he said.

"Mining at greater depths and the potential of new regulations on the horizon are challenges which we must be prepared to meet in a safe and cost-effective manner," said Joe.

"One of the ways to meet these challenges is research into usage of alternative fuels such as biodiesel."

Biodiesel could be the future of mining fuel at Inco and throughout the industry.

Then again, it's possible the new fuel, made with soybean from Ontario farmers, won't be practical or economical.

But Inco, with other Canadian mining companies in a research consortium called the Diesel Emission Evaluation Program (DEEP), have decided it's worth studying.

DEEP is undertaking an investigation of various technologies to reduce diesel particulate emissions. The biodiesel test was the first such investigation and was headed up by Joe from Inco and **Win Watts** of the University of Minnesota with input from **Bruce Cantrell** of the United States National Institute for Occupational Safety and Health (NIOSH).

The University of Minnesota, Ortech Incorporated, Natural Resources Canada and Michigan Technological University recently conducted this research to evaluate the impact of 50 per cent blended biodiesel fuel and current diesel on air quality and emissions at the 1,250 foot level of Creighton Mine's No. 3 Shaft.

Other partners in the study include the United Steelworkers of America Local 6500 (**Don McGraw**, chairperson of the Health, Safety and Environment Committee), NIOSH, the Manufacturers Emission Control Association (U.S. and Canadian members), the Ontario Soybean Growers' Marketing Board, Deutz Engines and the National Biodiesel Board (U.S.).

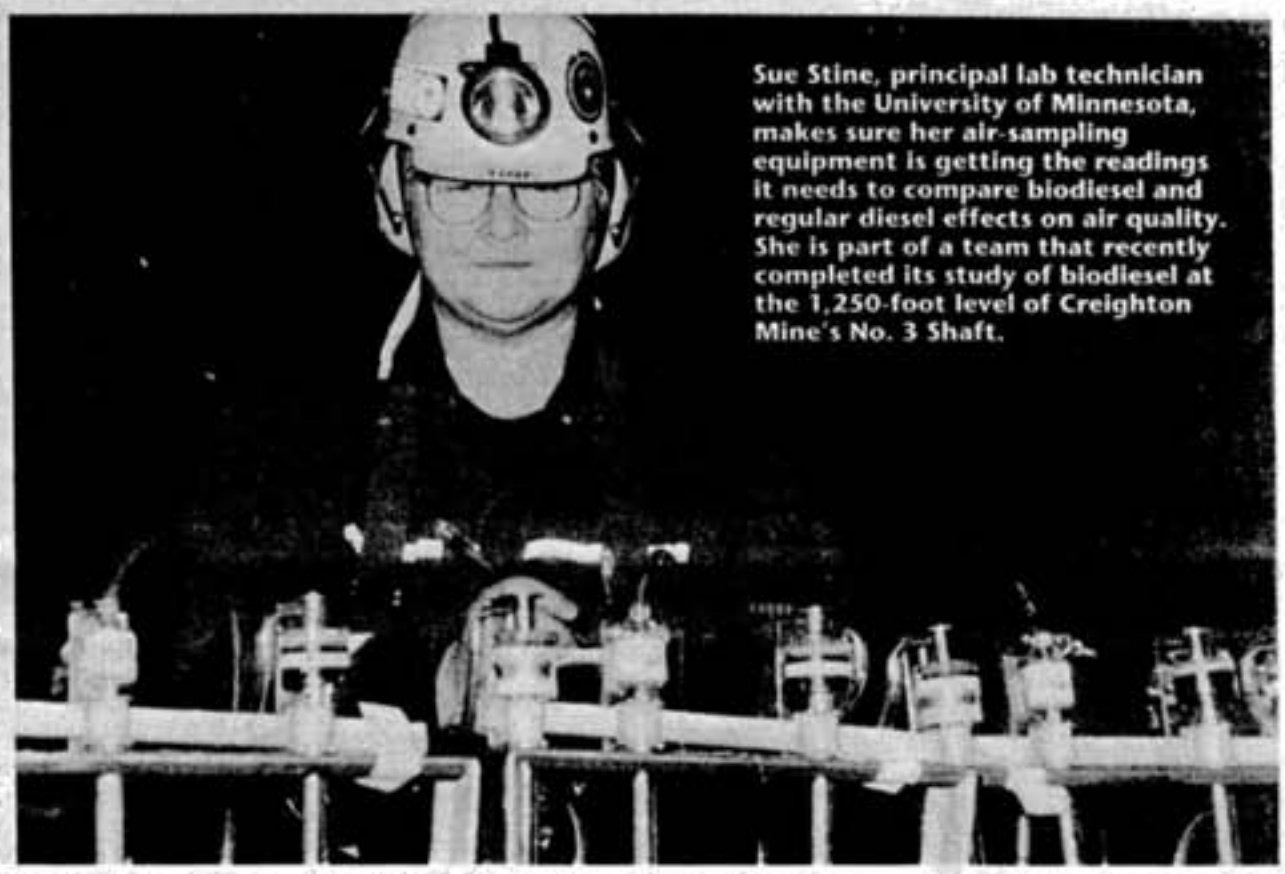
The objective of this research is to determine how much reduction in diesel particulate emissions can be obtained, and at what cost, using the blended biodiesel with modern low-sulphur diesel fuel.

This project is measuring and chemically and physically characterizing the type of diesel particulate matter and gas emissions present in the test section.

During the first week of the evaluation, a test vehicle was operated on a low-sulphur, petroleum number two diesel fuel (D2).

During the second week, the test vehicle was operated on a 50 per cent blend of soy methyl esters and D2 fuel.

"It is expected that the combination of



Sue Stine, principal lab technician with the University of Minnesota, makes sure her air-sampling equipment is getting the readings it needs to compare biodiesel and regular diesel effects on air quality. She is part of a team that recently completed its study of biodiesel at the 1,250-foot level of Creighton Mine's No. 3 Shaft.

Joe Stachulak, Inco's chief mines ventilation engineer with Mines Technical Services, left, examines an air sampling device with Win Watts of the University of Minnesota's Centre for Diesel Research. The testing team did a comparison of regular diesel, used by Inco scooptrams and other vehicles, and new biodiesel fuel at the 1,250-foot level of Creighton Mine's No. 3 Shaft.

Kevin Butler of Natural Resources Canada checks readings on gas analyzers which were at work during a study on the potential use of biodiesel as an alternative fuel source. Inco is one of many partners exploring the viability of a potentially cleaner underground fuel.

among Inco's efforts to deal with diesel

biodiesel fuel at this level of blending will reduce diesel particulate matter emissions by 30 to 50 per cent, with minimal sulphate emissions and no increase in other gaseous pollutant emissions," said **Watts**, of the University of Minnesota's Centre for Diesel Research.

"So far," he explained, "biodiesel would be too costly for the mining industry to replace regular diesel fuel."

