Commentary

The road ahead...

For many, the past few years in the iron and steel industry have been some of the toughest years ever, yet despite all the hardships and the strife, the road ahead looks rather promising. Such lows are a characteristic of the iron and steel industry, however, this last one especially. In these times, it can be easy to overlook the successes and innovations that are often overshadowed in down times. That is why we are happy to spotlight some of these milestones and developments in this issue of Direct From Midrex.

Recently, the MIDREX® Direct Reduction Module installed in the Arabian Gulf at the Qatar Steel Company (QASCO) celebrated its 25th anniversary. QASCO’s EAFs operate using a 95 percent DRI charge, which is one of the highest ratios in the steel-producing world making the MIDREX® Direct Reduction Plant an integral part of QASCO. Over the past few months we have been working with QASCO to design and implement various technological improvements to increase capacity including oxygen usage. With its latest production technology and equipment, the plant generates an annual production of 1.2 million tons of steel per year.

In addition, the MIDREX Direct Reduction Plant at OPCO recently achieved its 10 million ton production milestone. The OPCO HBI Plant is a great example of innovation, as it was a successful retrofit installation into the previously mothballed MINORCA HBI Plant, built by US Steel in the 1970s. OPCO was designed to retain as much of the original equipment as possible. Thus OPCO is the first use of a steam reformer with the MIDREX® Direct Reduction Furnace.

On the development side of the industry, we are very excited about the progress being made at the Mesabi Nugget Project in Silver Bay, Minnesota to develop the ITmk3® technology. At the end of May, Mesabi Nugget successfully produced its first iron nugget product as part of an initial 5-ton trial run completed May 24-25.

ITmk3 is Kobe Steel’s revolutionary new technology based on the Kobe/Midrex coal-based direct reduction technologies that have been in development over the past decade. We first talked about ITmk3 in the 1st Q 2001 Direct From Midrex outlining the process that creates pig iron quality iron nuggets. ITmk3 has been proven through the pilot plant stage and we hope to continue bringing you good news regarding the plant operation.

Change and evolution are constant in our industry. We continue with our ongoing efforts to make the industry healthier and more prosperous so that even in the bad times, eventually the cream will rise to the top. We look forward to saluting the continued successes both new and old for those associated with Midrex.

There still is a way to go before we are fully out of this down cycle, but in looking back, it is good to know how far we’ve come. And, the road ahead looks a lot better.

MISSION STATEMENT

Midrex Technologies, Inc. will be a leader in design and integration of solids and gas processes. We will meet or exceed performance expectations, execute projects on time, enhance existing product lines, and provide value-added design, procurement, logistics and field services to our clients. We will develop new business opportunities that will challenge our employees and maintain the economic vitality of our company. Our employees are the key to our success, and we are committed to encouraging them to grow professionally and personally.
By Larry Lehtinen
Mesabi Nugget, LLC

INTRODUCTION
The Mesabi Nugget Project is a venture to develop and apply the Kobe Steel ITmk3® iron nugget process in a commercial venture at the Northshore Mining Company facility in Northeastern Minnesota. ITmk3 is a new revolutionary ironmaking process that produces blast furnace quality pig iron in the form of iron nuggets using a coal-based rotary hearth furnace.

Capital requirements for the ITmk3 process are expected to be significantly less than the cost of alternative technologies, and operating costs are expected to allow the iron nugget product to compete successfully against imported pig iron. A successful project could have a dramatic impact on the steel industry.

WHO MAKES UP THE PROJECT?
Mesabi Nugget, LLC (“MNC”), a Minnesota limited liability company, will implement the Mesabi Nugget Project. MNC owns the assets used to produce the iron nuggets (“Mesabi Nuggets”) from the new process developed and owned by Kobe Steel, Ltd. of Japan. Equity participants of MNC include IronUnits, LLC (a subsidiary of Cleveland-Cliffs, Inc.); Ferrometrics, Inc. (founder of MNC); Kobe Iron Nugget, LLC (a subsidiary of Kobe Steel USA, Inc.); and Ferrous Resources, LLC (a subsidiary of Steel Dynamics, Inc.). Steel Dynamics, Inc. is also a strategic customer for the Mesabi Nugget product through an off-take agreement with MNC. Northshore Mining Company, the host for the project, is providing the site, building, concentrate supply, and other support services to MNC. Other than with regard to certain equity off-take arrangements with MNC owners, a subsidiary of Cleveland-Cliffs, Inc. will be the sales agent for the iron nuggets produced by the MNC commercial plant.

