Why is this painted-face youngster so happy? Find out on pages 8 and 9.

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Smelting process earns honors

A revolutionary breakthrough in smelting technology – almost half a century old – is still attracting praise from metallurgical experts today.

The Inco Oxygen Flash Smelting Process received the prestigious Falconbridge Innovation Award for 1997 during the recently concluded 36th Annual Conference of Metallurgists of the Canadian Institute of Mining and Metallurgy (CIM) at Laurentian University in Sudbury.

The award presentation highlighted a conference that attracted more than 600 delegates from around the world and saw some 300 research papers presented.

Developed through the pilot plant phase in the latter 1940s, the first commercial oxygen flash furnace was constructed in Copper Cliff in 1952. It ran successfully for a year until it was replaced by a larger furnace dubbed the Number Nine – which still exists today, though not in operation.

In the ensuing decades, the oxygen flash smelting process continued to evolve to the point where it became a pivotal part of the highly-regarded $600 million Sulphur Dioxide Abatement Project completed in Sudbury in 1994.

"It was revolutionary technology, not only for the nonferrous industry but all extractive metallurgy," said Carlos Diaz, conference chairman and former section head of Pyrometallurgy at the J. Roy Gordon Research Laboratory in Mississauga.

"It marked the first time for the use of pure oxygen in extractive metallurgy. For 40 years it was used to smelt copper concentrate at the Number Nine Copper Flash Furnace. When the Copper Cliff Smelter was renovated to meet increasingly lower SO2 emission levels, the company decided to go to bulk smelting, and the oxygen flash smelting technology was adapted accordingly."

In announcing the award, University of Alberta professor Hani Henein said "Inco developed a highly efficient and environmentally friendly process long before these concepts were popular."

Inco Chairman and Chief Executive Officer Mike Sopko accepted the award on behalf of the "countless Inco employees associated with the continuous improvement of the process."

During the Sulphur Dioxide Abatement Project, two new oxygen flash furnaces were constructed in Copper Cliff to smelt a bulk copper/nickel concentrate. Together with improved pyrrhotite rejection at the mill, a new Oxygen Plant and a new Acid Plant, the technology allowed Inco to reduce its SO2 emissions by 60 per cent and a full 90 per cent of the sulphur in the ore is now contained before it can reach the atmosphere.

Carlos regards the oxygen flash furnace as the most energy-efficient and environmentally-friendly smelting process in the world for sulphur-based ores.

The furnace uses commercially pure oxygen to provide the combustion in the smelting process with no additional fossil fuels required. This means no emissions of harmful carbon dioxide or nitrogen oxide – contributors to the greenhouse effect and acid rain respectively.

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Somewhere under the rainbow!

If you believe there's a pot of gold at the end of the rainbow, then Susan Fabris-Capstick was right on the money when she sent this photo into the Triangle. The photo, which clearly shows a rainbow descending on the Copper Cliff Smelter Complex was accompanied by a note that simply read: "Sudbury Operations is your POT OF GOLD!" The photo was taken on Regional Road 55, west of the Smelter at approximately 6:45 p.m. on August 27. An unabashed fan of Inco's Sudbury operations and wife of Ron Capstick with the Smelter satellite engineering group, Susan said "I couldn't believe it when I saw it (the rainbow). I had to stop."

Aerial seeding gives Mother Nature a boost

Aerial seeding and tree planting are becoming an even greater source of pride for Inco employees as years of work become more visible in many parts of the Sudbury region.

Part of what makes the regreening work so satisfying for those who do it is that they don't have to wait decades to see the fruits of their labor.

In fact, sometimes it only takes a year.

Grass and a few shrubs return only one year after a patch of environmentally-stressed land has been seeded by plane.

"It's amazing really. But that's all it takes," said Darl Bolton, Inco environmental analyst.

Darl has revisited areas done last year such as Daisy Lake in Coniston to find the black rocks already flanked by grass cropping up in the cracks and over the previously gray earth.

"Going to areas seeded eight years ago, at the start of the program, you can see trees taking hold. It's really impressive."

The seedings set the stage for nature to add its own magic to the soil.

Giving nature a boost with applications of limestone, fertilizer and grass seed dropped from planes, which take off from an airstrip at Stobie Mine, is all it takes to start the process of regrowth.

Counting this year's 450 acres treated by aerial seeding, a total of 2,915 acres have been done to date.

The work from the sky enables Inco to continue its regreening at ground level.

"It's our biggest year ever," said Paul Yearwood,

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Tree seedling total approaches 2 million

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coordinator of Decommissioning and Reclamation.

Some 300,000 trees were planted, bringing the total number planted since 1986 to 1.8 million.

The most easily visible job completed this summer can be seen off Highway 17 at the Copper Cliff Smelter Complex where many shrubs were planted augmenting an embankment that had been covered with lime, fertilizer and grass seed last summer.

Like the aerial seeding program, the lime, fertilizer and seed applications were only part of the process. Earlier, the slag embankment had been capped by 21,000 cubic yards of clay.

"Aerial seeding has been a great success story," Paul said.

Despite the success, the work is by no means done, he added.

Plans for next year's aerial seeding are being worked out already.

"We're probably going to come back in the Frood-Stobie area. We've got about 700 acres. It'll take a couple of years because we average about 400 acres a year."

Seeding from the sky will be further enhanced with the planting of more red pines, jack pines and white pines, which will be part of regreening efforts by Inco next summer in the Coniston and Clarabelle Mill areas. Those trees are grown by Inco, underground at Creighton Mine and at the company's Copper Cliff greenhouse.

Paul said other ideas being discussed in his department include liming swamp lands from the air.

He said that because swamps feed so many adjacent areas and act as a natural environmental screen for waterbodies it may be worthwhile to help them grow.

Environmental analyst Darl Bolton has noticed that grass and shrubs return quickly after environmentally-stressed land is seeded by plane. Trees like this pine take about 10 years to reach seven feet in height, but the aerial seeding makes the soil a hospitable host for that growth.

A total of 2,915 acres have been treated since the aerial seeding program began in 1990. The work from the sky enables Inco to continue regreening at ground level. Some 300,000 trees were planted this summer, bringing the total number of red, white and jack pine seedlings planted since 1986 to 1.8 million.

Will the real chef please stand up?

Instrument man Richard Dionne of Matte Processing had plenty of lunch options at the United Way kick-off barbecue inside the General Office. From left, Sudbury campaign co-chair Rob O'Keefe, Steelworkers Local 6500 president Dave Campbell and Vice-President of Milling, Smelting and Refining Mick Throssell filled Richard's plate with both a burger and a sausage. Rain may have forced employees inside to eat but it didn't dampen their enthusiasm for the Inco Employees' United Way Campaign which runs the entire month of October. Last year, employees contributed more than $355,000 to the United Way, in addition to Inco's corporate donation of $120,000.

It's nice to be appreciated!

Summer students Shari Carlaw, right, and Jennifer Cornthwaite, both of the Decommissioning and Reclamation department, were pleasantly surprised this summer when a large envelope of thank you letters arrived from Mrs. Paganucci's Grade 6 class at Wembley Public School. The pair visited the class last spring before school let out to discuss Inco's environmental operations. "The students were excellent. We talked for an hour and they asked a lot of questions," said Shari. Jennifer agreed, saying the students "were doing a mining unit at the time and were really quite knowledgeable." The thank you letters were posted in the work area for all to see.

– BUSINESS BRIEFS –

Drought conditions impact on P.T. Inco

The 'El Nino' phenomenon currently affecting the Pacific region is hurting production at P.T. Inco in Indonesia. Approximately 85 per cent of P.T. Inco's power needs are supplied by its 165 megawatt capacity hydroelectric generating facility. This climatic phenomenon, believed to be the worst in the last 50 years, is causing drought conditions in Australia and Indonesia, including the Soroako area on the island of Sulawesi where P.T. Inco's operations are located. The conditions have reduced the water level in the Soroako area lake reservoirs, limiting the amount of hydroelectric power P.T. Inco can generate. Based upon the conditions, P.T. Inco currently estimates its 1997 production at 75 to 80 million pounds of nickel in matte, compared to a 1997 production plan of 92 million pounds.

Goro pilot plant gets green light

Inco Limited has announced that it will proceed with the next stage of the Goro Nickel Project in the French Overseas Territory of New Caledonia. This stage will encompass the construction of an integrated pilot plant in the Territory capable of processing 12 tonnes of ore per day as well as engineering work related to the critical acid pressure leaching processing circuit for an eventual commercial plant. This stage is expected to involve expenditures totalling about $50 million (U.S.). The Goro Nickel Project, 85 per cent owned by Inco and 15 per cent by Bureau de Recherches Géologiques et Minières, an entity of the French government, is based on extensive nickel laterite deposits located in the south province of New Caledonia, about 1,500 kilometres east of Australia. The main Goro deposit hosts drill-indicated resources of 165 million tonnes, by dry weight basis, of laterites averaging 1.60 per cent nickel and 0.16 per cent cobalt. An initial mining zone with proven reserves of 47 million tonnes has been outlined as a 20-year source of feed for an eventual commercial plant.

Delay in Voisey's Bay Project announced

Inco Chairman and Chief Executive Officer **Mike Sopko** told investors and analysts at a metals conference in London that Inco Limited believes that initial production from the Voisey's Bay mine and mill facilities will be delayed by at least one year or until late 2000 at the earliest. This delay is based upon a review of the current status of the environmental review and approval process established under a January 1997 memorandum of understanding with the federal and provincial governments and aboriginal groups covering the mine and mill facilities to be constructed in Labrador as part of the Voisey's Bay project. Initial production of an intermediate concentrate product from the mine and mill had been projected by late 1999. Inco currently estimates that, due to delays in this environmental review and approval process, the necessary environmental approvals for the mine and mill will not be obtained until late 1998 at the earliest or more than six months behind schedule.

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Hundreds played role in oxygen flash smelting

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The furnace produces low volumes of high-strength SO2 as an offgas that is contained and converted to marketable sulphuric acid or liquid SO2.

"The Falconbridge Innovation Award, presented by the Metallurgical Society of CIM, is considered very prestigious both in Canada and internationally," said Carlos.

"It recognizes not only the original technology but also the continued modifications, improvements and optimizing of the technology to what we have today. A number of significant developments have taken place over many years and a lot of people have touched this technology – from researchers, to the pilot plants at Port Colborne to the furnace operators. All of them can be proud of this award."

Carlos said it required a tremendous effort to adapt the technology to bulk concentrate smelting, with most of the work conducted at the Copper Cliff Smelter to develop engineering and metallurgical parameters. At the same time, a great deal of work was taking place in Port Colborne to develop new gas cooling and cleaning technology.

"At this conference, Inco employees presented a paper on modifications to the furnace uptake," said Carlos. "That's a good example of recent research work which resulted in significant improvements to the design and operation of the furnace.

"We are always improving. It simply wasn't implemented years ago and we are using the same technology today – this technology is very much alive."

Inco Chairman and Chief Executive Officer Mike Sopko, right, proudly displays the 1997 Falconbridge Innovation Award with Carlos Diaz, CIM conference chairman and former section head of pyrometallurgy at the J. Roy Gordon Research Laboratory. Inco received the 1997 award for its Oxygen Flash Smelting Process.