But, with mass production and more innovations in terms of its cost, biodiesel could become economically viable for mining companies in the future.

Bruce Conard, vice-president and health science advisor at Inco's corporate office in Toronto, is also chairman of DEEP's Management Board.

"The biodiesel test at Creighton is the start of a major undertaking by DEEP, which is planning many other types of studies across Canada's mining industry as it searches for reliable and cost-effective technologies to reduce miners' exposures to diesel emissions," said Bruce.

Conducting the study underground at Creighton required teamwork and union cooperation, including the participation of worker safety representative **Randy Condie**, who functioned as the union liaison.

But many Inco employees contributed to the test at Creighton. **Doug O'Connor**, senior ventilation supervisor, provided day-to-day assistance and helped to coordinate the research effort.

Terry Turcotte, senior ventilation supervisor, coordinated with Doug and was responsible for safety and measuring the airflow parameters and gas data. When problems arose, he determined the cause and had them fixed.

Rene Fournier, research miner, operated the scooptram test vehicle. He put in many hours to ensure the success of the project.

Brent Holmes, ventilation assistant, provided transportation, ensured safety procedures were followed and added the odd hockey joke to keep researchers in good spirits.

Jason Simpson, engineer-in-training, assisted in many areas including calibrating pumps and recording data.

Bruce Urquhart, senior environmental analyst, prepared and analyzed samples.

Aurel Courville, Public Affairs coordinator and audio-visual supervisor, and **Mike Barrette**, audio-visual technologist, produced a video of the research project.

The engine maintenance team of **Rick Lamarche, Patty Desjardins, Chris Cayen, Greg Louisieze** and others, provided outstanding support to the researchers.

Joe said the research project would not have been possible without the additional support of the manager of Mines Technical Services **Mike Sylvestre**, Creighton management **Fergus Kerr, Menno Friesen, Mike Grace** and **Brian Young**, general foreman **Eric Loney** of Mines Research and Occupational Health management **Larry Banbury, Tom Mehes** and **Damian D'Aguiar**.

Rene Fournier, a miner with Inco Mines Research, found his scooptram performed at least as well using biodiesel as it does on regular diesel fuel. "Actually, I find I've got a little more power on the scoop when it's running on biodiesel."

– BRIEFS –

– Mechanic earns honors –

The Manitoba Division's **Scott Sanders** earned top honors as an apprentice instrumentation mechanic from the provincial government.

Scott, of Mill Maintenance, received his award at a special ceremony in Winnipeg honoring top apprentices in 23 trades.

– Heating up the savings –

Rounded corners are cutting corners on costs at the Manitoba Division's Refinery in Thompson.

Heating coils with square corners at the Refinery took a lot of time to repair. "We were repairing these heating coils about every three weeks," said **Dan Wrana** of the Refinery.

"It seemed like you would cut and grind for days," added welder **Tom Kippenhuck**.

Tom and **Tom Melcosky**, both of Central Maintenance, found ways to reduce the number of welds. They also started using pipe that could bend without crimping or causing other restrictions. Bent corners require no welds.

The first bent coil went into service two years ago and hasn't failed.

– Backing up safely –

Backing up a truck or other heavy equipment at work requires special attention.

The National Solid Waste Management Association Manual Of Recommended Safety Practices provides detailed procedures for backing up safely, acting as a spotter during backing and working around mobile equipment.

These procedures can be applied to any situation where backing up a vehicle or machinery is necessary.

Maintain visual contact between the driver and workers on foot when working close to the vehicle and when backing up.

Check both side mirrors repeatedly.

Use a reliable spotter positioned to see both the driver and blind spots behind the vehicle.

Use standard hand signals.

Stop the truck if the spotter must change positions.

Immediately stop if visual contact with the spotter is lost or obstructed.

Remain clear of the rear of the vehicle when back-up lights are on or the alarm is sounding.

What'll they do for Christmas?

These Information Systems employees dressed up for Halloween on a dress-down day for the United Way. Seated from left are grumpy old Russ Thom, bewitching Judy Taylor, nearsighted Liz Chorkawy and the witchly duo of Noreen St. Germain and Deb Presniak. Standing from left 'Rambo' Rose Tammi, Raggedy-Ann Jeanette Leftly, prisoner Gary Cotnam, pirate Denis Ramarr and ace of hearts Carmen LaPlante.

A few simple steps allow everyone to help lower Division energy costs

The cost of electricity, natural gas and fuels such as gasoline are cash costs that Inco pays to its suppliers each month.

Energy accounts for more than 10 per cent of the Ontario Division's operating costs and 1998 costs are expected to be even higher than those in 1997.

"Natural gas costs have increased because the Ontario Division had a contract at a very good price that has expired and we now have to pay a higher price for what we use," said **John LeMay** of Energy Management.

"Electricity costs have risen because we have to pay Ontario Hydro more for the power we use because of the problems in their nuclear plants."

Energy Costs *($million)*

	1997	1998
Electric Power	70.7	74.3
Natural Gas	27.0	30.7
Other Fuels	8.1	8.4
Total	105.8	113.4

John says everyone in the Division can help to reduce these costs by taking the time to do two simple things:

1) Turn it off — Do you leave lights on when you leave the room, motors running just so they will be *ready* when they are really needed, doors open on a cold day, trucks running while parked, conveyors running when empty or ignore compressed air leaks?

2) Turn it down — Do you leave the heat in a building turned up even when not in use, open a window rather than turn the radiator off, increase the setting on a mine air heater beyond the recommended level or have hot water temperature settings too high?

"These are a few of the ways that we waste money on energy," said John. "We are paying for something that is adding absolutely no value to the Division. If we all take a few minutes to turn energy-using equipment down or off when not needed we can reduce next year's energy costs by millions of dollars."

If you need help with a good energy-saving idea, call John at 682-8152 or **Andy Lemay** at 682-8993.

Good energy habits at home bode well for workplace conservation

Energy assessor Gary McCarthy suggests changing old shower heads to new energy-efficient models like this one.

Habits at home are taken to work and vice-versa.

With that principle in mind, Inco people are promoting wise energy use and conservation at home as well as on the job.

Discussions on how to reduce energy costs at plants and mines have been going on among supervisors and employees since October.

Now, energy coordinator **Andy Lemay** says it's time to take the Ontario Division's Energy Awareness Program to the next level.

"It's time to take it home," he said.

To that end, Andy has a few energy and money-saving tips from Eco-Action Sudbury, a group of energy-use experts, for employees to consider.

In 90-minute home inspections being done in a Valley East pilot project, assessors **Gary McCarthy** and **Mark Leclair** find some obvious and less obvious overlooked energy wasters.

A recent visit to a 45-year-old bungalow revealed common insulation flaws that were costing the homeowner as much as $40 a month extra on his oil bill.

"Sometimes just caulking up basement foundation cracks, corners of walls or adding proper insulation to windows and ceilings can save a person a lot of money," said Gary.