DESCRIPTION OF NEW TECHNOLOGY - ITmk3®
The ITmk3 Process (pronounced "IT Mark Three") developed by Kobe Steel, Ltd. is a new ironmaking technology that uses a rotary hearth furnace to turn iron ore fines and pulverized coal into iron nuggets of similar quality as blast furnace pig iron. The new ironmaking technology will be able to effect reduction, melting, and slag removal in only about 10 minutes.

The ITmk3 Process is an elegantly simple process as shown in Figure 1 on the following page with a one-step furnace operation that requires less energy, capital, and operating costs than existing pig iron technology. Consequently, a high quality iron product at a substantially lower cost is produced.
The quality of the iron nuggets is far superior to direct reduced iron (DRI) and equal to blast furnace pig iron. The chemical composition of iron nuggets is shown in the Table 1 below.

<table>
<thead>
<tr>
<th>Element</th>
<th>Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2.5 – 4.3%</td>
</tr>
<tr>
<td>Si</td>
<td>0.2%</td>
</tr>
<tr>
<td>Mn</td>
<td>0.1%</td>
</tr>
<tr>
<td>P</td>
<td>0.06%</td>
</tr>
<tr>
<td>S</td>
<td>0.015 - 0.05%</td>
</tr>
<tr>
<td>Metallic Fe</td>
<td>Balance</td>
</tr>
<tr>
<td>Density</td>
<td>7.4 – 7.6g/cm³</td>
</tr>
</tbody>
</table>

Table 1 Chemical Composition of Iron Nuggets

The iron nuggets can be fed directly to a Basic Oxygen Furnace (BOF) or Electric Arc Furnace (EAF) as a pure iron source instead of pig iron and as an excellent scrap substitute. The high quality and low cost iron nuggets are of great interest to EAF and BOF operators.

The recycling of scrap steel is an important issue for global environmental protection and the effective use of natural resources. The purity with respect to iron of the iron nugget product will facilitate a higher utilization of scrap recycling in EAF and BOF production due to its role of diluting tramp elements such as Cu, Pb, Sn, and Cr in order to produce flat products of high quality steel.

Another important aspect of ITmk3 is that the process makes it possible for the mining industry to supply iron nuggets directly to melt shops from the mining site as a value-added product by separating gangue elements from iron ore. This means that mining companies can widen their market from the traditional pellet customer of a blast furnace to all melt shops at BOF, EAF and foundry operations. This proposes an innovative concept on the rehabilitation of the mining industry, and it has a potential to change the overall logistics systems in the steel industry.

ITmk3 is unique in that nearly all of the chemical energy of the ingredient fossil fuel is consumed and no gas credit is exported from the system. This is an important difference from the conventional blast furnace. When the energy consumption is compared between ITmk3 and the blast furnace (BF) for the production of cold pig iron, the BF consumes 20.60 MMBtu versus
13.49MMBtu for ITmk3, which indicates that 30 to 35% of the BF energy can be saved when iron is produced with the ITmk3 process.

ITmk3 is environmentally friendly because the process does not require a coke oven or agglomeration plant. Consequently, less NOX, SOX and particulate matter (PM) are emitted than in the traditional BF system. We compared the greenhouse gas emissions of ITmk3 with the BF-BOF system at the point of crude steel product in different markets. In Japan, CO2 emission of the BF-BOF system is 2251kg (CO2)/t-steel and the ITmk3-EAF system can reduce CO2 emission by 21% down to 1734kg (CO2)/t-steel.

TECHNOLOGY DEVELOPMENT PLAN

The Mesabi Nugget team has developed a Technology Development Plan describing the development of the ITmk3 Process to a state of commercial readiness. The plan includes construction of a new pilot demonstration plant (PDP) at the Northshore Mining Company facility in Silver Bay, Minnesota. The PDP would only serve to collect environmental information and demonstrate the commercial viability of ITmk3.