Outstanding organizers

Conference organizing committee members, from left, included Ahmed Vahed of the J. Roy Gordon Research Laboratory, Brenna Scholey of the Copper Cliff Copper Refinery, chair Carlos Diaz, formerly of the J. Roy Gordon Research Laboratory, Sue Tessier of the Copper Cliff Nickel Refinery and Ken Scholey of Smelter Technical Services.

What's all the hoopla?

Delegates who attended the conference awards banquet were treated to a traditional "Hoop Dancing" exhibition performed by an award-winning dance troupe from the Wikwemikong First Nations community.

Conference benefits last forever: says chair

Carlos Diaz, CIM conference chair, said with metallurgists from 40 countries the Sudbury event was "truly an international conference."

It was last held in Sudbury in 1979.

As important as the 300 research papers and their findings are, just bringing together this many experts at one place for the conference is also a benefit to the profession of metallurgy, Carlos said.

"There is a lot of cross-fertilization and listening to what people are doing in their fields."

Years after the papers have been presented, metallurgists will benefit from having been at this and other conferences.

"You'll confront a problem in the field and remember a solution presented at a previous conference," said Carlos.

The critical review of each paper in the question-and-answer period following each presentation also gave researchers constructive feedback on how to improve processes or better solve efficiency problems, he said.

"After the conference our respective members went back to work with a lot of new ideas – most of them more productive and environmentally friendly ones."

Heat flux monitoring prolongs refractory life

Minimizing refractory wear was a popular subject for research papers at the CIM conference.

A paper entitled *Electric Furnace Refractory Wear And Heat Flux Calculations*, authored by **Emmanuel Tackie** of Inco's Manitoba Division, offered a unique perspective on that topic because it concentrated on how to prolong the life of refractory at the electric furnace in Thompson, Man.

Close monitoring of sidewall heat flux in metallurgical smelting furnaces is important for the control of refractory wear, Emmanuel said.

He developed a simple one-dimensional heat transfer model to estimate transient temperature distribution in furnace walls from pre-heat to steady conditions.

The model was applied to the refractory walls of Thompson's No. 2 rectangular electric furnace, completely rebuilt in 1996 with magnetite-chrome basic bricks.

The model predicted the establishment of equilibrium temperature profiles within about seven days after maximum slag temperature had been reached.

Current plant data shows values lower than the calculated equilibrium values, suggesting the presence of some degree of slag build-up at the hot face of refractory walls.

In his paper, Emmanuel said he found that estimated equilibrium heat flux offers advantages in the operation of electric furnaces. At the Thompson operations his model is being used as a guide to:

- Minimize refractory wear by operating at process intensities such that the operating heat flux doesn't exceed the equilibrium heat flux.
- Test the relative wear-resistance of different refractory materials subject to common operating conditions in an operating furnace.
- Test the performance of forced-air refractory cooling systems.

Uptake changes increase furnace throughput

Mixing gases just right in the smelting process can improve efficiency and make brick lining in furnaces last much longer.

Those observations are among the findings of a paper on recent design improvements to the Inco flash furnace uptake at the Copper Cliff Smelter.

The paper, called *Recent Design Improvements to the Flash Furnace Uptake at Inco*, was written by **Loris Molino** of Voisey's Bay Nickel Company, **Carlos Diaz**, **Chris Doyle**, **Juan Hrepic** and **Ralph Slayer** of Inco's J. Roy Gordon Research Laboratory in Mississauga, **Homer Carr** of the Copper Cliff Smelter and **M.H.I. Baird** of McMaster University in Hamilton.

The results boil down to a few significant points, Chris said in an interview at the CIM conference, held at Laurentian University last month.

"The furnace uptake is a lot easier to run and the refractory doesn't fall off the walls."

In the current Copper Cliff bulk copper-nickel concentrate smelting flowsheet, the uptake of the flash furnaces serves as a post-combustion chamber for elemental and other sulphide species, carried over by the furnace gases.

In the original uptake design, insufficient mixing of the furnace gases with the afterburner oxygen caused uneven combustion, which led to localized overheating of the castable refractory lining and irregular build-up on the walls.

The paper also discusses a cold modeling technique used to seek an afterburner configuration that would improve gas mixing and refractory studies which led to the selection of a plastic monolith with better resistance to corrosion in the uptake environment.

Based on these studies, the uptake of one of the Copper Cliff flash furnaces was modified during the 1996 summer shutdown.

The operation of the new system indicates that better mixing of furnace gases and afterburner oxygen has been achieved. Examination of core drills of the refractory show that it is performing as intended.

The authors found the new uptake at No. 2 Furnace, which was used in these design changes, operated much smoother than the older uptake at No. 1 Flash Furnace.

Furnace throughput and availability has also increased at No. 2 as a result of the design changes.

The uptake of No. 1 Flash Furnace will undergo similar modifications in the near future.

Based on laboratory studies, the paper also revealed that a type of high-alumina plastic monolithic refractory provided the most promising lining material for the flash furnace uptake. The experimental study also suggested that the steady uptake operating temperature shouldn't exceed 1,300°C in order to make the linings of flash furnaces last longer.

Them's the brakes!

Senior research technologist Kevin Reynolds of Inco's J. Roy Gordon Laboratory displays the *Drisc Brake*, which makes use of nickel-coated graphite for the disc and drum brake system for automobiles. The brake system displayed at the conference trade show is used on the Chevy Cavalier.

Research paper sheds light on converter life cycle

How to lengthen the operating life of converters, used to separate nickel and copper was the topic of a paper by two Inco employees and two university researchers.

"We wanted to get a more fundamental understanding of the nature of our process," said one of the paper's authors, **Carlos Diaz**, CIM conference chair and recently-retired section head of pyrometallurgy at Inco's J. Roy Gordon Research Laboratory in Mississauga.

The paper, titled *Mixing And Mass Transfer In A Cold Model Of A Semi-Blister Copper Converter*, was written by **M.H.I. Baird** and **P.G. Moruzi** of McMaster University, **Sam Marcuson** of Process Technology in Copper Cliff and Carlos.

"We wanted to know the factors influencing oxygen efficiency and the way heat is transferred within the vessel because that affects the life and productivity of the vessel," Carlos explained.

"A better understanding of the process will help us design a second generation of vessels" to replace the first generation, which came on line in the early 1990s.

For the research paper, a 28 per cent scale water model of Inco's semi-blister copper converter was operated with top-blown air and bottom stirring nitrogen, which entered via submerged porous plugs.

The research paper concluded that bottom-stirring by a gas stream is highly effective in mixing the liquid phase. Bottom-stir with nitrogen gas also significantly enhances the uptake of oxygen from top-blown jets of air.

To sum up, the top-blow and bottom-stir process helps Inco's bottom line by allowing converters to last longer.

Electric vehicles bode well for Inco products

John Jones, assistant vice-president and general manager of Inco Specialty Powder Products in Toronto, stands beside the General Motors electric car. The car is powered by the GM-OVONICS nickel metal hydride battery produced with Copper Cliff Nickel Refinery foam.

The future of the auto industry may be California dreamin'.

And Inco is part of that dream.

The west coast state is, so far, leading ~~the~~ way toward clearing the air above metropolitan urban centres in North America.

California law states that 10 per cent of cars sold in the year 2003 must be electrically-powered.

"The trend toward electric cars in California, Europe and a trend toward electric power-assisted bicycles in Asia bodes well for the future of Inco's specialty nickel products," said Victor Ettel, director of battery product research with Inco Specialty Powder Products at the J. Roy Gordon Research Laboratory in Mississauga.

Inco's specialty nickel products include:

- Nickel powders, used to make nickel cadmium batteries used in electric cars.
- Nickel pellets used in the manufacturing of stainless steel.
- Nickel foam and other specialty products.

There were 2,000 electric cars produced in 1996, Victor told a CIM conference audience.

Although sales of General Motors' EV1 battery-powered car were "disappointing" in the last year, Victor said that is likely to change as companies develop electric vehicles that are more powerful and go greater distances between recharges.

Victor was presenting a paper entitled *Specialty Products at Inco*, which he co-authored with **Wayne Leavoy**, on assignment at Inco's Clydach Nickel Refinery in Wales, **John Jones**, assistant vice-president and general manager of Inco Specialty Powder Products in Toronto and **Les Renny** of Clydach, Wales.

The paper documents the success of Inco's specialty products in such uses as the nickel-cadmium (NiCd) battery.

"Today, most of the small rechargeable batteries produced around the world are using Inco nickel powders."

The paper also chronicles the development of new specialty products.

"The latest product additions are extra-fine Inco nickel powders with particle size of only about one micron. Type 210 powder is finding growing applications as a performance-enhancing additive for new types of nickel batteries, in conductive inks and other uses," the paper states.

Since its introduction in 1990, the demand for this powder doubled every year.

The high quality nickel foam *INCOFOAM* is being produced for premium consumer and EV (electric vehicle) nickel metal hydride batteries by a proprietary carbonyl process at Copper Cliff.

Other new specialty nickel products include nickel-coated carbon fibres and fibre-containing resin pellets for electromagnetic shielding applications, super-pure nickel oxide for electronic, pigment and catalyst markets and graphite powders for specialty seals.

And a patented, direct-conversion process to produce low-cost, battery-grade nickel hydroxide for the anticipated electric vehicle market is being scaled up.

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Flotation research improves nickel recovery

Heida Mani, of Inco's J. Roy Gordon Research Laboratory, discussed her group's paper with Mike Fairweather of Cominco Ltd. Heida made a presentation on *The Effect of Ultramafic Mineralogy On Pentlandite Flotation.*

A group of Inco metallurgists have found a way to improve nickel recovery in the flotation process at the Thompson Mill.

It starts with improving nickel and copper separation in the flotation process at mill, said research metallurgist **Heida Mani**, one of four authors of a research paper at the CIM conference.

"We want to reject the sulphur-bearing mineral and we want to reject the rock," Heida said, explaining the basic aim of the flotation process.

But the standard process doesn't efficiently remove the nickel from magnesium-rich rock, found in some deposits in Thompson, home of Inco's Manitoba Division.

"When pentlandite is in magnesium-rich rock we found that the pentlandite is not flotable. Pentlandite is the mineral that contains nickel. It's the mineral we seek."

But by using the chemical carboxyl methyl cellulose (CMC) the pentlandite can be separated. "The CMC improved nickel recovery," said Heida, who presented the research paper during the conference.

The paper, *The Effect of Ultramafic Mineralogy on Pentlandite Flotation*, was written by **Manqiu Xu, Pete Quinn** and Heida of Inco's J. Roy Gordon Research Laboratory in Mississauga, and **Ric Stratton-Crawley**, Vice-President of Smelting and Refining at Voisey's Bay Nickel Company.

The essential problem their paper examined was that ultramafic nickelferrous ores frequently respond poorly to froth flotation.

The cause of poor nickel recovery was investigated for the ore from Birchtree Mine in Thompson.

Birchtree ore is different than the ore in Thompson Mine in that it is housed by a different type of rock, which metallurgists refer to as ultramafic. That ultramafic mineralogy makes it difficult to separate the nickel in the flotation process at the mill.

