ALASKA LEGISLATURE 1164
HOUSE and SENATE FINANCE COMMITTEE FILES, 1993-1994 238

For additional information about a RDIF loan, contact:

Elstun Lanesen
State-wide Economic Development Specialist
DCRA, 333 W. 4th Ave. Suite 220,
Anchorage, AK 99501-2341
259-4529

Economic Development Specialist
Service Areas

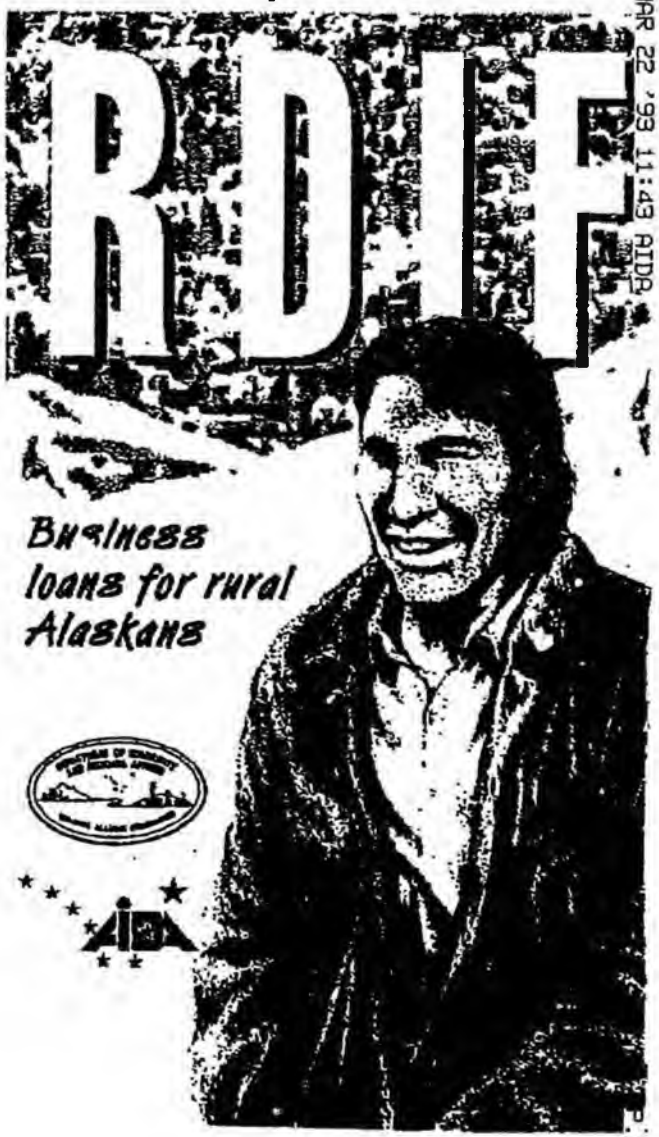
For AIDEA information:

Sue Wilds, Economic Development Coordinator
Sue Wellner, Loan Servicing Officer
AIDEA, 480 W. 117th, Anchorage, AK 99503
561-8050

You may also contact your bank.

POSTAGE

Rural Development Initiative Fund



What is the RDIF loan program?

The Rural Development Initiative Fund (RDIF) was established and funded by the Alaska Legislature in 1992. Its purpose is to target small businesses that may not be eligible for traditional commercial financing. RDIF loans are geared toward creating employment opportunities in rural Alaska by providing small, basic industries with business capital.

Who administers the program?

The Department of Community and Regional Affairs, in conjunction with private lenders and the Alaska Industrial Development and Export Authority (AIDEA).

Who is eligible to apply for a RDIF loan?

Alaska businesses located in communities of 5,000 or less, or in unincorporated communities.

How do I apply?

Prospective borrowers should discuss their proposed venture with their bank and the Economic Development Specialist serving their region from the Department of Community and Regional Affairs.

The bank and the Economic Development Specialist will work together to initiate and package the loan for submission to AIDEA. If the loan is approved, AIDEA may guarantee 80% of the bank's financing, with up to 20% of the remaining financing coming from the Department of Community and Regional Affairs.

How can I use a RDIF loan?

Purpose	Terms
Working Capital	Maximum of 5 Years
Personal Property	Maximum of 15 Years
Construction	Maximum of 20 Years

What is the maximum amount that I can borrow?

$100,000 per individual borrower or $200,000 for two or more borrowers. The number and size of loans may be limited by availability of funding.

Is there an application fee?

Yes. It's $100.

What is the interest rate?

7% until Octob. 1, 1993
Prime + 1% thereafter
(Never less than 6%)

SB

171

SFIN

FILE

SUBJECT: Amend. #1 SB 171
4-6-93

	YEA	NAY
SENATOR SHARP	✓	
SENATOR KERTTULA	✓	✓
SENATOR RIEGER		
SENATOR KELLY	✓	
SENATOR JACKO	✓	
SENATOR FRANK	✓	
SENATOR PEARCE	✓	
TOTAL	6	1

PASSED ✓ FAILED

SUBJECT: Passage CSSB 171 (Fin)
4-6-93

	YEA	NAY
SENATOR JACKO		✓
SENATOR KELLY	✓	
SENATOR KERTTULA	✓	
SENATOR RIEGER	✓	
SENATOR SHARP	✓	
SENATOR FRANK	✓	
SENATOR PEARCE	✓	
TOTAL	6	1

PASSED ✓ FAILED

SENATE FINANCE COMMITTEE REPORT

DATE: 3/24/93 FURTHER:

DATE TURNED INTO OFFICE: 4-6-93

The Finance Committee considered SENATE BILL NO. 171

Contracting and financing authority of the Alaska Industrial Development and Export Authority, giving approval of the issuance of the authority's revenue bonds, and delaying the termination date of the authority's business assistance program; efd.

and recommends:

[ ] replace with _____ CS SB 171 (FINANCE)
or [ ] adopt previous _____ CS _____ (_____)
[ ] attaches amendment(s)

[ ] same title
[ ] ~~new~~ title
[ ] technical title change (HB only)

[ ] adopts _____ Letter of Intent

[ ] further referral to the _____

CS (Fin) coming

[ ] ~~do~~ pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

NEW FISCAL NOTES

Department	Date	Zero	Fiscal

PREVIOUS FISCAL NOTES

Department	Date	Zero	Fiscal
DCED	3-22-93	0	

[ ] Appropriation No Fiscal Note

DO PASS: Tim Kelly

Bert Wrap

1. Mark DO PASS
Co-Chair: Signature/Recommendation

OTHER RECOMMENDATIONS:

Steve Rieger -- No Recommendation

2. True Parker. DO PASS
Co-Chair: Signature/Recommendation

FISCAL NOTE

No. 1

STATE OF ALASKA
1993 LEGISLATIVE SESSION

Bill Version: SB 171

(S) Publish Date: 3-24-93

Revision Date:

Department Affected: Commerce and Economic Development

Title: An Act relating to the contracting and financing authority of AIDEA and extending a program.

BRU: AIDEA

Component: AIDEA

Sponsor: Senator Pearce

Requestor: Senator Pearce

COMPONENT SERIAL NO.

EXPENDITURES/REVENUES:

OPERATING	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL	0	0	0	0	0	0
CONTRACTUAL	0	0	0	0	0	0
SUPPLIES	0	0	0	0	0	0
EQUIPMENT	0	0	0	0	0	0
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE FUND SOURCE:	0	0	0	0	0	0
FUNDING:						
1002 Federal Receipts	0	0	0	0	0	0
1003 GF Match	0	0	0	0	0	0
1004 GF	0	0	0	0	0	0
1005 GF/Program Receipts	0	0	0	0	0	0
1006 GF/MHTIA	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0
POSITIONS:						
FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year (FY 93) impact: -0-

ANALYSIS: (Attach a separate page if necessary.)
Bonds of AIDEA will be sold to finance the Anchorage public-use aircraft fueling facilities and will have no fiscal impact on the General Fund. The Business Assistance program is a guarantee program on bank originated loans and with careful oversight should have no fiscal impact on AIDEA.

Prepared by: William R. Snell, Executive Director
Phone: 561-8050
Division: AIDEA
Date: March 22, 1993

Approved by Commissioner: Paul Fuhs
Agency: Commerce and Economic Development
Date: March 22, 1993

PREPARER TO PROVIDE ALL DISTRIBUTION COPIES TO GOV
For further distribution information call the Governor

Changes in CSSB171 (Fin) have no fiscal impact. This fiscal note is appropriate.
4-6-93 date
Comte Aide (initial)

Rev 11/92
dg\162fn\aidea

SFC 4-6-93
JR
moved
Adopted
6-1

REVISED AMENDMENT NO. 1

OFFERED IN THE SENATE BY SENATOR PEARCE

TO: SB 171

Page 1, line 2-3:

Delete

"giving approval of the issuance of the authority's revenue bonds,"

Insert

"authorizing the Alaska Industrial Development and Export Authority to issue bonds in a principal amount not to exceed $40,000,000 to finance the acquisition, design, and construction of public use aircraft fueling facilities and authorizing the Alaska Industrial Development and Export Authority to issue bonds in a principal amount not to exceed $50,000,000 to finance the acquisition, design and construction of port facilities related to the development and operation of a direct reduction iron ore processing facility located at Point Mackenzie,"

Page 2, following line 1:

"Sec. 2. (a) The Alaska Industrial Development and Export Authority may issue bonds to finance the acquisition, design, and construction of a port facility and related loading and conveyor equipment related to the development and operation of a direct reduction iron ore processing facility for use by the Midrex Corporation. The facility is to be located at Port Mackenzie, and will be owned by the Authority. The principal amount of the bonds may not exceed $50,000,000.

