The Nickel Refinery is restructuring production, maintenance and the workforce. See page 7.

INCO
Triangle

Printed on Recycled Paper

June 1998 Ontario Division Vol. 57, No.6

Change vital to Division success

The ideas and actions of employees are the driving force behind a successful transformation of the Ontario Division, said Division President **Ron Aelick**.

"Employees must be part of the restructuring now underway to face the challenges of current and forecast low nickel prices," Ron said.

"By this time next year, the Ontario Division will not look the same." Cost reductions of $270 million Division-wide will have been achieved.

"The Division and its employees will be much better positioned to be profitable and will be able to offer shareholders a solid return on investment," Ron said.

The Division must look to core mines, those which can sustain profitability at low nickel prices, and continue to decrease production costs everywhere in its operations, he said.

"We need everyone working toward the same goal. Creating a more open environment will help people understand the need for change and encourage us all to share ideas for improving our Company."

Toward that end Face-To-Face sessions were held recently among management and employees in all plants and mines.

Continuing along that same open communications path is this special issue of *The Inco Triangle*, in which Company leaders share and elaborate on the goals each has set in their respective areas of the Ontario Division.

Let's start with an interview with Ron Aelick answering some questions and answers employees have on their minds.

Nickel market

Q What are the top three long-term strategic objectives of Inco?

A "For one, we must lower our cost base to be profitable in current and future low-price environments. Secondly, we must become the low-cost industry producer. Thirdly, we must compete profitably in commodity nickel and premium products."

Q What must be done to successfully address our challenges in the Ontario Division?

A "We must ensure each part of our operations producing metal improves its competitive standing. Meanwhile, service departments must operate at competitive cost levels and competitive levels of customer satisfaction. All departments of the Division have to add value to our operations or we must eliminate the work."

Q What are the next restructuring/downsizing measures going to be?

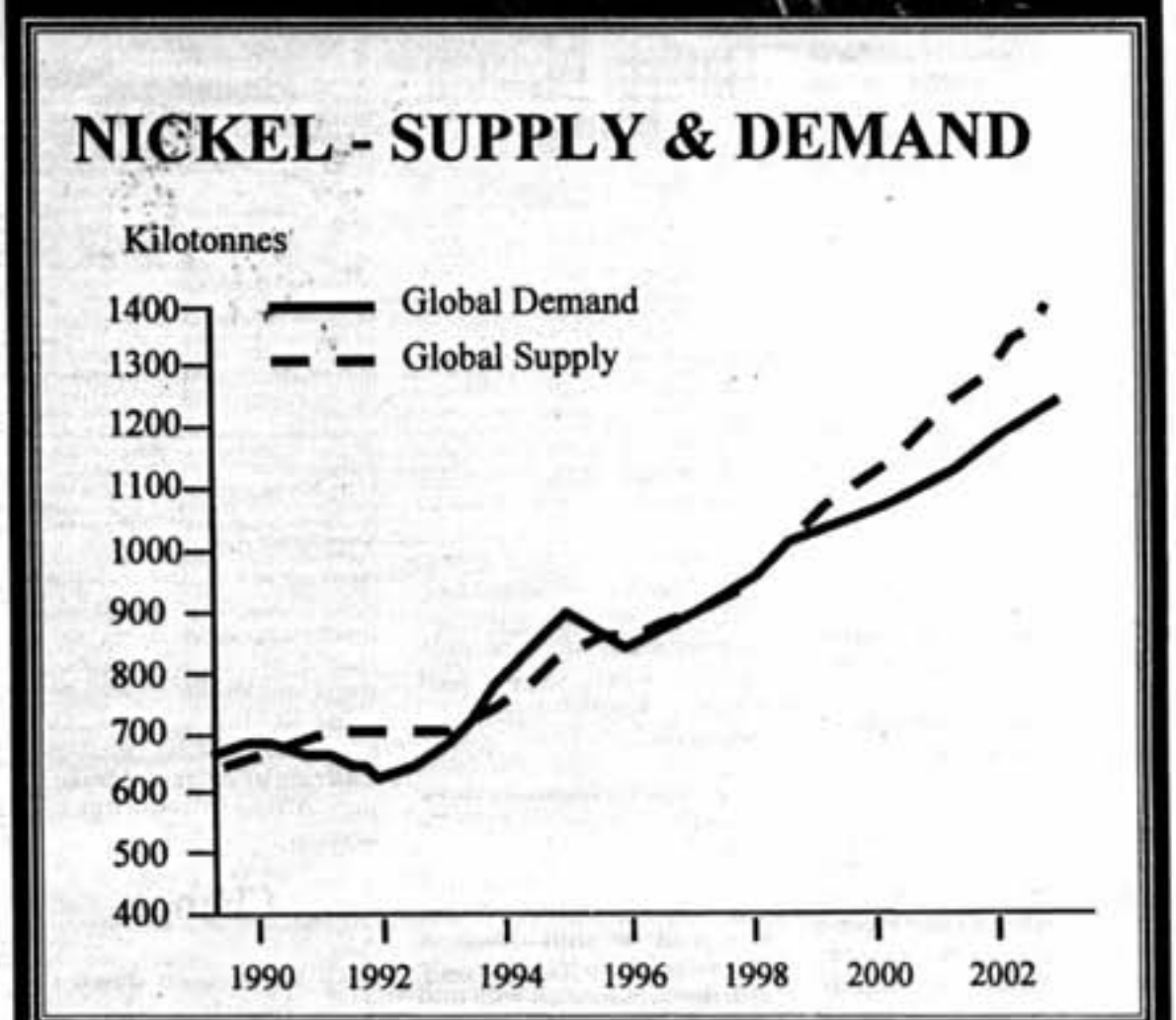
A "The All-Mines Review, which is nearing completion, will help in determining where we go in rationalizing our mining activity. Our parameters haven't changed — any mines that are unable to operate profitably will be shut down or phased out. There are other initiatives underway in the mines, the surface plants and the support groups to save money or increase revenue. A further shrinking of the workforce is only one component of our effort to attain profitability, but it will occur. How and when that transpires has not yet been determined."

Q Why are these actions needed?

A "Today's nickel market is in a state of oversupply, which is driving down price. What we can see of the future doesn't look any better. The oversupply will continue. The dumping of nickel onto the market from Russia

continued on page 2

Oversupply drives restructuring



Restructuring measures underway in the Ontario Division are positioning the Company for the increasing pressures of the current and future nickel market. The Ontario Division will shed $270 million by the end of June 1999 to make it an attractive place for investors to put their money. The efforts, ideas and talents of employees are needed to achieve this goal.

"The Need For Change"

Mines will shed $133M to be

"Core mines are those mines with long term reserves, low production costs and an ability to be profitable even at today's low nickel selling prices," said Mining Vice-President John Kelly.

The price of nickel is not going up – ever.

That's the assumption the Ontario Division has to operate under because it is the new reality.

"Forget the price going up," commented Creighton Complex Manager **Fergus Kerr**.

That reality is a driving force behind the Division's plan to reduce production costs in the mines by $133 million a year by June 1999.

Riding out a low-price period in a status quo mode until the price increases again is a management system that has gone the way of the dinosaur, Division management of mining-related operations said in a recent interview.

Restructuring is necessary and must occur very soon, they said.

But restructuring at the mines means more than just downsizing.

"It's doing the work where we need it when we need it," said **John O'Shaughnessy**, superintendent of Mines Engineering with Mines Technical Services.

"Some of the stuff we mine now is not ore," said **Joe Loring**, manager of the Frood-Stobie-Garson Complex.

Profitability is the priority

John Kelly, vice-president of mining for the Division, said in order to be profitable in current and forecast low-nickel prices the Ontario Division must mine only what makes money.

Maintaining a production level, or market share, is no longer a priority of Inco, Chairman and Chief Executive Officer **Mike Sopko** has said.

Mining what is ore at current and forecast nickel prices on the London Metals Exchange is the priority.

"Profitability must come first. It's as simple as that," John Kelly said.

The road to profitability for the Division is admittedly a rough one, Division mine managers and superintendents said.

Identifying core mines as the Division's future was the start of the review of mining operations.

Core mines

"Core mines are those mines with long term reserves, low production costs and an ability to be profitable even at today's low nickel selling prices," John Kelly said.

The Division's core mines are: Creighton Mine; McCreedy East; Copper Cliff North; and Copper Cliff South.

Two other mines in the Division are considered close, but not yet core mines: Garson and Stobie.

Because of the large volume of material moved at Stobie, it is more price sensitive than other mines.

"At Stobie what we call ore changes with the price of nickel, moreso than at other operations." Certain areas of Stobie could be mined while shutting down work in other lower-grade stopes in order to make it a core mine, Joe said.

Garson Mine could be

Market won't return to normal

continued from page 1

also continues. More significantly, there are a number of low-cost producers about the enter the market in the next few years. Anaconda Nickel's Murrin Murrin mining operation in Western Australia is boasting a production cost of 50-to-60-cent nickel. Even if Anaconda is off by 50 per cent in its estimate, it is still a major threat compared to our costs of production. We will control our own destiny by taking the necessary and sometimes tough measures required to be profitable."

Q Why are you confident that Inco will be successful in becoming a profitable company in low-price markets and a very profitable company in higher-price markets?

A "Simple. I have confidence in our people and their ability to adapt. And let's face it, we do not have a choice. This is not a market in which it would be nice to reach our goals, this is a market in which we must reach our goals in order to survive. I firmly believe we have the people, the resources and the will to succeed. The challenges confronting us are significant and the goals we have established to meet those targets are daunting. It won't be an easy journey but it is a necessary one. If all of us in the Ontario Division work together, there is enough intellectual horsepower to ensure we remain a viable producer and contributor to the community for many years to come."