The PDP will be capable of producing about 25,000 metric tonnes per year of Mesabi Nuggets. In terms of annual output of nuggets, such a plant would be nearly ten times larger than the Kakogawa pilot plant observed by the MNC founders in December 2000. However, the PDP will be about 1/17th the annual output of the first commercial module, which is contemplated to produce 500,000 metric tonnes of iron nuggets per year. The first commercial plant may be designed for 1,000,000 mtpy of iron nugget capacity from two modules, depending on process performance, project economics, environmental permitting, market potential, and financing arrangements. The PDP test sequences will generate about 15,000 metric tonnes of iron nuggets to be characterized physically and chemically and then tested in the steelmaking process at Steel Dynamics’ Butler, Indiana facility with smaller quantities to be tested at certain foundries.

The main technical challenge of the proposed research and development is the demonstration of continuous operations on a large scale. ITmk3 has been demonstrated on a 3.2 meter diameter rotary hearth pilot facility in Japan, but for commercial operations the RHF requires a scale-up to a 50 meter RHF. This is the reason for the 11 meters diameter RHF PDP at Silver Bay, Minnesota.

The potential risk to jump to commercial scale up is too great and must be mitigated by an intermediate-sized demonstration plant. The PDP will have an effective hearth area about ten times larger than the Kakogawa Pilot Plant but will still be about one-seventeenth the area of the ultimate commercial plant rotary hearth furnace.

Another critical aspect of the scale up issue, in addition to demonstration of continuous operation and reliability, is the refinement and confirmation of the unit productivity and energy consumption. Before we can commit the funds needed for a commercial plant, we need to have more confidence as to how many tonnes per year a 50 or 60-meter diameter full sized commercial RHF will make. We also need to have a better idea of how much fuel, electricity, labor, and raw materials will be required to make a tonne of iron nuggets.

And last but not least, we need to better understand what the levels of emissions of various pollutants may be from the new process, how well the envisioned environmental controls perform, and what additional measures or controls may be necessary to confirm the environmental acceptability of the new iron nugget process.

CONCLUSION

Kobe Steel and Midrex have developed an innovative new technology known as "IT Mark Three" (ITmk3), based on their coal-based direct reduction technologies that have been in development over the past decade. The process is proven on a small scale. The Mesabi Nugget Project currently underway at the Northshore Mining Company facility in Northeastern Minnesota is a venture to develop and apply ITmk3 at a larger scale for eventual commercial application.
Kobe Steel has recently announced that the Mesabi Nugget ITmk3® demonstration plant in northeastern Minnesota (USA) has successfully begun continuous production of iron nuggets. A successful initial trial run on May 24-25 produced 5 tons of iron nuggets. Beginning June 7, the plant has been operating 24 hours a day and is currently producing around 2 tons of nuggets per hour. On June 13 the first shipment of nuggets was delivered to the EAF shop of Steel Dynamics, Inc. in Butler, Indiana with reported good results obtained from the melting tests conducted.

The continuous operation of the plant will last for 35 days, after which it will be shut down for an inspection of the facility. The development plans call for the demonstration facility to operate for one year, until June 2004.

In March 2002, Kobe Steel signed an agreement with Mesabi Nugget, LLC for the construction and operation of the demonstration plant. The plant is located at the Northshore Mining taconite plant in Silver Bay, Minnesota owned by Cleveland-Cliffs, Inc.

Successful operation of the Mesabi Nugget plant would validate the commercial viability of the ITmk3 Process and could allow for the construction of a 500,000-ton commercial-scale plant. After obtaining EPA permission, the commercial plant could start up in 2006.

The ITmk3 Process could provide mining companies with an attractive alternative for mineral processing in supplying a value-added product in the form of iron nuggets. Consisting of 96% to 98% iron and 2% to 4% carbon, the iron nuggets are 50% lighter and 90% more compact than iron ore, thus reducing shipping costs.