Other household energy tips include:

Seal all openings or cracks. "Your attic hatch is like another door in your house," Mark pointed out. Weather stripping and a lock-and-eye latch provides a good seal.

Add acoustical caulking to any coal chute if you have an older home.

Tape seams in furnace ducts with aluminum duct tape to better direct heat and reduce heat loss.

Windows insulated with fiberglass pink insulation should have it replaced with low-expansion foam.

Wrap your water heater with a blanket of insulation. Insulation kits are available at most hardware stores.

Drape curtains in front of large windows. Curtains can help reduce radiant heat loss from windows.

Add weatherstripping to the tops and sides of any door frame.

Place shrink wrap over any window frames that feel cold. Windows are sources of heat loss even in newer homes. Shrink wrap is an effective and inexpensive solution to the problem each winter.

Place special Canadian Standards Association foam pads between receptacles and cover plates of electrical outlets, a source of heat loss few people consider.

Seal all joints with a flexible caulk that is clear or paintable. Joints to be sealed include baseboards, moldings and window and door castings.

Assessor Mark Leclair said windows can be well insulated with caulking, but not with fiberglass insulation such as this window. Fiberglass insulation becomes damp and moldy when used around windows.

Inco and Hydro join forces at Garson to identify potential energy savings

Garson Mine electrical foreman Ken Prestage, left, project manager Mike White and Doug Pacey, Ontario Hydro business markets advisor, review schematics of Garson Mine operations.

Ontario Hydro has gone underground to help the Ontario Division boost its bottom line.

"Inco recently agreed to let Ontario Hydro set up a monitoring system that would allow them to reduce unit costs in their mining operations," says **Guy Springgay**, an Ontario Hydro account executive for Industrial Sales. "One way to do that would be through more efficient use of their energy consumption.

"We have had a working relationship with Inco for eight years working on energy management related projects. This joint effort is a continuation of that relationship."

Garson Mine was chosen as the location to set up a pilot using Hydro's enVision, a total utility management system that offers the monitoring, targeting and management capabilities Inco was looking for.

Utility management systems were developed in the UK in 1980. Since then, Ontario Hydro has refined utility management techniques to achieve savings in the range of five to 15 per cent across a wide range of industries.

enVision monitors all plant utilities including electricity, fuels, compressed air and water — managing them as controllable resources in the same way as raw materials, finished goods, personnel and capital are managed. enVision is also designed to be compatible with existing plant hardware.

Using enVision, Inco will be able to track energy use against production, benchmark against similar operations and set reduction targets.

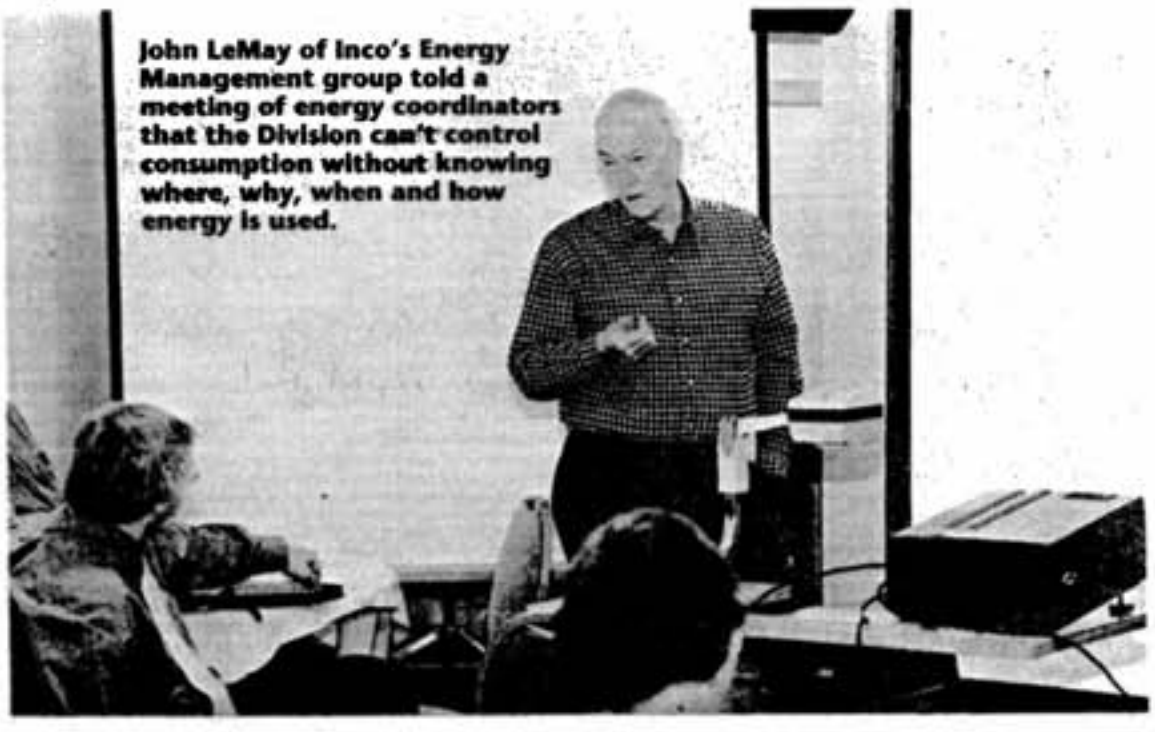
Opportunities for savings are significant. For instance, a common problem in the mining industry is that regular blasting jars loose the air fittings on compressors. Between 30 and 40 per cent of the compressed air can be lost. enVision helps Inco staff identify and quantify problems such as this. The problem then can be controlled efficiently and effectively.

"We've just completed the first milestone in the pilot," says **Doug Pacey**, business markets advisor at Ontario Hydro. "We've established the baselines. Targets can now be set and performance improvements monitored. A five per cent reduction in electricity and gas costs at Garson Mine could result in operational savings of $80,000 annually, a reasonable start in paring the unit cost of their operations."

Guy Springgay, Ontario Hydro account executive, and Mike White, a project manager at Garson Mine, look over a mine air compressor during its routine maintenance.

Lee Whitman of Ontario Hydro, standing, and Mike White of Garson Mine look over a computer program showing the mine's energy consumption.

Garson Mine employees like Mike White, electrical technologist and project manager, hope the monitoring partnership with Ontario Hydro leads to significant savings



John LeMay of Inco's Energy Management group told a meeting of energy coordinators that the Division can't control consumption without knowing where, why, when and how energy is used.

Former open pit now thriving lake

Fish are spawning in a lake that was recently the site of an active Inco surface mine.

"We've essentially created a lake here," said Inco biologist **Glen Watson**.

After the Garson pit, known as the 10.2 orebody, was mined of 130,000 tons of high-grade ore in 1990, work began almost immediately on land reclamation.

The pit was contoured with sand and clay. It didn't take long for the 46-metre (140-foot) deep pit to fill naturally with ground water.