Ontario Division Mining

Q What is a core mine?

A "Core mines are those with long-term ore reserves, low-cost production and able to be profitable at low nickel prices."

Q Which are the core mines of the Ontario Division?

A "There are four mines that we currently can place into this category. Copper Cliff South, Copper Cliff North, Creighton and McCreedy East."

Q What happens to those that are not core mines?

A "Non-profitable mines will be shut down or phased out. We have already shut down Shebandowan and Whistle mines and Levack, McCreedy West and Little Stobie will be shut down before the end of 1998. Others that are close to core status, such as Stobie and Garson mines, could be restructured to become profitable and move from what I call 'could-be core' mines to solid, profitable operations. Stobie and Garson are two of the many challenges that we face as a Division. An All Mines Review of our Canadian operations is nearing completion and will influence the future of our existing mining operations."

Q Will there be enough attrition to handle the downsizing of employment without further layoffs?

A "The numbers are certainly there, but the realistic expectation is probably not. As you well know, not every employee who is eligible to retire with full pension does so — nor should they be expected to. It's a very personal decision and a lot of our employees with 30 years service fall between the very young ages of 48 and 53. When they elect to leave, the company loses a lot of experience and a lot of knowledge. However, as stated on numerous occasions, our workforce will continue to shrink and further layoffs cannot be ruled out. The rate of retirements could play a role in reducing any layoffs."

Change

Q We've seen down cycles before, what's the big deal this time?

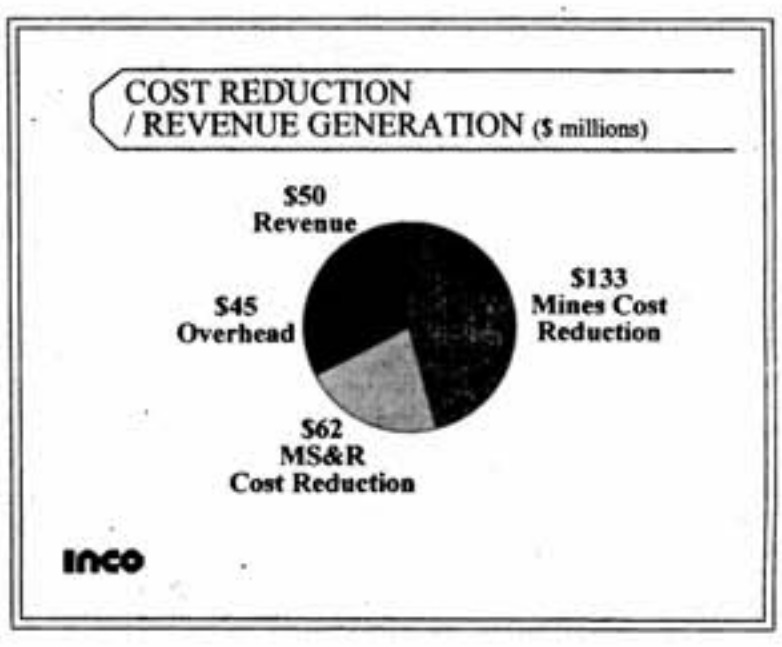
A "This is not simply a cycle. While it's true the market will continue to have ups and downs in supply and nickel prices, we are seeing a new reality of a more fiercely-competitive industry. We must position ourselves to turn a profit in the lowest of price conditions and to turn a big profit during higher prices. We can no longer count on riding out low-price periods until the higher prices return. The prices just will not increase to the levels of the past that once sustained higher-cost producers."

Q After we change to adapt to this market condition, will things get back to normal?

A "No. 'Normal' in the nickel industry, and particularly here at Inco, has become a state of constant change in adapting to and anticipating market trends such as oversupply and low nickel prices. Make no mistake, this Division in a year's time will not be the same. It will be a smaller, but much more profitable operation securing a brighter future for investors, employees and the community."

Q Will Inco continue to invest in Sudbury?

A "The decisions we are making today are to position ourselves for the future. Any new investment must produce an acceptable rate of return. We are taking the necessary steps toward ensuring a profitable future for the Ontario Division. The recently-announced $125 million (US) investment at Creighton Mine is a good example. It's an investment that will provide the Division with a good source of high-grade, low-cost copper and nickel, ensure another 18 years of production capacity at our oldest active mine, and be a profitable investment offering a very favorable rate of return to the Company. It is also consistent with our strategy to make investment in mines that are profitable at low nickel prices."



"The Need For Change"

competitive in fierce market

moved into the core category by improving performance, Joe said.

Ways of improving development and mucking of ore are ongoing.

'The jumbo can't sit idle'

"We've got to maximize face time," reducing the downtime between development periods, Fergus said as another example. North Mine leads the way in feet developed per manshift.

One means of achieving that improved development is with smaller development crews, of two and three instead of five and six, Fergus said. "It's multi-tasking." Everyone must be working efficiently, he said. "The jumbo (drill) can't sit idle."

The smaller crews can get as much valuable work done if deployed to the most profitable areas of each mine, he explained.

Joe said accountability of each crew is being emphasized. "So each crew knows what they are measured on."

More efficient work methods by employees will help the Division lower production costs, Joe said.

"Measuring development work by employees, as is done with contracted work, has resulted in greater efficiencies," Joe said.

By focusing the work of employees on development work, the Division will increase its development feet per shift.

"We don't ask them to do everything else. So they're focused."

Jon Gill, manager of the Levack Complex, added, "We've also got to drive quality. It's no good to get three feet of junk per manshift. We've got to study the process in detail.

"We have to put in the right ground support system, for example. Sometimes we over-support."

Downsizing part of solution

But make no mistake, downsizing of operations and of employment must be part of the solution given the current and expected market conditions, John Kelly said.

"Attrition alone won't handle it," Fergus said.

"I've told people at Garson we can't maintain things the way they are," Joe said.

"At Stobie, we may not beat 11,000 tons a day with 500 employees. Maybe we'll be something less."

The anticipated rate of retirement in the Division's mines simply can't handle the cost reductions needed in current and forecast nickel prices.

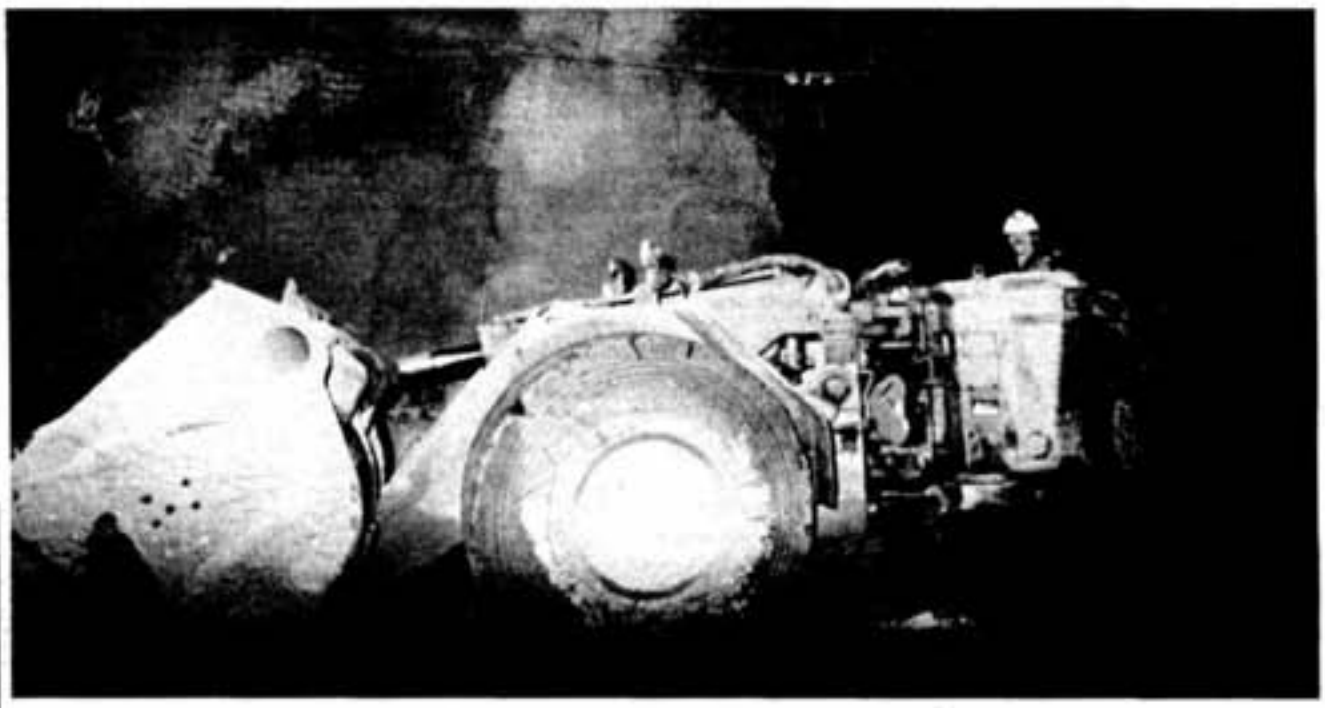
If all those eligible to retire did retire suddenly, layoffs might not be needed. But it's unlikely enough people will elect to retire quickly enough, the mine managers said.

By taking cost-cutting measures now, the extent of layoffs can be minimized and the Division's profitability maximized.

Maximizing development time and efficiency is one of the solutions to improving mining operations in the Division. Deployment of the mining workforce to the most profitable sectors of each mine is also being evaluated as part of an overall production cost reduction in the mines.