The flotation of pentlandite in the presence of serpentine, soft rock composed mainly of hydrated magnesium silicate, was improved by decreasing the froth depth.

Three remedial techniques, the addition of CMC, salt and acid for improving pentlandite flotation, were investigated by the authors of the research paper.

Their research shows that the main cause of poor pentlandite recovery in the flotation of ultramafic-associated ore, such as the Birchtree ore, is the serpentine (or magnesium) slime coating.

The opposite surface charges of pentlandite and serpentine particles result in slime coatings.

The slime coatings form a physical barrier between pentlandite particles and air bubbles, resulting in weak attachment.

"The pentlandite particle is negatively charged in the slurry," explained Ric Stratton-Crawley in a Manitoba Division publication. "The serpentine is positively charged. Opposites attract, so the negative pentlandite gets coated with a layer of positive serpentine."

Air bubbles in the flotation process act as a separator by attaching to the pentlandite and rising to the surface. But the bubbles have difficulty picking up the serpentine-covered particles, causing the poor recovery of nickel.

Their research showed that pentlandite recovery is inversely proportional to the amount of serpentine present in the ore.

The researchers also found that shallow froth depth during flotation and CMC addition can improve pentlandite recovery.

The addition of CMC disperses the serpentine slimes and inhibits the coating of pentlandite particles while the shallow froth depth helps transport weakly attached pentlandite particles over to the froth product.

Heida added, "We are in the process of testing CMC at the Thompson Mill. We are expecting significant gains in recovery and grade."

Gas cleaning key to high quality acid

High-strength acid from Copper Cliff produces many products people use every day around the world.

Inco's quality acid products are used in water treatment, gasoline refining, in chemical plants, battery companies, oil refineries, in food products and by the pulp and paper industry.

The quality of the acid is a result of the much-discussed $600 million Sulphur Dioxide Abatement Program, which was successfully designed to reduce emissions by 60 per cent.

A new Acid Plant was built to fix high-strength sulphur dioxide gases from two new flash furnaces and a copper reactor at the Copper Cliff Smelter.

Separate gas cleaning systems were installed on each of the three furnace operations to provide acid quality gas directly from the Smelter to the Acid Plant. The information is contained in a research paper prepared by Smelter employees and presented at the CIM conference.

Entitled *Gas Cleaning and Acid Plant Operations at the Inco Copper Cliff Smelter*, the paper was written by **Mike Humphris, Jin Liu** and **Frank Javor**.

Some of the developments and the performance of the flash furnace gas cleaning system, including froth scrubbing technology, the Acid Plant's flowsheet, performance and measures taken to meet acid quality are described in their paper.

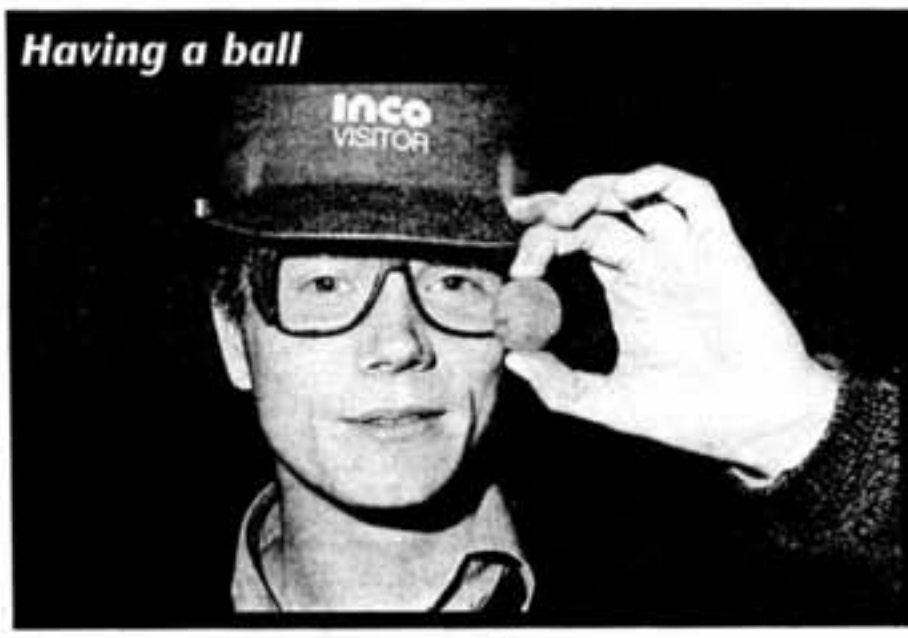
"A 60 per cent reduction in SO2 emissions from the Copper Cliff Smelter has been achieved through the fixation of high-strength gas streams from two new flash furnaces and a copper reactor," the paper stated.

"Acid quality gases have been produced by cleaning at source using innovative technology," it also said, adding that the new acid plant "has produced good quality 93 and 98 per cent sulphuric acids and 20 per cent Oleum product" for customers.

Making a point

Ric Stratton-Crawley, Vice-President of Smelting and Refining at Voisey's Bay Nickel Company, rises to answer a question during a well-attended panel discussion at the conference. Seated to Ric's left is George Robbins of Engineering and Technical Sales at the J. Roy Gordon Research Laboratory.

Having a ball



Lucas Pollemans, of Utrecht University in the Netherlands, examined some grinding balls used in the milling process at Clarabelle Mill. Mr. Pollemans was one of several visitors to Inco operations during the CIM conference in Sudbury.

Inco pioneers cyanide destruction

If it doesn't work for you, it might work for somebody else.

That about sums up the beginnings of the Inco SO2/Air Cyanide Destruction Process.

Widely regarded as the state-of-the-art process in cyanide detoxification, the roots of the Inco SO2/Air process can be traced to the company's early work on air pollution control.

In the mid-1970s it became essential to remove more pyrrhotite from the smelter feed to reduce sulphur dioxide emissions out the stack, said **George Robbins** of the J. Roy Gordon Research Laboratory in a paper entitled *Commercialization of Proprietary Technology – The Inco SO2/Air Cyanide Destruction Process.*

"Around that time a milling process was developed which utilized cyanide to depress pyrrhotite during flotation," said George. "If the process was going to be adopted, the cyanide in the resulting tailings slurry would have to be destroyed prior to being sent to the tailings pond."

Inco employees already had considerable experience with the oxidation of metal ions such as iron, nickel and cobalt, by utilizing SO2 in a high dissolved oxygen environment, he said. They were curious as to how this might affect metals in solution with cyanide present.

"Research in Copper Cliff and at the J. Roy Gordon Research Laboratory discovered that SO2/Air does oxidize cyanide when catalyzed by a small amount of copper in solution," said George. "Metals in the cyanide complexes are dissociated unoxidized and ultimately precipitated, primarily as hydroxides."

As it turned out, Inco developed and opted to use an alternative pyrrhotite rejection milling method without cyanide. However, it was recognized that other industries were using cyanide and might find the destruction process useful.

In bringing the technology to commercial development, Inco followed four main guidelines, said George. The first was a thorough market assessment followed by a look at competing processes to ensure the Inco SO2/Air process had a competitive edge. The third and fourth guidelines were to conduct a detailed legal and technical evaluation of the patent application.

Today, the process is licensed at over 50 project sites worldwide, with primary applications in the mining industry in precious metal recovery plants where it offers treatment for a wide range of waste streams.

More recently, the process has been applied to the rinsing and abandonment of heap leach pads where it has proven to be very cost-effective.

Poster session presentation examines performance of grinding circuit

After 1 1/2 years work Inco's **Melania Sabau** put her thesis to the test.

CIM delegates got to critique her thesis during the poster session at the international conference.

Analysis and Modeling of an Integrated Semi-Autogenous Rod-Ball Mill Ore Comminution Process was seen by many delegates.

The poster on her thesis was also an opportunity for her to meet professionals from around the world.

"I've made contact with a lot of people and learned their way of solving different problems," said Melania, an engineer-in-training with Process Technology.

Her thesis measured the impact of operating variables on Clarabelle Mill's grinding circuit performance..

It's important to improve controls of the circuit to make more efficient use of energy at Clarabelle, or any mill for that matter, in order to meet flotation targets, she explained.

But her thesis is more than just a theory.

Melania said she has had the satisfaction of seeing it put to use.

"Already, Clarabelle is using my model. They've run the model to see how the circuit reacts to operating conditions and dimensions," she said.

"This model allows the testing of different quantities and equipment configurations at a low cost."

Melania completed her engineering masters degree with this thesis.

Melania Sabau, an engineer-in-training with Smelter Technical Services, got professional feedback on her project on the *Analysis And Modeling Of An Integrated SAG-Rod-Ball Mill Ore Comminution Process*. Among those examining her work during a poster session at the conference was David Shoesmith of Atomic Energy Canada Limited in Pinawa, Manitoba.

Toxicology information on nickel misleading

Bruce Conard, Vice-President, Health Science Advisor in Toronto, presented a plenary paper on *Is Nickel Safe? A Toxicology Primer* on the first day of the conference.

The push to limit nickel use in several European countries is based on fear, not science.

That was the message **Bruce Conard** delivered during a plenary session lecture entitled *Is Nickel Safe? A Toxicology Primer*, at the CIM conference.

Vice-President, Health Science Advisor in Inco's Toronto office, Bruce told delegates that deeming nickel (in all its forms and compounds) a danger to the environment and a threat to human health is simply incorrect.

"Nickel means 'elemental nickel' and all of its components," he said. "Nickel is not a chemical entity. Toxicology must be based on unique chemical substances."

He said that while there are extremely toxic forms of nickel such as nickel carbonyl, a lot of other nickel compounds are perfectly safe.

"There are over 10 million known chemical substances," said Bruce. "The environmental and human health risks posed by certain chemical substances are very real and must be assessed and managed to prevent harm. In the case of metallic elements such as nickel, however, there is a tendency by the public and regulators to incorrectly oversimplify and misrepresent toxicological information by assigning the same toxicity to all compounds containing the metal. As a result, many people mistakenly think nickel, meaning all forms and compounds of nickel, is a threat to the environment and human health."

In fact, he said, while animal and human health studies exist which indicate that some compounds of nickel must be carefully managed, the vast majority of nickel compounds and the metallic form itself (including alloys) show little or no evidence of causing adverse health effects.

Some European countries are proposing to remove nickel from coinage and classify nickel-containing stainless steels as skin sensitizers and carcinogens and limit their use. Inco and other nickel producers are actively fighting these actions.

"Toxicity is substance specific," said Bruce. "And each substance has its own unique physical properties.

"Is nickel toxic? Of course it is – all substances on earth are toxic in some dose and some exposure. Water is a poison. If you inhale it we call it drowning. Oxygen is also a poison. One hundred per cent oxygen can damage your lungs."

To back up his point, Bruce pointed to the writings of Paracelsus (1493-1541), whose work led to one of the most important foundations of modern toxicology, namely, that dose is what classifies anything as poisonous.

Paracelsus wrote: *"What is it that is not poison? All things are poison and none without poison. Only the dose determines that a thing is not poison."*

Some substances are required for life to occur, said Bruce, including iron copper and nickel.

"Nickel is not known to be essential in humans yet but is essential to many plants. Scientists theorize there are likely human enzymes yet to be discovered which are nickel-dependent."

