DIRECT FROM MIDREX

1ST QUARTER 2008

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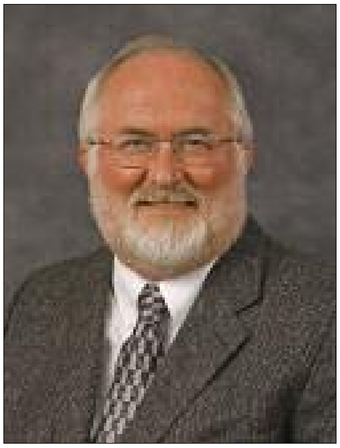
Commentary



Robert Hunter
Product Applications Manager

"I Don't Know Where I'm Going to Go When the Volcano Blows"

At the time of this writing (late March), prices for iron and steel worldwide have literally erupted, rising to extraordinary levels. Reading current metal market news, one finds words often being used by reporters and editors that include:

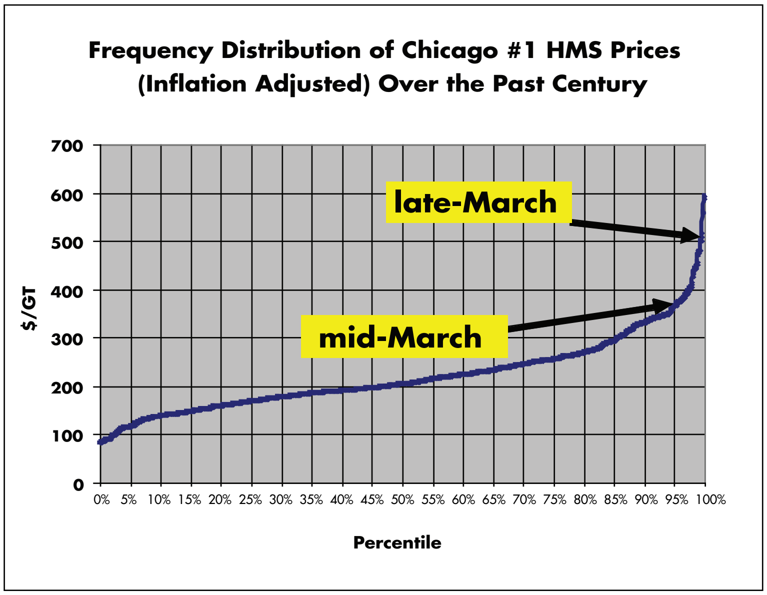
> ***increase****…****hike****…****stratospheric****…****new high****…and* ***all time high****…****surge****…****climb****…****soar*** *(used many times)…****rise****…and* ***rocket up****…and* ***upward spike****…* ***gain****…****top shoot*** *(as in* ***shoot up*** *or* ***shoot higher****)…* ***jump****…****lifts****…*

These words and phrases are frequently combined with terms such as *continue* and *huge*, for example, "continue surging to ever new record highs," and "huge hike raises tags to stratospheric levels."

Of course if the newsmen are writing about inventories, everything sounds different. In such situations, the terminology is reversed, as in, "inventories collapse to new lows." When writing about buyers and users, the words generally involve terms like *squeezed*, for example, "buyers squeezed by rocketing costs."

So, what is happening? Apparently, the world is experiencing a shortage of iron and steel unlike anything encountered since 1974. If it continues at a slightly greater intensity, it may exceed any shortage seen in the past century.

Economists don't like to use the term *shortage*. Supposedly, shortages are nonexistent in a free market. Only shortages at a price can be considered as real. To determine the severity of the price increases, Midrex looked at the distribution of scrap prices in the Chicago market over the past century (inflation adjusted). Please refer to the attached graph. In mid-March, scrap prices in the United States reached the 95th percentile. Since then, worldwide prices have moved up with remarkable speed. Estimating the Chicago price by deducting freight costs between Chicago and various locations, shows the Chicago price to already have risen to around the 99th percentile.



Clearly, we are seeing a rare event. How long will it last? How high will prices go? The only knowledge we have of the future is that we don't know what will develop. But there are two developments that are quite likely. Price volatility will almost certainly increase to a degree as extraordinary as the levels of prices; and the price escalation in iron and steel is part of a much broader movement. Prices of nearly all metals, prices of other materials used in construction and fabrication, prices of energy, prices of food, prices of most base commodities are all at new record levels and continuing to rise. Obviously, the second likely development is an increased rate of general inflation, not just in the U.S. dollar, but in all currencies.