"The Need For Change"

Inco people working on solutions to dilution



"You don't just pick up what's there," said Scoop Operator Gilles Labre. "When you're mucking you look for anything that doesn't look like muck (ore). I put rocks in the storage for rocks." He added, "We take out chains, buckets, bolts, vent pipe, air and water pipes and put it in the scrap bin. It's the best way to get rid of scrap at this level."

"We can use this stope (3540-level) for rock storage, saving us on hoist costs," said South Mine Planner Phil Dawson. The storage area will save the mine $500,000 a year.

Getting each part of the production chain to understand the value of limiting dilution is key to lowering costs. Planner Phil Dawson and Development Miner Gord Snow work out the best means to drill an area.

People call it "hard-rock mining."

But mining rock is something the Ontario Division is minimizing.

Dilution is what happens when worthless rock is mined with ore.

More precise blasting is a start to reducing dilution and increasing profits.

"We started using a certain powder in perimeter blasts. It helps prevent the rock from the back from caving into the ore. It helps prevent overbreak, which contributes to dilution," said Development Miner **Gord Snow**, of South Mine.

Improvement starts at source

It all starts in the mines, of course.

But dilution of ore affects the entire chain of operations.

The higher the grade coming out of the mines, the higher the grade will be coming out of Clarabelle Mill, the Smelter and into the refineries.

"If you send rock to the mill and process it, the rock takes some nickel with it to the tailings. It can't be helped," explained **Jerry Verbrugge**, a planner at South Mine.

That's why limiting rock content to a minimum at source from the mines is the best way to start the process of producing lower-cost nickel, he said.

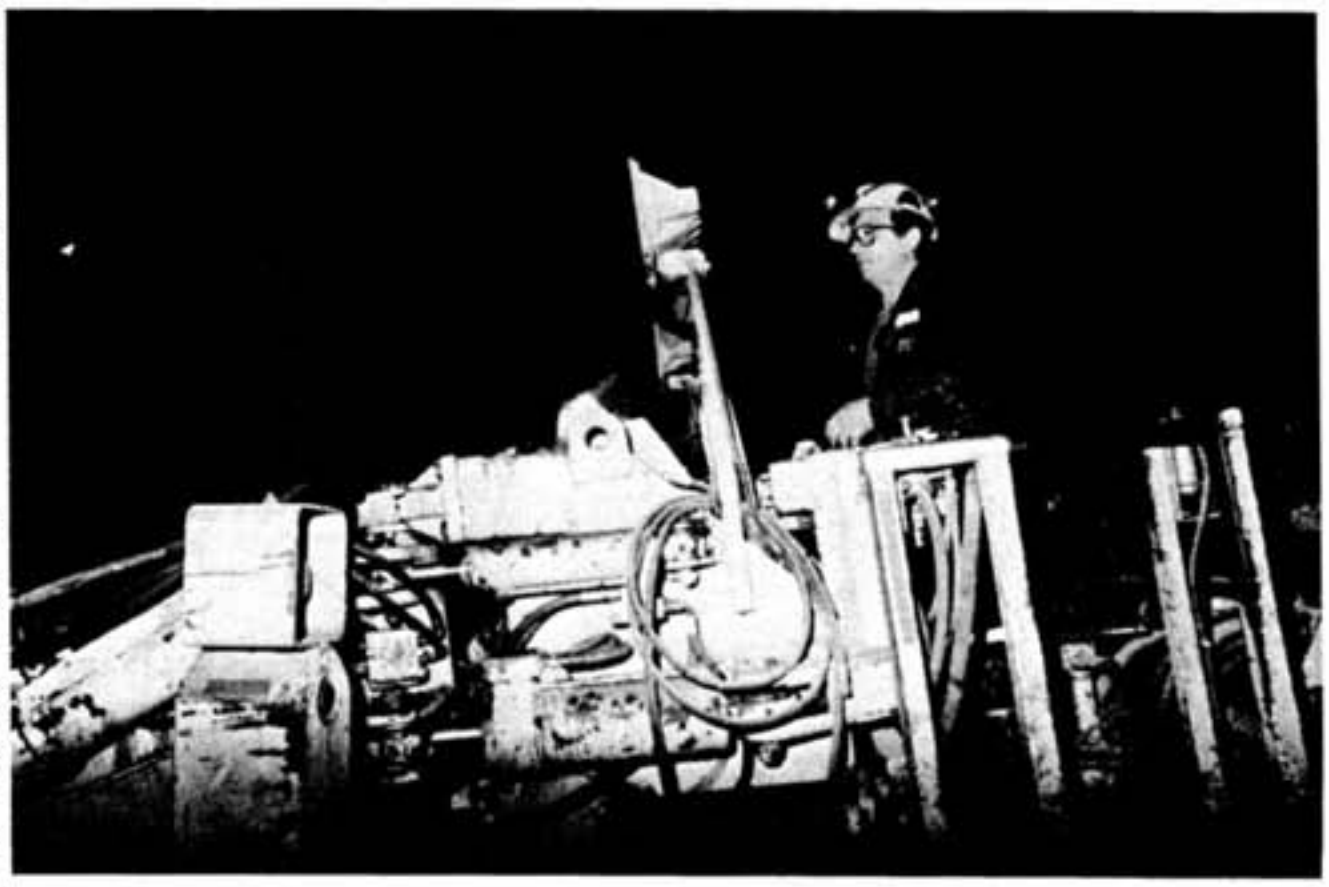
Precision pays

Precise ring layouts for blasting also have a significant impact on maximizing ore retrieval and minimizing rock content, Jerry said.

"That way we don't want to grab too much of the hanging wall or footwall (surrounding the ore)," he said.

"And we don't want to leave behind too much, if any, ore."

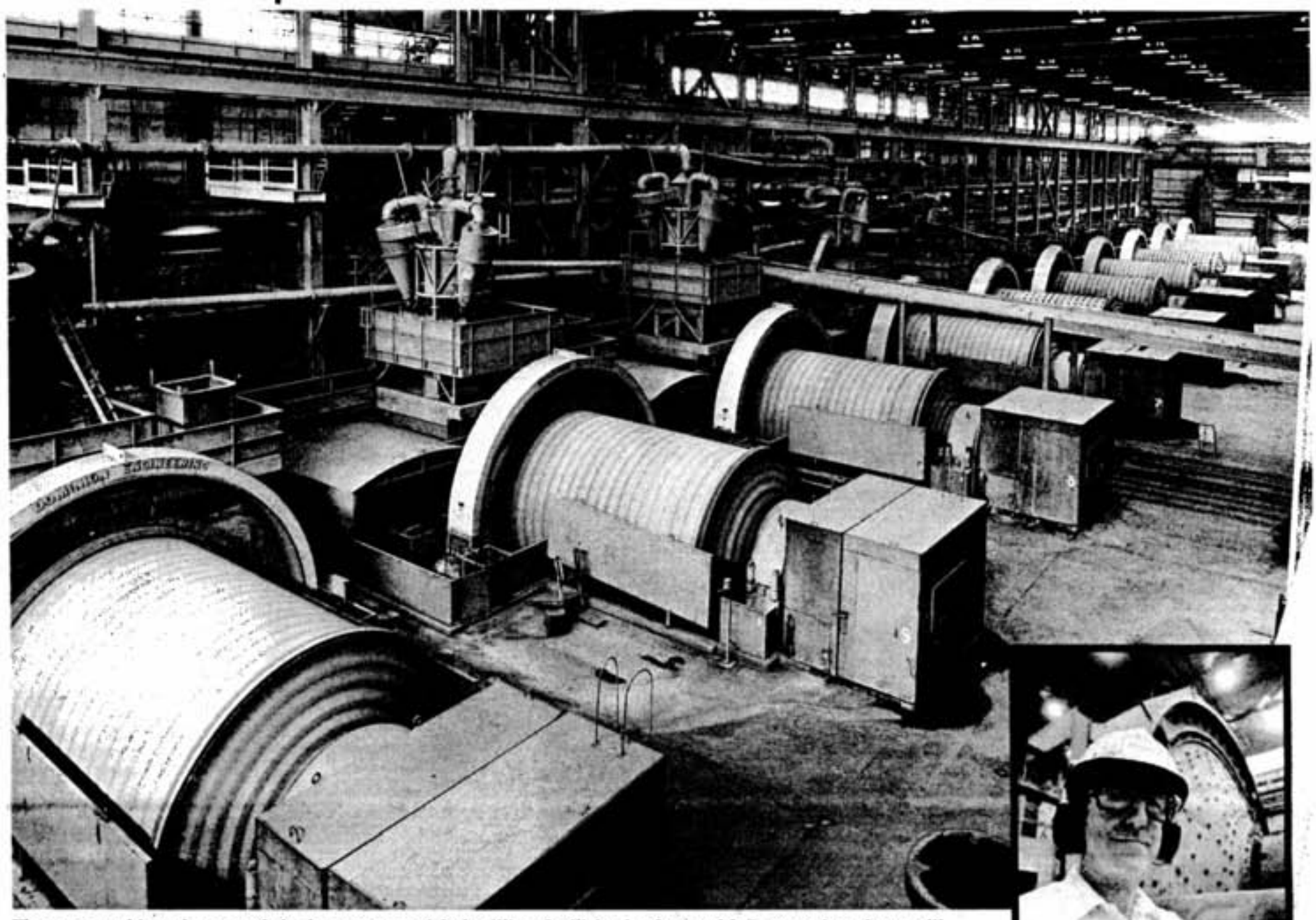
continued on page 10



Development Miner Gord Snow, who operates a jumbo drill, said using the right blasting explosive helps prevent overbreak – reducing ore dilution.

"The Need For Change"

Mills to cut $11M and make $17M more revenue



The cost goal is to be one of the lowest-cost nickel milling facilities in the world. But getting there will not be painless for Clarabelle Mill. "The number of staff positions is shrinking by 35 per cent and the number of unit jobs will also decrease, albeit at a lesser rate," Dietrich Liechti said.