Abatement program made many gains

Mike Humphris of Smelter Technical Services fields questions following his presentation on *The Smelting of Bulk Copper/Nickel Concentrate at the Copper Cliff Smelter.*

One of Inco's greatest success stories in the 1990s was also the topic of a paper presented by Mike **Humphris** of Smelter Technical Services.

The much-heralded Sulphur Dioxide Abatement Project formed the basis for a paper entitled *The Smelting of Bulk Cu/Ni Concentrates at the Inco Copper Cliff Smelter.*

Co-authors with Mike were **Aldo Longo**, formerly of the Smelter and now with P.T. Inco, and **Homer Carr** of the Smelter.

In 1994 the Ontario Division successfully implemented its abatement program to reduce sulphur dioxide emissions from 685,000 to 265,000 tonnes per year with emissions of 230,000 to 236,000 tonnes per year in 1994-1996, said Mike.

Previous emission reductions from about two million to 685,000 tonnes per year in the 1970s and early 1980s were achieved by increased pyrrhotite rejection in the mills.

To achieve a further reduction, it was recognized that a substantial change in smelting practice was required.

A major research and development program was undertaken in the 1980s to investigate alternative smelting routes. The program involved the J. Roy Gordon Research Laboratory, the Port Colborne Research stations and both the Ontario and Manitoba Divisions.

"Roast-reduction smelting and flash smelting options were both tested extensively," said Mike. "The latter option was chosen because it offered several advantages."

Those advantages included the use of well-established Inco flash smelting technology, consolidation of milling operations and separation of copper and nickel from the Bessemer matte in one stage, use of the concentrate sulphur as fuel producing a low-volume, high-strength gas stream suitable for fixation as acid and liquid SO2, higher furnace matte grades with an accompanying decrease in converter workload and a simplified flowsheet with fewer unit operations.

"The new process flowsheet not only met the environmental goals of Inco and the government but also realized productivity gains, reductions in fugitive emissions and improvements in the working environment," said Mike.

The first flash furnace was commissioned on nickel concentrate feed in October 1991, simultaneous with new oxygen and acid plants. The copper reactor and the second flash furnace were commissioned in May and August 1993, respectively. The switch from separate copper and nickel concentrate smelting to bulk concentrate was made in November 1993.

"In summary, the flash furnaces were commissioned successfully and design operating rates were achieved," said Mike. "The sources of furnace gas cleaning system delays were identified and addressed such that the average furnace burner operating factor is now about 90 per cent and steadily increasing."

Mike said additional work is being done to reduce short-term fluctuations in matte grade and slag silica and further improve metal recoveries. He added that significant progress had been made in improving furnace design to address heat distribution and build-up problems.

Hazard criteria misused

"How many of you would like to fly in a biodegradable airplane?"

He was joking, of course, but the message hit home with delegates attending **Rick Hilton's** discussion on *Metals in the Marketplace: Hazard Criteria.*

"The PBT hazard criteria, as it exists today, is simply not appropriate for assessing metals and metal compounds," said Rick, manager of Occupational and Environmental Health in Toronto. "Yet it is used extensively by agencies such as Environment Canada, the Environmental Protection Agency and the Commission of the European Union to guide policy and regulation."

PBT is an acronym for a typical hazard criteria whose components are:

- Persistence (biodegradability)
- Bioaccumulation
- Toxicity

The PBT criteria was originally developed for organic substances as a simple tool to predict potential health and environmental impacts, said Rick. It has never been validated for naturally occurring substances such as metals and inorganic metal compounds.

"Metals, by definition, are very persistent – they last. If they didn't we would be out on the lawn instead of in this building," he told delegates to the CIM conference at Laurentian University.

"It is also true that they can bioaccumulate in some organisms, can be toxic to organisms in sufficiently high concentrations, and can be toxic in low concentrations in the case of essential metals."

As a result, he said, metals and metal compounds are being unfairly targeted for banning, substitution and restrictions on their use by regulatory agencies, designers and metal customers in general.

Of particular concern are the hard-line strategies in European countries such as Denmark and Sweden to limit, substitute and ban metals based on PBT criteria.

"If it lasts, ban it, says Sweden" – taken from an article in the July 5 edition of *New Scientist.*

Despite those kinds of obstacles, Rick said progress has been made. Canada, for instance, has championed discussion of the application of PBT to metals and metal compounds and the international community has recently reached consensus on the fact that persistence and bioaccumulation are not appropriate hazard criteria.

The key hazard criteria for metals and metal compounds are now being recognized as acute and chronic toxicity of the bioavailable species present in the environment . . . not the total metal content, said Rick.

Still, the fallout of misused hazard criteria has been felt.

Mercedes Benz plans to develop a nickel-containing stainless steel car were stopped because they were concerned that nickel, in Europe, is classified as a suspect carcinogen. The company itself did not regard the materials as posing any risk in the workplace or the environment, but were simply concerned about bad press, said Rick.

Even more absurd was an article in the May 29 edition of *British Jeweller,* which warned that "nine-carat gold is only 37.5 per cent pure. The rest contains alloys such as nickel, copper, zinc, brass, solder and even lead . . . these alloys may result in nickel or copper allergies but could even lead to lead poisoning." Conversely, the same article argued that "titanium is 99.7 per cent pure metallic element and therefore hypo-allergenic."

Rick Hilton, manager of Occupational and Environmental Health in Toronto makes a point with the audience during a presentation on the hazard criteria used to evaluate metals in the marketplace.

The solution to the problem is three-fold, said Rick.

"We have to design hazard criteria to be more representative of actual health and environmental effects of metals and metal compounds, we have to determine and utilize better Life Cycle Assessment information and we have to educate, educate, educate!"

Slow cooling keys separation

Bob Agnew of Smelter Technical Services, presented a slide show for a paper on *The Inco Matte Separation Process For Bulk Bessemer Matte.*

Drastically reducing sulphur dioxide emissions posed quite a challenge to Inco people studying the smelting process in Copper Cliff in the 1980s and 1990s.

"Slow cooling is the heart of the process," **Bob** Agnew of Smelter Technical Services told CIM conference delegates during the presentation of a research paper he co-authored.

The paper, entitled *The Inco Matte Separation Process For Bulk Bessemer Matte,* was written by **Tony Fritz** of Bulk Smelting, **Mike Humphris** of Smelter Technical Services and Bob.

Their paper focused on the changes made to the casting and matte separation operations to handle the bulk matte.

The introduction of bulk smelting of copper and nickel matte, rather than separate processes for each, presented challenges for the casting and matte separation operations because of the need to process higher matte tonnages and the increased copper component in the matte.

A new process was developed as part of the Sulphur Dioxide Abatement Program completed in 1994.

The process includes oxygen flash smelting of bulk copper-nickel concentrate followed by converting of furnace matte to Bessemer matte. The matte is slow-cooled, crushed and ground. The copper and nickel is then separated by mineral processing techniques.

The abatement program succeeded in reducing sulphur dioxide emissions from 685,000 tonnes in the 1980s to 236,000 tonnes a year by 1996.

The paper described the effect of increasing matte tonnage and changing the matte nickel-copper ratio on casting and separation.

Recycling keeps landfills clear

Managing wastes that no one else wants is simply good business for the International Metals Reclamation Company (INMETCO) in Ellwood City, Pennsylvania.

Relying on a core business of recycling stainless steel production wastes since 1978, INMETCO operates a world-class recycling facility that has successfully added nickel-cadmium batteries and chromium bearing refractories to the long list of materials it processes, said **Richard Hanewald**, president of the wholly-owned Inco subsidiary.

Richard co-authored and presented a paper entitled *High Temperature Solution For Recycling Spent Nickel-Cadmium Batteries and Chromium Refractories.* The remaining authors were **David McComas** and **Russell Bleakney**, both with INMETCO.

"INMETCO began operation of its $5 million state-of-the-art cadmium recovery facility on December 29, 1995, and is capable of processing more than 3,000 tons of spent nickel-cadmium batteries per year," said Richard.

"The facility can be expanded to process up to 10,000 tons annually when the North American collection programs are more fully developed. Currently, the facility has four cadmium furnaces in operation with provisions for expanding up to 16 units."

Several collection programs are in place for the collection of nickel-bearing batteries in the U.S., where householders are prohibited by law from discarding used nickel-cadmium batteries into the municipal waste stream.

"Each year, over 50 environmental audits are performed to meet our customers' demands for a suitable recycling company to manage their wastes in a manner that will avoid potential liability," said Richard. "We have continued to satisfy over 500 customers' expectations on this environmental issue."

Coleman and McCreedy East families sample mining first-hand

Retired Levack shop leader Horst Rychlowski views the copper samples on display in the geology department during the Coleman and McCreedy East Family Day.

Brandi Braithwaite brushes up her football throwing arm during the Coleman and McCreedy East Family Day. Brandi is the 13-year-old daughter of Murray Braithwaite, an underground mechanic.

They sported over-sized hard hats and safety glasses, transforming children into miners for the day.

Employees of Coleman and McCreedy East Mines, along with their families, participated in an annual Family Day this month that attracted about 800 people. The day entailed a tour underground, a visit to the engineering and geology departments and participation in various games. At the end of the day, many family members were presented with a "Miner's Certificate".

The weekend event was the second of its kind for Coleman and McCreedy East, sponsored by Levack Complex manager **Jon Gill** and mine superintendent **Terry Van Kempen**. Organizer **Carol Walton**, training instructor, said the day was held in an effort to bring employees together outside of the workplace and allow family members to experience first-hand the mining industry. Many children waited patiently for an underground tour or to sit inside one of the heavy-duty trucks parked at the site.

"It provides an opportunity for the families to see how the mine operates," explained Carol.

Following the in-depth tour, participants were treated to a corn roast, hot dogs and hamburgers. Further energy was spent at the football toss and golf swing events.

The engineering and geology departments were also buzzing with activity, as employees on hand answered questions from the curious. **Brian Buss**, mine engineering supervisor, spent the morning explaining the logistics of the engineering department. Retired Levack shop leader **Horst Rychlowski** had many questions for Brian during his brief tour, which earned him an official miner's certificate.

"It's nice to come back and talk to the people again. It's nice to stay in touch," he said.

For others, the excitement centred around the underground tour. Eight-year-old **Kayla Whalen** and her 10-year-old brother **Shawn**, the children of Coleman support miner **Larry Whalen**, were anxiously awaiting the tour. The excursion would mark Shawn's third tour and Kayla's first. Not quite sure what to expect, Kayla said, "This is my first time. I think it's going to be fun."

Donna Viianen, project administrator at McCreedy East, said the day offered a unique opportunity for the children to explore the mine. "It's nice to have a day for the kids to come out and go underground and participate."

Even a hard hat can't protect Shawn Whalen, 10, from the vice-like grip of his younger sister Kayla, 8. They are the children of Coleman support miner Larry Whalen.

Rick Seguin, of SCR Mines Technology, served up corn from a cauldron for some 800 hungry Family Day participants.

Lou-Anne Ricard, 11, is geared up and ready to try her backhoe operating skills. Lou-Anne is the daughter of Marcel Ricard, an instructor at Coleman.

Levack Complex manager Jon Gill rides shotgun with a group of young underground visitors during Family Day celebrations.