Inco reclamation employees added lime and grass seed to the banks of the former pit, roughly 10 acres.

Ground water flowed in at a relatively modest rate of 150 gallons a minute across the entire pit area. That water had been pumped out as quickly as it seeped in when the pit was an active surface mine.

Within a year of Inco's land restoration efforts, a flock of geese arrived to make the new lake their home.

"Things got there on their own after that," Glen said.

"Frogs, turtles, geese, ducks and gulls use the lake," said Inco environmental coordinator Carolyn Hunt.

"We saw an opportunity to take this project one step further by going into the water," she said.

"So we created a fish habitat – a place for fish to hide from the sun, eat and spawn."

After sinking many recycled wooden pallets, dead trees and rocks to the floor of the lake, the habitat was ready for its inhabitants to move in.

"We even made use of a big poplar tree by the Copper Cliff Clinic that had fallen this summer in a wind storm," added Carolyn.

Minnows and crayfish were added earlier this summer – with surprisingly speedy success.

"The minnows have already reproduced. We didn't think that would happen this year," Glen said.

A brief recap of the developments at the site put that achievement in perspective.

The site started as a five-acre section of flatland until the open pit began operating with ramps reaching down 46 metres.

It has been mined, landscaped, fertilized and seeded. An aesthetic berm was also constructed on the south side.

"So we have fish reproducing in what was once an open pit mine," Glen summed up.

Adding to the underwater success is the steady growth of trees and vegetation around the as-of-yet unnamed lake.

Carolyn said the positive results are a source of pride to her and her fellow employees.

"This has never been done before, as far as we know. But we always go a step further at Inco."

Inco biologist Glen Watson and environmental coordinator Carolyn Hunt place some minnows in their new home. Glen said he's impressed that the minnows have already reproduced at the new lake in Garson, once the site of open pit mining.

These environmental employees dump rock into the former open pit mine to help create a suitable habitat for aquatic life. Wooden pallets, visible to the right, were also sunk to the lake floor.

Can you believe this was an open pit mine? It's fast becoming ready to join the ranks of the Sudbury region's many beautiful lakes.

Regreening around the world

As mining progresses in the background, P.T. Inco in Indonesia employees carry on with the company's extensive revegetation program outside the Soroako plant. Since the regreening began, more than 900 hectares of land have been revegetated.

– BRIEFS –

Christmas trees for sale

The First Copper Cliff Scouts group is selling Christmas trees again this year to raise money for supplies. The trees can be seen at the home of Safety Health and Environment's **Mike Peters**, 10 Balsam St., Copper Cliff.

Magazine highlights Inco

The Ontario Division figured prominently in the October issue of the Canadian Mining Journal. Articles touched on Inco's cost-cutting measures, tele-remote mining, the Victor Advanced Exploration Project and the Laurentian University Mining Automation Laboratory of which Inco is a partner.

Pensioners tour refinery

The Port Colborne Refinery opened its doors to more than 150 pensioners last month for its annual Pensioners' Day event. The day started with coffee and donuts at the Italian Hall before those that wanted to were bused to the plant for tours of the Precious Metals Refinery, Nickel Processing and Cobalt Refinery.

Treat electricity wisely

Because virtually everyone works around electricity, receiving an electrical shock is not just limited to electricians.

Many of us take for granted that we know what to do to avoid being electrocuted.

But it's good to remind ourselves of some basic safety tips.

Here are some guidelines to follow when working around electricity:

- Inspect your work area for possible electrical hazards.
- Never overload a circuit by plugging too many items into one outlet.
- Keep all electrical supplies away from damp or wet areas.

Rail device makes bridge inspections safer

CP Rail operator Lyle Manchester, left, and Inco engineer Bob Catto begin their descent under an Inco rail bridge on the hot metal line in Copper Cliff.

Inspecting Inco's railway bridges frequently puts Transportation employees between a rock and a hard place.

But it's always a safe place.

Inco people inspect bridges annually for structural integrity to see if extra maintenance work needs to be done. That inspection process was recently completed in the Ontario Division.

But for the first time, CP Rail equipment and operators were involved with the inspection of two Inco bridges which intersect CP Rail lines.

Using a CP Rail-owned crane-like device positioned on a rail truck, a CP Rail operator and an Inco engineer were hoisted 270 degrees around a bridge in order to closely examine its underside.

"We used to use a cherry picker. This is much quicker," said **Bob Catto**, Inco specialist in structural engineering who conducted the inspection.

"We're looking for any cracks, fissures, rust and imperfections in the steel," said CP Rail operator **Lyle Manchester.**

"We've been out changing rail ties and tightening bolts," said Inco track boss **Angelo Anzil** summing up what much of the work entailed in recent weeks.

Three other Inco bridges, which do not intersect CP Rail lines, were also inspected.

"When you have the kind of traffic we have, regular maintenance is a must," Angelo added.

Despite the fact that some of the bridges are 50 years or older and take a daily pounding from ore cars, the Inco inspections didn't find any need for major repairs or rebuilds.

"The bridges were in good shape," said Bob.

Eero Mansikka, Inco survey party leader, said keeping up regular inspections is a must in the transportation business.

"Trains are getting heavier, bigger and faster all the time."

Currently loaded ore cars weigh about 100 tonnes and hot metals cars weigh up to 340 tonnes.

Eero said Inco is keeping up with the pace of rail traffic ensuring that safety is always number one.

The hydraulic arm slowly extends down the side of the bridge where Inco engineer Bob Catto can begin his close-up examination of the structure's integrity and general state of repair.

By the end of the mechanical arm's extension, it has brought the inspection crew 270 degrees around the bridge allowing for a thorough inspection.

Wrapping helps hay survive winter

"It looks like a big caterpillar creeping along the ground. I think we'll have to paint some eyes on it," says Mike Peters, grounds supervisor with Safety Health and Environment, as he overlooked the new way to store hay and straw for the winter.

The straw and hay is spread by tractor, by operators such as Mike Sleik, as a means of dust control and as the first step in reclaiming environmentally-stressed land.

When it comes to land reclamation, Inco really gives a hay.

"The hay really helps the land germinate and grow. We use a straw mulch on top of the tailings to start the regermination process," said **Mike Peters**, of Safety Health and Environment.

Spreading hay and straw over mine tailings is part of the regreening process which has proven so successful over vast tracts of once environmentally-stressed land.

Years before trees planted by Inco reach the 20 and 30-foot heights seen on older reclaimed sites, a base for revegetation must be created. That's where the hay and straw enter the picture.

"But we also use it for dust control," said Mike.

Every spring, the reclamation process is restarted by Mike's group.

But every winter a portion of hay and straw, purchased earlier in the year from northeastern Ontario farmers, decomposes somewhat before it can be used.

That decomposition is a result of moisture build up.

This year, Mike thinks he's got that problem wrapped up.

"We're sort of shrink-wrapping it," he said.