The Division's milling operations will see production costs drop by $11 million during the next year while higher nickel and other metal recoveries will mean $17 million more in revenues per year.

"We are going to recover more metal from each ton of ore, by improving the process and the use of new reagents" said **Dietrich Liechti**, manager of Mills and Transportation.

Radical change

"We are radically re-organizing the milling operation. This is not window dressing," Dietrich said. "There will be much fewer staff."

Mill line management is decreasing from 42 in 1997 to 21 in the year 2000.

As part of overall restructuring, Clarabelle Mill will become a "requisite organization," the minimum organization required to achieve our business goals. This will enhance creativity, productive effectiveness, human satisfaction and morale, he said.

More-interesting work

Dietrich said the Company is putting new action behind its belief that the workforce is its greatest asset.

"We have given too many people in the unit menial work. The jobs we provided for many of them didn't allow them to use their capabilities to the fullest," Dietrich said.

But that is changing.

As part of restructuring efforts "our operators and trades-people will make more decisions" and will have "challenging, interesting jobs."

That change in itself will help improve efficiency, he said.

Cost-reduction changes underway

There are many other changes already underway.

"Firstly, we are combining the Clarabelle Mill, Copper Cliff Mill, Tailings Area and Water Plants into a single operation, headed by one mill superintendent (**Mike Mayhew**)," Dietrich outlined.

"Secondly, we are joining the maintenance and operating crews in each area. Instead of 21 maintenance and operating crews (each with a foreman) we will have seven area groups led by a group leader."

The Mill will be divided into seven groups: Coarse Ore; Grinding; Flotation; Filter Plant, Tailings, Water Plants and Instrument/Electrical.

Each group, except for the last two, will consist of a group leader, maintenance crew, an operating crew and a planner.

They will operate, maintain and plan for their areas and each will have a budget and targets to reach.

Rebirth of milling

"This rebirth of the milling organization will not be without pain. The number of staff positions is shrinking by 35 per cent and the number of unit jobs will also decrease, albeit at a lesser rate," he said.

Dietrich added that the extent of downsizing at the milling operation also depends on how much ore the mines will provide in the future.

He has no doubt about the urgency of downsizing and continued change.

"It's driven by the nickel price. With 50 per cent of our costs being people, we have no choice but to reduce."

"We are joining the maintenance and operating crews in each area. Instead of 21 maintenance and operating crews (each with a foreman) we will have seven area groups led by a group leader," said Mills and Transportation Manager Dietrich Liechti.

Highlighted Goals of Mills

People:

Enable personal job satisfaction and pride in one's work

- Establish a requisite organization, a caring system that creates trust and respect.
- Train everyone in requisite theory.
- Communicate goals and objectives for mills and each work area with monthly updates of progress toward our goals.
- Recognize individual contributions.
- Coach and mentor for personal growth.
- Update and follow a succession plan. Retain and transfer knowledge.

Production:

Optimize metal recoveries at specified concentrate grade

- Process all available ore.
- Meet planned recovery of 80 per cent nickel at a concentrate grade of 19.5 per cent Cu+Ni (1998).

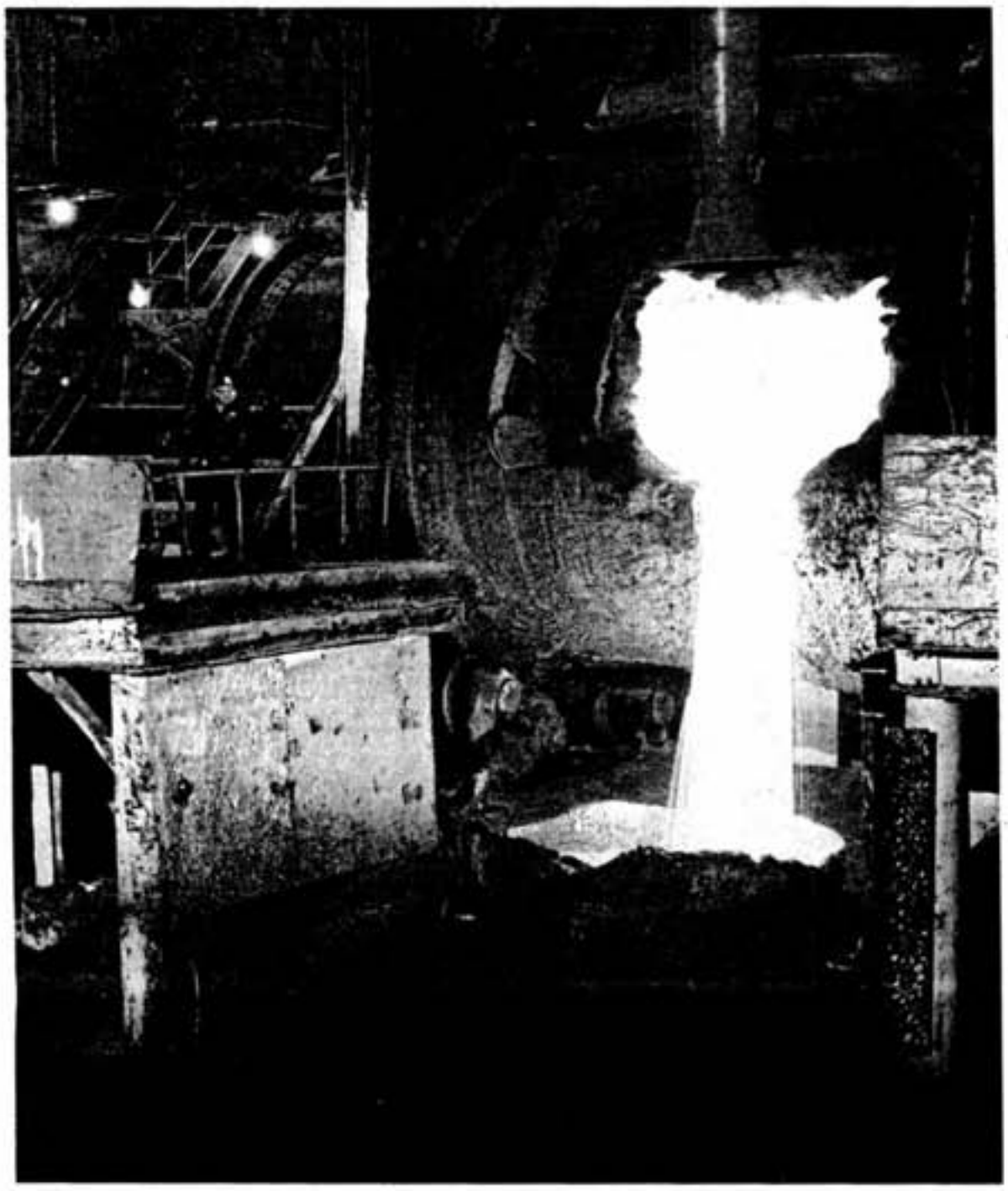
Cost:

Be one of the lowest-cost nickel milling facilities in the world

- Achieve a 20-cent per pound of copper-nickel unit cost at planned rate (1998).
- Carry out activities that will lower the Division's cost of producing copper and nickel by five cents a pound by mid-2000.

"The Need For Change"

Smelter lowering costs by $17M by next summer



The Copper Cliff Smelter's goal is to reduce operating costs by $17 million by June 1999.

Measures are already well in the works for that to happen.

"We have to do this to ensure our Sudbury (operations) survive and prosper in a market of low nickel prices," said Smelter Complex Manager **Sid Segsworth**.

Many projects already started

There are many production cost reduction projects underway.

Improving employment productivity, which will include downsizing, will reduce costs by $3 million a year.

Among the largest of projects underway is the in the area of converters.

By enriching oxygen in converters, aisle scrap consumption can be increased by 30 per cent. That will eliminate the need to operate the scrap-melting converter, which costs $2 million a year to operate.

Decreasing the amount of material recycles from matte separation will reduce reprocessing costs by $1 million a year and increase production of nickel and copper by four million pounds a year.

The Smelter's target is to increase circuit efficiency in the separation building from 88 per cent to 92 per cent.

"We have six or seven projects that will save us $1 million or more each. Plus we have about 30 others that save us thousands of dollars each," Sid said.

Frank communication

As in all other plants and mines, employees have been informed and asked for their ideas in Face-To-Face meetings.