MIDREX® Direct Reduction Plants
2007 Operations Summary

Thanks to good market conditions, MIDREX® Plants produced 39.7 million tons in 2007, approximately 11.5 percent more than in 2006. Many plants established new production records (15 annual and 16 monthly production records) because of the continued high demand for metallics. The plants in general were successfully able to withstand the continued pressure for maximum production. Three new MIDREX® Modules started up in 2007: Qatar Steel's Module 2 and Hadeed's Module E started up in July, while Lebedinsky GOK's Module 2 started up in October. The two MIDREX Modules moved from Mobile, Alabama to Dammam, Saudi Arabia, restarted in May and December of 2007 as Direct Reduction Iron Company, Ltd. (DRIC), belonging to the Al-Tuwairqi Group. ArcelorMittal Canada's Module 2 restarted in April 2007 and Module 1 shut down in November 2007. At least 16 MIDREX® Modules operated in excess of 8,000 hours. Iron ore prices increased again in 2007 due to the high demand worldwide despite increased steel prices, while Venezuelan DR plants faced shortages of locally produced pellets and difficulties to import pellets. MIDREX Plants have produced over 520 million tons of DRI/HBI to date, surpassing the 500 million ton mark around the middle of 2007.

ACINDAR
ACINDAR operated above rated capacity for the sixteenth consecutive year, and set a new monthly production record averaging 145.4 t/h in December after the start-up of a three-bay MIDREX® Reformer expansion in July 2007.

Antara Steel Mills
Antara set a new monthly production record in May and fell short by less than 5,000 tons from setting a new annual production record.

ArcelorMittal Canada
Despite high raw material costs, Module 2 was restarted in April operating at 50 percent of maximum capacity. Module 2 operated most of the year at full capacity but was shut down in November, falling just 2,000 tons short of a new annual production record.

ArcelorMittal Hamburg
AM Hamburg's MIDREX Plant operated well over rated capacity in 2007 for the sixth consecutive year.

Antara Steel Mills

ArcelorMittal Lazaro Cardenas

ArcelorMittal Lazaro Cardenas
AMLC continued operating at high capacity throughout the year, producing almost 1.6 million tons despite natural gas shortages and a planned shut down for maintenance. AMLC has produced over 15.7 million tons since its start-up ten years ago.

ArcelorMittal Point Lisas
AMPL's three modules produced over two million tons and exported 1.3 million tons of DRI by ship in 2007.

ArcelorMittal South Africa (Saldanha Works)

Saldanha achieved over 7,100 hours of operation in the year at its COREX® Export Gas-based DR Plant, and averaged 65 percent Sishen lump ore usage for the year.

COMSIGUA

EZDK

Hadeed Module E

ArcelorMittal USA - Georgetown

ArcelorMittal's MIDREX Plant in Georgetown, S.C., remained shut down the whole year for the fourth consecutive year due to the high cost of raw materials. It will not be restarting in the foreseeable future.

COMSIGUA

In 2007, COMSIGUA operated well below its annual rated capacity of one million tons per year due to a shortage of locally produced pellets and difficulty in importing pellets in the second half of the year. Since its start-up in September 1998, COMSIGUA has produced over 10 million tons of HBI in less than nine years of operation.

Delta Steel

The two Delta Steel modules, which had been inoperative since 1988 and 1996 respectively, restarted operations in May and November 2006 under new ownership, operating in 2007 at reduced capacity.

DRIC (Direct Reduction Iron Company, Ltd.)

These two modules have been relocated by the Al-Tuwairqi group from Mobile, Alabama, USA to Dammam, Saudi Arabia, and were restarted in their new location in May and December 2007.

Essar Steel

Essar Steel surpassed the 30 million ton mark and produced over four million tons in 2007 with their fifth module in its first full year of operation. A significant portion of the DRI produced (approximately 50 percent) is charged hot to Essar Steel's EAFs.

EZDK

EZDK's Module I operated over 8,500 hours in the year while Modules II and III averaged over 8,000 hours per year, despite shutdowns for planned maintenance.

Ferrominera Orinoco

Ferrominera Orinoco took over operational responsibilities from OPCO for the HBI producing facility in Puerto Ordaz, Venezuela. Production at the facility was restrained by oxide pellet availability in Venezuela.