By bundling hay and straw in 10-foot round bales and wrapping plastic around it, moisture is less likely to get locked in and do its damage, he explains.

It's the first year this idea has been put to use. But results look promising, Mike said.

For now, long caterpillar-shaped bales of hay and straw will wait out the winter at the Copper Cliff tailings site.

Come spring, Mike is counting on those caterpillars being about the same size as they were when they were wrapped.

Employee involvement key to food drive

Worker safety representatives extended their support to the Inco Employees' Christmas Food Drive again this year. The safety representatives will help distribute plastic bags to employees to take home and fill with food donations.

There didn't appear to be anything special or even unique about the contents of a brown cardboard box that brought members of the local Steelworkers union together earlier this month.

But as Inco's **Edgar Burton** reached in and pulled out the white plastic bags adorned with holiday symbols, the significance of the gathering was revealed.

These plastic grocery-type bags will package food donations for the 10th annual Inco Employees' Christmas Food Drive.

Edgar, the Divisional Shops mechanic who initiated the collection, met briefly with union representatives of Locals 6500 and 6600 to distribute 12,000 bags for food donations. This year, employees will receive a bag at the workplace and be asked to fill it and return the contents to one of 30 wooden boxes set up at various Inco locations.

Over its nine previous years, the Inco Employees' Christmas Food Drive has collected 35 tons of food. Edgar attributes the drive's consistent growth to generous employees, company support and supportive union safety representatives. "I never thought it would ever be this big," said Edgar. "Even the community gets involved. Grandmother's Pie Shoppe on Kelly Lake Road has been donating butter tarts to the campaign."

Noting that the safety representatives have been very supportive over the years, Edgar said they are responsible for distributing the plastic bags at their respective gates.

Brenda Alberty, worker safety representative in General Engineering, said participation was inevitable. "We automatically got involved," she said. "We usually get involved in good causes such as this. We felt it was a valuable project especially at Christmas time."

Ed Dumais of the Copper Refinery echoed Brenda's sentiments adding the food drive is a worthy project to support. "The Copper Refinery has shown a willingness to actively participate in anything to help people out. They are always getting involved. We recognize that there are others not as fortunate. To share a little of what we have will go a long way for the needy."

And distributing 12,000 bags to Inco employees will help this sharing process because of its convenience, said **Shirley Brown** of the Nickel Refinery. "We all recognize the need. This allows us to bring something out of our cupboard and put it into theirs."

For **Dan Fortin** of Coleman Mine, the project shows a willingness for employees to help others less fortunate. "It shows how people at work support the community," he said.

Divisional Shops mechanic Edgar Burton, left, distributed 12,000 bags to worker safety representatives for the Inco Employees' Christmas Food Drive. The worker safety representatives, including Dan Fortin of Coleman Mine, are responsible for distributing the bags to employees.

Pensioners' donations welcomed

Ontario Division pensioners are again invited to participate in the annual Inco Employees' Christmas Food Drive.

Last year, in an attempt to help the drive grow and allow pensioners to take part, arrangements were made with the Canadian Imperial Bank of Commerce (CIBC) and the Credit Union to accept cash donations at any of their branches. That option is being continued this year.

"While the Christmas season is a joyous one for most people there are unfortunately many in our region who will face a bleak holiday with little food on the table," said **Major Larry Bridger**, director of Community Relations with the Salvation Army in Sudbury.

"I realize budgets are tight for most pensioners and I do understand that many on fixed incomes are unable to contribute. However, some pensioners continue to support the annual food drive and have made cash contributions through the bank branches."

Any pensioners wishing to contribute money to this year's food drive can do so at any branch of the CIBC or Credit Union in the Sudbury region. In making contributions, people must state that the donation is for the Inco Employees' Food Drive Account.

Money raised through cash donations goes directly toward the purchase of food for the needy.

Employee campaign surpasses $200,000

The 1997 Inco Employees' **United Way** Campaign is almost complete and employee donations to date have surpassed $200,000.

In addition to this amount, pensioners have contributed approximately $11,000 and special events have raised another $1,400.

Despite the fact the number of potential employee donors is decreasing as more people retire, campaign co-chairs **Brian King** and **Eric Fenton** say they are very encouraged by the results and want to thank all the donors and canvassers who made this year's campaign a success.

The results, they said, prove once again that Inco employees and pensioners are willing to help the less fortunate residents of the community through a United Way donation.

Final campaign figures should be available in December.

LETTERS TO THE EDITOR

Dear Editor,

Thank you for your support of Cinéfest '97, Sudbury's International Film Festival. I am very pleased to inform you that this year's event enjoyed unprecedented success, ensuring a bright future for world-class film in the North.

Without committed community investment, Cinéfest would never have become the most anticipated cultural and entertainment event in Northern Ontario.

Thank you again for helping ensure the resounding success of this year's festival.

Sincerely,
Tammy Frick
Executive Director

Dear Editor,

I am writing this note to thank Inco for the award I received for being the highest standing Grade 11 student at St. Charles College. The award was very generous and I feel very honored.

It is nice to know that international corporations such as Inco support academic achievements and give back to their communities.

I am continuing to work hard again this year to maintain the standards I have set for myself.

Thank you again,
Colleen Langdon

Many factors contribute to back injuries

(Editor's Note: The Ontario Division has seen an increase in the number of reported injuries in the sprain or strain category, especially of the back. The following article is designed to help you understand and prevent some common causes of back injuries.)

By Heather Wallingford

Back pain is the most common reason for lost time at work.

It is estimated that more than 80 per cent of the population will suffer from back pain that will change what they can do for part of their lives.

Most back pain is not caused from an actual accident. It is often caused by repetitive strain. The most common causes of back pain are from a combination of things over time. These include:

- Twisting with a load.
- Improper lifting and reaching.
- Jerking and jarring.
- Habits and routines at work and at home.
- Going from doing nothing to being very active without warming up.
- Unfit muscles that stabilize the back.
- Stress.
- Fatigue.
- Lack of fitness.
- Smoking.

1) Avoid twisting with a load. Twisting with a load is the leading cause of back pain according to the word's leading expert. This is not new news since virtually anything that we read or hear about looking after your back says "Do not lift and twist, move your feet."

So why then is this still the leading cause of back problems?

Most of us try to follow this rule. But we sometimes find ourselves in awkward positions or on awkward footing where moving our feet while turning may not be possible or would be even more unsafe than staying put.

Did you know that twisting with a load also includes turning to look around while:

- Carrying a tool bag or box or wearing a heavy tool belt?
- Carrying groceries or a child?
- Bending or reaching with our body leaning forward?
- Pulling a large cable or a high pressure hose?

2) Follow proper lifting and reaching procedures. There are many aspects to safe lifting including making sure your path is clear, checking the load and having a safe grip. But there are a few key aspects to safe lifting that we usually do not give enough consideration.

a. Keep your back straight. All of us have been taught to lift with our backs straight. But as soon as we reach for anything we usually have to lean forward. Even to turn on a tap requires some leaning forward. As soon as we lean forward we are lifting half our body weight, more if we have a pot.