About the ITmk3 Process
- The Kobe Steel-developed ITmk3 (pronounced "Eye-Tee Mark Three") Process is a new ironmaking technology that, in a rotary hearth furnace, turns iron ore fines and pulverized coal into iron nuggets of the same quality as blast furnace pig iron.
- Reduction, melting, and slag removal takes only about 10 minutes. In comparison, blast furnace steelmaking takes 8 hours, while direct reduction can take 6 hours. The iron nuggets consist of 96% to 98% iron and 2% to 4% carbon, which is nearly the same as blast furnace pig iron.
- Energy efficient and environmentally friendly, the ITmk3 Process emits 20% less carbon dioxide than blast furnace operations.
- Capital investment is projected at roughly half the cost of conventional ironmaking technologies. (On the same scale, initial capital investment of an ITmk3 plant is estimated to be about half the initial investment cost of a blast furnace with associated facilities, including coke ovens, as well as oxygen generation and supply equipment.)
- Iron nuggets could provide an attractive mineral processing alternative for mining companies.

Development of the Process
Kobe Steel and its subsidiary Midrex Technologies, Inc. began research on the ITmk3 Process in July 1996. A pilot plant with a production capacity of 3,000 metric tons per year was built at Kobe Steel’s Kakogawa Works. Test operations carried out between October 1999 and December 2000 successfully produced iron nuggets under continuous operation. In March 2002, Kobe Steel signed an agreement with Mesabi Nugget, LLC.
for the construction and operation of the demonstration plant. In May 2003, the plant was completed and trial operation was commenced.

**Future Plans**

Plans call for the demonstration plant to operate until June 2004. In parallel, preparations would be made for the construction of the commercial plant. The commercial plant would begin operations in 2006.

**About the Mesabi Nugget Project**

Mesabi Nugget, LLC, formed in September 2001, is the project owner for the Mesabi Nugget project. The equity members in Mesabi Nugget are Ferrometrics, Inc. and subsidiaries of Cleveland-Cliffs, Inc., Steel Dynamics, Inc., and Kobe Steel, which provide equity for the $26 million project. The state of Minnesota provides financing for the construction of the project out of the Minnesota Minerals 21st Century Fund.

The project is also supported by the U.S. Department of Energy. Of the total project cost of $26 million, the DOE is anticipated to fund $5 million (19.2%), of which $2 million has already been obligated. In a collaborative R&D strategy called “Industries of the Future,” the DOE provides partial funding for steelmaking projects crucial to the industry’s future.
In April 1978, the Qatar Steel Company (QASCO) began operation of a 400,000 tons per year rated MIDREX Direct Reduction Module. This year the first MIDREX Plant installed in the Arabian Gulf celebrated its Silver Anniversary.

Located in Mesaieed Industrial City, 45 kilometers to the South of Doha, QASCO consists primarily of four units: direct reduction plant, electric arc furnace, continuous casting, and rolling mill. It was the first integrated steel plant in the Arabian Gulf region, established in 1974 by three shareholders: Government of the State of Qatar; Kobe Steel, Ltd., Japan; Tokyo Boeki, Ltd., Japan. Steel production started in 1979. In 1997 the company became wholly owned by the government of Qatar.

Qatar Steel Company’s management selected the DR-EAF route of steelmaking due to the many advantages of using DRI. Moreover, Qatar is blessed with abundant natural gas resources. For these reasons, DRI has been utilized by QASCO for producing the required quality of steel. Normally two steel grades (High Tensile and Mild Steel) are produced. QASCO’s EAFs operate using a 95 percent DRI charge, which is one of the highest ratios in the steel-producing world.

The MIDREX Direct Reduction Plant is an integral part of QASCO that has helped it earn a reputation for delivering exceptional quality steel products.

Through optimization and continued operation, QASCO’s nominal annual capacity was passed within the third year of operation in 1980. Currently, the annual production capability of the unit is 700,000 tons per year.

In the past year Midrex has worked with QASCO to design and implement various technological improvements to increase
capacity via oxygen use at its MIDREX Plant. Midrex and QASCO are in the process of modifying the existing plant to raise capacity to approximately 850,000 metric tons/year through these improvements and installing an oxide coating system. Additional improvements are also being planned.