Hadeed

Hadeed exceeded rated capacity for the 23rd consecutive year in Modules A and B, and for the 15th consecutive year in Module C. Modules A and B averaged over 8,650 hours of operation in the year and set new annual production records, while Modules A and C set new monthly production records. Hadeed's Module E, with a newly designed 7.15 meter diameter MIDREX® Shaft Furnace and a capacity to produce 1.76 million tons per year, started up in July 2007 producing cold DRI. Trial runs of the hot conveyor system delivering hot DRI to the steelshop occurred in November and December.

Ispat Industries, Ltd.
IIL of India exceeded rated capacity operating over 8,650 hours in the year, but again experienced restricted production due to limited availability of natural gas. Lump ore usage averaged 63 percent for the year.

Khouzestan Steel
All four modules exceeded rated capacity again in 2007 for the fifth consecutive year.

Lebedinsky GOK
Lebedinsky GOK's second DR module, capable of producing 1.4 million tons of HBI per year, started up in October 2007.

LISCO
LISCO set a new annual production record in Module 2 for the fourth consecutive year, as well as a new annual production record in Module 1. Through 2007, LISCO has produced over 20 million tons of DRI/HBI from its MIDREX Modules in Misurata.

Mobarakeh Steel
For the fourth year running, Mobarakeh Steel set annual and monthly production records in Module E, as well as a new annual production record in Module A. With Module F in its first full year of production, Mobarakeh Steel produced a total of over 5.2 million tons from its six modules with an operating availability in excess of 8,270 hours on average for all modules.

Nu-Iron
In its first full year of production, Nucor Corporation's MIDREX Plant (relocated from Louisiana to Trinidad and restarted at the end of 2006) produced over 1.4 million tons of DRI, most of which was shipped to the United States.

OEMK
Twenty years after the start-up of Modules III and IV, with its four modules operating on average over 8,150 hours, OEMK produced over 2.2 million tons in 2007. Module II set a new monthly production record in December, after the introduction of oxygen injection. Module I has produced over 10 million tons since its start-up in 1983 with the other three modules expected to reach this milestone in 2008.

Qatar Steel
Qatar Steel's Module 2, a dual product plant rated for 1.5 million t/y, started up in July with the production of cold DRI and began producing HBI in September. Module 1 set a new monthly production record of 80,072 tons in January and operated almost 8,100 hours in the year, despite scheduled shutdown time for major maintenance.

TenarisSiderca
TenarisSiderca comfortably exceeded rated capacity and has surpassed the mark of 15 million tons produced since start-up.

LGOK Module II

Nu-Iron

Qatar Steel Company Module 2

Ternium Sidor
Thirty years after start-up of the first MIDREX Module, production from all four of Ternium Sidor's MIDREX Modules exceeded 3.6 million tons in 2007. Module 2A established new annual and monthly production records after its 2006 expansion.

VENPRECAR
VENPRECAR's production was significantly restricted by the limited availability of iron ore pellets in Venezuela.

Ocean Shipping of Hot Briquetted Iron
An Extraordinary Record

Editor's note:
Recently, there has been much discussion and subsequent misunderstanding regarding the shipping and handling of DRI. Midrex has run articles in 4Q 2006 and 4Q 2007 issues of DFM on various aspects of DRI and HBI handling. This article examines additional aspects of the subject.

Hot briquetting of DRI has been practiced on an industrial scale for more than three decades and is the preferred method of preparing DRI for storage and ocean shipping.

Unfortunately, over the past three or four years, there have been a few incidents involving ocean shipping of fines and other by-products of DRI plants. In these cases, the materials caused problems during shipping and handling. The incidents have cast a shadow over an otherwise remarkable record.

None of these incidents involved HBI; however, they did attract the attention of insurance companies, property and indemnity clubs, and the International Maritime Organization.

Prior to the increase in the price of iron and scrap steel that began in 2003-2004, there was rarely any reason to ship DR plant fines and other by-products. The value of the material was less than freight costs, but after prices increased, there was a surge in shipments of these materials, including product and oxide dusts, fines, clarifier slurry, etc.

In that there is no official name or designation for such materials, various names were placed on bills of lading, often confusing the shippers who would see a name such as "HBI fines" and assume that it was a shipment of HBI and therefore treated as such. It should be noted that there have also been a few incidents involving cargoes of DRI.

The frequency of the incidents, as well as the severity of some of them, was sufficient to cause the International Maritime Organization to revisit its guidelines concerning the shipment of HBI, DRI and fines. The revision process is currently underway.