Safety on and off the job celebrated by Nickel Refinery

It had all the elements of an Inco family day – clowns, horse rides, hamburgers – but with a unique combination of family and safety.

The Copper Cliff Nickel Refinery held its Family Safety Day at Fielding Park with a focus on the importance of safety in the workplace and at home.

For this reason, the refinery celebration is characterized as unique. **Al Cruthers**, refinery manager, explained the premise of combining family and safety. "The whole part of this day is to try and make apparent that safety is as important to family as anywhere else. It is for them (family) that we strive to work safely."

In addition to focusing on safety, the outing, which drew an estimated 800 people, also celebrated a social element. "It's a nice way to meet everyone. You don't have the chance to meet the family . . . so this is an important component," said Al.

Those who attended the event agree.

Refinery technician **Brian MacDonald** and wife **Cherie** said the day was a wonderful opportunity to spend time with family and meet co-workers and their families. "It's nice for the kids to be having so much fun," said Cherie. For Brian, "meeting old buddies" was one of the highlights the day offered.

The highlight of the day for Nickel Refinery foreman **Andre Fournier** was conversing with employees and their families off the job. "The kids look forward to it. They meet new kids too."

Others shared Andre's enthusiasm.

"This is fantastic," said **Cindy Blanchard**, a regular at the Family Safety Day for five years. Cindy is the daughter of refinery employee **Alan Stargratt**.

Several events were planned for both adults and children, with numerous aspects focused on safety. **Shirley Brown**, worker safety and health representative, said the event was organized with the idea of involving the entire family. "We have always had a Family Safety Day because we feel it is important on and off the job. Safety doesn't stop when you leave the plant."

To help promote safety, a children's safety poster contest was held with judging taking place at the park. Shirley stressed the importance of promoting safety through the children, as it becomes a way of life.

Safety is a top priority in the workplace as well, she said.

"We tend to do very well with our safety record. Today, safety is in the forefront."

In keeping with the family theme, all food and pop left over from the event was donated to needy families through Sudbury's food kitchen.

Kyle Benoit, 7, is all smiles on the back of Trigger, one of two ponies which treated children to rides throughout the day. Kyle and Trigger were led around the grounds by Jeff Sonnenburg. Kyle is the grandson of John Treling, a retired lab technician at the Nickel Refinery.

These three cooks, or 'flippers', were extremely busy through the day satisfying the hunger of Nickel Refinery employees and their families. Seen from left are administration supervisor Bernie Oliver, production assistant Reg White and electrician Jack Parry.

Casey Digby, 4, diligently works on her submission to the safety poster contest. Casey was the guest of Rene Goulet, a janitor at the Copper Cliff Nickel Refinery.

Foreman Andre Fournier said his children look forward to the Family Safety Day. He is seen here with daughter Caitlin, 1.

Just swinging in the sunshine was Cody Jordan, 7, grandson of Michael Jordan, Nickel Refinery maintenance mechanic.

A relaxing hayride through the nature trails of Fielding Park was a favorite attraction for all family members.

Orientation introduces new engineers to Inco

First impressions are crucial.

For an employee starting a new job, first impressions have the potential to determine career success. A positive attitude makes all the difference, say three of Inco's newest mining engineers-in-training.

Frank St. Cyr

Meet **Tammy Leeson**, **Frank St. Cyr** and **James Tocco** – these three mining engineers-in-training (EITs), along with **Yves Leveille** and **Steve Forcier**, will be training for another year as part of a two-year program designed to familiarize them with Inco.

"Inco is investing in its future through the younger generation," said James. "This training program allows us to get a flavor for all of Inco's operations. I've seen everything from the drilling and blasting of muck to the final market products and I've met a lot of great people who were willing to take the time to answer my questions, or let me get involved in what they were doing," he said.

The orientation program gives EITs a chance to learn about the process behind the product and an opportunity to meet new people, said **Choon Park**, superintendent of Mines Engineering.

The EITs toured surface plants and departments allowing them to apply textbook principles and academic training in the workplace, said James.

The same observation is held by Frank, who added that he has a clearer understanding of how departments are interdependent of each other in the customer and supplier relationship.

Although the three EITs concede they have much to learn about the Inco process and experience to gain, they are confident that over the next year, the training program will answer their questions.

While they were on tour at the Copper Refinery Tankhouse, opinions and impressions were being formulated by Frank, James and the seasoned Inco employees they met there.

"These EITs are coming in with schooling experience, but they'll find out where the real world is when they get down into the mines as supervisors. Although we have the same standards and goals, there's a great difference between mining and surface employees," said **George Courtney**, copper refining foreman.

All three EITs have spent summers gaining valuable experience at various mines across Canada and the United States. The next 14 months of the training program will provide EITs with more focused and detailed experience, while they, in turn, hope to "bring in a whole different attitude and new outlook on teamwork and quality of product," said Tammy.

"They have new ideas, enthusiasm, and offer a new perspective," said **Rick Barrett**, Copper Refinery supervisor. "If we ever hope to change the culture at Inco, we need to bring in new people," he added before offering his insight to the EITs.

Tankhouse supervisor Ray Brule, right, shows engineers-in-training Frank St. Cyr, left, and James Tocco, the results of the copper plating and Tankhouse process.

"I'm a fixture – been here for 30 years – what you do with your full-time job is up to you. You're in control of your destiny."

Long-term service employees also offered advice about the importance of continued education, explained Frank, who cited the geology department of Stobie Mine as a perfect example.

James Tocco

"Here we have a group with several years of seniority who were generally not trained during their schooling to use computers. They have taken it upon themselves to learn how to use computers resulting in a group of highly-skilled people who know how to operate various computer programs. These types of people and surely many others combine to form one of Inco's greatest assets."

Designed for EITs to provide them with an overview of people and operations, the training program has left Tammy, Frank and James with impressions that will stay with them throughout their careers at Inco.

"We may work in different departments and complexes, but we are all working towards the same goal – to make Inco as safe, cost-effective and productive as we can," said James.

The surface orientation tour and mining engineer training program are leaving not only EITs with a lasting impression, said tour guide **Ray Brule**, Copper Refinery Tankhouse first line supervisor.

"It's tours like these that make the Inco family strong."

Tammy Leeson

Inco and fire crews stress teamwork

Ron Babin, emergency systems coordinator for the Smelter, took all eight of Sudbury's firefighting crews on a tour of Inco's ever-changing "industrial city" to keep them abreast of where chemicals, acids, sprinkler systems and other important materials are found.

If you saw fire trucks at the Copper Cliff Smelter Complex frequently this summer, don't worry – there was no smoke and no fire.

The visits by firefighters were part of Inco's and the Sudbury Fire Department's emergency planning process.

This summer all eight crews of city firefighters toured the Smelter Complex with a goal of improving their performance in an emergency, enhancing their safety and the safety of employees working on-site.

The annual orientation tour for firefighters reflects Inco's "proactive" approach to safety, explained **Ron Babin**, emergency systems coordinator for the Smelter.

"The orientation is done so these gentlemen have an idea of what is in our industrial city here in Copper Cliff. You could call it accident prevention for the fire department."

Ron also offered many important safety tips for the firefighters to keep in mind during an emergency situation.

"When you walk into a smoky building and you walk into an area where it's two per cent acid in the air, it'll stop your breathing like that," he said, clapping his hands together. "Just remember you were breathing two steps back – so step back."

Ron also pointed out that a parking lot throughway via Benjafield Road had been blocked midway by a concrete barrier. The barrier went up last spring to remove the potential for employees being hit by through traffic. The fire department can access the complex through the Central Gate.

Ron said that by calling ahead on their radios while enroute to Copper Cliff, firefighters can learn if the Central Gate is clear.

"All emergency agencies are directed to our Central Gate, unless there is a gas leak blowing into the area," he said.

If the Central Gate is not a safe entrance or otherwise blocked there are emergency entrances near the General Office that can be accessed. Firefighters would again use their radios to make sure the railway tracks and other traffic are clear at the access points.

The orientation included a tour of the Oxygen Plant, in Copper Cliff's Little Italy neighborhood.

Gil Depatie, utilities foreman at the Oxygen Plant, showed them around.

"It's important to familiarize the fire department with what they can expect if we have a fire," Gil said.

Captain Robert Talevi said touring Inco's Smelter Complex once a year keeps the firefighters up to date on locations of natural gas lines, oil containers, acid tanks, acid lines, sprinkler systems and other significant material.

"We as firefighters work with Inco learning how to handle a hazardous situation," he said.

"It adds to safety for me and my guys and for whoever is in here. It's a teamwork effort."

Gil Depatie, utilities foreman at the Oxygen Plant, said it's important to familiarize the firefighters with each area of our operations in case of fire or other emergency.

Refinery karate expert undefeated in '97

Don Benoit's fierce kicking ability is one of the reasons he's undefeated thus far this year in competitive karate tournaments across North America. The packaging and shipping operator at the Nickel Refinery holds a sixth-degree black belt.

Tired of jogging, sweatin' on the stairmaster, *Sweatin' To The Oldies*, taking step classes or even rollerblading to improve your fitness level?

One Nickel Refinery employee has found and stuck to a regimen that has proven to be more than a passing exercise craze for him.

Don Benoit, 48, feels so strongly about martial arts that if he had his way everybody would be *Kung Fu Fighting*, as the 1970's tune goes.

The packaging and shipping operator doesn't expect people to take it as seriously as he has since 1972, which is about when the *Kung Fu Fighting* song, **Bruce Lee** movies and the TV series *Kung Fu* added to North American interest in the age-old, Asian martial arts.

"Even a little karate training can help relieve stress for one thing," said Don, pointing out one of its many positive aspects.

While the fad of kung fu came and went, Don found martial arts to be worth exploring further.

For Don, martial arts – karate to be specific – is his way of keeping physically and spiritually fit.

"Physical fitness, confidence, flexibility. It keeps your mind clear all the time. I was amazed at the techniques, the blocking, the punching. A good workout feels great," said Don, who's considering retiring in three years when he becomes a 30-year veteran of Inco.

His admits his foray into martial arts has bordered on obsession over the years. But it's been a healthy preoccupation for him and his family.

"Martial arts are in him now. When he does retire from Inco, he won't retire from martial arts. He'll always be involved," said his wife **Marje**, who is the office manager of Benoit's Martial Arts.

The dojo, in the city's south end, boasts 160 members from children to adults.

Don, himself a sixth-degree black belt in karate, has clearly passed on his interest in karate to his children.

Terry, 22, and **Donna**, 20, who also have black belts of lower degrees, help him teach aspiring martial artists at the dojo.

"The kids will take over as time goes on," Don said with some pride.

He keeps his weekends free, but not to take it easy.

That's when he competes in karate tournaments, where he has defeated competitors in their 30s. In fact, he hasn't lost any of the eight tournaments he's entered this year in the 35-and-over category.

He's also hosting the Northern Ontario Karate Championships on Oct. 25 at Lockerby Composite School.

As long as his kicks are "fast as lightning," Don said he doesn't have any retirement plans for the karate side of his life.

For now, he plans to maintain a hectic schedule of teaching hour-long evening classes at his dojo four nights a week – after he gets home from work that is.

Karate has been a large part of Don Benoit's life for 25 years.