Oxygen injection provides more energy to the MIDREX® Shaft Furnace, thus improving reformed gas utilization and overall plant efficiency/performance. Oxygen use will result in higher furnace bed temperatures, thus providing higher rates of in-situ reforming of the natural gas, which leads to higher productivity, increased carbon content in the product, and improved natural gas utilization efficiency.

QASCO will use the additional DRI in their recently upgraded steel shop, which includes three electric arc furnaces (EAFs).

Since 1990, QASCO’s MIDREX Plant has consistently demonstrated operational availability rates exceeding 8,000 hrs/year. The plant produced a record 734,000 metric tons of high quality DRI in 2001 for use in the adjacent QASCO steel mill. Typical QASCO DRI metallization is 95-96 percent.

QASCO’s objective is to produce steel reinforcing bars to meet the domestic demand, as well as the demand of surrounding countries. With its latest production technology and equipment, the plant will generate an annual production of 1.2 million tons of molten steel.
As stated from its title, this article intends to predict scrap prices for future U.S. market. To do this we start where we left off last issue. The precious article in this series ended with a graph that, judging from the number of questions received about it, was not well understood. This article aims to revisit this topic and further explain.

EXPLANATION OF TRI-MODAL DISTRIBUTION OF PRICES DURING PERIOD OF ‘RELATIVE STABILITY’

The first graph (Figure 1) is a frequency distribution of the three-city composite (Chicago, Philadelphia, and Pittsburgh) price of #1 HMS, as reported by American Metal Market. Prices have been corrected for inflation according to the U.S. Consumer Price.

The graph is divided into cells, each of which is five dollars wide and is centered on an integral multiple of five dollars. For instance, the first cell containing data is centered on $90, and extends from $87.50 to $92.50. During the 192 months in this sample of data, 1982-1997, the #1 HMS composite fell within this range twice: November and December of 1982. For those months, the composite was at $50.63 and $50.95, respectively. Correction factors to convert the value of the dollar from November and December of 1982 to the average of 2001 are 1.780 and 1.788. Applying these factors, the three-city composite in 2001 dollars was $90.14 for November 1982, and $91.08 for December 1982. Continuing, there is one month of data in the cell centered on $95, there are three in the cell centered on $100, and so forth.

Looking at the overall pattern of the graph, rather than being a normal distribution with a single peak as we expected to find, the graph has three distinct peaks; that is, a tri-modal distribution. Let us interpret these as being a buyers’ market with a median value of about $117, a sellers’ market with a median value of about $158, and the in-between market (which tends to be less stable) with a median value of approximately $138. Each of the three peaks has approximately equal area, that is, an approximately equal probability of occurring.

DISTRIBUTION OF PRICING DURING THE REMAINING (NOT SO STABLE) PERIODS

The above defines the price history during a period of relative stability, 1982-1997. What about the rest of the 20th century when
prices certainly were not so stable? Interestingly, the three peaks can be seen echoing throughout the data, although they were often masked when prices peaked at far higher levels or slumped to lower levels. Let’s refer to the graph of scrap prices for the 90-year period, 1913-2002, which was shown as Figure 2 in the first article of this series.

Excursions above the routine tri-modal distribution

According to how one defines an upward excursion from the standard range, there were from five to eight periods when prices broke out of the pattern on the high side. Altogether, more than 25% of the time was spent at prices over $180/t. However, arguments can be made that the three peaks immediately following WWII were largely a result of the Open Hearth (Siemens-Martin) steel making equipment in place at that time. These furnaces could accept any blend of hot metal and cold charge (scrap), so when high production levels were required, they just continued to buy more and more scrap, bidding the prices higher and higher. The same is not true today, nor in the earlier part of the 20th century, when pneumatic steel making furnaces (Basic Oxygen and Bessemer, respectively) prevailed. Ignoring the twelve-year period when those post-WWII peaks occur (1947-1958) causes the fraction of time spent over $180/t to decline to about 15%.