WHAT IS THE DIFFERENCE?

HBI

HBI is typically 50 percent denser than DRI pellets and lump, which significantly reduces the tendency for reoxidation. DRI is compressed at high temperatures into pillow-shaped briquettes with a typical size of 30 x 50 x 110 mm. This enables HBI to be stored and handled without special precautions as recognized by the International Maritime Organization (IMO).

DRI

Direct Reduced Iron (DRI) is iron that has been reduced (the oxygen removed) from iron oxide pellets, lump ores or fines without melting. Its physical appearance remains as pellets, lump or fines.

FINES

Fines are iron-bearing materials, very small in size and weight. Generally, fines are classified as material less than four or six millimeters in size. Fines and other by-products absorb much more water than HBI and standard pellet and lump DRI, making fines more prone to problems during shipping and handling. There are no IMO-approved guidelines for shipping fines as of yet.

WHAT IS DRI?

Definition of DRI listed in IMO* as:
Direct Reduced Iron (B) (not to be confused with IRON SPONGE, SPENT) such as lumps, pellets and cold-moulded briquettes

IMO defines DRI as: "a metallic material of a manufacturing process formed by the reduction (removal of oxygen) of iron oxide at temperatures below the fusion point of iron. Cold-moulded briquettes should be defined as those which have been moulded at a temperature of under 650° C or which have a density of less than 5.0 g/cm^3."

WHAT IS HBI?

HBI is a compacted form of Direct Reduced Iron (DRI), a metallic material manufactured by processes that reduce (i.e., remove oxygen from) iron oxide fines, lump, and pellets at temperatures below the melting point of iron.

Definition of HBI Listed in IMO* as:
Direct Reduced Iron (A) Briquettes, hot-moulded

IMO defines HBI as: "A material emanating from a densification process whereby the direct reduced iron (DRI) feed material is at a temperature greater than 650° C at time of moulding and has a density greater than 5.0 g/cm^3. Fines (under 4mm) not to exceed 5%."

Courtesy of Hot Briquetted Iron Association Ltd. Web Site

* Code of Safe Practice For Solid Bulk Cargos (BC Code), 1994 Edition, International Maritime Organization (IMO), London, 1994.

EXCELLENT SHIPPING RECORD OF HBI

When it's really HBI, as defined by the IMO, there have been NO incidents of over-heating. The inset box contains the official descriptions of HBI and DRI.

Exact records are not kept, but reasonably accurate estimates can be made from existing data...

- HBI shipped as ocean freight, to date, is well over 60 million tons; ton-kilometers to date are approximately 450 billion.
- Based upon typical shipments being in vessels of about 30,000 tons, there have been over 1,800 ocean shipments of HBI.

Only three incidents of cargo over-heating are known. In all three cases, upon closer investigation (inspection of photos of the hot material), it was found that the cargo (or at least the portion of the cargo that over-heated) did not fulfill the IMO specification of HBI. In each of the three shipments, the concentration of fines exceeded the limitation mandated by the BC code of no more than five percent of minus four millimeters. We would also like to emphasize that ***none of the three cargoes*** consisted of MIDREX® HBI.

In other words…

- No known cargo of HBI meeting IMO specifications has ever had an incident.
- No known vessel loaded with MIDREX® HBI has ever had an incident.
- If HBI is properly prepared and transported, there will be no problems. It is a safe material with a proven record.
- Also, among the latest 90 percent of these shipments (over 55 million tons), there has been only one incident.

CONCLUSION

Over simplifying issues and incorrectly defining iron products has led to misconceptions about HBI in general. For more than a third of a century, HBI has safely and successfully allowed for storage and ocean shipping of direct reduced product. HBI will continue to be the preferred product for merchant supply of DRI, even after the forthcoming revision of the IMO Code of Safe Practices for Solid Bulk Cargoes (also known as the BC Code).

Nucor Gives Breath of Fresh "AIR" to Idled MIDREX® Plant

By Lester Hart, Nu-Iron Unlimited
John Kopfle, Midrex Technologies, Inc.

INTRODUCTION

The explosion of world steel prices beginning in 2004 has revitalized the steel industry and created tremendous optimism. North American electric arc furnace (EAF) operators, including Nucor, have benefited from this run-up in prices through higher profit margins and expansion. Nucor has production capacity exceeding 25 million tons of steel per year and sells a range of products including rebar, wire rod, structural steel, plate and hot-rolled coil. This growth has created a need for additional sources of high quality metallic feed for the EAFs. Nucor and other mini-mills are implementing new strategies, including backward integration, to meet this demand.