(b) Subsection (a) of this section grants the legislative approval required by AS 44.88.095(g).

SENATE FINANCE COMMITTEE
Amendment Number: 1 Revised
Bill Number: SB 171
Sponsor: Pearce Date: 4/5/93
Logged In By: RM

OFC 4-6-93
BS moved Adopted

SENATE FINANCE COMMITTEE
Amendment Number: (2)
Bill Number: SB 171
Sponsor: Pearce Date: 4/4/93
Logged In By: BW

AMENDMENT

OFFERED IN THE SENATE BY SENATOR PEARCE

TO: SB 171

Page 1, line 12:

Delete "revenue"

8-LS0883\A.1
Chenoweth
4/5/93

~~4~~ 3
JK moved including title change

AMENDMENT

OFFERED IN THE SENATE BY SENATOR ELLIS 5-1

TO: SB 171

DP
TL JR
JG
BS
JL

(BF absent)

Page 2, following line 1:

Insert a new bill section to read:

"* Sec. 3 The Alaska Industrial Development and Export Authority may issue bonds to finance the acquisition, design, and construction of a facility for the offloading, processing, storage, and transloading of seafood, to be located in Anchorage and owned by the Authority. The principal amount of the bonds may not exceed $50,000,000. This section grants the legislative approval required by AS 44.88.095(g)."

Renumber the following bill sections accordingly.

SENATE FINANCE COMMITTEE
Amendment Number: _____
Bill Number: _____
Sponsor: _____ **Date:** 4/6/93
Logged In By: Ron

CS SENATE BILL NO. 171 (Fin)

IN THE LEGISLATURE OF THE STATE OF ALASKA

EIGHTEENTH LEGISLATURE - FIRST SESSION

BY SENATORS PEARCE, Leman, Ellis, Donley

Introduced: 3/18/93
Referred:

New title language: See Amend #2 & 3 Add info re: all three projects + bond amounts to title language

A BILL

FOR AN ACT ENTITLED

"An Act relating to the contracting and financing authority of the Alaska Industrial Development and Export Authority, ~~giving approval of the issuance of the authority's revenue bonds~~, and delaying the termination date of the authority's business assistance program; and providing for an effective date."

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* **Section 1.** (a) The Alaska Industrial Development and Export Authority may issue bonds to finance the acquisition, design, and construction of public use aircraft fueling facilities located at the Anchorage International Airport, to be owned by the authority. The principal amount of the bonds may not exceed $40,000,000.

(b) For purposes of determining the applicability of AS 36.30.850(b), a contract entered into by the Alaska Industrial Development and Export Authority that relates to the project described in (a) of this section and that is to be paid from the proceeds of the ~~revenue~~ bonds issued under (a) of this section is a "contract relating to airports."

(c) Subsection (a) of this section grants the legislative approval required by

AS 44.88.095(g).

* **Sec. 2.** Section 4, ch. 162, SLA 1988, as amended by sec. 4, ch. 25, SLA 1991, is amended to read:

Sec. 4. AS 44.88.500 - 44.88.599 are repealed July 1, **1996** [1993].

* **Sec. 3.** This Act takes effect immediately under AS 01.10.070(c).

NOTE

TO: LEGAL SERVICES

FROM: KATHY
SENATE FINANCE

DATE: APRIL 6, 1993

RE: CSSB 171 (FINANCE)

PLEASE DRAFT A SENATE FINANCE COMMITTEE SUBSTITUTE FOR SB 171 INCORPORATING THE ATTACHED THREE AMENDMENTS. THE SENATE FINANCE COMMITTEE INCORPORATED THE SUBSTANCE OF SB 16 WITHIN AMENDMENT NO. 3. PLEASE INSERT LANGUAGE RELATING TO THE SEAFOOD CENTER AND ITS COST INTO THE TITLE PER THE REQUEST TO DO SO FOR THE AIRCRAFT FUELING FACILITY AND IRON ORE PROCESSING CENTER CONTAINED IN AMENDMENT NO. 1. THE BILL WAS REPORTED OUT OF COMMITTEE THIS MORNING AND WILL BE READ ACROSS INTO RULES, SO A RETURN AS SOON AS POSSIBLE WOULD BE APPRECIATED.

PLEASE DELIVER TO KATHY, ROOM 520 (WE NOW HAVE A NUMBER ON OUR DOOR, BUT IT'S THE SAME BLUE DOOR BY THE AMERICAN FLAG). GIVE ME A CALL AT 465-2816 IF THERE ARE QUESTIONS.

Thank you.
Kathy

4-6-93
John Olson
AIDEA

AIDEA PROGRAMS

1. CREDIT PROGRAM (AS 44.88.150 (d))
   * PRIVATE BANK IN THE LEAD
   * 80% OF LOAN UP TO $10 MILLION = AUTHORITY'S PARTICIPATION
   * PROJECT/PROPERTY REMAINS IN PRIVATE HANDS

2. DEVELOPMENT FINANCE PROGRAM (AS 44.88.172)
   * TERMED THE "OWN AND OPERATE" PROGRAM
   * PROJECTS OVER $10 MILLION REQUIRE PRIOR LEGISLATIVE APPROVAL
   * ADVANTAGE - TAX EXEMPT FINANCING
     - PORTS
     - AIRPORTS
     - WATER, ELECTRICITY, SEWER SYSTEMS
     - OTHER PROJECT CATEGORIES AS PERMISSIBLE UNDER THE IRS CODE
   * STATUTORY SAFEGUARDS (AS 44.88.095 (c) & (d))

   * AIDEA BONDS
     - REVENUE VS GENERAL OBLIGATION
     - TAX EXEMPT VS TAXABLE

   * PROCESS DESIGNED TO ATTRACT PRIVATE SECTOR

STATUTORY SAFEGUARDS (AS 44.88)

AS 44.88.095(c):

BEFORE ENTERING INTO A LEASE OR OTHER AGREEMENT THE AUTHORITY SHALL FIND ON THE BASIS OF ALL INFORMATION AVAILABLE:

1) PROJECT IS ECONOMICALLY ADVANTAGEOUS TO THE STATE AND GENERAL PUBLIC WELFARE

2) THE PROJECT APPLICANT IS FINANCIALLY RESPONSIBLE (CREDIT ANALYSIS)

3) DEMAND ON PUBLIC FACILITIES CAN BE SUPPLIED REASONABLY

4) PROJECT WILL PROVIDE/RETAIN EMPLOYMENT CONSISTENT WITH THE SIZE OF THE INVESTMENT

AS44.88.095(d):

BEFORE ADOPTING A RESOLUTION APPROVING A PROJECT UNDER AS 44.88.172 [THE "DEVELOPMENT FINANCE PROGRAM" FOR WHICH BONDS MUST BE ISSUED THE AUTHORITY SHALL FURTHER FIND THAT:

1) THE PROJECT IS ECONOMICALLY AND FINANCIALLY FEASIBLE AND ABLE TO PRODUCE REVENUE ADEQUATE TO REPAY THE BONDS
2) THE PROJECT COMPLIES WITH APPLICABLE LAW
3) ISSUING THE BONDS IS NOT EXPECTED TO ADVERSELY AFFECT OTHER CREDIT INSTRUMENTS OF THE STATE

AIDEA BONDS

"REVENUE" BONDS VS. "GENERAL OBLIGATION" BONDS

* AS VIEWED BY INVESTERS, ALL AIDEA BONDS ARE "REVENUE" BONDS SINCE THEY ARE BACKED BY A PLEDGE OF REVENUES.

* BONDS SUPPORTED BY A CREDIT PLEDGE OF THE AUTHORITY ARE REFERRED TO AS "GENERAL OBLIGATION" BONDS, FOR CONVENIENCE. THE TERM DOES NOT IMPLY SUPPORT OF TAXING POWER

* UNDER AIDEA'S "GENERAL OBLIGATION" CREDIT PLEDGE, THE AUTHORITY WILL MAKE PRINCIPLE AND INTEREST PAYMENTS REGARDLESS OF A DEFAULT BY THE USER. HENCE THE IMPORTANCE OF STATUTORY SAFEGUARDS AND CREDIT ENHANCEMENTS.

* THE AUTHORITY IS COMPENSATED FOR USE OF ITS CREDIT PLEDGE BY A MARKUP ON INTEREST RATE CHARGES.

TAXABLE VS. TAX EXEMPT BONDS

* IDB'S PRACTICALLY ELIMINATED IN 1986
* TAX EXEMPT STATUS REQUIRES GOVERNMENTAL OWNERSHIP
* THE AIDEA "DEVELOPMENT FINANCE PROGRAM" TAKES ADVANTAGE OF THE TAX EXEMPT STATUS FOR QUALIFIED FACILITIES (eg PORTS)
* PROJECTS MUST TO BE OPERATED BY THE PRIVATE SECTOR
* TAXABLE DEBT LACKS THE ADVANTAGES OF AIDEA

AIDEA PROCESS - PRIVATE SECTOR PARTICIPATION

DEVELOPMENT FINANCE PROGRAM

1. REIMBURSEMENT AGREEMENT - ATTACHMENT A
   * RECOGNIZES POTENTIAL BENEFITS OF AIDEA PARTICIPATION
     - AIDEA TAX EXEMPT FINANCING
     - STATE GOVERNMENT SUPPORT FOR PROJECTS
   * PROVIDES FULL REIMBURSEMENT TO AIDEA FOR FEASIBILITY AND RELATED STUDIES SHOULD THE DEAL NOT GO FORWARD.
   * IF THE DEAL CLOSES, COSTS FOR FEASIBILITY ANALYSIS AND NEGOTIATIONS ARE INCLUDED IN THE FINANCING.