– Benoit's Best –

Don Benoit has no shortage of karate titles to his name. Here's a sample of several of his first-place victories so far this year:

- Hurricane Nationals in Galveston, Texas, in categories of Traditional Forms and Creative Forms (Sept. 19).
- Jhoon Rhee Internationals, Washington, D.C. (July 4).
- Battle of Martial Arts, Virginia, Mass. (May 18).
- Tiger Balm Internationals in Vancouver (March 22).
- Diamond Challenge, Brampton (March 8).

WCB tours Modified Work Centre

In the photo at left, Leo Leclair, a repairman at the Modified Work Centre, shows an Oxweld torch and other tools of his trade to Ric deMeulles, manager of the mining section with the Workers' Compensation Board (WCB), during a recent visit. The WCB's visit to Inco operations coincided with the launch of a new model of service delivery to be located in Sudbury. The new model will handle claims, adjudications and administration of specific industry areas. Gary Hughes, Inco's general foreman of compensation, explained, "The mining sector unit is the pilot project in a new WCB initiative intended to ensure more effective workers' compensation services to workers and employers alike. We are entering what promises to be a new partnership." At right, Miro Czerkas, gasket maker at the Modified Work Centre, chats with Glen Wright, chair of the Workers' Compensation Board, while Michael O'Keefe, the WCB's President and Chief Executive Officer, looks on in the background.

LETTERS TO THE EDITOR

Dear Editor,

I find the three-inch gold medal (first prize in the Intermediate Physical Sciences category at the Sudbury Regional Science Fair) very attractive. It will be a precious souvenir of the time and energy that went into my project Windjammer. The fun that went into building a few wind turbines will be with me forever now, engraved on my beautiful gold medal. I wish to thank Inco very much for this special keepsake.

Nikola Rank
Grade 9

Dear Editor,

On behalf of Economic Director Larry Pittman, Town Councillors Ron Boules and Bernie Broomfield and myself, I would like to extend our thanks for arranging the April 21 tour of the South Mine, the Clarabelle Mill and Purchasing and Warehousing.

We were extremely appreciative of the effort made to ensure we were given the "royal tour". The day was both interesting and informative and all of the staff involved was very helpful.

We would also like to extend our thanks to Bob Zadow who was a wonderful guide and made every effort to make sure we were on time for everything.

Sincerely,
Colleen Baikie
Executive Director,
Labrador North Chamber of Commerce

Dear Editor,

On behalf of Robert Esmie, his family and myself I would like to personally thank Inco for sponsoring the (Paul Harris) dinner. It was a remarkable event, particularly for Robert, who confided with me that the tears he shed were the first in 10 years since his father died.

The success of the evening was a fine example of teamwork. The magic captured throughout the evening was electric and was generated by "**The power in each of us comes from all of us**" (track coach Mike Murray). It was teamwork like this that guided Robert to become an Olympic champion and it is teamwork such as this that will ultimately propel Robert to the top of the podium in 2000.

As Robert continues to chase his dream we thank you for your present support. Even more importantly, thank you for your confidence and belief in Robert in the past, which without a doubt, helped Robert achieve the platform on which he is now building.

The energy and excitement during the dinner is an indication of more great moments to come. We look forward to working together as they unfold.

As Robert so eloquently states, "Dreams can come true."

Truly yours,
Geoff Sternberg
Vision Quest Management Inc.

Dear Editor,

On behalf of the Cambrian Foundation, Cambrian College and our students, I would like to express our sincere appreciation for your contribution and participation in Cambrian College's 1996-1997 Scholarship, Bursary and Award Program. Your generous support provides our students with much needed financial assistance and helps us to profile student excellence at Cambrian College.

Thank you once again and we look forward to your continued support of the Cambrian College Scholarship, Bursary and Award Program.

Yours truly,
Miriam McDonald
Executive Director,
Cambrian Foundation

Dear Editor,

On behalf of the Sudbury Yacht Club and the Organizing Committee of the 24th Annual Inco Regatta I would like to thank you for your support.

Approximately 35 boats took part in the successful event and more than 70 people attended the Saturday dinner. Media coverage by the television station MCTV was certainly an important tool in promoting the event.

Next year will be the 25th edition of the Inco Regatta and plans are already underway to make it a more important gathering. We hope to count on your support for another succesful Inco Regatta. Thank you very much.

Yours sincerely,

Louis-Pierre Gagnon
Inco Regatta Chairman

Dear Editor,

On June 3 the administration, the staff, the students and their families celebrated the accomplishments of the Class of 1997 at Lo-Ellen Park Secondary School's annual Graduation Ceremony.

In addition to the diplomas, a total of 70 special awards were presented to deserving students in recognition of both academic achievement and contribution to the school and community life. We recognize that this success is due to the contributions of many individuals and would like to thank Inco for its contribution.

Thank you again for your interest in our students and for the support you have given to them.

Sincerely,
Pat O'Malley
Principal, Lo-Ellen Park Secondary School

Dear Editor,

We the graduates, members of the faculty and management of l'Ecole secondaire catholique l'Horizon, are grateful to have received your bursary for our graduates of 1997.

Your company's name appeared on the list of our supporters which was included in the program given to our guests on the evening of our graduation.

We thank you and assure you that this gift was greatly appreciated.

Please accept our best wishes.

Armelle Brunet,
President of the graduation committee

Dear Editor,

Thank you so much for the videos – my students enjoyed The Next Generation. I am also sharing the videos with other schools in our area that are working through the unit Mining Matters. It is an excellent unit!

Even my mother enjoyed Taming The Demon Ore since we lived in Levack for several years and many of her family live in Sudbury.

Thanks again,
Carole Ruttan

Dear Editor,

What a spectacular year it was for Junior A. Tier II hockey in Northern Ontario! The Sabrecats exceeded all our goals and expectations and represented us proudly as the 1997 Central Canada Champions!

On behalf of Don McLean, Gary Delorme and the entire Sabrecats' organization, I would like to take this opportunity to extend our thanks and appreciation for your loyalty and support.

We have been very fortunate in that we have been able to recruit a hockey team with character, talent and ability. We have accumulated many loyal fans and, most importantly, we have a group of sponsors that are second to none! Without you we would not have been able to accomplish what we did this year and we are very grateful.

Our 1997/98 season is shaping up to be even better than this past year. The N.O.J.H.A.'s new interlocking schedule with southern Ontario ensures that you, our fans, will be privy to some of the finest hockey Rayside-Balfour has ever seen! We look forward to your continued support for the 1997/98 season and cannot express how important you are to our future successes.

Sincerely,
Miss Heather Davey
Marketing/Promotions
Rayside-Balfour Sabrecats Hockey Club

Dear Editor,

On behalf of the Rotary Club of Sudbury Sunrisers, I would like to thank you for your generous support of the Robert Esmie Paul Harris Dinner.

As you know, the evening was a huge success and approximately $10,000 was raised to further Robert's training program. You have invested in a significant 'gold' market at the Sydney 2000 Olympics for our community and country. Sudbury is fortunate to have outstanding corporate citizens such as Inco who certainly help make "dreams come true" for others.

Thank you for your support and commitment to better define the Rotary motto: "Service Above Self".

Sincerely,
Gerry M. Lougheed Jr.

INCOME *ideas*

by Susan LeMay, CMA

Financial plan must benefit the planner

It is time for the last 'Income Ideas' column.

For the last four years I have had the great pleasure of choosing topics, doing the research, and presenting you with the results. My goal has been to provide awareness and some concrete suggestions about how to ensure that your money works as hard as you do.

Over these four years the availability of information on all financial matters has mushroomed to the extent that there is almost too much information to absorb. Sometimes it also appears conflicting. I am going to sum up what I believe are the most important principles to follow in any financial decisions.

Responsibility

All financial planning has one focus and that is to benefit the person making the plan. That means that you are responsible for the details. You are the one making the decisions. There are no wrong goals in financial plans. The goals are yours, and you also choose the priorities for reaching those goals. There is lots of superb expert help out there, but in the end it is only good help if it gets you where you want to go.

Basic Requirements

Using the information or the expert help has one basic requirement. You must have some capital to make it work. The first step of your plan must be to find money for planning. This means savings – and that leads to budgeting and back around to planning. Start small, but start.

Financial Information

The financial information explosion has taken all forms and formats and each one has its following.

I am most used to the printed word in books, magazines, newsletters and newspapers. The difference between the different sources is in their current value. There are new financial books out almost every month. They describe history, present trends or theories and provide basic definitions. *Boom, Bust and Echo* discusses trends. *Bre-X*, a new release, provides history, even though it is history from only six months ago. Magazines and newsletters are more current. They are only a month or two old by the time we read them. Then there is the daily newspaper providing events as closely as paper can to the actual event. It is a lot to read, absorb and understand. It takes a lot of time.

For many of us, television has replaced the printed word. Television offers many of the same things as paper. There are documentaries that compare to books, in-depth special reports that compare to magazines and the daily business report that is like the newspaper.

You and The Experts

There are experts in financial plans as there are elsewhere. Financial planning experts either charge their customers a fee for services, or they earn a commission on the investments you choose to make. You can pay the adviser to deal with you individually, but some of these experts offer courses and seminars where you can get information at a lower cost if you are prepared to do some of the work. Courses are offered through Community Colleges in financial planning for those who want to pursue it as a career.

There is nothing to stop any of us from learning by taking these courses. The investment is time instead of money. Since you need to invest time to establish your goals in any event, these are a good option for determining what you need to know.

New Technology

The newest source in the financial information arena is 'The Net'. Here you can get information literally as it happens. No need to wait until it is printed or even reported on television or on the radio. I have a couple of cautions about 'the net' and information.

It takes a lot of time to find information on the web. There are many paths to the same site. Because the Internet is still developing, sites that look and sound terrific sometimes have no information to give you.

The Internet, in some ways, is the printed word in a different format. The closing quotations from the various stock markets are there and the headline business news is presented. You read your screen instead of a book or magazine or newspaper.

More and more sites now require you to subscribe to get access to all the information. You can read the headlines, but not the inside story. Sounds like magazines and newspapers to me. Don't buy without sampling.

You will reach goals and then have to go through the planning exercise over again. There may be new information, too. This is the normal progression of events. Changes in the environment need to be monitored. They may require changes in our goals and plans.

I can think of several examples. For instance, increases in university tuition will mean a need for more money to educate our children. Changes by the federal government to retirement income are being proposed. We need to monitor whichever of these has the most direct impact on us. There is no way we can monitor it all. Look for the specialized information once you have mastered the basics.

