

Workers At Cerro Matoso In Colombia Partner With Management To Implement Employee Development System

PROGRAM HELPS ALREADY HIGHLY EFFICIENT MINING & PROCESSING OPERATION INCREASE PRODUCTIVITY.

By James M. Cusimano, New York City

Located in northwest Colombia South America, 180 miles from Cartagena, Cerro Matoso S.A. produces 55 million pounds or so of the finest nickel alloy anyone has ever seen. This premium ferromnickel — 3% of the world's supply — is a critical component in the production of high quality stainless steel and specialty steels.

With 700 employees — 490 in production — Cerro Matoso is one of the most efficient mining operations of its class. The company is jointly owned by Billiton (The Netherlands) and the Colombian government.

Acting through their union, workers joined management to institute an employee development program so that workers could grow in their jobs through their own motivation and effort. In the process, the union would agree to scrap the old seniority system. The workers reasoned that by improving their skills, Cerro Matoso would become more productive and competitive, which would help ensure everyone's future.

Management agreed. “We thought to improve quality and help our workers become multiskilled” explains Fernando

Jaramillo, Cerro Matoso's President & General Manager. “It was silly. A solenoid goes out and it would take several people — an electrician, a mechanic and so on — to change it. It makes much more sense to train the operator to do it himself.

Also, the workers were unhappy; you heard things like, ‘Well, Geez, I've been here for fifteen years watching the belt to go by. I want to do more than that.’

“So there were good reasons for everyone to want training and retraining. Management was willing to compromise to reach our goals, and the union and workers were willing to put their traditional antagonism and distrust of management aside to reach our goals.”

Although participation in the new system would be optional, commitment to this radical departure from the past was widespread throughout the workforce. “It is voluntary”, says Eduardo Vidal, union officer at Cerro Matoso. “The only consequence for those who don't participate is stagnation. They stay in the present and don't enter the future.”

Management was very supportive of the initiative. Like the union, they saw that employee development could be a means to improve operations and productivity. As a result, the company formed a union-management steering committee to implement the initiative.

The first task was to find the right development system. They visited a number of

companies and found an ideal match in a multi-component, functional training system developed by **Manufacturing Technology Strategies (MTS)**, a St. Louis based international training and consulting company.

WHY THE SYSTEM WORKED FOR CERRO MATOSO

MTS had implemented its system in a number of mining operations throughout the world, including those of Inco, the world's leading nickel producer. Although the primary emphasis of the methodology is training, the system's driving forces are its insistence on competency based learning in which employees objectively demonstrate mastery of new skills and its emphasis on each employee taking responsibility for learning.

“All of our projects are customized for the requirements of individual industrial sites,” explains Vince Estrada, MTS President & CEO. “We didn't have to do anything radically different at Cerro Matoso, although certain elements of our methodology were intensified to meet the workers' and the organization's developmental needs.”

CONTENTS	
Why The System Worked.....	1
Training Needs Analysis.....	2
At-The-Job Learning.....	2
Learning, Writing & Training.....	2
Implementation.....	2
Changing Role Of Supervisors.....	3
Harmonizing Other Programs.....	3
Results.....	4

These are the key components in the MTS System that made so attractive for Cerro Matoso:

TRAINING NEEDS ANALYSIS

During the initial design phase, MTS produces a detailed analysis of the technology (process and equipment) employed in a given site. It then identifies each task, skill, tool and knowledge element required to operate the technology in a given step or sub-step in a process. This information is mapped onto individual analysis sheets as a matrix. The process and its equipment are on the vertical axis, and the skills, knowledge and tools are laid out on the horizontal axis. Each intersection on the analysis sheet represents a task or activity a worker needs to master in order to operate or maintain the corresponding piece of the process. The analysis sheets can be coded for jobs. Thus, some of the tasks in the matrix are relevant to operators, others to mechanics, others to instrument technicians. These analysis sheets function as curricula for individual jobs and their workers. Each worker must complete the training required to perform the task or other requirements signified by the relevant intersection in the matrix. As individuals master the necessary skills through training and practice, they must objectively demonstrate this competency to — depending on the organization — trainers, supervisors, associates or their team. Training Needs Analysis (TNA) is central to the system of competency based training. TNA's served a number of functions at Cerro Matoso:

- They provided a roadmap to all the skills and abilities needed to operate the company's processes. This in turn enabled the company to orga-

nize those operations into a hierarchy. In the refinery, for example, the tasks necessary to perform statistical process control, operate the control room, or perform analytical troubleshooting required a higher level of skill than running the process on the refinery platform or in the recovery plant.

- The requirement that workers objectively demonstrate skills through the TNA's gave the company a method of tracking progress and objectively certifying that a given employee had mastered a cluster of abilities necessary to rise to another level.
- The training and development system was implemented in an established organization where the employees were working and had already developed many skills. The TNA's gave Cerro Matoso a tool for measuring where workers were at the outset. They were given credit for demonstrated existing skills and the corresponding training did not have to be done.

Here's how it worked. Each employee in a given job level entered a 0, 1 or 2 in each applicable matrix intersection to indicate whether they needed no training, some training or full training to perform the given task. They then demonstrated their competence. This established the starting point, customized to the needs of each individual. It also organized the path each individual would need to follow to satisfy the requirements for the current position. When these requirements were completed, the worker could go to another job level; the first step would be to fill in the relevant analysis sheets.

AT-THE-JOB LEARNING (AJL™)

As an established, functioning organization, Cerro Matoso could not spare many workers to train in classrooms off the job. With this system, it wasn't necessary. The system incorporates an At-The-Job Learning process, in which workers learn to use customized training manuals, trainers, fellow workers, group sessions and other resources to meet the requirements mapped out in their own TNA's. It is a highly structured form of managed on-the-job training in which the workers take responsibility for meeting their specific learning needs. Placing responsibility for learning on the workers was ideal for Cerro Matoso, since the responsibility fosters employee development. To further strengthen the At-The-Job Learning process, workers were trained in a workshop on "Learning How To Learn".

LEARNING, WRITING AND TRAINING WORKSHOPS.

The MTS System requires:

- The development of training manuals specifically based on the technology of a given site, which are coordinated with the analysis sheets.
- Supervisors and others in the line organization who know how to train within the AJL™ process.
- Workers who know how to learn and use the manuals and the TNA's and other resources.

The workshops to cover the above needs, in themselves, develop the capabilities of the workers and their leaders. They also institutionalize the training and development system. The workshops enabled Cerro Matoso employees — workers and supervisors — to write the training manuals, train workers and learn using the system. The ultimate goal is to make the system self-sustaining, to make learning the responsibility of Cerro Matoso rather than the consultant's. Institutionalizing the system in this way ensures that the developed process will continue into the future, while also developing the skills and talents of the Cerro Matoso organization.

“Since we began implementing the methodology in 1993, we’ve enjoyed an increase in productivity of 18%... We have no hard data to establish specific cause for improvement...”

We assumed there was synergy among the three initiatives (MTS, Total Quality and Loss Control...”

Hernán Rincón, Engineering Manager
Cerro Matoso, S.A.

IMPLEMENTATION

Since the program began to be implemented in 1993, 40 employees have been trained as writers, 50 have been trained as instructors, 440 have participated in the "Learning How To Learn" workshop, 125 manuals have been written and 160 TNA's have been produced. In addition, 45 employees have completed troubleshooting training, 30 statistical process control (SPC) training. Troubleshooting and SPC are necessary requirements to qualify for "Category 14" — the highest skill level and pay grade.

Of a total workforce of 490 hourly employees, 425 are participating in the program. Of those, 380 have been validated as having mastered all the skills in their current position. And 280 have had new skills certified in their development.