2. FEASIBILITY ANALYSIS FINANCE PLAN - ATTACHMENT B
   * CREDIT STRENGTH, RISK ANALYSIS, MARKET REVIEW
   * REVENUES SUFFICIENT FOR DEBT AND OPERATIONS
   * BONDS WILL NOT ADVERSELY AFFECT OTHER CREDIT INSTRUMENTS OF THE STATE.
   * SOURCES AND USES OF FUNDS FOR THE PROJECT ARE CLEARLY DESCRIBED

3. LEASE/ USER AGREEMENT
   * FULL INDEMNIFICATION - ALL CAUSES
   * PROVISIONS FOR MAINTENANCE AND UPKEEP
   * TAKE OR PAY CONTRACT
   * ADDITIONAL CREDIT ENHANCEMENTS, AS REQUIRED
   * ALASKA HIRE
   * LOCAL GOVERNMENT APPROVAL / PAYMENT IN LIEU OF TAXES ("PILOT") AGREEMENTS

ATTACHMENT A

REIMBURSEMENT AGREEMENT

THIS REIMBURSEMENT AGREEMENT (herein, the "Agreement") is made this 12th day of March, 1993, between Anchorage Fueling and Service Company ("AFSC") and the Alaska Industrial Development and Export Authority (the "Authority").

R E C I T A L S:

WHEREAS, pursuant to AS 44.88 (the "Act"), the purpose of the Authority is to promote, develop, and advance the general prosperity and economic welfare of the people of Alaska, to relieve problems of unemployment, and to create additional employment by providing means of financing and facilitating the financing of industrial, manufacturing, export, small business and other business enterprises, and other facilities, including facilities for transportation; and

WHEREAS, AFSC desires to operate a new tank farm and fuel pipelines connecting to its existing aircraft fueling hydrant system and supply pipelines, and is considering the construction of a new maintenance and operational base building and replacement of existing facilities (the "Facility" as more particularly described in Exhibit "A" attached hereto) located at the Anchorage International Airport; and

WHEREAS, to facilitate the interests of the State of Alaska, the Authority and AFSC in constructing and operating the Facility, the parties hereto desire to obtain all available information as to the Facility, including information as to the feasibility and planning thereof, and thereafter enter into an agreement with AFSC providing for the ownership, financing and management of the development of the Facility; and

WHEREAS, the Authority is willing to acquire the necessary interest in the site on which the Facility is to be constructed; and

WHEREAS, AFSC desires to lease the Facility from the Authority, or otherwise enter into an agreement for the use and/or management of the Facility, providing that the Facility is constructed in accordance with Plans and Specifications to be later developed by consultants to AFSC and reviewed by the Authority; and

WHEREAS, the Authority encourages the use of competitive procurement principles in the study, development, financing, design, and construction of the Facility except for those portions of the Facility as to which AFSC and the Authority mutually determine that only one firm or a select number of firms posses the requisite expertise; and

WHEREAS, in connection with such review the Authority plans to retain feasibility, planning, financial, design and engineering consultants, as well as bond counsel and such other qualified professionals as are necessary as consultants to assist it in obtaining and evaluating information related to the Facility and the development thereof and to provide professional advice to the Authority in that regard (the "Study); and

WHEREAS, the consultants are expected to gather and review all available information concerning the Facility and to inform the Authority as to, among other things, the adequacy of such information for making investment decisions as to the Facility, the nature of the financial risks involved in investment in the Facility, the engineering and other considerations involved in the selection and site development for the Facility, and the design and construction of the Facility; and

WHEREAS, Resolution No. A93-1 of the Authority provides that the Authority shall enter into an agreement with AFSC related to the costs of such a study and evaluation by the Authority and provides further that AFSC shall reimburse the Authority for the costs thereof, and this Agreement is intended to fulfill that requirement; and

WHEREAS, the Authority has determined that it is in the public interest to enter into this Agreement with AFSC with respect to the Facility; and

WHEREAS, the Authority and AFSC are each legally authorized to enter into this Agreement and each is legally authorized to perform its respective duties as set forth herein; and

WHEREAS, the parties hereto to expect that if the results of the Study are favorable they will enter into an amendment to this Agreement or an another similar agreement providing for the undertaking of additional pre-construction activities and tasks including, but not limited to, design of the Facility.

NOW, THEREFORE, in consideration of the mutual covenants and promises herein contained, and for other valuable consideration, the receipt and sufficiency of which is acknowledged, the Authority and AFSC do hereby agree as follows:

1. Subject to the reimbursement requirements set out herein, the Authority agrees that it will expend not to exceed $500,000 for costs of the Study. The Authority shall have the sole authority to enter into contracts with the consultants and other professionals who will conduct the Study, shall administer such contracts and direct the activities of those persons working on the Study. The Authority agrees that it will

consult with AFSC and seek the concurrence of AFSC before entering into any commitment or engagement as to the Study which is material.

2. If the results of the Study are favorable and the Authority and AFSC enter into a lease or other final agreement with respect to the use and/or management of the Facility, AFSC agrees that all costs of the Study incurred under this Agreement will be included as a qualified cost for purposes of determining any user fee, lease or other payment to be negotiated between the parties ("costs" of the Study as such term is used in this Agreement means the out-of-pocket costs of the Authority).

3. AFSC agrees to reimburse the Authority for all costs of the Study if (a) AFSC withdraws or otherwise declines to proceed with negotiation of an agreement providing for ownership, financing and management of the development of the Facility or a lease or other final agreement with respect to the use and/or management of the Facility, (b) the Authority, for whatever reason, declines to approve financing and/or construction of the Facility under the Development Finance program, or (c) the Authority and AFSC are unable to execute an agreement as to ownership, financing and management of development of the Facility, or a lease or other final agreement for use and/or management of the Facility. Payment of such costs of the Study is due within ninety (90) days following the date which the Authority notifies AFSC in writing of the amount of repayment which is due. If any portion of such amount is not timely paid to the Authority, interest shall accrue on the unpaid amount from the date of such notice by the Authority as provided in the preceding sentence at a rate per annum

equal to the "Prime Rate" as reported in the Wall Street Journal plus one percent (1%), such rate to be adjusted quarterly on the first days of January, April, July, and October.

4. The obligation of the Authority pursuant to this Agreement is strictly limited to participation in the Study as described herein. The Authority may impose such further terms and conditions with respect to the Study as the Authority, in its sole and absolute discretion, determines to be reasonable and prudent.

5. AFSC may instruct the Authority to terminate the Study at any time, and the Authority agrees to use its best efforts to conclude the work undertaken as part of the Study as economically as possible.

6. AFSC shall defend, indemnify and hold harmless the Authority from and against any all suits, claims, actions, losses, costs, penalties and damages (of whatever kind or nature, including reasonable attorney's fees and litigation costs) arising in favor of government agencies or third parties (including employees of the parties) on account of any damages arising out of, or in connection with, the Study or this Agreement unless due to the negligence or misconduct of the Authority or its contractors (excepting AFSC).

7. This Agreement shall be governed by and construed under the laws of the State of Alaska.

8. Any action or judicial proceeding arising out of this Agreement shall be filed and prosecuted in the Superior Court for the State of Alaska, Third Judicial District, at Anchorage.

9. This Agreement may not be modified or amended except by a writing signed by the parties.

IN WITNESS WHEREOF, the parties hereto, in consideration of the mutual covenants set forth herein and intending to be legally bound, have caused this Agreement to be executed and delivered as of the date first written above.

ANCHORAGE FUELING AND SERVICE COMPANY

By _____
FRED KETZEBACK
Chairman

ALASKA INDUSTRIAL DEVELOPMENT AND EXPORT AUTHORITY

By _____
WILLIAM R. SNELL
Executive Director

EXHIBIT A

Description of Tank Farm and Aircraft Fueling Facility

The Facility will consist of a tank farm on the west side of the Anchorage International Airport consisting of three 100,000 barrel steel tanks, a pump house and filtration building, and two 20 inch and one 8 inch buried pipelines from the tank farm through an existing utilidor under the north-south runway to connect to existing pipelines and hydrant system.

A maintenance and operational base building of approximately 16,000 square feet which may be included as part of the Facility will occupy a four acre site in the area near the domestic terminal presently utilized by Anchorage Fueling and Service Company for a tank farm and associated facilities.

Also under consideration for inclusion in the Facility are the replacement of old facilities including provisions for DART loading, DART de-fueling, refueling DART and hydrant cart vehicles; a meter prover-loop system; and related improvements

cc: WRS
REM

ATTACHMENT B

KPMG Peat Marwick

Airport Consulting Services

Post Office Box 8007
San Francisco International Airport
San Francisco, CA 94128-8007

Telephone 415 571 7722

Telefax 415 571 5220

Office Location
160 Bovet Road
San Mateo, CA 94402-3107

March 26, 1993

Mr. John Olson
Manager, Design and Construction
Alaska Industrial Development
and Export Authority
480 West Tudor
Anchorage, Alaska 99503

Re: Proposal, Anchorage Fueling and Service Company Financing Project, Anchorage International Airport

Dear Mr. Olson:

Enclosed is our letter proposal to serve as airport consultant in connection with the financing of a proposed major fueling facility relocation and expansion at Anchorage International Airport.

We look forward to receiving an executed contract from you.