In Memoriam

Name	Date of Birth	Date of Death	Years of Service
Andre Arbour	08-11-24	08-21-97	24.5
Jean Bouchard	03-31-27	08-26-97	34
Horace Bourget	09-22-29	08-26-97	35.5
Romeo Boutot	07-12-13	08-19-97	34.5
Michele Corsini	04-08-09	08-13-97	23.5
Omer Deziel	08-28-23	08-31-97	24.5
Hilden Discher	07-15-20	08-17-97	35.5
Otto Dudas	06-12-17	06-23-97	25
Edwin Evershed	06-05-20	08-15-97	38.7
Carlo Falcioni	03-14-29	08-21-97	35.5
Caliste Francis	12-06-22	08-29-97	32.8
Romeo Frenette	08-09-27	08-28-97	37
Tony Greggio	12-08-14	08-05-97	35
Benno Gundrum	07-21-37	08-12-97	30
John Hovanec	06-09-27	08-13-97	37
Feodor Kowalenko	10-01-14	08-09-97	27
John Krieger	07-29-32	11-16-97	32
Steven Kusan	06-01-37	08-13-97	34.5
Jean Lemay	04-09-45	08-13-97	27
Romeo Lepage	09-12-17	08-12-97	37.5
Arthur Leroux	03-06-07	08-13-97	29.9
Eugene Longual	03-21-28	08-08-97	28.5
Robert McLeod	12-17-06	08-31-97	32.2
John Meandro	04-03-41	08-27-97	30
Sava Milosevic	11-15-27	08-08-97	15
Arthur Morin	06-23-25	08-05-97	31.4
Robert Patterson	03-10-16	09-02-97	41.5
Joseph Pawlowicz	11-02-17	08-19-97	22.8
Thomas Prisque	07-09-27	08-25-97	25
Roger Ramsay	07-20-20	08-09-97	34
Colin Reid	03-20-11	08-26-97	24.3
Lucien Sauve	10-20-16	07-18-97	29
Howard Schooley	03-09-18	07-07-97	40.3
Joseph Scinto	03-01-17	08-22-97	44.5
William Shymkiw	04-07-12	08-17-97	32.5
Norman Talbot	07-10-30	08-12-97	35.5
Alfred Tranchemontagne	05-23-18	08-06-97	20
Petro Worona	01-20-13	08-04-97	23.5
Ronald Young	08-31-43	07-10-97	25.5
Andrew Zahorouski	07-15-46	08-31-97	32

FYH
FOR YOUR HEALTH
From the Occupational Medicine Dept.

Osteoarthritis must be managed

By Susan Jefferson

September was arthritis month!

The word arthritis means joint inflammation ('arth' = joint; 'itis' = inflammation). Nearly four million Canadians have arthritis, which can occur in more than 100 different forms.

Osteoarthritis is the most common form of arthritis. An estimated 2.7 million Canadians have osteoarthritis. It is the single most frequent cause of lost time from work and leisure activity. People of all ages can get osteoarthritis, but it usually affects older people (85 per cent of the population will be affected by osteoarthritis by age 70).

Osteoarthritis is usually described as joint 'wear-out'. Symptoms come on slowly, and may include pain in or around a joint, stiffness or problems moving a joint and swelling in a joint. Osteoarthritis can affect any joint but commonly affects weight-bearing joints such as the hips, knees, feet and spine.

No one knows exactly what causes osteoarthritis, although scientists have determined that a breakdown of the cartilage that cushions the ends of the bones occurs. There are several factors that may increase a person's risk of getting osteoarthritis. They include heredity, excess weight, injury from accidents or repeated use, and complications from another type of arthritis such as rheumatoid arthritis.

Establishing the correct diagnosis is very important, because something can be done to manage most types of arthritis and most treatments work best when started early.

Osteoarthritis may be diagnosed based on a person's medical history and physical examination. Sometimes certain tests may be ordered such as x-rays, bloodwork, or joint fluid tests.

There is no cure for osteoarthritis today, but a lot can be done to help people who have the condition. Treatment for osteoarthritis includes:

• Medications

Non-prescription medications such as acetaminophen, ASA and ibuprofen can provide temporary pain relief. Doctors may prescribe nonsteroidal anti-inflammatory drugs (NSAIDS) which provide long-term relief from chronic pain and inflammation. For severe pain and inflammation, doctors can inject an anti-inflammatory drug, called a corticosteroid, directly into the affected joint. How and when to take the medication, potential side-effects and interactions with other medications should be reviewed by a doctor and pharmacist.

• Heat/Cold

Heat or cold can provide temporary relief of stiffness. Heat, such as a hot shower, helps relax aching muscles and relieve joint pain. Cold, such as an ice pack, helps numb the area.

• Exercise

Exercise helps lessen the symptoms of osteoarthritis and improves overall health. Stretching exercises will help relieve the pain and keep the area around the affected joint more flexible and strong. Low-impact exercises such as swimming, walking, water aerobics and stationary bicycling can decrease pain while maintaining strength and flexibility.

A doctor should be consulted before beginning an exercise program. Physiotherapy may be prescribed for some people.

• Protecting Joints

Protecting joints means using joints in ways that avoid excess stress from daily activities. Three ways of protecting joints are pacing (alternating heavy or repeated tasks with easy tasks or breaks), joint position (using joints in the best way to avoid extra stress), and helpful devices (ie. canes, grocery carts, grab bars). An occupational therapist may be consulted to assist in these areas.

• Weight Control

Staying at a recommended weight or losing weight helps reduce the risk of osteoarthritis of the knees and lessens pain by reducing stress on the joints. A doctor and dietitian should be consulted to discuss the best program.

• Viscosupplementation

This is a new treatment in Canada for people with osteoarthritis of the knee. A clear gel-like substance is injected into the knee which helps the joint fluid lubricate the joint cartilage and absorb the shocks of daily living. Pain is reduced allowing greater mobility.

• Surgery

Some people with advanced osteoarthritis may require surgery. This may include arthroscopic surgery – small incisions through which surgeons can clean cartilage debris from the joint or surgery to replace a joint with an artificial joint.

Along with the physical symptoms of osteoarthritis, people may experience feelings of depression and helplessness. Learning daily living strategies to manage osteoarthritis may create a greater feeling of control and a more positive outlook. Practicing relaxation techniques such as deep breathing and meditation may also be helpful and referral to a counsellor may be required for some people.

People affected by osteoarthritis need to become actively involved in their treatment plan. There are several services/resources available in the Sudbury Region which can assist people in finding out how to best manage their arthritis. The Arthritis Society is a non-profit agency dedicated to funding and promoting research into the causes of and cures for arthritis. It is also involved in client care, advocacy and public education. Some of its services/resources include:

- **Arthritis Aquatic Programs** provide the benefit of warm-water exercise as well as opportunities for those with arthritis to support each other.
- **Arthritis Bluebird Club** is a support group for those affected with any type of arthritis.
- **Arthritis Self-Management Program** is a six-week program designed to help people better understand their arthritis, learn ways to cope with chronic pain and to take a more active role in arthritic care.
- **Consultation and Therapy Service** includes occupational therapy and physiotherapy.
- **Arthritis Bell Connection** is a support line for people who want information about arthritis and who need guidance in accessing the healthcare system. Trained volunteers also provide emotional support to callers. The contact number is 1-800-321-1433.
- **Information Program** includes a broad range of information brochures on most forms of arthritis and issues relating to the disease. The Arthritis Society has also placed comprehensive information about arthritis on the Internet World Wide Web (www.arthritis.ca).
- **Videos** about the diagnosis, treatment and management of arthritis are available in the Resource Centre of the Arthritis Society.

For more information on Arthritis or available services/resources, please contact the Occupational Medicine Department at 682-5179 or the Arthritis Society at 674-0285.

(Resources used in the writing of this article were provided by the Arthritis Society.)

LET'S TALK SAFETY

Being prepared key to any task

with Ron Rafuse

Summer is gone and the beauty of fall is about to descend upon us.

Yes, it is the season of change from summer to fall. It is the time to take out a different type of clothing and a time for different outdoor activities.

The hunters are getting anxious to be out there and the children are in school. For some it is time to start the woodstove or fireplace.

STOP! THINK!

Have I checked out the equipment from last year? Is my chimney in good condition? Do I know the changes to the hunting regulations?

The list goes on, but what it really comes down to is are you prepared for the fall and the changes it brings?

This is the time of year we in industry and the public sector prepare to launch the Emergency Preparedness and Fire Prevention Week awareness campaigns. In the event of an emergency at home or at work, you only have time to react to the event. This is where knowledge and training as well as practice pays off. Are you prepared and do you know what to do?

Fire is among the most common of workplace emergencies. Make sure you know what to do if you discover a fire. Sound the nearest alarm or send someone for help. If the fire is small and you have a clear escape route and know how to use an extinguisher, put the fire out. Always know your exit route and an alternate route to leave buildings.

Learn the fire procedures at your workplace and refresh yourself on these periodically.

Off the job, have you made back-up copies of all the important documents you need to function with such as birth certificates, marriage certificates, wills, deeds to property, insurance policies and computer back-ups?

Remember, you may not be home or have time to get these papers, so copies must be stored at an alternate location such as the home of a trusted friend, a safety deposit box or a fireproof strong-box.

When you stop and think about it, it is a secure feeling to be prepared in the event of an emergency or to be prepared for any task or activity.

Within a month or so, the Getting To Zero Safety Workshop that has been jointly developed with our unions will be starting in all plants in the Ontario Division. The workshop deals with procedures and why they are an important part of safety in our daily working lives. It will again give each work group the opportunity to reflect on the gains and commitments that were made at last year's workshop and to discuss what improved, what did not get better and how we can do something about it.

Part of learning and understanding procedures is recognizing that they prepare us to do the work.

This is not much different from being prepared for a new season, or an emergency or doing a task. It all goes much easier when we are properly prepared before we start.

If you think it is not necessary to prepare for emergencies, here are some facts:

- Since 1900, floods have killed 10,000 people in the U.S. alone.
- The most destructive earthquake in history killed 830,000 in China in 1556.
- In 1992, Mount Pinatubo in the Philippines erupted causing 342 deaths.
- There are more than 500 active volcanoes in the world.
- The natural disaster causing the most deaths in U.S. history was in 1900 in Galveston, Texas where a hurricane killed 6,000 people.

Always plan and prepare for what you know you are going to do and train and prepare a plan for the things you may not expect.

We develop and have procedures so that we all know how to do the job or handle the emergency properly.

Remember the safety principle: *Training Employees to Work Safely is Essential.*

Ron Rafuse is superindendent of Safety in the Ontario Division

LESS WATT

Clean, steady power – it's more important now than ever

By Guy Springgay
Ontario Hydro

Today, we've become accustomed to using sophisticated electronics in our homes and offices. From computers to phone systems, copiers, even kitchen appliances, these machines have more capabilities than ever before thanks to advances in microprocessor chips.

As these chips become more complex, they become increasingly dependent on clean continuous power to function properly.

And while the power that leaves the utility plant is pure, there are many things that can happen to the electricity by the time it's actually used. In fact, surveys show that up to 80 per cent of all electrical disturbances occur at the customer's location.

The Blink Of A Clock

You may notice your digital clock flashing because of a split-second power disturbance, and if your computer shuts down or your cash register quits, you may wonder what happened. Power disturbances have always been around, but today's electronic devices are more sensitive to slight power fluctuations so any disturbance is now more obvious.

It may show up as an equipment malfunction, equipment damage, or loss of computer data. In some cases, it could present a health or safety hazard if medical or security equipment is affected.

Typical Culprits

There are many ways that power in your home or office can be affected. Here are a few of the most common ones.

1. Appliances starting up or shutting down.

Research shows the number one cause of power fluctuations are the brief reductions or increases in voltage when appliances start and stop their power cycles. If you have ever noticed your lights flicker when your refrigerator or air conditioner starts, you've experienced this phenomena. Any equipment that draws a fluctuating current or a great deal of power at start-up could cause this. Typical culprits in the workplace could include everything from photocopiers and computers to power tools and electric welders.