Leaning forward, even a little, without our backs flat puts stress on the discs, small joints and finely-tuned muscles. Just leaning in this way can give us a sore back.

Learn from the weightlifter and lift or reach with your seat out. This ensures that we keep the arch in our backs and makes the big, strong hip joints do the work. The hip is the strongest joint of the body and has the strongest muscles. It is made for heavy work. In actual fact there are very few hip injuries at Inco.

Keep the arch in your back when lifting or reaching by:

- Bending your knees.
- Keeping your seat out.
- Keeping your head up.

b. Keep your back upright. As soon as we lean forward, even a few degrees, the strength required to hold us there is multiplied. Keep in mind that even before we lift anything or apply any force to something we are lifting half our body weight (more if we have a pot). So a 200-pound person is lifting at least 100 pounds.

Stress on the lower back is eight times greater when we bend at a 45-degree angle and 10 times greater when we lift at a 90-degree angle.

A 200-pound person lifting a 50-pound object at a 90-degree angle would put 100 pounds + 50 x 10 = 1,500 pounds of stress on the back.

This is true standing, sitting or kneeling.

If we have the arch in our backs, we are doing this work with our large, trailer hitch-type hip joints. If we do not have the arch in our backs we are lifting it with our backs.

See for yourself the strength required when bending over. Hold a broom upright with the bristles at the top. Keep the end of the handle at your waist and slowly let the bristle end go forward away from you. You will see that the broom required little strength to hold in the upright position but becomes increasingly heavy and harder to hold onto as it leans forward.

3) Avoid jerking and jarring. Jerking and jarring are like having a whiplash injury to your back. They increase the force on your back seven times. If you are lifting 50 pounds at the time of the jerking and jarring you are lifting half your body weight plus 50 pounds times seven.

Jerking and jarring are involved in:

- Lifting a load that is too heavy.
- Falling or nearly falling, especially if you grab onto something.
- Stopping or starting quickly on the hoist, in the car and during recreational activities.
- Driving on bumpy roads, especially in a vehicle with poor suspension or poor shock absorbing seats or both.
- Opening and closing valves that are stuck.
- Reefing on a bar or tapping a furnace.
- Yanking on a hose or cable.

4) Watch you habits and routines at work and home. Have you ever had an ache or pain from an activity that you had previously been doing for a long time without a problem?

You may have experienced a repetitive strain injury and it may have been from some of your habits at work, home and play.

Our bodies do not usually give up on us for little or no reason. If we do hurt our backs by doing something that we have been doing for many weeks or years or for little or no reason, such as bending over to pick up a wrench, it is usually not that activity but the many things we did over the past few days or longer. We must go back and assess what we were doing that day and for the last few days. Often the problems are a combination of things related to work and home.

Things to consider are:

- Have you been putting your back in the same position at work and at home, such as leaning forward, twisting (especially to the same side) or have you been working overhead?
- Did you shovel snow or do something unusual before you came to work?
- Were you on a long trip recently or in a situation where you did a lot of sitting?
- Have you been working several shifts of overtime recently?
- Have the physical demands at work increased over a short period?
- Have you been sleeping well? Are you under any unresolved stress? Are you eating properly?

5) Do a gentle warm-up before doing an activity. This is especially important if you have been driving or sitting for more than 20 minutes.

- Bend elbows and hold arms at shoulder height.
- Bring elbows together.
- Hold 2, 3, 4.
- Move elbows backwards.
- Hold 2, 3, 4.
- Keep back and neck straight.

- Pull your belly button up and in.
- Hold 1, 2, 3, 4.
- Do not raise your chest or shoulders.
- Do not lose the arch in your back completely.

- Stand in a comfortable position keeping your toes on the floor.
- Lift one heel up, then lower.
- Repeat with other heel.

6) Do exercises every day for the muscles that stabilize the back. It is very important that we do the following exercises for the back, especially if we are more than 40 years old.

a. Exercise your short back muscles. The long muscles of the back are strong. Lifting half the body's weight every time we lean forward or get up using the lower back exercises them strenuously.

Short muscles that stabilize the back only get strengthened if we are doing activities or exercises on our hands and knees.

Short muscles of the body stabilize our joints. They work for long periods of time without getting tired. If they are not fit, the longer back muscles do their work. Long muscles of the body are fast-acting but they fatigue quickly and do not do a good job of stabilizing the back. This increases our chances of a sore back.

Exercises to strengthen the short muscles include:

- Keep knee bent and keep elbows straight.
- Look at hands.
- Lift leg up to the side and back.
- Repeat with other leg.

- Reach one arm up in front.
- Reach opposite leg up behind.
- Look at the floor.
- Repeat with other hand and leg.

- Reach hand up in the air and bend other elbow.
- Bring arm down under body until shoulder is near the floor.
- Look at the floor.
- Repeat with other hand.

b. Exercise your abdominal muscles. There are no muscles on the front of the back. The abdominal muscles are the muscles that support the front of the back. These muscles do not get strengthened during normal activity so specific exercises must be done to strengthen them.

- Hold abdominal muscles in for three seconds then relax.
- Repeat with knees slightly to the right.
- Repeat with knees slightly to the left.

- Keep looking at the ceiling.
- Lift head and shoulders off the floor.
- Do not sit up or force.
- Lower slowly.
- Repeat to right knee.
- Repeat to left knee.

7) Learn some ways to relieve stress that are effective for you. Challenge tunes our body so that we are at our best physically and mentally. But stress makes our muscles tight and makes us less well-coordinated. It is important to take extra caution when doing things in this state. When we are under stress at work or home, injury is more likely because:

- Our mind is often on other things.
- We may not be planning ahead or paying attention to how we are doing things.

8) Make sure that you get enough good sleep. The minimum amount of sleep recommended for good health is six hours every 24 hours. Some people require 7.5 or nine hours. For sleep to be effective it must be in 90-minute cycles. Some people sleep for 4.5 hours and then have another 90 minutes sleep at another time of the day. This is especially true for people on shift work.

The 90 minutes is necessary for you to go through your dream sleep when you unwind and repair your brain and your deep sleep when you repair your body. If you have difficulty sleeping, get your family doctor to refer you to a sleep clinic for an assessment.

9) Keep yourself fit and flexible. If you do physically demanding work you don't have to go to the gym but you should do the exercises for the back mentioned earlier in the article. If you do not do physically demanding work on the job or at home you should do a general conditioning program at home or at the gym as well as the back exercises previously mentioned.

10) Get some help to stop smoking. There are numerous studies now that indicate that smoking is a major contributor to disc problems. The disc does not have very good blood supply. Smoking decreases the circulation to all of the cells of the body including the discs that already have a poor supply, making injury and slow repair more likely.

