

Claremont Graduate University

Course: Operations Management 360

California Steel Industries - Site visit on August 18, 1999

14000 San Bernardino Avenue, Fontana, California 92335

by Dean S. Tripodes

California Steel Industries, Inc. (CSI) was founded in 1983 based on the acquisition of steel-processing facilities from Kaiser Steel Corporation. They began operations in late 1984 as a mini-mill, with no steel manufacturing done on premises. CSI purchases steel slab from a number of international and domestic sources, and converts the semi-finished steel product into a wide variety of coil and sheet products. Much of CSI's product lines are sold throughout the western and mid-western United States, with some product sold worldwide through the export market. CSI is jointly and equally owned by the Japanese owned Kawasaki Steel Corporation and the Brazilian owned Rio Doce (a U.S. subsidiary of Companhia Vale do Rio Doce - CVRD), an international company that owns vast mineral and forest resources.

California Steel Industries sits on 380 acres with nearly 115 acres of the plant under roof. The plant includes an 86" Hot Strip Rolling mill, hot strip finishing facilities (build-up, shear, and slitter lines), two hot-dip Galvanizing lines, a 62" Continuous Pickling line, a 5-Stand Tandem Cold Reduction mill, cold rolling equipment, and an Electric Resistance Welded Pipe mill. Their annual designed capacity is 154,000 tons. Their effective capacity is 145,000 tons, and they are presently operating at 112,000 tons. They are considered a medium diameter mill, manufacturing pipe from 4½" to 16" outside diameter. The facility is served by 8.5 miles of feeder roads and a 22 mile railroad system. CSI operates seven diesel locomotives and 140 flat

and gondola cars, and is served by the Burlington Northern Santa Fe and the Union Pacific rail lines.

CSI is the only west coast steel supplier of five main product lines, including hot rolled, pickled and oiled, galvanized, cold rolled sheet, and electric resistance welded pipe. Shipments in 1998 exceeded 1.6 million tons, with projections for 1999 of more than 2 million tons. Their annual sales are \$700 million, total assets are \$475 million, and their network is \$175 million. CSI's mill has 1999 forecast sales of \$44.9 million.

About The Site Visit

On August 18, 1999, we visited California Steel Industries at 14000 San Bernardino Avenue in Fontana, California. Upon arriving on the large 380 acre campus, we were offered a presentation by Jim Busch (Operations Manager), John Brown (Operations Planner), Ralph Hayden (Manager, Quality Services CSI), and Tom Andersen (Senior Metallurgical Engineer). Jim was the main speaker, and mentioned that we would be focusing on one section of CSI, their tubular products division. That division had 78 employees, and had achieved ISO 9002 certification, meaning they have standards in their areas of applications in production flow for procurement, production, and installation, but not design development and servicing (pp. 220-221, *Production and Operations Management*). According to Jim, their specifications for products might be from a manual or a boilerplate from the American Petroleum Institute. They believe strongly in thinking groups. These groups are responsible for rewriting job procedures, using the PDCA cycle (Plan Do Check Act), and establishing a total quality environment. We

note that PDCA cycle, also called the Deming Wheel, conveys the sequential and continual nature of the continual improvement process (p. 213, *Production and Operations Management*).

Sales does the forecasting and ordering of steel slabs. Inventory is stored with a bar code system, and it is moved about by train. CSI is trying to reduce finished inventory to 6000 tons. All current inventory is PSL 1, and next year they will only be manufacturing PSL 2. Their current slab inventory is 210,000 tons. They are using robotics and more automated systems. One of their major clients is Williams Companies, which is one of this country's largest producers of natural gas.

Their peak season is from March to November, because temperatures and climate in the midwest can preclude large projects in the winter time frame. Usually in summer, they are backlogged 5-6 months. In winter, they are rolling their inventory. CSI is number one in quality and delivery, and they are competitive in price west of the Mississippi. Their products are shipped FOB delivery. Their competition is Geneva (in Utah), LTV (in Chicago), USS (in Pittsburgh), and various off-shore manufacturers in Asia. They benchmark very well against their competition, with other pipe makers utilizing between 16-18 operators per shift, and CSI's tubular products division utilizing 11 operators per shift.

To their credit, they are the first pipe mill in the country to be ISO registered. Their operating philosophy includes the 5 S's: 1) Seiri (organization), 2) Seiton (neatness), 3) Seiso (cleaning), 4) Seiketsu (standardization), 5) Shitsuke (discipline). Their operations priority is 1) safety, 2) quality, 3) productivity, 4) profitability, and 5) human relations. Their optimal production or "sweet spot in the mill" is 8", 10" and 12" pipes. Their industry is changing tremendously in their source steel that they work with, noting that 75% of the steels they use

today weren't available in quantity just fifteen years ago. They are high strength, low alloy with a resistance to corrosion, and carbon based materials. Their markets do not include telecommunications conduit pipe needs, as their galvanized products have far more stringent requirements than simple conduit.