2. Physical disturbances to the utility's power distribution system.

Whether it's a tree branch falling on lines, a traffic accident that involves a utility pole, or a broken cable due to underground digging, any disturbance to the distribution system can result in a temporary power outage.

3. Energy surges when power resumes.

Equipment malfunctions can also result from a surge of energy following a power interruption. Most sensitive equipment is not designed to handle such a rush of energy. That's why it's wise to turn off all equipment and appliances during a power outage and turn them on only after power has been restored.

Be Prepared

Despite everyone's best efforts, accidents that cause power fluctuations will happen. So it's best to plan ahead and be prepared.

First, be sure that your home or building's electrical system is designed to handle all the equipment that will be used. This is very important. Most other protective measures cannot make up for inadequate wiring or power supply to your facilities. If you are in an older building or have reason to believe that the present electrical system could be the cause of your problems, get an electrical inspection.

Your Electrical Contractor Can Help

A thorough inspection by a qualified electrical contractor can be a good preventive measure.

Here are some of the areas a contractor can help you with:

1. The wiring should be inspected to confirm that it is in good condition, properly sized and properly grounded. Ensure that proper wire sizes are used to handle the circuit loads.

2. All wire connections should be secure. Loose connections frequently create problems, often in an unpredictable manner.

3. Sensitive equipment should be on a separate circuit within the facility to avoid disturbances caused by other equipment (coffee makers, copy machines, etc.). In some cases a dedicated circuit may be required, running directly from the fuse or breaker panel to a specific piece of equipment, making it impossible to connect other equipment to the circuit.

Steps You Can Take Yourself For Better Computer Performance

For many of us, dependable computer operations have become vital. Here are a few ways to protect your computer and get the best possible performance.

1. If your computer does not have surge protection, it may be a good idea to unplug it during thunderstorms.

2. Put your computer and laser printer on separate circuits.

3. Keep your computer cord safely secured and out of the way, so it will not be unplugged unintentionally.

4. Protect new data by saving it regularly to your hard drive or a floppy disc, especially during bad weather. The more often you save, the safer your new data is. Some software packages will save your new data automatically at timed intervals (for example, every 10 minutes). Once saved, your data cannot be lost as a result of a temporary loss of power.

Low Cost Solutions

After you are sure that you have an adequate power supply and your wiring is in good condition, there are a number of low cost steps you can take to protect your equipment.

1. Reduce static electricity.

Static electricity can cause loss of data or damage to computers. If you have high levels of static electricity, investigate anti-static sprays and mats. You can minimize static electricity by maintaining at least 50 per cent relative humidity. You may want to consider installing computer-grade carpeting.

2. Buy equipment with a built-in back-up system.

Today, you can buy computers and other digital appliances that have built-in battery back-ups which will remember clock and memory settings when power is briefly lost.

3. Plug-in equipment protectors.

Plugged into a single wall outlet, these protectors guard your equipment against minor electrical disturbances. However, look in the next section for better levels of protection.

Moderate Cost Solutions

Depending on your situation, you may find it pays to invest a little more to protect your equipment. Here are two suggestions:

1. Use surge suppressers.

Surge suppressers either limit impulses or divert them to ground so they are not passed through sensitive equipment. Exact protection capabilities vary with the quality of the device. Because surge suppressers are relatively inexpensive, it makes sense to install them to help reduce the potential of equipment damage, particularly from lightning strikes.

2. Isolation transformers can help.

Isolation transformers are specifically designed to prevent electrical noise on the power line from being passed through to the protected equipment. Be aware that isolation transformers do not regulate voltage or protect against sags, surges, or harmonics. For that, you will have to move up to the next level of protection. In some cases, isolation transformers are included as original equipment in the computer's power supply.

Please note that a power bar is not a voltage suppresser; it is simply an extension cord with a breaker which provides no protection to sensitive equipment.

Higher Cost Solutions

If your computer and other equipment are vital to your income, it pays to buy higher levels of power protection. There are two main types:

1. Line conditioners or power conditioners

Line conditioners or power conditioners provide several types of protection in one device. They often combine the properties of an isolation transformer, a surge suppresser and a voltage regulator (to maintain a steady voltage). The term "power conditioner" is applied rather loosely and may not perform all three functions. Be careful to get equipment that provides the degree of protection you need.

2. Uninterruptible power supply (UPS)

An uninterruptible power supply (UPS) is the only device that provides protection from almost all power disturbances. Typically, during a power outage, these units provide 5 to 10 minutes of power to your sensitive equipment. They are ideal for use with small computers and small control systems because they can be placed close to the equipment they protect, and require no special installation or ventilation. For best protection against most power disturbances, the UPS must be the "on-line" type and not simply a "standby power supply".

For more information, contact your Ontario Hydro account team:

Account Executive,	Guy Springgay,	905-664-2519 (Stoney Creek)
SUDBURY		
Energy Advisor,	Doug Pacey,	705-525-6303 (Sudbury)
Energy Technician,	Ron Lefebvre	705-525-6304 (Sudbury)
PORT COLBORNE		
Energy Advisor,	Ron Clark	905-680-4561 (Thorold)
Energy Technician,	Fred Tiekstra	905-680-4563 (Thorold)
SHEBANDOWAN		
Energy Advisor,	Tom Pickett	807-343-3350 (Thunder Bay)
Energy Technician,	Jeff Field	807-343-3568 (Thunder Bay)

Polish government honors Inco trio

George Aniol, superintendent of Inco McCreedy West and Levack Mines, received a high honor from the government of Poland for his outstanding volunteer contributions to the local Polish community. George is seen here holding his Silver Cross of Merit.

George Aniol, Jozef Korobij and Leon Stefanczuk share a special bond that extends beyond their Inco employment and across the Atlantic Ocean to their Polish homeland.

The three were decorated with a high honor from the Polish government for their extensive and selfless dedication to the local Polish community in Sudbury. The trio received recognition from the government with Silver and Gold Crosses of Merit at a special ceremony with the Consul General of Poland.

The three share a bond that extends beyond even their cultural ties. Each has dedicated countless hours to the various Polish clubs and organizations in the Sudbury Region, and each was among seven Sudburians to receive the honor. George, superintendent of McCreedy West and Levack Mines, received the Silver Cross of Merit. Retirees Jozef and Leon each received the Gold Cross of Merit. *(Because of illness, Leon was unavailable for an interview.)*

Both George and Jozef are modest in discussing their contributions to the local Polish community and appear a little embarrassed over all the fuss – helping their fellow countrymen to settle into a foreign territory and keeping their culture alive have been all the thanks these two men craved. Yet despite their modesty, the list of local achievements was too vast for the Polish government to overlook.

George's list of achievements include the presidency of the Canadian Polish Congress, Sudbury District, for a record seven years, and three years as vice-president. George is also a member of the Polish Club and Polish Combatants' Association, was co-host of the Polish Team at the II World Junior Track and Field Championships in 1988, and has twice received the Ontario Volunteer Service Award. The Consul General also presented George the 1939 Campaign Defence Medal, awarded posthumously to his father Jozef Aniol, wounded in a 1939 battle in Eastern Poland.

George's father was extremely active in the Polish community upon arriving in Sudbury after the Second World War. Both George's parents were victims of war circumstance. In 1939, Jozef Aniol was captured and remained a Prisoner of War for the duration of the Second World War. George's mother was removed from her home at the age of 14 and moved to Germany where she worked in a munitions factory. Following the aftermath of the war, George was born in Germany. Three years later, in 1949, the family moved to Ralphton, Ontario, and in April 1950, to Sudbury. George's father retired as an Inco miner in 1982. Once the family settled in the area, George's father was quick to seek out local Polish clubs. Although not affiliated with one club in particular, he volunteered where needed. George followed in his father's footsteps.

The projects the Polish clubs have undertaken over the past few decades are numerous, including fundraising for Polish education, cultural events, and grants to hire university students. George recalls one particular project with pride. It was the summer of 1983 when an influx of young Polish people immigrated to Canada. It was labelled the Solidarity Movement and over a dozen Polish clubs in Sudbury collaborated their services to assist throughout its four-month duration.

Sudbury and surrounding area still house a very strong Polish community, George attests. Earlier settlers arrived about 100 years ago in Hanmer, most being farmers, miners and those in the lumber industry. It was this strong Polish community that has given the local clubs their impetus over the decades.

"The clubs help to keep the language and culture alive," said George.

The clubs George supports through his volunteer work are indebted to his dedication, but George maintains he does not volunteer for the recognition, but rather to keep the spirit of Poland thriving. "I didn't work in a volunteer organization to receive an award, but to maintain the Polish heritage and culture."

George said he was pleased, yet a little surprised to be the recipient of such a prestigious medal, accompanied by a certificate signed by the president of Poland.

Also delightfully surprised was Jozef Korobij, retired from Inco in 1985 and now decorated with the Gold Cross of Merit. For several years he held the position of president of the Polish Club, the oldest Polish organization in Sudbury. He is also a member of St. Casimir's Parish Council and the Canadian Polish Congress, Sudbury District. Jozef twice received the Ontario Volunteer Award and also the Sudbury Multicultural Folk/Arts Association Community Award in 1992.

Jozef said he was excited at receiving the decoration, but like George, never expected the recognition and was content to volunteer his time to promote and maintain his heritage. "I didn't expect this. I did it for the love of the club and to keep my culture alive."

In July 1947, at the age of 27, Jozef immigrated to Canada having served in the army. Jozef, along with other immigrants, signed a contract with the German government to harvest wood in the White River camp (Northern Ontario) for 10 months. In lieu of payment, the government would pay their passage into Canada. When Jozef's contract agreement was fulfilled he relocated to Sudbury to work at Inco. His English was extremely poor when he began to work at Inco in the spring of 1948. He remained with the company until 1985 and retired a drill-fitter. When he arrived in Sudbury, Jozef sought out and joined the Polish Club as a member and found comfort in the ability to converse with the other Polish immigrants. At one point, membership soared to over 250 members, he recalled. The club now has 45 to 60 members, with Jozef as president.

Jozef recalled the importance of the club during his early years in Sudbury. "I was able to go to the club and meet with people who knew how to speak the language. Most people when they immigrate from other countries they can't express themselves. For a long time it was hard to express myself, I didn't know English very well. The club helped to keep my culture alive."

Another retired Inco employee credited for keeping the Polish culture thriving in Sudbury is Leon Stefanczuk. For over 20 years he was the treasurer and secretary of the Polish Club where he organized the Polish Saturday School. Leon was a founding board member and treasurer of the Canadian Polish Congress, a member of the Polish Alliance in Canada board, and the Polish Seniors Association. He also received the Ontario Volunteer Service Award on two occasions, and the Sudbury Multicultural Folk/Arts Association Community Service Award.

When retiree Jozef Korobij is not busy volunteering at the Polish club, he enjoys tending to his garden. Jozef was decorated with the Gold Cross of Merit for his countless hours of volunteer service to the local Polish community.

MAIL POSTE

Blk Nbre

2065
Sudbury, Ontario

Publicati
Cory M

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