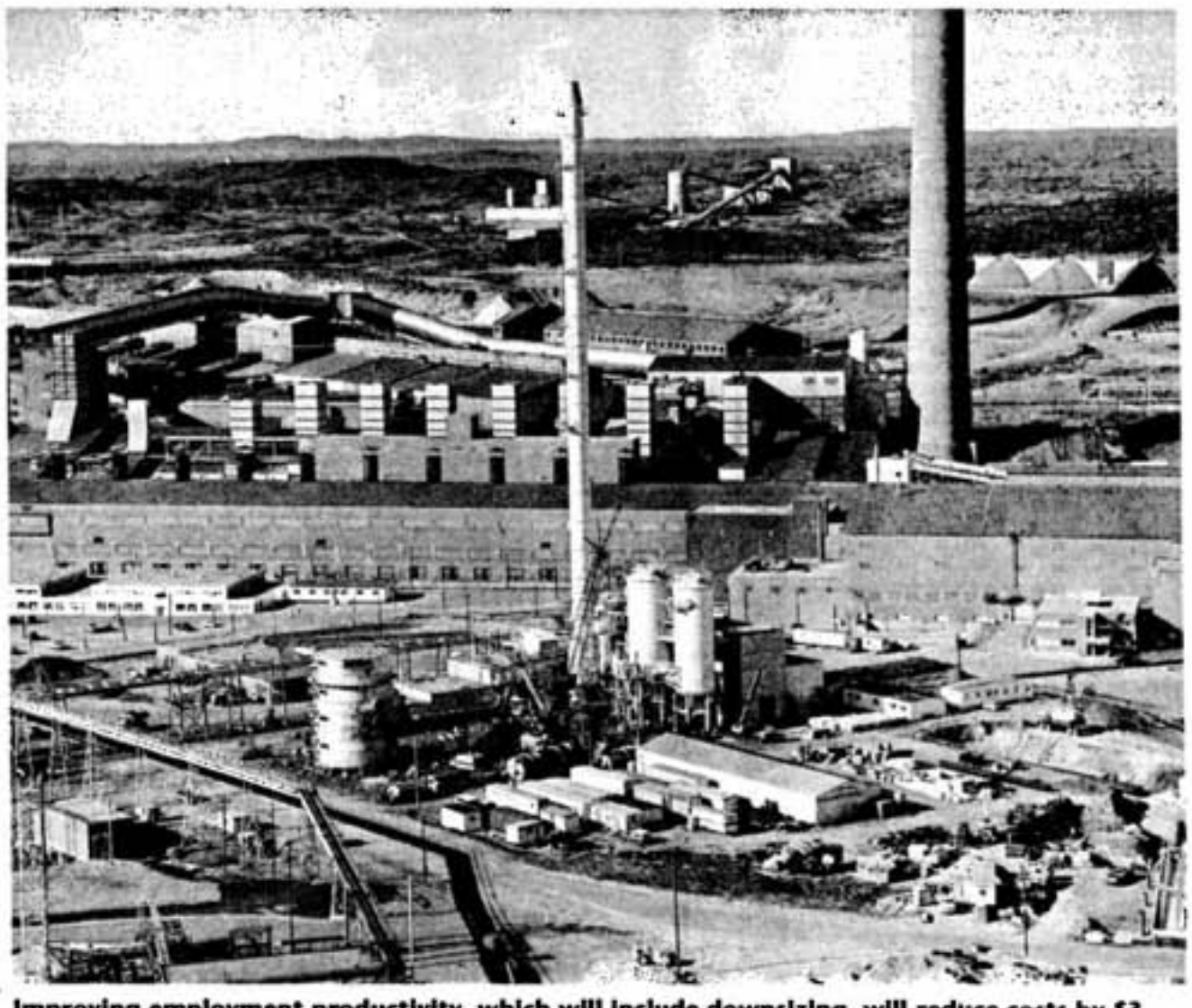
The frank Face-To-Face discussions about the need to lower production costs to become profitable in current and future low nickel price environments has left many employees feeling a sense of "shock, fear and concern," Sid said.

But it's a reality that must be faced, he added.

"We have very good, talented people here. I'm confident we will meet our target reduction."

By enriching oxygen in converters, aisle scrap consumption can be increased by 30 per cent. That will eliminate the need to operate the scrap-melting converter, which costs $2 million a year to operate.

Smelter Complex Manager Sid Segsworth said $17 million will be reduced in production costs, as part of the Ontario Division's reduction of $270 million by June 1999.



Improving employment productivity, which will include downsizing, will reduce costs by $3 million a year, as part of the Smelter's $17 million cost reduction.

"The Need For Change"

Nickel Refinery cutting $6.6M in production costs

Twice a year maintenance of the Nickel Refinery's pellet decomposers used to take 14 days to complete. But that will now take three-and-half days because of a change in work scheduling going to 12-hour shifts, seven days a week.

Reducing the cost of nickel production by $6.6 million while also increasing production levels are goals that go hand-in-hand for the Copper Cliff Nickel Refinery.

"We will increase production and lower our costs per pound of nickel because our increased production doesn't require spending more capital funds. It's just a matter of managing our equipment better for higher throughput," explained Ivon **Chaumont**, the Nickel Refinery's maintenance superintendent.

The top priorities to achieve those two goals at the Nickel Refinery by June 1999 are:

- Reducing costs per pound of nickel production;
- Increasing production by 10 million pounds a year;
- Improving safety, which has a direct cost-savings benefit.

"Our biggest challenge is to reduce our cost per pound of nickel going out the door. We have to stay competitive. We have to manage our business very differently than in the past."

16 projects to reduce costs by millions

Nickel Refinery cost reductions will take place under 16 projects, which are either underway or under review.

Included in the projects are discussions on downsizing employment at the Nickel Refinery, Ivon said.

"Retirements will address most of our downsizing needs. But not all of our needs."

Among the significant projects are:

- A pellet decomposer maintenance initiative, which started May 15. This project is actually designed to increase nickel production, but it has the added benefit of reducing costs of production. It has meant an increase in equipment availability because of greatly reduced downtime. Maintenance of the refinery's 18 pellet decomposers, done twice a year, used to take 14 days to complete. But it will now take only three-and-a-half days to do the same work. That's because of a change in work scheduling from having eight industrial mechanics on eight-hour shifts five days a week to now having them work 12-hour shifts on a seven-day schedule. "There's a cost savings from this as well. We have done two units thus far with an average savings of $7,000 per unit. Plus the industrial mechanics are now free to take other jobs," Ivon said. "This will also have a direct savings on contracting out." The 18 pellet decomposers are maintained twice a year – same as in the past;
- A move to using bags versus more expensive steel containers for packaging nickel products, while still meeting customer demands;
- The installation of three new package boilers is under review. The new boilers are more efficient than the current older and larger boilers used in the IPC process and meet the present requirements for steam. The new boilers would mean a cost saving of $2.8 million a year.

10 million more pounds of nickel

Higher production, lower costs.

That's the drive behind increasing production by 10 million pounds a year by June 1999.

In fact, the pellet decomposer maintenance project is already allowing for greater equipment availability, Ivon said.

Most significantly the Nickel Refinery will increase production by:

- Using the clock for maintenance work.
- Seven-day schedule for maintenance on lifeline equipment.
- Full utilization of the maintenance systems developed.
- Reducing cycle time on process equipment (*i.e.* reactor cycle time.)
- Employee involvement in cost reductions and increased equipment availability
- Equipment monitoring.

Safety counts

"Improving safety saves us money."

Beyond the obvious benefit of reducing, if not eliminating, injuries to employees, there is a financial benefit to improving safety as well.

"Our LTA (Lost Time Accident) target rate is 1.5. We're trying to do even better than that."

Ivon said, "Reducing disabling injuries is important, because our people are important to us. And in doing so the other benefit is that it's a direct compensable costs savings to us."

The need is urgent

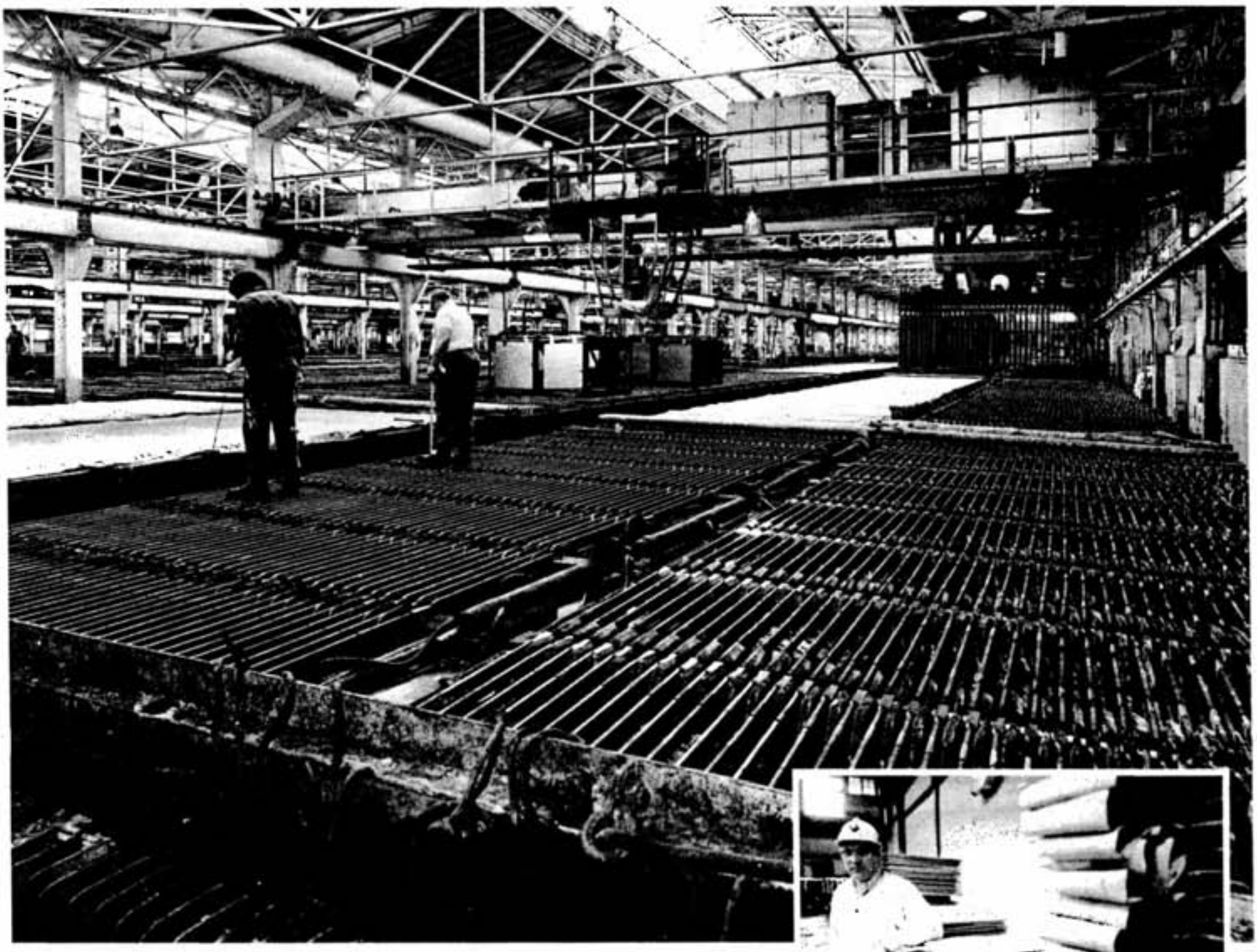
"The urgency for lowering production costs is the most critical I've seen in my career with Inco. This is the toughest I've seen it, because it's not a short-term cycle. This market condition is long term," Ivon said.