THE NEED FOR DRI

From the 1960s through the 1980s, mini-mills produced mostly long products such as rebar, which can be made using common grades of scrap. Beginning with Nucor's Crawfordsville, Indiana mill in 1989, however, the situation changed drastically. The Crawfordsville mill was designed to produce hot-rolled coil, a flat steel product that is used for automobiles, appliances and for other uses. In contrast to most long products, hot-rolled coil requires a special feed because it is rolled and pressed into thin sheets. This processing requires that the steel be almost totally free of other metals, or "clean." Steels made directly from iron ore have this quality, but steels manufactured via the recycling of scrap are generally contaminated.

There is some scrap produced in the USA that has low amounts of metallic impurities, but the volume is limited. Therefore, feed materials made from iron ore with essentially zero metallic impurities content must be blended with the scrap. This blending provides an average content that is acceptable. The materials made from iron ore are generically known as alternate iron and include direct reduced iron (DRI) in pellet or briquette form (HBI) and pig iron. Nearly all of these materials are imported to the USA.

The flat products mini-mills found that by using 20-50 percent alternate iron, they were able to produce clean steel and successfully meet the metal residuals specifications in their steel products. With the use of alternate iron, the business model was very successful. A number of mini-mills making special bar products also use some alternate iron.

For the past several years, USA imports of alternate iron have been at the six million ton per year level and Nucor has accounted for a significant share of those imports. As the company continued to grow and metallics prices jumped in 2004, Nucor began searching for new sources of alternate iron to feed its ever-expanding needs. The company began investigating DRI production and discovered a recently closed direct reduction plant.

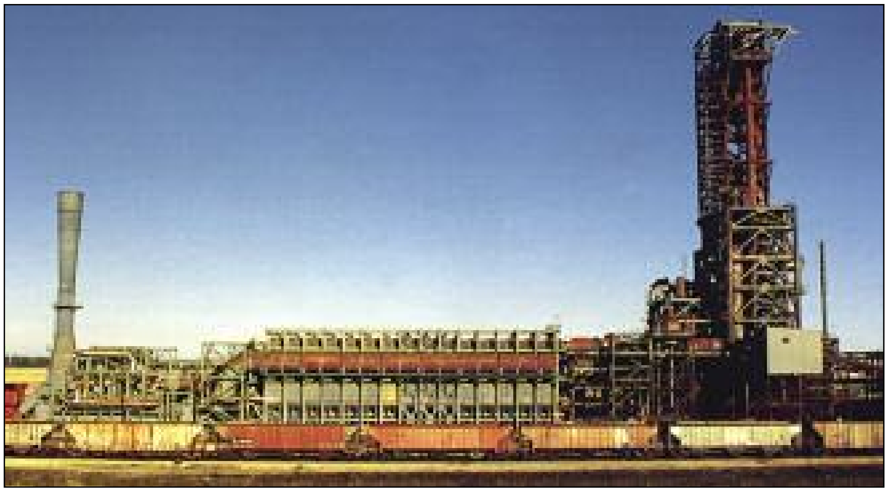


Figure 1- American Iron Reduction, Convent, Louisiana, USA

HISTORY OF THE NU-IRON PLANT

During the 1990s, rising scrap prices forced USA mini-mills to look for alternate sources of feedstock. An attractive option was domestic natural gas-based direct reduction because of low natural gas prices, from $1.50-2.00 per million Btu at the wellhead. GS Industries, then the parent company of Georgetown Steel Corporation (now owned by ArcelorMittal), and Birmingham Steel (now owned by Nucor) partnered to develop a new MIDREX MEGAMOD®. The concept was to produce DRI in Louisiana that would be shipped to the partners' mini-mills in the southeast and midwest USA. Excess product would be sold to others.

The plant was known as American Iron Reduction (AIR) and it was located in Convent, Louisiana, on the Mississippi River between New Orleans and Baton Rouge. This location had several advantages, including inexpensive natural gas, river access to receive Brazilian iron ore and ship out DRI, and rail connections.