Sincerely,

Michael G. Morchey
Principal

MGM/et
Enclosure
ANC115

KPMG Peat Marwick

Airport Consulting Services

Post Office Box 8007
San Francisco International Airport
San Francisco CA 94128-8007

Telephone 415 571 7722

Office Location
160 Bovet Road
San Mateo CA 94402 3107

March 26, 1993

Mr. William R. Snell
Executive Director
Alaska Industrial Development
and Export Authority
480 West Tudor
Anchorage, Alaska 99503

Re: Anchorage Fueling and Service Company Financing
Project, Anchorage International Airport

Dear Mr. Snell:

In accordance with our March 10, 1993, telephone conversation, KPMG Peat Marwick is pleased to submit this letter proposal to serve as airport consultant in connection with the financing of a proposed major fueling facility relocation and expansion at Anchorage International Airport (the Airport). Our proposal consists of this letter and its attachment.

BACKGROUND

The proposed financing would be undertaken by the Alaska Industrial Development and Export Authority (AIDEA) on behalf of the airline consortium (Anchorage Fueling and Service Company [AFSC]) that operates the fueling facilities at the Airport. The project consists of the development of fuel storage facilities at a new site and certain other modifications and improvements to fueling facilities at the Airport. The financing may also involve refinancing or defeasing some existing AFSC debt. The estimated amount of the financing is about $40 million, and is expected to be in the form of general obligation bonds.

Goldman Sachs & Co. and Prudential Securities Incorporated have been selected by the AIDEA to serve as underwriters for the transaction. Public Financial Management will serve as financial advisor for the transaction.

Mr. William R. Snell
March 26, 1993

REPORT OF THE AIRPORT CONSULTANT

As you indicated, our role would be to prepare the Report of the Airport Consultant, which would be organized in three sections: background, airline traffic analysis (market analysis), and financial analysis.

Background

The background section would present pertinent information concerning (1) the AIDEA, (2) the AFSC, (3) the Airport, (4) the Airport System (including Fairbanks International Airport), (5) existing and proposed fueling facilities, (6) the basis of need for proposed fueling facilities, including the balance of proposed capacity and demand, (7) the contractual basis for operation of the fueling system, (8) existing and proposed agreements with the users of the system, and (9) a brief discussion of competitive factors.

Airline Traffic Analysis

The airline traffic analysis would present the following: (1) an analysis of the demographic and economic basis for airline traffic in the region served by the Airport, (2) historical and forecast airline traffic (international and domestic passenger and cargo traffic) and fuel demand, (3) an analysis of international refueling stopovers, and (4) a discussion of the key factors affecting future airline traffic and demand for fuel. The airline traffic analysis would identify and present a discussion of the origin and destination passenger and cargo activity at the Airport (that is generated by the Anchorage region), cargo transit activity, and refueling stopover activity. We would give particular attention to a review of changing air service patterns for passenger and cargo airlines. The analysis will focus on the market as a whole, not on the needs of specific airlines.

Airline Traffic Forecasts. The base case forecast of airline traffic would be based on the analysis of the demographic and economic bases for airline traffic at the Airport, and discussions with the airlines serving the Airport regarding their projected traffic and their key assumptions regarding airline traffic.

In addition, to facilitate the sensitivity analysis, alternative high and low forecasts of airline traffic would be presented. The forecast period would extend five years beyond the estimated completion date of the project.

As part of our current master planning assignment at the Airport, we are preparing generalized forecasts of airline activity for planning purposes only. The forecasts would provide the basis from which we would develop forecasts suitable for financing purposes.

The master plan forecasts are prepared for long-term facilities planning, in terms of planning activity levels that correspond to Airport facilities requirements in 5-, 10-, and 20-year increments. Forecasts for financing purposes reflect the most likely level of activity for the immediate period following completion of the project, and are typically developed for a shorter time horizon.

In addition, the forecasts for the financing of the proposed fuel project would place particular emphasis on activity that specifically affects fuel flowage at the Airport, including transit and refueling aircraft activity; the master plan forecasts are more broad-based to consider overall Airport facilities planning. Further, the master plan forecasts do not include the sensitivity analyses that would be considered in forecasting airline traffic for the proposed financing.

Specific forecasts of fuel demand, and an analysis of the competitive factors affecting fuel demand, would be developed for the proposed financing.

Competitive Factors Affecting Fuel Demand. On the basis of the forecasts of airline traffic (aircraft operations in particular), as well as historical and projected trends in aircraft fueling activity, fuel demand at the Airport would be forecast. To forecast fuel demand, we would review key factors affecting airlines' fueling decisions, including (1) unit price, (2) alternative supply (including tankering and trucking of fuel), (3) diversion of traffic, and (4) contractual or other obligations. We would also review the capacity of the Airport and availability of Airport facilities (fueling, airfield, etc.) to accommodate passenger and cargo operations implied by fueling demands. The forecast of fuel demand would be based on the base case forecast of airline traffic. In addition, to facilitate the sensitivity analysis, an alternative low fuel demand forecast would be prepared to accommodate either (1) the

alternative low forecast of airline traffic, (2) adverse effects of price and/or other competitive factors on fuel demand, or (3) some combination of the two.

Financial Analysis

The financial analysis would present the following: (1) the framework of the relationship between the AIDEA and the AFSC, (2) an analysis of the financial operations of the AFSC, (3) project cost estimates (Source: AFSC), (4) project financing--sources and uses of funds (Source: underwriters), (5) annual debt service and other requirements, including status of outstanding debt (Source: underwriters), (6) fuel system operating and maintenance expenses (from current cost experience by AFSC in Anchorage and information provided by AFSC), (7) calculation of the fueling system revenue requirement, and (8) calculation of average fueling cost per gallon and per aircraft departure.

To prepare the financial analysis, we would review the estimated costs, schedule, and cash drawdowns for the planned improvements to be included in the bond financing, as provided by the project engineers. We would also review and incorporate relevant information on the plan of finance provided by the senior underwriter and other members of the finance team. We would also review the bond authorizing legislation (bond indenture/ statutes). Comments on these documents would be presented to the AIDEA and its bond counsel, financial advisors, underwriters, and the AFSC at a review meeting.

Base Case. The base case financial analysis would be based on the base case forecast of airline traffic and fuel demand at the Airport, from the results of the airline traffic analysis.

Sensitivity Analysis. In addition to the base case financial analysis, our report would present the results of a sensitivity analysis of the effects on the forecast financial results of lower airline traffic and reduced fuel demand based on the results of the airline traffic analysis.

The ability of the AFSC member airlines collectively to pay the fees and charges necessary to support the financing is a derivative of (1) the strength of the origin and destination markets at the Airport, (2) the demand for stopover and transit activity, (3) competitive factors affecting fuel demand, and

(4) the forecast level of fees and charges required to amortize the project, all of which would be analyzed and presented in the report, under both base case and sensitivity case assumptions. This information would be provided to Public Financial Management for airline credit analysis. Public Financial Management's airline credit analysis would not be included in our report.

Our report would be prepared in a format suitable for inclusion in an Official Statement for the sale of bonds, as well as to accommodate AIDEA conformity with requirements of the finance plan under AS 44.88.173 and 3 AAC 99.510, and would be made available to rating services, bond insurance companies, and institutional and retail investors in connection with the marketing of the bonds. If our report is included or referred to in the Official Statement, it must be included in its entirety.

CONTRACTUAL BASIS

We would prepare the Report of the Airport Consultant described above under the terms and conditions of our Professional Services Agreement (the Agreement) dated October 29, 1992, between the State of Alaska Department of Transportation and Public Facilities and KPMG Peat Marwick, which expires October 31, 1994. In addition to the terms and conditions in the Agreement, our services would be performed in accordance with the General Conditions Regarding Financial Studies for Public Offerings, included as Attachment A to this letter.

Before we issue our final report, we would require a letter from the Chairman of the AFSC indicating that he has reviewed our report, provided us with all relevant information, and concurs with the assumptions and financial forecasts contained in the report. We would also require a letter from the Executive Director of the AIDEA stating that the AIDEA has made available to us all relevant information concerning the financing arrangement described in the report, and concurs with the characterization of that financing arrangement.

If this proposal is acceptable, we request that the State of Alaska Department of Transportation and Public Facilities amend our Agreement to (1) authorize the work discussed herein and (2) extend the term to the expected completion date of this financing.

KPMG Peat Marwick

Mr. William R. Snell
March 26, 1993

PROFESSIONAL SERVICES FEE AND FINANCING SCHEDULE

We propose to undertake this engagement for a fixed fee of $70,000 plus out-of-pocket expenses (not to exceed $15,000) for airfare; lodging, meals, and ground transportation while in the field; telephone, postage, computer services, and express mail services; and printing and other report production costs. The distribution of fees and estimated schedule for each task is as follows:

Task	Fixed Fee	Not-to-exceed	Schedule from start date
Airline Traffic Analysis	$15,000	$ --	6 weeks
Financial Analysis	25,000	--	8 weeks
Report of the Airport Consultant	20,000	--	8 weeks *(a)*
Meetings and Coordination	10,000	--	Ongoing
Expenses	--	15,000	n.a.
Total	$70,000	$15,000	n.a.

(a) Complete draft report.

As shown, we would expect to produce a complete draft report eight weeks from the project start date. Review and revision of the report would follow, based on the schedule of the finance team. We would prepare a draft final report for presentation to the rating agencies. We would thereafter finalize the report for inclusion in the Official Statement. The budget assumes there would be no need for material changes in the final version.

This proposed fee is predicated on the assumption that the project will move forward expeditiously and that the financing will be concluded within four months of the project start date. If the financing is delayed for any reason after we have performed a substantial portion of our work or if significant time passes and subsequent events necessitate the update of the report, we reserve the right to request an increase in the fee to cover any increased cost that may result from such delay.

The fee estimate is based on an assumption of four working group meetings and preparation of two drafts of our report; additional meetings, including any meetings required in connection with rating agency/credit analysis presentations, if required, would be billed in addition on a time-and-materials basis.