"We're in a survival mode right now. But we are making some hard decision that will certainly move us into a profit mode even at these low nickel prices."

Nickel Refinery cost reductions will take place under 16 projects, which are either underway or under review. Included in the projects are discussions on downsizing employment at the Nickel Refinery, said Nickel Refinery Maintenance Superintendent Ivon Chaumont. "Retirements will address most of our downsizing needs. But not all of our needs."

"The Need For Change"

Copper Refinery cuts $5.2M in production costs



By lowering production costs by $5.2 million a year, the Copper Refinery can expect to contribute positively to the Division's bottom line. The aspects that have made the refinery successful in the past will be enhanced for customers under restructuring initiatives in the works.

"Our marketing guys have negotiated with the customer to receive the copper cathodes by truck," while maintaining deadlines and methods of unloading satisfactory to the customer, Copper Refinery Manager Dale Krueger said explaining the team effort involved in one of several restructuring projects. It's an initiative that will save $500,000 a year.

Lowering costs of production at the Copper Refinery by $5.2 million annually by this time next year means applying new solutions to the new challenges of a low-price copper market.

"We're an old plant," said Copper Refinery Manager Dale Krueger.

"It's a process that's been around since 1931. So it's really difficult to get outside the box."

'The box' is the usual way of conducting business. And the usual won't do anymore, Dale said.

But old plants can learn new tricks.

A recent example, Dale said, can be found in the Copper Cliff Copper Refinery's shipping system.

"We were maintaining an entire rail system to ship five per cent of our copper products to one customer."

After discussions with Inco's marketing people, a solution was developed.

"Our marketing guys have negotiated with the customer to receive the copper cathodes by truck," while maintaining deadlines and methods of unloading satisfactory to the customer.

The change in transportation to trucks means the refinery can sell its locomotives and railway track and save $35,000 a year in municipal taxes paid for the track.

"In all, it's going to save us $500,000 per year. We arrived at the solution because we questioned the status quo."

'Level 3' financial emergency must be addressed now

That sort of new thinking must be applied to all areas in order for the Ontario Division to become profitable in current and forecast low nickel and low copper prices.

"When it comes to the financial picture we're at a Level 3 emergency. If we don't do anything about it – we're out of business in two years," Dale said.

Dale said although copper is a smaller part of Inco's business, compared to nickel production, it has been and will again be a significant revenue generator.

"We never have trouble selling the stuff – it's the price you get for it."

Copper prices have been on a similar downward path as nickel.

By lowering copper production costs by $5.2 million a year, the refinery can expect to contribute positively to the Division's bottom line.

Dale said the aspects that have made the refinery successful in the past will be enhanced for customers under restructuring initiatives in the works.

"Our customers buy from us for our quality and our service. We have on-time delivery, packaging to customer demands and excellent response to customer complaints. That will continue to improve."

Employment restructuring

Another challenge to reducing costs at the Copper Refinery is the same at all plants and mines: employment costs.

Retirements may take much, perhaps all, of that reduction requirement at the Copper Refinery.

"Sixty per cent of our people will be eligible for retirement in three years. So we're going to need the young guys."

A layoff would leave the refinery with a potential shortage of experienced employees once the retirements go through.

"It's a balancing act."

Dale explained, "With demographics we don't want people laid off when others are going to retire. We have to transfer knowledge and skills."

In a climate of downsizing and restructuring, it's also important to remember that people with 30 years service, who are eligible to retire on full pension, are productive employees, he said.

"Just because someone has 30 years, doesn't mean he or she should leave. They are valuable people. And they're only 48 to 55 years old."

Communication is key

Getting employees onboard to work toward a more profitable future in tough market times is a crucial component to long term survival and prosperity for any business.

Face-To-Face discussions at the Copper Refinery have been getting the word out about Inco's continuing need to reduce its production costs in all areas.

"Supervisors are involving employees."

"The Need For Change"

Mines Research – Working toward the future: Reducing production costs

By Greg Baiden, manager of Mines Research

As the price of nickel hovers around $2.00/lb many are asking why and what are we going to do about it?

While everyone in our plants is working hard to improve the systems we have in place, Mines Research is working on technology that will change the way we will mine – sooner than everyone thinks.

We are currently working on the tele-operation of mining machinery. The current pieces in the field are the surface operated Tamrock Datasolo 1060 drills and Wagner Roboscoops.

As of the last month a new machine, the Autotoper will be making an appearance in our mines.

Tele-drilling

Tele-drilling is a key technology for us in the future. What is tele-drilling? Well, first we have some of the world's most automated drills: the three Datasolo 1060s. These are linked to the control on surface with a cellular radio network and computers. A few years ago this was considered impossible now we run these in production at Stobie Mine.

The drilling attendants account for almost 20 per cent of the Division's production in the clean, safe control room environment.

These drills have reduced our costs by greater than 20 per cent and have increased the rate at which we can drill.

Robo-scooping

Robo-scooping is also being done at Stobie Mine but now it is starting to spread to Creighton Mine.

This technology allows one operator in an office to run a number of scooptrams leaving the machines to drive from the drawpoint to the dump by themselves.

On the horizon is an office control room in the Copper Cliff Clinic that will run two scoops at Creighton and two scoops at Stobie.

The contract to do this work worth $2.5 million has just been awarded by Precarn Associates to Inco, which will do the research. The contract will further development of the Tele-scooping technology we have already in place.

Autotoper

Our newest machine that is just going through field trials at McCreedy East is the Autotoper.

This machine is an aid to our surveyors. It can drive throughout a mine taking topographic maps of the drifts at five-foot intervals. This allows the creation of a "virtual reality" fly-through of the mine drifts.

These techniques can be used to improve our mine planning and ventilation systems.

The advantage of this kind of machine is its speed and accuracy in mine drawing creation. To date field trials are showing what would take us 100 hours to do can now be done in two hours.

These advances are a few of the techniques Mines Research is working on for Inco in Sudbury, Thompson, Voisey's Bay and Indonesia to remain competitive in the nickel business.

Mining from surface allows the operator to control more than one piece of equipment, including drills and scoops, all in the comfort of an office.

Organizational Effectiveness and the Copper Refinery Quality Plan

By John Shelegey
Electrowinning foreman
Copper Refinery

"The need to tweak"; "reacting to noise"; "experience over data"...these operating philosophies have been prevalent in the Copper Refinery culture for years.

The need to consistently apply statistical thinking in our process control and decision making was one of the key issues identified in the Copper Refinery Organizational Effectiveness Study (O.E. Study).

Back in April 1997, the Copper Refinery volunteered as one of two test sites for the O.E. initiatives in the Division.

This study has molded the quality plan at the plant as a result of the changes in roles and responsibilities, organization design and management systems. The traditional organization had one supervisor per crew.

The "new" organization will have group leaders (supervisors) responsible for multiple teams (crews), with team leaders to coordinate the activities of the team.

We realized that fact-based decision making should not only be used at the group leader level and up, but had to be used from the ground floor where we will be relying on team leaders and teams to make many of their own decisions.

The first step was to educate our people on the tools in the Quality Process. With the help of **Joe Dippong** from the Quality and Human Resource Development Department, a two day workshop was developed and attended by all senior management and supervisory personnel.

Teams and team leaders will receive "just-in-time" training by the O.E. coordinator on the quality process as they become comfortable with their new roles and responsibilities.

The course itself emphasized the use of control charting, which incorporated a process mapping exercise to determine the key measures for the plant.

To cultivate "plotting the dots" in the organization, the workshop included a homework exercise, which required each individual to take ownership of a parameter within their process areas and develop a control chart with calculated upper and lower limits.

We have always been good at providing education in the past, but often lost the skills learned because we failed to apply them in our work.

The ongoing application and maintenance of control charts has now become an important facet of our jobs.

The key measures of each department are posted in their respective areas to introduce charting to hourly workers and familiarize them with these parameters.

Eventually, the plant parameters will be maintained on the Copper Refinery database, where charts will be automatically updated as new values are inputted.

The Copper Refinery O.E. study has been tremendously challenging as it has tied together many concurrent changes. We are always faced with cultural barriers when we try to move forward.

However, with regards to our quality plan, having everyone speaking the same language is a powerful driver for change.

LET'S TALK SAFETY

with Ron Rafuse

'Safety plays a major role on the road to survival and prosperity'

The goals is zero.

This means the elimination of disabling accidents in our workplaces.

It is essential that people work safely and are trained to do work the best way we know how. At all levels we must be held accountable for our responsibilities in adhering to standards and rules in the workplace.

It takes the involvement of everyone to make and keep the work area safe.

Management has the responsibility to ensure that the tools, training and time are given to prevent injury, and to set and enforce standards. This is all just good business for any world-class organization – an organization built on a strategy for safety based on beliefs and principles.

The seven safety principles of the Ontario Division must be part of our everyday life on the job as we go through restructuring and constant change.

The seven safety principles must be applied both underground and on surface with even greater attention during times of change and downsizing to achieve our goals.