The plant, shown in Figure 1, included a 6.65 meter diameter MIDREX® Shaft Furnace, a 15-bay MIDREX® Reformer and it was the first MIDREX Plant to incorporate a vertical furnace feed conveyor. AIR started up in January 1998 and passed the performance test within one month of first product. Production rates of up to 180 ton/hour were achieved, with metallization levels as high as 96 percent and carbon content of 1.8 percent. Unfortunately, the USA steel market turned down in 1998, reducing demand for DRI and AIR did not operate continuously. By the second half of 2000, rising natural gas prices forced the owners to close the plant permanently. It produced a total of 1.65 million tons of DRI from start-up until its closure in September 2000.

A DIRECT REDUCTION RENAISSANCE

After performing its due diligence, Nucor determined that it would be feasible to dismantle the AIR Plant and relocate it to Trinidad. This promised to provide a competitive supply of natural gas and favorable logistics for receiving iron ore and shipping DRI to Nucor's meltshops in the United States. Such a move was not unprecedented, as relocation of MIDREX Plants had been done twice before. The former NFW Plant in Germany was moved to India in 1990 and the British Steel Modules in Scotland were relocated to Mobile, Alabama in 1997. In September 2004, Nucor purchased the idled AIR Plant and became dismantling it. In April 2005, Nucor signed a contract with Midrex Technologies for upgrading of capacity by 400,000 tons per year. A site was identified at the Point Lisas Industrial Estate in Trinidad.

Figure 2 - Locations of American Iron Reduction and Nu-Iron Plants

Nucor named the new company Nu-Iron Unlimited. Figure 2 shows the locations of AIR and Nu-Iron and the proximity of Trinidad to the southeastern USA.

Several obstacles were overcome by Nucor's construction and engineering group to safely and efficiently dismantle and transport the plant on 13 ocean barges down the Mississippi River, across the Gulf of Mexico and Caribbean Sea to its final destination in Trinidad, with the last barge diverting slightly to avoid Hurricane Katrina. Simultaneously, Nucor worked closely with Midrex to modify the plant's capacity by adding reforming capability and gas compressor capacity, which increased the nameplate rating to 1.6 million tons per year. The completed facility is shown in Figure 3, with the shaft furnace in the center of the photo, the red DRI storage bins just to the left and the receiving and shipping docks behind them.

On December 31, 2006, Nu-Iron started operations after a two year process of relocation and reconstruction. The start-up of the plant proved to be highly successful. The combination of proven MIDREX Technology, highly competent commissioning staff, along with the talented and dedicated Nu-Iron team, completed with ease the Midrex PGT (Performance Guarantee Test) in the second week of operation and the team at Nu-Iron never looked back. Achieving the million ton milestone in a mere 257 days is a stellar feat. Nu-Iron finished 2007 with over 1.4 million tons produced with average metallization of 95.7 percent and average carbon content of 2.41 percent. All the Nu-Iron product is transported by water to Nucor's steelmaking plants in the USA and in 2007, 1.3 million tons were safely shipped without incident. Nu-Iron DRI is providing a valuable source of high quality feed for many Nucor meltshops.

Figure 3 - Nu-Iron Unlimited, Point Lisas, Trinidad & Tobago

Midrex News & Views

Interview with Midrex President and CEO James McClaskey

MIDREX TECHNOLOGIES' BUSINESS STRATEGY

– Meeting Strong Demand for Direct Reduction Plants –
– Maintaining 60 Percent World Share –

Editor's note: Recently Midrex President and CEO James D. McClaskey was interviewed in Tokyo, Japan by the Japanese media regarding Midrex and the DR industry. The following is a reprint of the article in its entirety translated from Japanese to English, page 3 of Sangyo Shimbun - February 18, 2008.

By Masumi Tanifuji

Kobe Steel's 100 percent owned subsidiary, Midrex Technologies, Inc., headquartered in Charlotte, North Carolina, is the world's leading direct reduction plant engineering company. Approximately 60 MIDREX plants are in operation in North, Central and South America; the Middle East; Southeast Asia and other regions that produce natural gas. Of the 60 million tons of direct reduced iron made worldwide in 2006, the MIDREX® Process commands a 60 percent share. The Sangyo Shimbun asks Midrex President and CEO James McClaskey, who was recently in Japan, about the direct reduction business and prospects for the future.

What does Midrex do?

"We provide direct reduction process engineering, plant and equipment supply, and field services worldwide, together with Kobe Steel and Siemens VAI. The processes consist of our MIDREX® Process, FASTMET® / FASTMELT® co-developed with Kobe, and ITmk3® developed by Kobe."