Mr. William R. Snell
March 26, 1993

QUALIFICATIONS AND EXPERIENCE

Our experience with airport fueling systems has been developed through the performance of general studies involving airport master planning and financial planning and specific studies involving fueling system requirements, fueling system business planning, and fueling system financial feasibility studies. Through this experience, we have developed an understanding of current airline industry practices related to current trends in fueling system business arrangements at some of the country's busiest airports.

As you may know, we provided similar services in connection with the issuance of industrial development bonds for the expansion of the airline fueling system at Lambert-St. Louis International Airport. Also, we have recently completed a series of fueling system studies for Massport (Boston Logan International Airport), including a survey of fuel system facilities and management at major U.S. airports. In addition, we have been involved in a variety of planning and business consulting efforts regarding the development and operation of airline fueling facilities at a number of other large hub airports.

For the State of Alaska Department of Transportation and Public Facilities, we prepared forecasts of airline traffic and fuel system throughput in association with airline negotiations in 1984 and the 1986 Series G State of Alaska International Airport Revenue Bonds. In 1987, we updated the forecast of airline activity at the Airport. Therefore, we are familiar with the Airport, its existing facilities, airline operations in Anchorage, the Airport traffic mix, and trends in the industry.

Finally, we have extensive experience in airport financing and in preparing feasibility studies that explain and document the financial aspects of complicated financing/leasing structures related to airport facilities. We believe that we can provide the AIDEA with a report that will be effective in explaining the complicated nature of this financing, thereby enhancing the marketability of the bonds.

* * * * *

KPMG Peat Marwick

Mr. William R. Snell
March 26, 1993

We very much appreciate the opportunity to present this proposal and look forward to the opportunity to participate in this financing. If you have any questions or if we can be of further assistance, please call me at (415) 571-7722.

Respectfully submitted,

KPMG PEAT MARWICK

Michael G. Moroney
Principal

MGM/et
Enclosure
ANC115

Attachment A

GENERAL CONDITIONS REGARDING
FINANCIAL STUDIES FOR PUBLIC OFFERINGS

With regard to services to be provided by KPMG Peat Marwick in connection with the proposed fueling system financing program by the Alaska Industrial Development and Export Authority (AIDEA), the following general conditions shall apply:

A. Use of Reports

Any draft or preliminary financial reports prepared by us are to be used solely for the internal purposes of AIDEA and for discussion and coordination with members of AIDEA's financial working group, including AFSC. Any such draft or preliminary reports are not to be made available to any other party or to be used for securing financing or for any other purpose.

It is understood that our final Report of the Airport Consultant may be included in a prospectus or offering circular to be issued in connection with the proposed financing. We will consent to such use of our final report provided that:

1. The report with attachments, assumptions, and financial exhibits is included in its entirety in any such prospectus or offering circular.

2. We approve in advance any reproduction of our report or part thereof or any reference to the report or Peat Marwick's engagement included in the prospectus or offering circular or transmitted to other parties.

It is further understood that any information quoted or abstracted from our report and reproduced in the prospectus or offering circular will make appropriate reference to (1) the sources for and assumptions underlying such information, as described in our report, and (2) the need for the report to be read in its entirety for an understanding of the information and the underlying assumptions.

B. Information Sources

The data, information, and assumptions used to develop the financial forecasts will be derived from published information and other appropriate sources. We will not assume responsibility for the accuracy of such data, information, and assumptions.

C. Achievability of Forecasts

Any financial forecast is subject to uncertainties. Inevitably, some assumptions used to develop the forecasts will not be realized, and unanticipated events and circumstances may occur. Therefore, we cannot provide any form of assurance that the forecasts will be achieved. The actual financial results achieved will vary from those forecast, and the variations may be material. Our report will contain statements drawing attention to these uncertainties.

D. AIDEA and AFSC Representations

Before we issue our final report, we will require a letter from the Chairman of the AFSC stating that (1) they have made available to us all relevant information of which they are aware, (2) they consider the assumptions underlying the financial forecasts to be reasonable and appropriate and reflect expected conditions and expected course of action, and (3) they agree with and adopt the forecasts as representing, to the best of their knowledge and belief, the expected financial position and results of operations of the AFSC. We will also require a letter from the Executive Director of the AIDEA stating that the AIDEA has made available to us all relevant information concerning the financing arrangement described in the report, and concurs with the characterization of that financing arrangement.

E. Project Costs and Schedule

Before we issue our final report, we may require a written opinion from the legal counsel for the AIDEA, professional engineers, and/or the Chairman of the AFSC, as appropriate, stating that the projects and improvements to be financed will comply with applicable regulations and that the estimated costs and schedule for the planned projects and improvements are reasonable and achievable.

F. No Obligation to Update Report

Our final report will be dated as of the date we complete our work. It is understood that we will have no responsibility or obligation to update the final report or to revise the associated financial forecasts because of events, circumstances, or transactions occurring after the date of the report. We will not issue any form of "comfort letter" or other assurance regarding the effects of any such subsequent events, circumstances, or transactions on the conclusions of our report.

G. No Contingent Fees

It is understood that neither our fees nor the payment thereof will be contingent upon the results of our work or upon your obtaining the proposed financing.

H. General Conditions

We would express no opinion as to the ability of individual airlines or AFSC members collectively to pay scheduled rates.

JFC-93
#51
4-6-93

Fairbanks North Star Borough

809 Pioneer Road P.O. Box 71267 Fairbanks, Alaska 99707-1267 907/459-1000

April 5, 1993

SB 171

The Honorable Bert Sharp
Alaska State Senate
State Capitol
Juneau, AK 99801-1182

Dear Bert,

I would like to express to you my support for an amendment to Senate Bill No. 171, which would allow the issuance of $50 million in revenue bonds for a port facility at Port McKenzie.

The Matanuska-Susitna Borough is working hard to develop an iron ore processing facility at Port McKenzie and these revenue bonds financed by AIDEA would make this project possible.

This regional project would also assist North Railbelt communities in development of the vast coal and timber resources of the Interior.

Thank you for your assistance.

Sincerely,

Jim Sampson
Mayor

JS:rlf

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 1
To Bert Sharp	From Jim Sampson
Co.	Co. FNSB
Dept.	Phone # 459-1304
Fax # 465-2070	Fax # 459-1102

SFC-93
#51
4-6-93

Matanuska-Susitna Borough

350 EAST DAHLIA AVE, PALMER, ALASKA 99645-6488 • PHONE 745-9682
BOROUGH MAYOR

April 5, 1993

Honorable Steve Frank and Drue Pearce, Co-Chairs
Senate Finance Committee
State Capitol Building, Room 518
Juneau, Alaska 99801-1182

Dear Senators Frank and Pearce:

Attached are the schedules of expenditures by the Matanuska-Susitna Borough for the development of the industrial property at Pt. MacKenzie since 1987. As this information shows, the Borough has invested over $2 million to make this site suitable for major private industries, such as MIDREX, to locate and operate in the state of Alaska.

The expected return on this investment will be in the form of more jobs for Alaskans, lease payments, property sales, an expanded tax base, and other positive economic benefits for the state and local economies.

S.B. 171 would authorize AIDEA and the Borough to work with the private investors to arrange financing for the 'public-owned assets associated with this project. Such financing will be accomplished as a loan, and not as a grant.

The basis of both AIDEA's and the Borough's involvement in the MIDREX project is as investors seeking a return for our citizens/shareholders.

SFC-93
#57
4-6-93

PORT DEVELOPMENT OPERATING EXPENDITURES

BY FISCAL YEAR

	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993
Salaries	53,805	80,913	28,234	-0-	-0-
Benefits	15,539	26,083	10,547	-0-	-0-
Expenses Within Borough	1,905	3,542	3,341	263	523
Expenses Outside Borough	6,471	17,197	8,406	8,443	6,877
Communications	663	2,348	1,208	12,749	185
Advertising	645	2,495	3,781	6,902	-0-
Printing	470	824	492	10,589	20
Rental/Leases	210	-0-	[illegible]	134	-0-
Professional Charges	-0-	111,044	27,223	12,391	3,309
Maintenance	-0-	85	20	361	-0-
Contractual	3,294	19,758	78,688	116,946	68,721
Office Supplies	830	1,162	648	501	-0-
Miscellaneous Supplies	1,131	1,654	199	759	-0-
Equipment Under $300	546	346	230	-0-	-0-
Other Equipment	9,916	1,250	-0-	1,120	-0-
Furnishings	-0-	356	-0-	-0-	-0-
TOTAL	**95,425**	**269,057**	**163,217**	**171,158**	**79,635***

* Note the amounts for fiscal year 1993 represent only amounts actually expended or encumbered through December 3, 1992.

TC/120392-1

4-6-93
SB 171

SFC-93
#51
4-6-93

Matanuska-Susitna Borough

350 EAST DAHLIA AVE, PALMER, ALASKA 99645-6488 • PHONE 745-9682
BOROUGH MAYOR

April 5, 1993

Honorable Steve Frank and Drue Pearce, Co-Chairs
Senate Finance Committee
State Capitol Building, Room 518
Juneau, Alaska 99801-1182

Dear Senators Frank and Pearce:

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The expected return on this investment will be in the form of more jobs for Alaskans, lease payments, property sales, an expanded tax base, and other positive economic benefits for the state and local economies.

S.B. 171 would authorize AIDEA and the Borough to work with the private investors to arrange financing for the public-owned assets associated with this project. Such financing will be accomplished as a loan, and not as a grant.

The basis of both AIDEA's and the Borough's involvement in the MIDREX project is as investors seeking a return for our citizens/shareholders.

It is my hope that you will find the attached information helpful in making a decision on S.B. 171, and that you will share this information with the other members of the Senate Finance Committee. If I can be of any further assistance, please contact me at your convenience.