Ontario Division Safety Principles

- All injuries can be prevented
- Employee involvement is essential
- Management is responsible for preventing injuries
- Working safely is a condition of employment
- All operating exposures can be safeguarded
- Training employees to work safely is essential
- Prevention of personal injuries and incidents is good business

As we face the new challenges of the next few years and the changes that will take place both in the workplace and the way work is done, safety plays a major role on the road to survival and prosperity.

We especially need to focus on the last of the seven safety principles. Good safety performance is a leading indicator of a business that is well run. Each time there is an injury at work there is a cost and a price to be paid.

First there is the pain and suffering that is the result felt by the individual and the effect of that on family and loved ones. Then the monetary cost of the injury with costs that are direct and indirect to both the individual and the Company.

Direct costs to the Company include, health care and compensation costs. Indirect costs to the Company include replacement of the injured employee, possible training of the replacement, the cost of time to do a proper investigation, repair of damage and loss of production.

There is also the cost of repairing relationships with the people in the workplace and community.

Direct compensation costs alone in 1997 were about $10 million. This is down from $17 million in 1994, when our disabling accident frequency was at 7.7. (Disabling accident frequency is the number of modified work and Lost-Time Accidents per 100 employees a year.)

In 1997 it was 3.5.

The target for the Ontario Division in 1998 is 1.7 and heading to 1.0 in 1999.

Who wins when we lower accident rates? We all win.

Pain and suffering is prevented. Families don't suffer. There are no production delays. No time is spent on reactive work of an investigation, which allows more proactive safety work such as inspections, job demonstrations and safety training.

A large amount of time and money has to be invested in a safety program and like any other investment it is only successful if it has a payback. At Inco we are seeing paybacks, with the greatest being the reduction of injuries.

We have a come a long way. But it takes the caring and looking after each other in the workplace, working safely as a team and the belief that all injuries can be prevented to realize our goal of zero disabling injuries and to make our Company a world-class operation.

Ron Rafuse is Superintendent of Safety in the Ontario Division.

Performing as separate companies adds to competitiveness

continued from page 4

Jerry said it's a delicate balance that planners, engineers, geologists and miners have to pay greater attention to, especially in a low-price nickel market.

Customer relationship works best

If every part of the Division acts as a separate company, within the Company, then each of their customers down the line will receive a better and more cost-effective product.

"We are the producer," Jerry said of mining operations.

"The mill is our customer. With rock, we are just adding to the cost of production at the mill."

In addition to more precise ring layouts, blasting more selective mucking by scoop operators (leaving rock behind), there are other solutions being put into action at South Mine.

"We use one stope (on the 3540 level) for rock storage, saving us on hoist costs," said **Phil Dawson**, South Mine geologist.

"It costs us $30 a ton to hoist and process rock. So this storage stope should save us half a million dollars this year."

Multi-millions can be saved

Phil pointed out the startling savings potential in cutting dilution.

"If we could eliminate all dilution at all mines, the savings would be $250 million a year. Realistically, in the short run, we can save 20 per cent of that – that's still $50 million."

Conductivity probes are another way dilution is being minimized, he said.

In the last five years, conductivity probes detecting nickel and copper have become more sensitive. "Before they just detected nickel."

Computerization of the probes has also improved detection allowing readings to go directly into an engineer's computerized drawing.

Cavity monitor surveys are also more precise giving geologists and planners a clear picture of how much ore was taken, or left behind, after a blast.

"It gives us a better handle on dilution. And it helps us plan our blasting of the next stope by adjusting drilling and blasting patterns," Phil said.

Indeed, minimizing dilution is everyone's concern.

"If we can reduce dilution by 20 per cent or even 10, it will have a profound effect on the profitability of the Company," said **Dietrich Liechti**, manager of the Mills and Transportation.

"Ore grade is the single largest factor that contributes to the profitability of a company," Dietrich said.

"And dilution is ore grade. The more rock you throw in, the lower your grade."

Scrap also a problem

Large pieces of mine steel scrap, from chain links, pails, roof bolts and screening cause process problems at the mill, such as spillage or production problems.

Gilles Labre, scoop operator at South Mine, said an Inco Computer Based Training module he went through at work recently helped him understand the importance of minimizing scrap in the ore.

"It gave me more understanding about how the mill runs. Our vent pipe, bolts and rebars create steel chokes at Clarabelle Mill. A steel choke can cause grinding mills to shut down while the choke is cleared."

Improvements in minimizing scrap from the mines have already been made, in which the scrap is separated at the mines before the ore is moved to the mill.

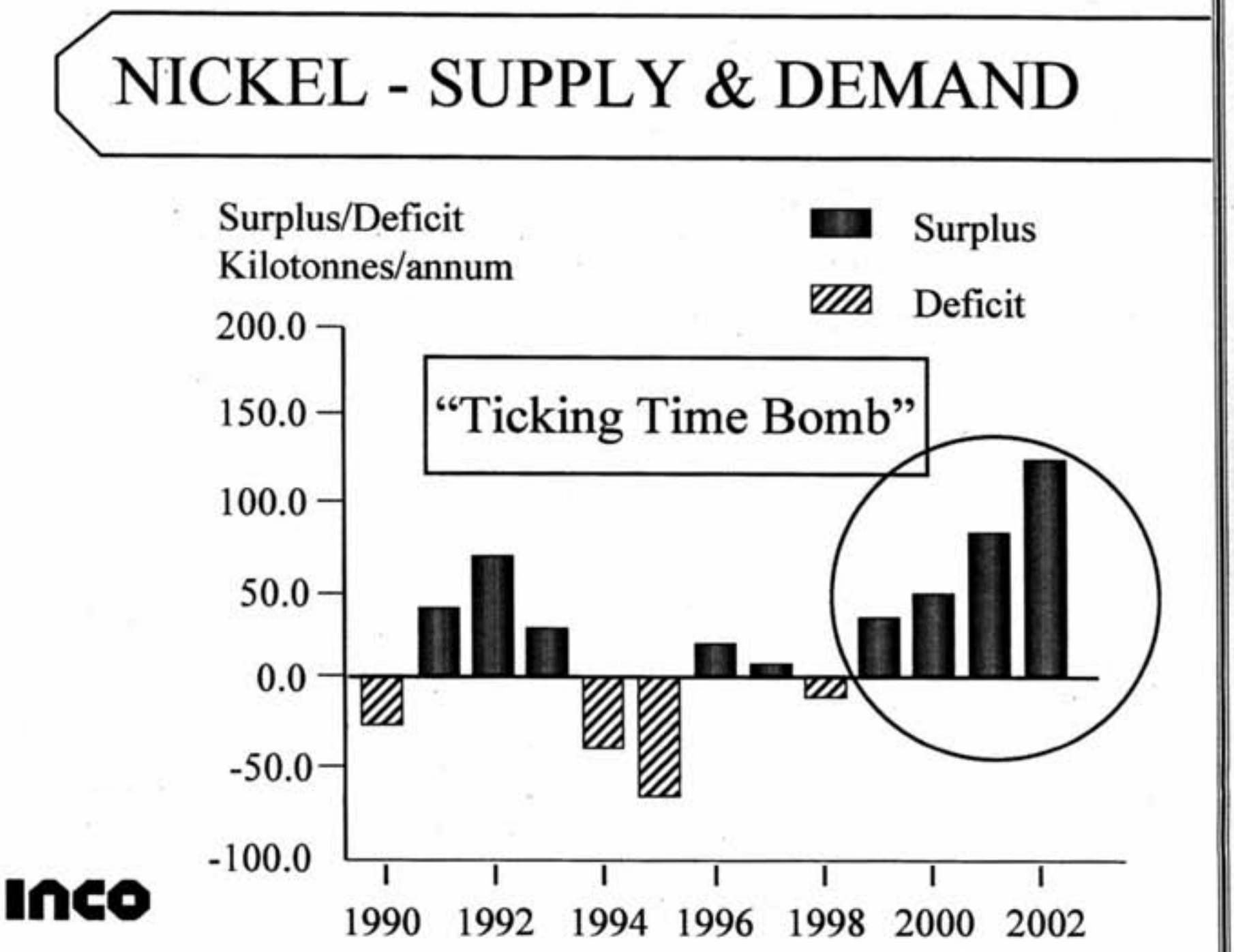
"The mines have already eliminated the large pieces of steel," Dietrich said.

"When they do that with the smaller pieces, it will improve safety and production at Clarabelle Mill."

He added that although scrap is a serious problem, it is minimal compared to gains that can and will be made in minimizing ore dilution.

"The Need For Change"

- MINING WORLD NEWS -



Stainless oversupply to close mines

Closings of nickel mines are likely in the near future as a result of an oversupply of stainless steel, which consumes about 50 per cent of all nickel production, reports the London-based commodity analyst **GNI Ltd.** "There will be so much supply in the market that closures will be forced upon producers rather than them being proactive," said **Peter Fish**, managing director at the U.K.-based steel analyst **MEPS (Europe) Ltd.** Major nickel producer **Eramet**, meanwhile, is predicting prices will stay low for the long term.

Upstart claims 60-cent nickel production

Anaconda Nickel Ltd. estimates that its Murrin Murrin mining operation will produce nickel from its close to the surface, clay-like, laterite deposits at about 50 to 60 cents a pound. The Australian company's claim compares well below the typical cost of $1.70 to $2.30 of mining underground granular sulphide deposits, which are volcanic in origin. **Michael Masterman**, Anaconda's director of finance and marketing, said the laterite ores, estimated to contain two-thirds of the world's nickel reserves, will allow his company to steal nine per cent of **Inco**'s current 21-per-cent market share. Inco has laterite deposits in Indonesia and New Caledonia that are richer than Anaconda's, pointed out **Jerry Rogers**, Inco director of corporate affairs. Mr. Rogers added that Anaconda's estimates are "only on paper" at the moment. The first phase of Murrin Murrin is scheduled to be operating at a capacity of 115 tonnes of nickel by the year 2000.