Two other factors may also have caused a small portion of the data to appear higher than the $180/t level. First, there is an argument that the United States Consumer Price Index ran slightly too fast during the latter part of the 20th century. Allowing for this effect brings another 1% to 2% of the data below the $180/t level.

Second, the technology for collection of scrap was not as efficient in the earlier part of the century as it has been during the last few years. For purposes of making a prediction for the next 25 years though, this is not expected to have much of an effect. Efficiencies are already so high that one should expect diminishing returns on further improvements, which means even a revolutionary improvement in scrap steel collection will probably have little effect on lowering the price of scrap steel. After all, steel scrap is, by far, the world’s largest recycling industry. The big cost saving measures have already been taken.

To summarize, making exceptions for technology differences and for the above mentioned additional factors, price excursions above the routine tri-modal range occurred slightly less than 15% of the time.

Excursions below the routine tri-modal distribution

The analysis of the low price periods is simpler. In the 20th century, prices fell below routine levels three times: during the Great Depression, 1933; during the 1982-83 recession; and most notably during the recent five-year period affected by the Asian crisis and the availability of low priced scrap steel from the Commonwealth of Independent States. Altogether, the data is below $100/t for slightly less than 8% of the time.

SCRAP PRICE PREDICTION FOR THE NEXT 25 YEARS

There is little reason to believe that the future will be radically different from the past. Obsolete scrap steel will continue to consist
of steel from old cars and old appliances, steel from demolished buildings, from railroad rolling stock and from the rails themselves, steel from used food cans and from used oil cans. It will continue to be collected, processed, and brokered in ways similar to what is done today, as well. A multitude of scrap steel collectors supply approximately 3,500 processors in the United States alone. The processors cut, shred, sort, clean, size, densify, and otherwise upgrade the scrap for easier use by the steel maker or foundry. Most of this scrap is sold through brokers. Theoretically, prices should, and probably will, come down slightly as better techniques and equipment are applied to scrap collection and processing, but as mentioned above, there are no big gains left to be made.

Also, as alternative iron materials (steel scrap substitutes such as DRI, HBI and pig iron) become more common, the cost of manufacturing these materials may begin to effect scrap prices. But with merchant alternative irons currently comprising only a small percentage of total cold charge materials, any such effects remain inconsequential.

So, in summary scrap prices are expected to do the following:
- be in the range of $117 +/- 12 for about 20 to 35 % of the time,
- be in the range of $138 +/- 12 for about 20 to 35 % of the time, and
- be in the range of $158 +/- 12 for about 20 to 35 % of the time.

Please note, the above ranges overlap. This is not uncommon for multi-modal distributions.

In addition, there is a possibility of price excursions outside of these ranges. The price may:
- be below $105 for about 5 to 10 % of the time, and
- be above $170 for about 10 to 20 % of the time.

All estimates are in 2001 dollars. To convert to mid-year 2003 dollars, multiply by 1.038.

It is interesting to reflect on a prediction of scrap prices published in this magazine seven years ago (3rd quarter 1996). At that time, John Kopfle made a 10-year prediction for the years 1996-2005. He also divided his prediction into three ranges, "low", "average", and "high". The figures for his prediction were (in 1996 dollars) 110, 125 and 140. Converted to 2001 $ that is 124, 141, and 158. Even though Kopfle’s method of estimating was completely different from the one used in this analysis, the two predictions are remarkably similar.

One additional point should be made with regard to DRI, HBI and pig iron, the "alternate irons". The prices of all iron units will continue to move approximately in parallel, rising to high levels in good economic times and falling to low levels during recessionary times. This was well illustrated in Figure 3, “World Ferrous Prices”, of the article in the previous publication of Direct From Midrex. However, the relative premium between various iron commodities need not remain constant. One of the primary functions of alternate iron in EAF steelmaking is to dilute residual metals (copper, nickel, tin, etc.). According to the available supply relative to demand of alternate iron, its premium value over cut grades of scrap may vary substantially. But that is a subject for another article.