Sincerely,

Donald L. Moore, Manager
Matanuska-Susitna Borough

DLM:whk

Attachments (4 pages)

SFC-93
#37
4-6-93

PORT DEVELOPMENT OPERATING EXPENDITURES

BY FISCAL YEAR

	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993*
Salaries	53,805	80,913	28,234	-0-	-0-
Benefits	15,539	26,083	10,547	-0-	-0-
Expenses Within Borough	1,905	3,542	3,341	263	523
Expenses Outside Borough	6,471	17,197	8,406	8,443	6,877
Communications	663	2,348	1,208	12,749	185
Advertising	645	2,495	3,781	6,902	-0-
Printing	470	824	492	10,589	20
Rental/Leases	210	-0-	200	134	-0-
Professional Charges	-0-	111,044	27,223	12,391	3,309
Maintenance	-0-	85	20	361	-0-
Contractual	3,294	19,758	78,688	116,946	68,721
Office Supplies	830	1,162	648	501	-0-
Miscellaneous Supplies	1,131	1,654	199	759	-0-
Equipment Under $300	546	346	230	-0-	-0-
Other Equipment	9,916	1,250	-0-	1,120	-0-
Furnishings	-0-	356	-0-	-0-	-0-
TOTAL	**95,425**	**269,057**	**163,217**	**171,158**	**79,635***

* Note the amounts for fiscal year 1993 represent only amounts actually expended or encumbered through December 3, 1992.

TC/120392-1

4-6-93
SB 171

SPECIFIC PROJECTS ASSOCIATED WITH THE PORT
EXPENDITURE BY FISCAL YEAR

Port MacKenzie Port Road

	FY87	FY88	FY89	FY90	FY91	FY92	TOTAL
LAND							
Consultants		21,500.00	9,600.00			665.41	31,765.41
Design/Recon.		91,877.00	14,825.00				106,702.00
Printing Costs						5,000.00	5,000.00
Construction					43,829.03		43,829.03
Materials Purchased					92.25		92.25
Misc. Expenses	26.55	96.30	133.00		387.31	26.00	669.16
Advertising	226.40	360.90					587.30
ENGINEERING STAFF							
Administrative Time	3,805.34	5,283.64	1,367.14	5.75			10,461.87
Inspection Time		391.16					391.16
Survey Time		4,994.27					4,994.27
Design Time	1,511.27	503.25	1,742.27				3,756.79
TOTALS	5,569.56	125,006.52	27,667.41	5.75	44,308.59	5,691.41	208,249.24*

* The funding for this project was from the following revenue sources: General Fund Balance ($21,460), Land Management Fund ($90,000) and a State Administration Municipal Grant ($96,789.24).

Point MacKenzie Phase III Road**

	FY87	FY88	FY89	FY90	FY91	FY92	TOTAL
LAND							
Land		10,653.62					10,653.62
Survey		5,100.00					5,100.00
Administration (PS&E)		387.00					387.00
Construction		673,043.21	2,940.47				675,983.68
Rental		5,113.03					5,113.03
Materials Purchased		46,197.86					46,197.86
Legal Expense		1,000.65					1,000.65
Advertising		12,757.87					12,757.87
Film Processing		836.30					836.30
Mail Delivery		424.11					424.11
		15.00					15.00
ENGINEERING STAFF							
Administrative Time		37,521.25					37,521.25
Inspection Time		9,239.35					9,239.35
Survey Time		32,985.19					32,985.19
Design Time		1,674.94					1,674.94
FURNISHINGS/EQUIP.							
Furnishings/Equip.		40,006.10					40,006.10
Advertising		104.05					104.05
TOTALS		877,059.53	2,940.47				880,000.00*

* Funding for this project was from the Land Management Fund.
** Phase II related to agricultural parcels only.

Point MacKenzie Transportation Corridor

	FY88	FY89	FY90	FY91	FY92	FY93	TOTAL
BUILDINGS Advertising						223.20	223.20
LAND Design/Recon. Advertising					50,000.00	 89.25	50,000.00 89.25
IMPROVEMENTS Survey					23,835.89		23,835.89
TOTALS					73,835.89	312.45	74,148.34*

* Funding for this project was from the General Fund Balance ($50,000) and the Land Management Fund ($24,148.34).

Point MacKenzie East Port Site

	FY88	FY89	FY90	FY91	FY92	FY93	TOTAL
IMPROVEMENTS		38,600.00					38,600.00
TOTALS		38,600.00					38,600.00*

* Funding for this project was from the Land Management Fund.

Point MacKenzie AMSA Plan

	FY88	FY89	FY90	FY91	FY92	TOTALS
PLANNING STUDIES	32,400.00	12,833.53	38,766.47			84,000.00
OTHER CONTRACTUAL				24,070.00	7,930.00	32,000.00
TOTALS	32,400.00	12,833.53	38,766.47	24,070.00	7,930.00	116,000.00*

* Funding for this project was from the General Fund.

In Summary:

Total expenditures from operating funds	$ 778,492.00
Total expenditures from projects	1,316,997.58
GRAND TOTAL	**$2,095,489.58**

SFC-93
#51
4-6-93

TESORO ALASKA

April 2, 1993

Mr. Riley Snell
Director
Alaska Industrial Development Authority
480 W. Tudor Road
Anchorage, Alaska 99503

Subject: Tesoro Alaska Support of S.B. 171

Dear Mr. Snell:

As per our recent discussion, Tesoro Alaska supports the successful passage of Senate Bill 171 which will facilitate financing of needed aircraft fueling facilities at the Anchorage International Airport. These improvements are needed and will enable Alaska's support facilities to keep pace with the current and future needs of the air cargo and passenger services. The result provides benefits to all Alaskans.

We will attempt to follow the progress of this legislation and will be available to assist your efforts as appropriate. I will not be able to be in Juneau next week for your planned hearing; however on behalf of Tesoro Alaska please feel free to communicate our support.

If we may be of any future assistance in this, or any other matter, please do not hesitate to contact me.

Sincerely,

Gene Burden
Senior Vice President

cc: Senator Drue Pearce
Senator Loren Leman
Senator Johnny Ellis
Senator Dave Donley

Tesoro Alaska Petroleum Company, P.O. Box 196272, Anchorage, Alaska 99519-0272 (907) 561-5621 FAX (907) 561-5047

SFC-93
#51
4-6-93

ALASKA INDUSTRIAL DEVELOPMENT
AND EXPORT AUTHORITY

480 WEST TUDOR • ANCHORAGE, ALASKA 99501-6690 • (907) 561-8050 • FAX (907) 561-8998

PROJECT FACT SHEET: **Matanuska-Susitna Borough dock and associated infrastructure to service the MIDREX direct reduction iron processing plant**

DATE: March 31, 1993

STATUS: Legislation is currently pending in the Alaska State Legislature to provide bonding authority for this project.

PROJECT BUDGET: $30 million in bonding authority is sought for dock facility.

SOUCE OF FUNDS: Bonds sold by AIDEA to be repaid by user/handling fees.

PURPOSE: To provide tax-exempt financing for a public-use dock and associated infrastructure to service and support a MIDREX Direct Reduction Corporation (MIDREX) direct reduction iron processing plant at Point Mackenzie in the Matanuska-Susitna Borough.

PARTICIPANTS: AIDEA will finance the acquisition, design, and construction of a public use port facility; MIDREX Corporation (a subsidiary of Kobe Steel, Ltd of Japan) will provide technology and assist in finding investors and a plant operator for the $200 million direct reduction iron processing plant. The land is currently owned by the Matanuska-Susitna Borough.

BACKGROUND: The Matanuska-Susitna Borough has been working with MIDREX to encourage the corporation to locate in Alaska to produce a product through the reduction of iron ore which is used in the manufacture of steel products. Processing requires a long-term source of natural gas, found abundantly in Alaska. Ore would be imported from South American or Australia, reduced, and the processed product would be exported to the Pacific Rim. MIDREX, which has process license agreements with owners of 42 plants world-wide, would be the project manager and insure that the plant is properly engineered and operated. Direct reduced iron ore - a more pure form of iron - has seen increased demand as a supplement to scrap processing as processors have shifted away from large plant technology to new-technolog electric arc furnaces used in smaller mills which specialize in steel products for niche markets.

ECONOMIC EFFECTS: The MIDREX plant will provide 100-120 jobs in the Mat-Su area - a region historically known for high unemployment rates.

SOCIAL EFFECTS: The facility will strengthen the Southcentral economy by providing additional value-added processing of steel products.

SCOPE OF PROJECT: MIDREX began exploring the possibility to locate a plant in Alaska in early 1992. A final decision on the feasibility of the project is expected in April, 1993. If found to be feasible, construction may begin during the summer construction season of 1993. The plant will have the ability to manufacture approximately one million tons of reduced ore annually and will cover an area larger than a football field.