Anaconda-aboriginal employment deal

Anaconda Nickel Ltd. has reached an employment agreement with aboriginal people of Western Australia's outback. Under the agreement which includes a substantial training component, Anaconda has committed to employ 115 local Aborigines as part of the 350-strong workforce to work on the processing facility at Murrin Murrin. The company's chief executive **Andrew Forrest** said Anaconda is firmly committed to aboriginal training and employment.

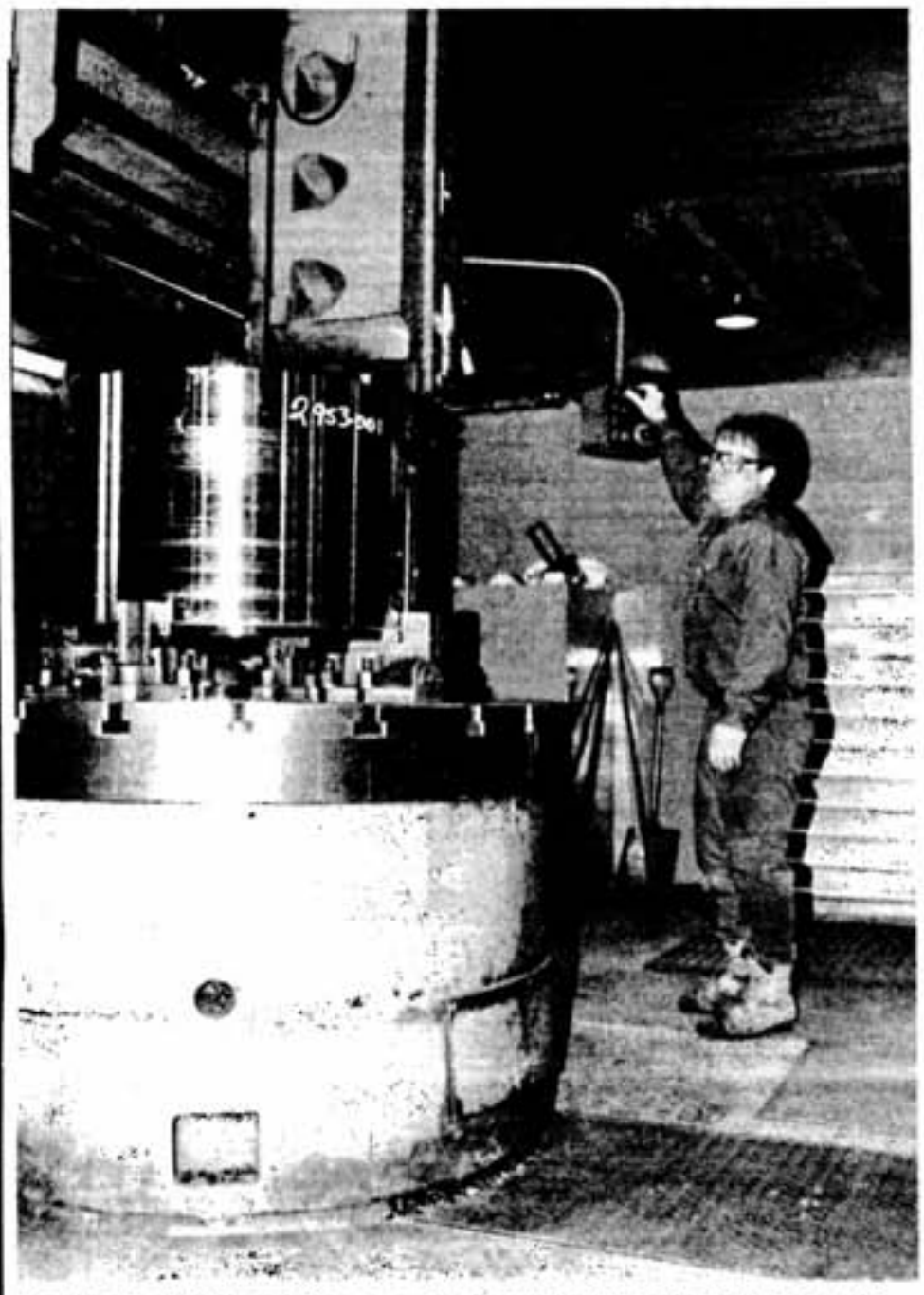
Voisey's Bay Nickel adds to information

Inco Ltd. has submitted an additional 600 pages of information on its **Voisey's Bay Nickel** project to an environmental panel studying the huge project. Toronto-based Inco produced the material, now totaling 2,500 pages, in reply to the panel's request last month for more information and its plans to manage its effects on the environment. **Brian Torrie**, manager of the panel reviewing Voisey's Bay, said the earliest public hearings on Voisey's Bay can begin is early September.

Ownership deal for Peru copper

Teck Corp., **Rio Algom Ltd.** and **Noranda Inc.** have agreed in principle on a revised ownership to develop Antamina copper-zinc project in Peru. The companies said Rio Algom and Noranda would each hold 37.5 per cent of the project, with Teck holding the remaining 25 per cent. This replaces an earlier proposal under which each company was to hold one-third of the project.

Divisional Shops reducing maintenance costs by $10.2M



Services in Divisional Shops, as in the entire Ontario Division, must be competitive and add value to operations.

The Solution:
Our Ontario Division Strategy

What must be accomplished?

1 Each element of the value chain of producing metal must improve its competitive standing.

2 Operations which provide direct service must operate at competitive levels of cost, service and customer satisfaction.

3 Central functions must add value to the operations or we seriously consider eliminating the work.

INCO

Divisional Shops will go from seven operating facilities to two by June 1999, as it reduces costs by $10.2 million.

That's an almost 30 per cent cost reduction and a work area reduction of 38 per cent, from 178,000 square feet to 110,000 square feet.

The two facilities that will remain by next year are the Track Equipment Repair Shop (the existing Loco Shop after amalgamation with the Car Shop) and Divisional Shops' Complex, both located within the Copper Cliff Smelter Complex.

"While the cost of doing the work was a major deciding factor, this was only one of many factors considered as we examined all work and services we provide," said **Paul Elson**, who is supervising the restructuring project at Divisional Shops.

In addition, issues such as quality, cycle time and risk to the Ontario Division were also evaluated to ensure there would not be a negative impact as a result of using outside vendors.

Each shop was systematically evaluated in detail using the tools developed in-house and recommendations were made on which products and services Divisional Shops should continue to provide and support.

"It is worth noting that the strategic initiative to analyze Divisional Shops products, services and costs began over a year ago in March 1997," said **Randy Hiscock**, superintendent of Divisional Shops.

"Recognizing that change was necessary as a result of manpower losses (both present and anticipated), customer dissatisfaction, our increasing charge-out rate and product cost, a team of unit and staff employees, later known as the Value Added Committee, was formed."

Randy said, "For those products and services that we will discontinue we are working closely with the customers, Purchasing and in some cases the vendor to ensure customer satisfaction, high quality, acceptable cycle times and the best value for the Ontario Division is maintained."

Paul added, "Our operating strategy will include a continuous evaluation of products and services."

Physical structures have also been evaluated for their role in lowering costs.

"Most of the buildings we occupy are old, with some built in the late 1920s," said **Willy Metson**, general foreman.

"Therefore, as part of our restructuring, the Steel Fabrication Shop, the Welding Shop and the existing Car Shop will be demolished, which will significantly reduce Divisional Shops' overhead – saving the Ontario Division more than $400,000 a year in building taxes, heat, electricity, and maintenance," Willy said.

"Work has already begun with closure of the North Mine Automotive Garage in late February, and movement of the Combustion Department into the Winding Shop. Engineering is also underway for further consolidation of shop facilities."

Leaner, more efficient

Bill Toivonen, maintenance foreman in Divisional Shops, said, "Restructuring can be a stressful time for all employees and false information or rumors add unnecessary anxiety. Let me say, we are not closing. We are still very much in business. And to stay in business we must become a leaner and more efficient operation."

Bill said the Divisional Shops charges to the mines and plants they serve will be much more in line with similar services offered outside of the Company.

Another significant change will be in the transition from primarily a one-shift operation, with minimal afternoon shift support, to a full two-shift operation with operating hours from 7:30 a.m. to 11:30 p.m., Monday to Friday."

Downsizing needed to lower costs

Throughout this restructuring, surplus employees will be identified and made available to the Division, Randy said.

"The present-day workforce consists of 197 staff and unit employees (which is under the 1998 plan of 233). It is felt that approximately 165 will be required to support the product and service lines we shall keep. Fewer and fewer employees will be charged to overhead as a result of elimination of duplicated services in our facilities," Randy said.

"It is not yet known whether retirements and transfers will accommodate the required reduction in our workforce."

Team effort

Randy said, "With the support of Joe **Dippong**, Divisional co-ordinator of Quality, **Sheila Giroux**, statistical advisor, and many hours slaving over a hot keyboard, a product evaluation form was designed to value-rate products, based on factual information, not supposition or gut feel. By year-end the team had evaluated, scored and prioritized hundreds of product and service lines," Randy said. In addition, **John Kanerva** and **Doug Fosten** participated in a comprehensive risk evaluation process, which was completed by March 1998.

The Triangle is published monthly for employees and pensioners of the Ontario Division of Inco Limited. Produced by the Public Affairs Department, members of the International Association of Business Communicators.

Letters and comments are welcomed and should be addressed to the Editor at Inco Limited, Public Affairs Department, Copper Cliff, Ontario P0M 1N0. Phone 705-682-5429.