The system is constructed so that workers receive additional pay for demonstrated skills and knowledge. It is the responsibility of management to take advantage of these capabilities. However, before a worker can be certified for a new level, the person must have 6 months in a grade.

"An experience factor is built into the process," explains Training Director Rodolfo Baron. *"You can't take a test every day. But the more skills you have, the more assignments you get as needs arise. The process is monitored by the whole line organization through our business units, so everyone is responsible. Besides the joint union-management steering committee, we only have one training person."*

So far the training has been focused on the career paths within the organization's four operating business units: mine, ore preparation, smelting and refining. But Cerro Matoso has an ambitious strategy for the future. They plan to cross-train workers so they have the skills necessary to work in any of the four business units. They also are designing career development for all staff, including administrators and engineers. In addition, there is a movement afoot to institute self-directed work teams, with union support. The

"Instead of being an order giver and technical expert who can solve hands-on problems, the supervisor needs to become a leader who can let go and give some of the traditional authority to developing workers..."

"...They must learn how to lead, empower, influence, set objectives, assess performance and coach..."

"We have had some substantial successes..."

Vince Estrada
President & CEO of MTS

institution of teams is a tremendously challenging goal.

"It seemed logical and easier to manage, to implement the program in steps with selected business units," says Jaramillo. *"It may have made sense to someone with an engineering background — many of us are engineers here. But from a public relations or people point of view, it might have been better to take the whole operation along together."*

CHANGING ROLE OF SUPERVISORS

First line supervisors are a crucial link in Cerro Matoso's system. They interview workers to assess needs and determine competency, guide learning and go on record to validate and certify workers. These responsibilities put new pressure on supervisors, which is compounded by the fact that the workforce is becoming more competent and self-directed.

"We need to train supervisors to use the analysis sheets, but also help them become better supervisors," says MTS' Vicente Estrada. *"Instead of being an order-giver and technical expert who can solve hands-on problems, the supervisor needs to become a leader who can let go and give some traditional authority to developing workers. For some, this is difficult. They need a whole new range of skills; they must learn how to lead, empower, influence, set objectives, assess performance, and coach."*

To help supervisors meet their new challenges, MTS customized and extended its standard 3-day workshop "What Is A Supervisor," to five days. In the sessions, which feature group interactive experi-

ences, participants develop fresh job descriptions for supervisors in the changing organization and then develop the analysis sheets — TNAs — based on this new portrait. So far, 76 supervisors have been trained in 12 sessions.

"We have had some substantial successes," says Estrada. *"We ran a session for superintendents which really turned people on like gangbusters. A couple changed the way they ran their units. But change is more incremental than dramatic."*

HARMONIZING OTHER PROGRAMS

At about the same time Cerro Matoso implemented its employee development methodology, it also launched initiatives in Total Quality Management (TQM) to gain ISO 9002 certification, and instituted a system of Loss Control Management. Each of these programs had a different methodology and they all had to be harmonized. To accomplish this, people worked together to identify areas where the methodologies overlap or contact and make sure these matters were handled in a uniform way.

Here are points of overlap: ISO 9000 auditors insist that processes, procedures and training are normalized in one acceptable, compatible format. Loss Control Management requires disciplined analysis to identify critical tasks necessary to control loss, document critical procedures, and train on those procedures.

The analysis sheets became a tool to harmonize these areas of overlap. The format met the requirements of ISO 9000 by

ensuring that documentation of procedures and training were compatible. After all, the analysis sheets and training manuals are interlocked into a single closely coordinated system. The analysis sheets also served the needs of Loss Control Management by providing a mechanism to make critical tasks visible.