Ralph Hayden, Manager of Quality Services at CSI, then addressed our group. He said that profit sharing was 8% across the board. They had an open door policy, and an employee review board that required a formal hearing for any disgruntled employees. They employed quality circles, and strived to have everyone thinking about productivity. CSI has a non-layoff policy, and a zero tolerance for drugs. There was an attempt 8 years ago to unionize, and only 33 people tried to sign-up. By paying attention to their employees, they have kept a union free shop. The CEO/President is Brazilian, Ralph's boss is Japanese, and Jim's boss is American, indicating that their management is truly multi-national.

Jim Busch continued, stating that their second galvanized mill allowed for a production increase from 1.7 million tons to 2 million tons. If they require more capacity, they can buy it from another mill. Larger mills run 24 hours per day, with one to two days down per week for maintenance.

At this point we broke into groups for our tour. John Brown, Operations Planner, was our tour guide who walked us through the process. It was extremely noisy within the tubular manufacturing facility, and we were not able to hear what he was saying. Accordingly, most of analysis is based on observations and what we gathered after the tour by speaking with John when we left the facilities.

After the tour, Jim Busch, Operations Manager, concluded our presentation. He said they

try to keep inventory to 90 days, going for production smoothing. In 1997 they had more injuries. They expanded and used temporary workers. To maintain quality, they no longer hire temporary workers. They have 30,000 tons of steel slabs as raw materials. To calculate their safety stock, they gage past performance, check with customers, and they rotate sizes every quarter. When they order steel from around the world, it can take 90 days to get there, as some have to be transported over water.

Quality Controls

CSI quality standards require that all their products be produced from continuous cast, calcium treated slabs. By working with a superior material, they minimize chemical segregation and non-metallic inclusions, as well as enhancing surface quality. To insure that rigid specifications are being met, CSI maintains a complete materials traceability list.

CSI employs on-line quality testing using the latest manufacturing technology. The mill also performs nondestructive testing by use of electromagnetic induction flux leakage. This process can identify defects in the weld zone and pipe body on both the inner diameter and the outer diameter. Gating permits inspection of the weld at a higher sensitivity than the body. The system's computer maintains permanent records.

CSI does include worker involvement in their processes. They also have different quality control inspections in their continuous flow manufacturing processes.

Forecasting and Safety Stock

There was no indication of forecasting techniques in our site visit. How much finished material should they make each day? Each week? CSI indicates a concern to limit finished inventory to 6000 tons. They have 30,000 tons of steel slabs as raw materials. To calculate their safety stock, they gage past performance, check with customers, and they rotate sizes every quarter. But they do not employ statistical forecasting techniques which could improve both finished and raw material inventory. We would recommend that they employ more sophisticated forecasting techniques for inventory management. This can be particularly significant for raw products, because when they order steel from around the world, it can take 90 days to get to CSI.

Worker Safety

CSI's first operations priority is safety. We saw in photo 13 (p. 13) that CSI believes: "Our most important assets are the employees of CSI Tubular Products. This is why safety is our number one priority." But as we saw in photo 14 (p. 14), CSI does have some injuries in their factory. We were concerned that they did not indicate hearing loss as a potential injury. However, Tom Andersen told us that earplugs drop the noise in the plant by 34 decibels. A rock concert may be a 100 decibels, and 66 decibels is the sound in a noisy room. CSI does test employee hearing every year as precaution for hearing loss.

Future

For plant improvement, CSI has worked on a continuous modernization process since 1988 when they installed larger levelers, a weld bead milling head in their splice station, a new side trimmer with entry guides, and new inside bead cutter. In 1988, they also converted to automatic weld temperature control. They installed a cooling tower and adopted a weld sample check procedure. These improvements have helped in many areas, including improving the yield by shortening the weld splice, reducing edge damage on pre-slit coils, improving inner diameter surface and shape, improving weld integrity and uniformity, and improving mill speed.

In conclusion, CSI wants to focus on finish-problem handling (as indicated by the pipe paint errors). They want a faster and smoother improvement process. They are concerned with the deregulation of the natural gas and electrical generation and distribution industry. In addition, many of their clients may be consolidating in the oil industries and natural gas distributors, and they want to be a supplier to surviving merged companies. Their natural gas clients may expand into regions previously dominated by hydro electric energy companies, bringing more opportunities. Finally, CSI wants to be a part of any replacement programs for the national infra-structure of oil and gas pipes.