704/378-3379
DIRECT LINE

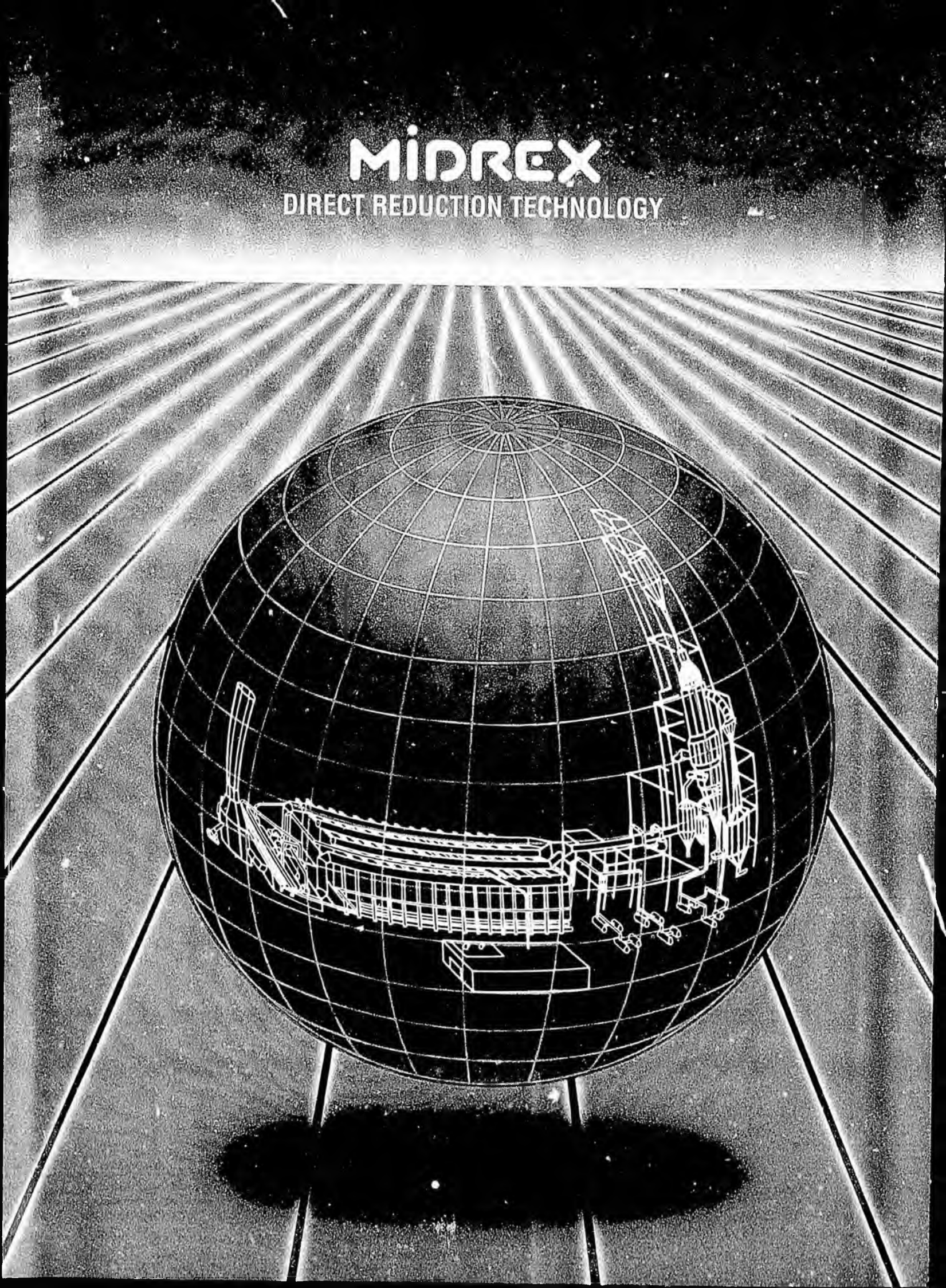
MIDREX

GREGORY S. BRANNING
MARKET DEVELOPMENT

MIDREX DIRECT REDUCTION CORPORATION
CHARLOTTE PLAZA • CHARLOTTE, NORTH CAROLINA 28244 U.S.A.
PHONE 704/373-1600 • TELEX 6827031 • FAX 704/373-1611, G2/G3

MIDREX

DIRECT REDUCTION TECHNOLOGY



Evolution of MIDREX Direct Reduction Technology

1930s Surface Combustion Company was founded and developed pyro-processing technology.

1940s Surface Combustion developed an oxide pelletizing shaft furnace and a stoichiometric gas reformer.

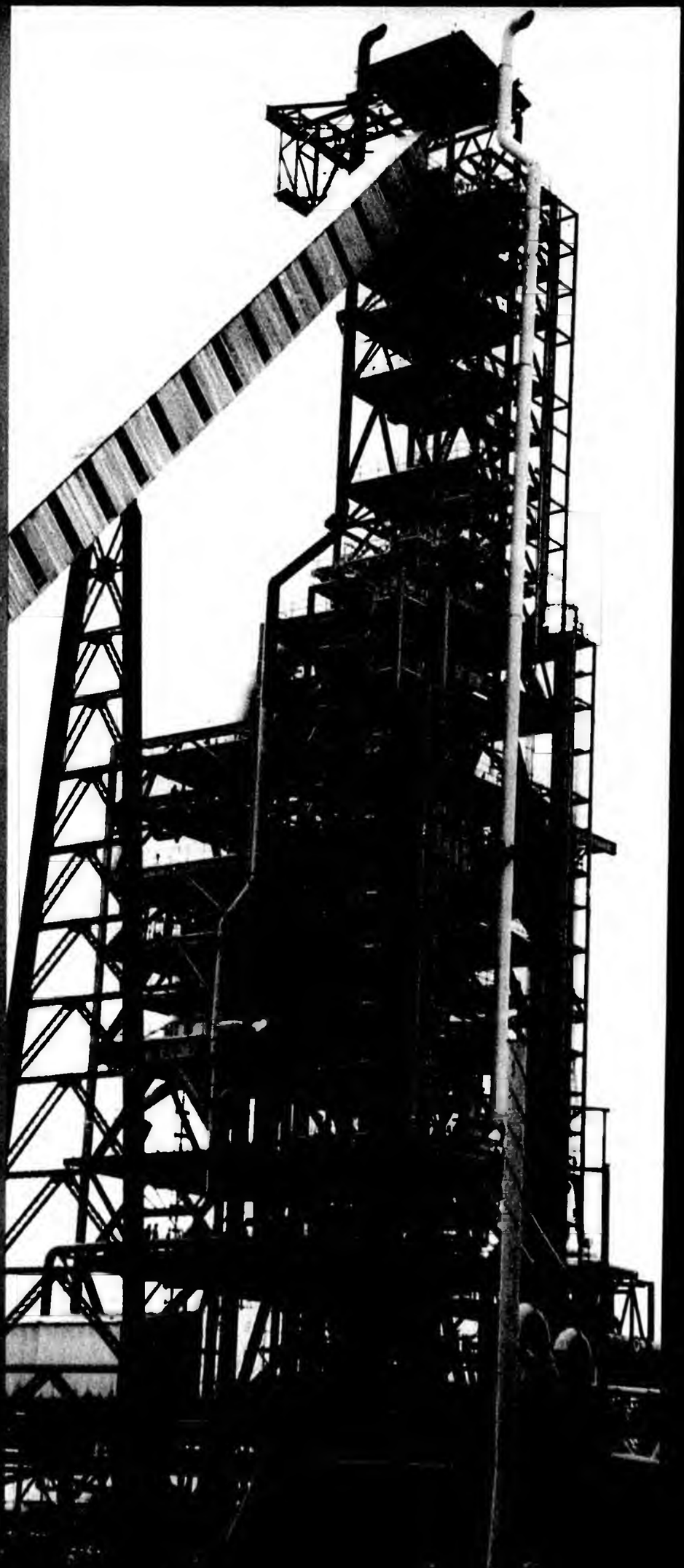
1950s Midland-Ross Corporation acquired Surface Combustion Company and began studying direct reduction of iron ore.

1960s Midrex Division was established within Midland-Ross. The MIDREX® Direct Reduction Process was scaled up to a commercial-size prototype plant in Portland, Oregon.

1970s Korf Industries, Inc. of Charlotte, NC, acquired the Midrex Division of Midland-Ross. Midrex Corporation was founded and headquartered in Charlotte, NC. More than 40 MIDREX™ Direct Reduction Modules were either installed or under construction, contract, or agreement. Numerous MIDREX Process innovations were developed and commercialized (e.g., cold briquetting, in-situ reforming, and heat recovery).

1980s Kobe Steel, Ltd. of Tokyo, Japan, acquired Midrex Corporation from Korf Industries, Inc. MIDREX® Direct Reduction Plants annually accounted for more than 50 percent of worldwide direct reduced iron (DRI) output. MIDREX Process efficiency was increased and alternate fuel options were developed. Hot discharge/hot briquetting technology was developed, and the first hot briquetted iron (HBI) plant was started up on Labuan Island, Malaysia.

1990s MIDREX Modules were designed for annual capacity of more than 1 million metric tons (tonnes). MIDREX™ Shaft Furnace was adapted to steam reforming option. MIDREX Process enhancements were developed for simultaneous hot/cold discharge of DRI, operator selection of discharge mode, and hot transport/hot charging of DRI. Coal-based FASTMET™ Process was introduced to complement gas-based MIDREX Process. Joint development of the HIsmelt™ Process (smelt reduction) was undertaken with CRA of Australia.



Shaft furnace of VENPRECAR (a.k.a. SIDECAR) plant in Matanzas, Venezuela

Evolution of MIDREX Direct Reduction Technology

1930s Surface Combustion Company was founded and developed pyro-processing technology.

1940s Surface Combustion developed an oxide pelletizing shaft furnace and a stoichiometric gas reformer.

1950s Midland-Ross Corporation acquired Surface Combustion Company and began studying direct reduction of iron ore.

1960s Midrex Division was established within Midland-Ross. The MIDREX® Direct Reduction Process was scaled up to a commercial-size prototype plant in Portland, Oregon.

1970s Korf Industries, Inc. of Charlotte, NC, acquired the Midrex Division of Midland-Ross. Midrex Corporation was founded and headquartered in Charlotte, NC. More than 40 MIDREX™ Direct Reduction Modules were either installed or under construction, contract, or agreement. Numerous MIDREX Process innovations were developed and commercialized (e.g., cold briquetting, in-situ reforming, and heat recovery).