“The three methodologies are compatible,” says Hernán Rincón, Cerro Matoso’s Engineering Manager. *“None of them surrender anything. Each makes a separate and distinct contribution, and the analysis sheets help integrate them at the interfaces.”*

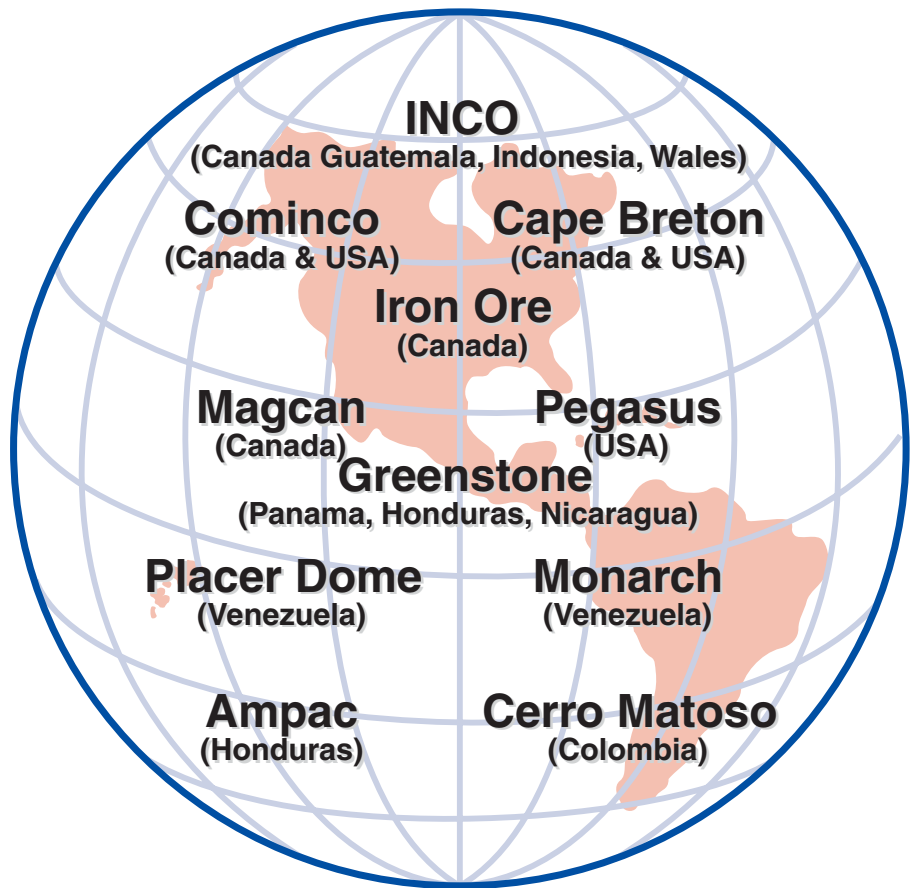
RESULTS

Cerro Matoso learned that training people also motivated them. Problems — even serious problems — became opportunities. *“Once we started we found we had bigger problems than we thought,”* asserts Jaramillo. *“We learned that some of our people could hardly read and write.”*

“But this apparent problem created enormous opportunities. We said, ‘Okay, we’ll teach you how to read and write’ and then developed literacy courses which really caught on. People wanted to get their high school education finished and we enabled them to do that. People wanted to increase their knowledge and were willing to do it on their own time. So out of what seemed like a weakness, we developed some interesting opportunities which people were very committed and excited about.”

The impact on the bottom line of training and other programs was quite dramatic.

“Since we began implementing the methodology in 1993, we’ve enjoyed an increase in productivity of 18%,” says Hernán Rincón. *“We also see better decisions in the workplace. While we have no hard data to establish a specific cause for improvement, we assume there was synergy among the three initiatives. That’s common sense.”*



MTS™ Projects In The Mining And Metallurgical Industry

For more information about **MTS™** and the **MTS™** System, please contact:



11426 Dorsett Road
St. Louis, Missouri 63043-3414

Phone: 314 298-0004
Fax: 314 298-0006

E-mail: mts@mtsworld.com

Websites: www.mtsworld.com & www.mtselearning.com