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**Figure 3 - World Ferrous Prices (as in the previous publication of Direct From Midrex.)**

![Figure 3](image-url)
OPCO Produces 10 Million Tons of HBI
Using Steam Reformers with the MIDREX® Direct Reduction Process

OPCO, located in Puerto Ordaz, Venezuela has recently announced its 10 Million Ton Production Milestone that occurred May 15. Despite being idle for eight months in 2001, Operaciones al Sur Del Orinoco (OPCO) has produced more than 10 million metric tons of hot briquetted iron (HBI) with its MIDREX® Direct Reduction Plant since operations began in February 1990.

OPCO is a unique plant because it does not employ the conventional MIDREX® Direct Reduction Process, but rather uses steam reformers as the primary source of reducing gas without the benefit of recycling these valuable reducing gases. OPCO is the first use of a steam reformer with the MIDREX® Direct Reduction Furnace.

Shortly after purchasing Midrex in 1983, Kobe Steel, Ltd. and Midrex engaged in a study to retrofit the mothballed MINORCA Direct Reduction Plant to incorporate the MIDREX® Process. MINORCA had originally been designed using fluidized bed reactors in the HIB process, but was closed down in 1982.

Kobe Steel wanted to retain as much of the original equipment as possible, including the steam reformers. Midrex replaced the fluidized bed reactors with a MIDREX® Shaft Furnace and in 1990 the newly refurbished plant, OPCO, produced its first HBI. This was the first application of the very successful MIDREX MEGAMOD® Shaft Furnace which has a nominal 6.5 meter inside diameter.

Demand for HBI was strong in the 1990s and a three-bay MIDREX® Mini-Reformer was added to provide more reducing gas and implement some recycling of the spent top gases. The OPCO Plant exports HBI to its customers around the world.
Midrex News & Views

Techint USA Changes Name to Core Furnace Systems

In early May, Techint Technologies, Inc. (USA) announced that the US company will change its name to Core Furnace Systems Corporation. Core Furnace Systems, and Techint (Italy), Midrex Technologies, Inc. and Kobe Steel, Ltd. have a strategic alliance for the marketing and supply of FASTMET® and FASTMELT® projects worldwide.

The name change was initiated as a proactive step to position the company to best serve the company’s customers in the North American metals market. Consolidation is changing the landscape of the North American steel industry. Core Furnace Systems is now totally focused on furnace design and supply as well as providing customers with quality after-market services. The company’s extensive furnace capabilities serve the melt shop, reheat, heat treat, carbon baking, and aluminum industries.

“We believe that this change will benefit our current and future customers,” stated Dominic Faccone, Core Furnace President and CEO. “Through the transition of Techint Technologies (USA) into Core Furnace Systems, we are able to preserve our key people and dedicated team members to continue to support our strong furnaces customer base in the North American market from our fully-staffed Pittsburgh based operation.”

Core Furnace Systems will continue to operate from the current office located in Coraopolis, PA. Core Furnace Systems is a designer and supplier of high quality reheat and heat treat furnaces and melt shop equipment for the iron, aluminum, and steel industries.

For more information, please contact: info@corefurnace.com or visit www.corefurnace.com.

Midrex Announces Donald Beggs Scholarship Recipients

Midrex is pleased to announce Patrick Elliot and Amanda Harton as the 2002 recipients of the Donald Beggs Scholarship Program.

Named for Donald Beggs, who conceived the idea for MIDREX Direct Reduction Process in the early 1960s, this scholarship is awarded to college-age sons and daughters of Midrex employees and is meant to acknowledge and reward the hard work and academics of these students.

Patrick Elliot is the son of Antonio Elliot, Manager of Technical Services at Midrex. He is a sophomore at the University of North Carolina at Chapel Hill (UNC) working towards a degree in Biochemistry. Patrick’s activities at UNC include President of the University’s Amnesty International chapter.

Amanda Harton is the daughter of C. Lynn Harton, Senior Electrical Engineer at Midrex. She is entering her sophomore year at the University of North Carolina at Wilmington (UNCW) studying pre-physical therapy/athletic training. During her freshman year Amanda was a Cheerleader for the UNCW Seahawks basketball team and she worked as a YMCA Lifeguard during school semester breaks.

Congratulations to Patrick and Amanda, and thank you to all applicants who participated in this year’s program.

Christopher M. Ravenscroft: Editor

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