Programs available at Inco

Here is a listing of programs available through the Occupational Medicine department. For more information on these programs contact Occupational Medicine at 682-5179.

- Early Intervention Back Group
- Physiotherapy
- Occupational Therapy and Pain Management
- Physical Reconditioning Program
- Home Exercise Program
- Hydrotherapy
- Weight Loss Program
- Psychosocial Support
- Cardiac Rehabilitation
- Workplace Assessments

An 11-minute in-house video on preventive back care filmed at Creighton Mine and narrated by **Heather Wallingford** is also available through the Audio-Visual department. Entitled *Guess Who's Back*, the video can be borrowed by contacting **Mike Barrette at 682-5275.**

Inco artists fare well at exhibit against Northern Ontario competition

Barry Bowerman, section leader in Process Technology at the Nickel Refinery, received a $200 award for his acrylic painting entitled *Otter Family*.

Carenie Little, wife of Crean Hill geologist Terry Little, received an honorable mention for her acrylic painting *Ruth*.

Lynne Demers, daughter of retired Stobie miner Germain Deschenes, had her *Self Portrait* in watercolor selected to be a part of the road show exhibit.

The Northern Ontario Art Association (NOAA) has its share of Inco connections.

Take **Barry Bowerman**, section leader in Process Technology at the Nickel Refinery. Barry won a $200 award for his acrylic painting called Otter Family.

There's **Lynne Demers**, daughter of retired miner **Germain Deschenes** of Stobie Mine. She had her watercolor, entitled Self Portrait, selected to be a part of the NOAA's road show.

Carenie Little, whose husband **Terry Little** is a geologist at Crean Hill Mine, received an honorable mention for her acrylic painting entitled Ruth.

Then there's **Andrea Larsen**, whose husband **John Larsen** is a general foreman at Creighton Mine. She was the organizer for the Lively-Walden Art Club that hosted the exhibition and the first showing last month.

Andrea said the artists appreciate Inco's involvement.

"I'd like to thank Inco for its support of the event with their generous donation towards an award for one of the best paintings."

And of course there's artist **Marty Neva** of Accounting who keeps the Triangle informed about the NOAA.

The NOAA is an association of art clubs across Northern Ontario which was formed in 1949 by five clubs to encourage original art, an increased appreciation of artists' work and to further art education in northern communities. This year there are 14 clubs in the association including three local clubs, Lively-Walden, Onaping Falls and Sudbury.

The 41st annual exhibition this year saw 176 paintings submitted. They were judged by **Charlie Rapsky** of Sudbury and **Richard Edwards** of Kagawong who selected 32 pieces to go on tour across Northern Ontario for a year to the various participating clubs.

LET'S TALK SAFETY

with Ron Rafuse

Measure safety before job starts

How do you measure safety?

In life most things that we do and purchase are measured. We get paid a certain wage for a measured time worked. A price is paid for a measured amount of fuel for our cars. Our children in school are measured by their report cards and the list goes on.

Safety measurements can vary by accepting accidents and incidents as part of life or establishing a goal of zero accidents and incidents in the workplace and home.

In everyday life we have rules, procedures, training, proper tools and enforcement to prevent accidents and incidents. It is the adherence to these rules by individuals and work groups in teams that prevents accidents. All of this caring for ourselves and each other is what is known as behavior.

Behavior is usually taught and enforced by role models. Our children at home look to parents as role models and on the job we look to leaders and supervisors as well as senior management as role models – those who influence our behavior or the way we approach tasks each day.

Both on and off the job safety can be measured in three categories.

They are:

- ***Leading*** or preventive safety indicators or measurements
- ***Present*** or what is happening now indicators, and
- ***After the fact*** or statistical indicators.

First let's take a look at what we are most familiar with — the safety statistics or after the fact indicators. These are measurements of failures in safety. They give us a universal frequency based on the number of accidents divided by hours worked. There is nothing that can be done after the accident to change that statistical measurement. The event has happened.

The next measurement of safety are *present* indicators. They look at the effectiveness of training. How are attitudes in the workplace toward safety, procedures and standards? Are recommendations from investigations being implemented? Is housekeeping at the worksites clean? These are all indicators of what is now happening.

The *leading* or preventive indicators are the most important to have in place. They are important for industry and also in your home life. In industry, preventive indicators include having good training programs and ensuring they meet the needs of the workplace, good communications, personal and team goals, auditing programs, a thorough investigation process and high standards and values at all levels.

What this all means is being sure that all the proper measures are in place prior to starting work so it can be done safely and properly by well-trained people who care and have values. Then we have to be able to monitor the work to ensure it is being done properly and take the required steps for correction. With this in place the effects of the *after the fact* indicators are minimal and so is the pain and suffering of the effects. What each of us needs to measure is not how lucky we were that an incident or accident didn't occur or we did not get injured, but before we start work we must ask if we have the tools, the training and a clear understanding of how to do the work the best way possible.

Then, we must ask if we have the pride and value in ourselves, which is the right attitude to do the job.

With our families we need to measure our children with *leading* indicators such as being good role models, ensuring good values and proper training with power tools and vehicles. We must measure how well they are doing by discussing, observing and taking corrective action as required. This is to prevent having to use the *after the fact* indicator to measure how or where the failure occurred.

Always measure safety by what is done up front.

Ron Rafuse is superintendent of Safety in the Ontario Division

FYH
FOR YOUR HEALTH
From the Occupational Medicine Dept.

Follow fitness to a better life

Do you know how to condition your body?
Are you aware of the benefits of a fit, trim body?
Do you know how to train without straining?
Do you know just how beneficial a simple walking program can be?
The following information will help answer some of these questions.

Body Composition

Lean versus Fat:

The ratio of fat to lean is important because the lean body mass does all the body's work — moving, pumping blood, breathing, thinking and digesting. A certain percentage of fat is necessary as stored fuel but too much fat weighs you down and puts unnecessary strain on your heart and other organs.

There are various ways to measure your body composition including height/weight charts and skinfold measurements. However, the best way of measuring your own body composition is by taking a good look at yourself in the mirror. Do you like what you see?

Strength

Muscle strength and tone help determine how you look and are vital for efficient movement when walking, lifting or any motion requiring large muscle groups.

To increase your strength try using light weights and do 10 to 15 repetitions. This will create tone without bulk. If you want bulk use a heavier weight and fewer repetitions.

Flexibility

Maintaining suppleness and agility are as important as toning muscles and losing weight. Stretching builds flexibility, improves balance, prevents nagging injuries and extends your range of motion.

Stretching should be done before and after cardiovascular endurance exercises to prevent injury and keep muscles limber

Here's some simple guidelines:

- Don't bounce — this will only make muscles tighter.
- Sneak stretches into your everyday activities — reaches, side bends and gentle twists.
- Use your breath. Breathe deeply and fully.
- Let gravity help. Stretching is a gentle activity. Let your body weight work for you. Hold the stretch for 20 to 30 seconds.