MIDREX plant orders have been strong. What about your business performance?

"Since 2004, we have received nine orders from such countries as Saudi Arabia, Qatar, Egypt, Malaysia and Pakistan. This large number of continuous orders is a first for us. Since 1969, we have received orders for a total of 64 plants in 21 countries. Four of the plants are currently under construction. In 2006, both sales and profits (profit before income taxes) reached record highs. Although 2007 results did not reach the same level as 2006, they were extremely robust. We project that our performance in 2008 will be similar to 2007.

Midrex became a wholly owned subsidiary of Kobe Steel in 1983 and this year marks our 25th anniversary. Around 2000, orders for direct reduction plants fell to zero. It was a very difficult time for us, and it was a very difficult period for Kobe Steel as well. But Kobe Steel steadfastly stood by us and for that I am thankful."


日刊 産業新聞
Japan Metal Bulletin
還元鉄プラント好調
ミドレックス・テクノロジーズ 経営戦略
世界シェア60%を維持
ジェームス・マクラスキー社長兼CEOに聞く

Why are orders for MIDREX plants so strong?

"The world steel market is in a high-growth phase, and demand for metallics from resource-rich countries with natural gas and iron ore has grown tremendously. The advantages of DRI in terms of cost and quality, compared to pig iron and steel scrap, and the stable operating performance of the MIDREX Process, compared to other DR processes, have been highly evaluated. DRI made by the MIDREX Process is a high-quality product consisting of 95 percent iron. It is generally traded at similar

(Continued on following page)

Midrex News & Views

Larry W. Shields
Plant Sales Manager

Midrex Introduces Plant Sales Manager

Larry W. Shields has been announced as new Plant Sales Manager for MIDREX® Shaft Furnace Technologies.

He is the latest member of the Midrex Commercial Sales Group, joining Todd Ames and Henry Gaines in promoting and negotiating new Shaft Furnace Direct Reduction Plant sales worldwide.

Shields comes to Midrex Technologies, Inc. from Pneumafil Corporation (Charlotte, NC) where he was Business Development Manager. He has more than 25 years experience selling capital equipment to industry with an extensive technical background in process equipment and a wealth of cross-industry experience.

Shields resides in Rock Hill, SC and has a Bachelors of Science from Western Carolina University and MBA from UNC-Charlotte.

(Interview continued from previous page)

price levels as bundles, bushelings and other types of high-grade scrap. DRI contains no copper, as opposed to scrap, which does. A MIDREX Plant with a capacity of 1.4 million to 1.8 million tons costs around $300 million to $400 million to build. Russia, which has its own source of iron ore and natural gas, has a production cost of about $100 per ton, excluding depreciation and interest. In the Middle East, where iron ore must be procured from elsewhere, the cost is estimated to be around $180 to $200 per ton. The price of high-quality scrap has climbed to around $400 per ton and is anticipated to rise further."

How much CO_2 does the MIDREX Process emit compared to a blast furnace?

"Natural gas, which is used as the reductant, has less carbon than coal. The MIDREX Process emits only one-third the CO_2 of a blast furnace, on a per ton basis. The reduction of greenhouse gases used to be an issue limited to certain regions, but no longer. We will continue to conduct research on increasing energy savings in the MIDREX Process and improving the process itself."

What is the medium-term outlook for the DR market?

"By 2015, we anticipate that world DRI production will double to 110 million to 120 million tons. Over 90 percent of the DRI is used in electric arc furnaces, but the market is growing for use in basic oxygen furnaces as a supplement to scrap. We project that we will be able to maintain a roughly 60 percent share of the market and hope to even increase that share."

We have received numerous inquiries for the MIDREX Process from areas where natural gas is available, such as Russia, the Middle East and other regions. As for FASTMET, FASTMELT and ITmk3, feasibility studies are underway in the United States, Australia, Eastern Europe and India. Last year, mini-mill steelmaker Steel Dynamics and Kobe Steel agreed to build a commercial ITmk3 plant. Natural resources company Cleveland-Cliffs and Kobe are also working on a joint venture project, which I hope will be decided within this year. As for FASTMET / FASTMELT, we anticipate gaining an order this year. Looking at the medium term, we hope to win orders for at least one gas-based plant and one coal-based plant each year."

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Christopher M. Ravenscroft: Editor

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