Aerobic Conditioning

As a muscle your heart needs to exercise too, and this is best accomplished by aerobic exercise. These are activities that involve the whole body such as running, brisk walking, bicycling, aerobics, swimming and cross-country skiing.

Remember three principals:

- Frequency — three to five times a week is ideal. Never let two days elapse without aerobic activity.
- Intensity — your goal is to raise your heart rate to your training level. This is between 70 and 85 per cent of your maximum heart rate. You should be able to comfortably maintain a conversation. If you can't — SLOW DOWN!
- Time — maintain your training level heart rate for 20 minutes.

Walking Program

Walking tops the list of most popular activities. It is a natural and effective way to stay active.

Getting Started:

- Well-designed walking or jogging shoes are a must.
- Choose a distance and pace that are suited to you.
- Remember to stretch — calf, thigh, hamstring and Achilles tendon.
- Keep a record —distance and regularity are the keys to burning calories.

Physical Activity and Self-Esteem

Research has shown an association between self-esteem, body image and physical activity. People of all ages who are active have a better image of themselves than those who are not active. Improvements in self-esteem are particularly pronounced in those who initially had lower self-esteem.

So don't wait! Start your walking program today. Just think of all the benefits. And best of all — it feels great.

In Memoriam

Name	Date of Birth	Date of Death	Years of Service
Bruno Adami	07-24-22	10-14-97	25
Alex Balogh	08-15-21	10-08-97	31
Rene Berthiaume	02-01-38	10-30-97	29.5
William Boyuk	09-27-18	10-18-97	33.5
Lawrence Brunelle	04-28-25	10-16-97	34.5
Luigi Casagrande	01-19-12	10-19-97	29
Joseph Champoux	10-05-21	10-19-97	30.5
Earl Chase	12-25-18	10-27-97	27
Marko Curich	10-10-19	10-06-97	27
Peter Duffy	01-11-14	10-02-97	38.8
Malcolm Finlayson	09-06-13	10-12-97	42.8
Jacques Genereux	09-28-40	10-13-97	27.1
John Arvi Hautamaki	12-03-16	10-05-97	39
Jean Paul Imbault	03-25-22	10-13-97	32
Roger Joly	03-16-24	10-25-97	37.2

Name	Date of Birth	Date of Death	Years of Service
Eudore Lapointe	11-27-49	10-15-97	28
John Mitchell	03-02-21	10-28-97	38
Joseph Murphy	10-11-12	10-11-97	30.5
Darlene Nagy	08-04-49	10-08-97	17
Emile Racine	03-17-13	10-23-97	27
William Robinson	10-06-17	10-05-97	31
Domenico Scagnetti	10-19-11	10-25-97	31.5
Edwin Shannon	04-12-15	10-26-97	32.3
Arthur Shaubel	06-02-18	10-11-97	37.4
Weldon Simpson	06-06-19	10-23-97	26.5
Guido Stradiotto	09-21-10	10-10-97	26
Donald Teahen	11-26-32	10-16-97	29
Charles Workman	05-11-10	10-09-97	38.5
Charles Young	10-06-13	10-12-97	41.4

Employee efforts help save lives

When three Inco employees collaborated to build a heliport they could not have foreseen its immediate and crucial need.

Within two days of completion the air ambulance was dispatched to the Panache Lake site to air lift a heart attack victim to the hospital. Had the site not been able to accommodate the helicopter the outcome could have been tragic.

Instead, the person was released from the hospital three weeks later and returned to the lake with a pacemaker.

Creighton chief mine engineer **Brian Young** recalled the incident with relief. It was a hot Saturday in August when volunteers worked despite intense heat to complete the helicopter pad. "I remember leaving at the end of the day feeling like we had accomplished something," he said.

The members of the Panache Campers' Association overcame numerous obstacles in the actual construction of the site, Brian recalled. The workers encountered problems with large tree stumps and rocks, yet persevered throughout the day. Their dedication was rewarded. "The volunteer day was a Saturday and Monday the helicopter was here to take away a heart attack victim."

Brian, along with retired Central Mills general foreman Jack Hamill and Inco's legal officer Bill Cook, worked as executive members of the association to bring the heliport project to fruition. In June 1996, the association began its efforts to construct the landing site, working with the Ministry of Natural Resources (MNR), the Ministry of Health and the Town of Walden. In November 1996, the association committed $6,000 to the project and the Town of Walden $2,500. Through fundraising ventures the association collected the remaining $7,000 needed to purchase reflective cones allowing the ambulance to land at night. With the funds secured, construction of the site commenced in July.

Brian said the association perceived a need for such a project in considering the aging population, increased lake usage and the lack of immediate ambulance service. "There are also a lot of permanent residents here and there is more activity on the lake such as fishing and snowmobiling. We thought it was important."

He also noted one incident where a family member was in need of an ambulance more than a year ago. It was luck, said Brian, that allowed the air ambulance to land at a nearby marina. Had the marina been busy on that particular day the ambulance could not have landed.

Brian, association membership chairman, said the incident raised awareness of the need for a heliport. "It was always in the back of everyone's mind but this really brought it into the forefront."

Bill added he felt fortunate to have been involved in such a crucial undertaking. "I'm very pleased and proud to be associated with the project," he said.

Jack, the association president, echoed Bill's sentiments saying the project that all those who assisted with the project should be pleased with their achievement. "It (the landing service) has been used quite often since. I think it's safe to say the Ministry of Health is impressed with what we have done."

Prior to the heliport construction, the lake residents relied on a land ambulance dispatched from Lively, a 25-minute drive. In addition to the waiting period, the Lively land ambulance service only responds during the day. In the evening, ambulances are dispatched from Sudbury or Chelmsford. Jack stressed that although the lake now houses a landing service it does not guarantee the air ambulance is available, however, the site will allow the ambulance to land when possible, day or night.

Construction of the landing site recently garnered the Panache Campers' Association the prestigious Jerry Strickland Award of Merit for 1997. Named after the long-time executive director of the Federation of Ontario Cottagers' Associations, the award is presented annually to the association that has "realized significant accomplishments and demonstrated innovation in its work with its members and surrounding communities."

In addition to the landing site, the association has undertaken many lower-profile projects. Last year the group took over the management of one acre of crown land from the MNR. The association is currently working to repair a dock along the shoreline declared a safety hazard by the ministry and install steel posts to control access to the lake at that particular site.

Both Jack and Brian said not all the association's projects are of a serious nature. Jack pointed out the association hosts dances and picnics throughout the year, keeping him relatively busy in his retirement.

Creighton chief mine engineer Brian Young is proud of the recently constructed heliport on Lake Panache.

Paul Young, left, helps his father Brian and retired Central Mills general foreman Jack Hamill install steel pipes to limit lake access at a site considered unsafe. The three are members of the Panache Campers Association which successfully constructed an air ambulance landing site this summer.

The reflective cones surrounding the heliport site allow the air ambulance to land day or night.

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