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Shaft furnace of VENPRECAR (a.k.a. SIDECAR) plant in Matanzas, Venezuela

Providing the international iron and steel industry with state-of-the-art ironmaking technology is the sole focus of Midrex Corporation. Over the years, Midrex has become known for technical innovation and customer service — and continues to build on this reputation to advance the limits of ironmaking technology.

Many improvements have been made in the two decades since the MIDREX Direct Reduction Process was first introduced on a commercial scale. However, the basic process technology has remained steadfast, providing the technical stability that has allowed Midrex to commit itself to:

Optimizing equipment and systems for improved performance.

A MIDREX Direct Reduction Plant never becomes obsolete because the evolutionary nature of the MIDREX Process keeps it on the leading edge of technology. MIDREX Plants reach rated capacity quickly after start-up, thus contributing to rapid return-on-investment.

Meeting specific customer requirements.

Every direct reduction project has its own unique conditions. With MIDREX technology, the customer can specify iron ore and energy options, unit capacities, reformer types, and product options in order to optimize capital and operating costs and maximize the profitability of the project.

Providing on-going support after plant start-up.

A MIDREX Plant owner has access to a broad range of services to assure reliable, efficient operation. The Midrex technology transfer program entitles plant owners to improvements and innovations to the technology and ready access to experienced engineers and technicians to help keep their plants trouble-free.

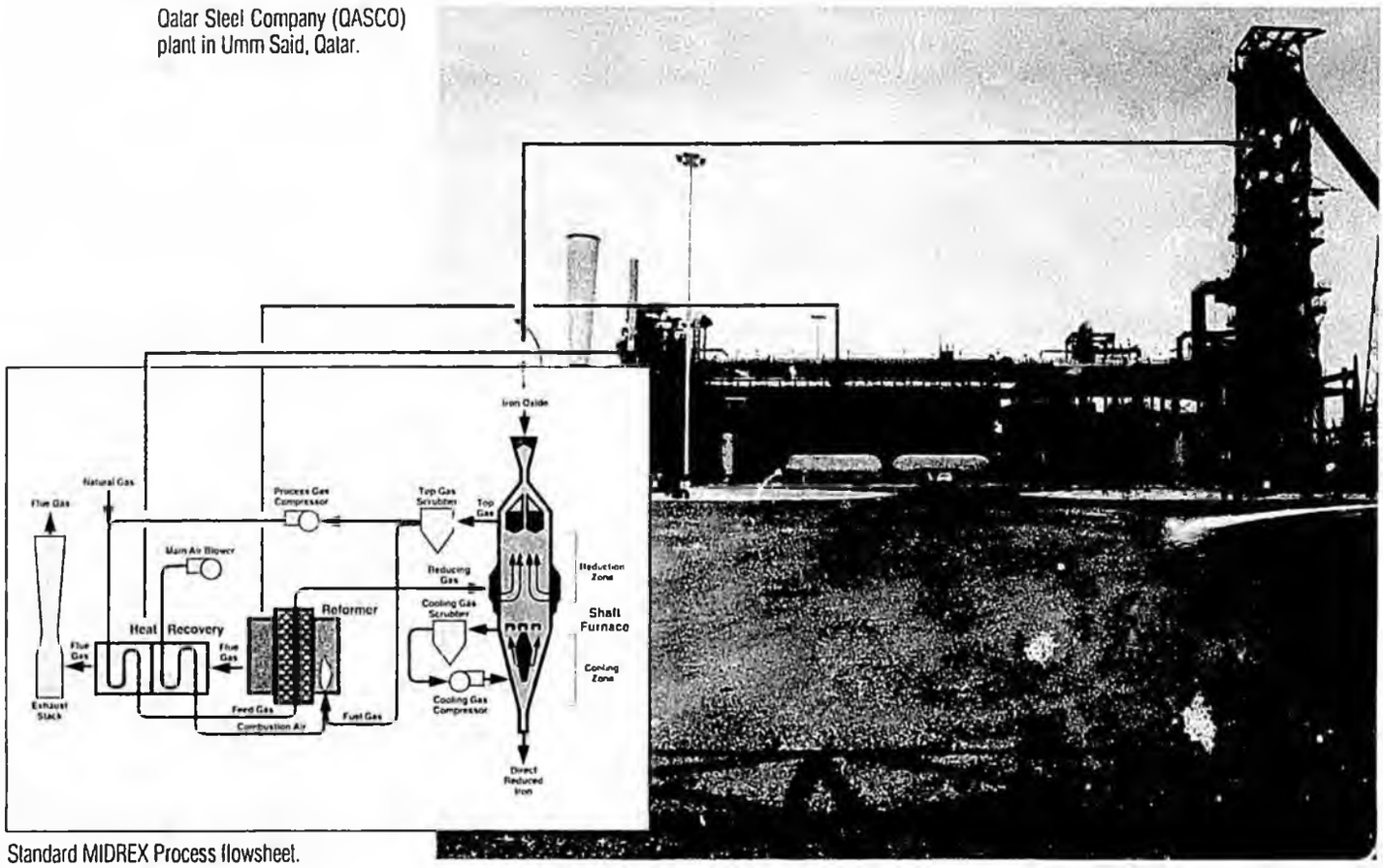
Improving the existing direct reduction technology.

The technology development strategy of Midrex encompasses both laboratory and commercial-scale work. Iron ore testing and small scale evaluations are performed at the Midrex Technical Center. Commercial-scale development is done in cooperation with operators of MIDREX Plants, where new ideas can be put to the test in ways the controlled environment of a pilot plant cannot duplicate.

Developing ironmaking technology for future market needs.

Midrex is intensely involved in the development of coal-based ironmaking and smelt reduction technology. The FASTMET Process, based on the rotary hearth furnace using pulverized coal and iron ore fines, is available for immediate commercial application. Over a longer term, Midrex is jointly developing the HIsmelt Process, a smelt reduction technology, with CRA of Australia.

Qatar Steel Company (QASCO) plant in Umm Said, Qatar.



Standard MIDREX Process flowsheet.

The MIDREX Process converts iron oxide in pellet or lump form to high purity direct reduced iron (DRI). The major components of a MIDREX Plant include the shaft furnace, reformer, and heat recovery unit. When equipped to produce hot briquetted iron (HBI), MIDREX hot discharge/hot briquetting technology is included in the plant design. These components are supported by ancillary systems for handling iron ore, gas, water, and DRI/HBI.

Reduction

Direct reduction is carried out continuously in a vertical shaft furnace. Iron oxide is fed to the top of the shaft furnace, where it flows downward by gravity and is discharged from the bottom in the form of DRI.

The shaft furnace of a standard cold discharge plant has two independent zones. In the reduction zone, iron oxide is heated and reduced (i.e., the oxygen is removed) by hot counterflowing reducing gas containing hydrogen (H_2) and carbon monoxide (CO). In the cooling zone, a counterflowing gas cools the DRI and increases its carbon content.

When hot briquetting is included in the MIDREX Process, the cooling gas circuit is eliminated and the hot DRI is compacted by briquetting machines. The HBI produced is continuously discharged from the briquetting machines, separated, and cooled.

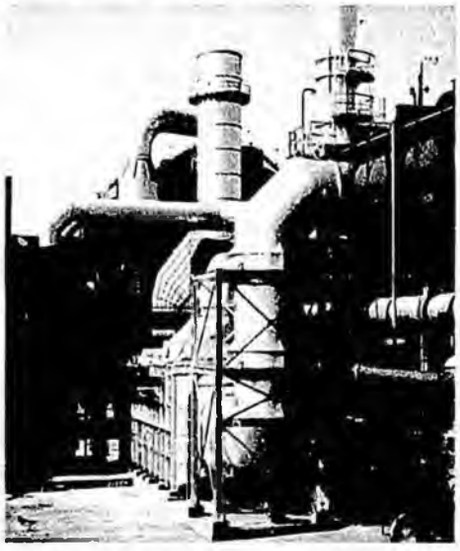
Reforming

Reducing gas is generated from a mixture of preheated natural gas and recycled gas from the shaft furnace (i.e., top gas). This mixture is chemically converted to 90-92 percent H_2 and CO in a gas-tight, refractory-lined furnace (reformer) containing alloy tubes filled with catalyst.

Reforming takes place as the gas mixture flows upward through the catalyst tubes. The hot reducing gas is used directly in the shaft furnace, which conserves energy.

Heat Recovery

The thermal efficiency of the reformer is greatly enhanced by the heat recovery system. This unit consists of tube bundles located in the flue gas ducts coming from the reformer. Sensible heat is recovered from the reformer flue gas to preheat both the combustion air used in the reformer burners and the mixture of top gas and natural gas fed to the reformer tubes.



Reformer of VENPRECAR (a.k.a. SIDECAR) plant in Malanzas, Venezuela. (top photo)

Heat recovery system at SIDERCA plant in Campana, Argentina. (bottom photo)

MIDREX Process Advantages

Commercially Proven Technology

The MIDREX Process is backed by over 250 plant-years of successful operation in 15 countries. MIDREX Plants annually produce more DRI/HBI than all other direct reduction plants combined.

Low Energy Consumption

MIDREX Plants have achieved natural gas rates of less than 2.4 net Gigacalories per tonne (Gcal/t) of DRI on a sustained basis in commercial operation.

Simple and Safe Operation

The MIDREX Shaft Furnace operates at low pressure, which improves plant safety and eliminates the need for complicated material charging and discharging systems. The MIDREX® Reformer eliminates the need for a carbon dioxide removal system, reformed gas quenching and reheating systems, steam generation system, auxiliary boiler, and in some cases, natural gas desulfurization system.

Broad Raw Material Flexibility

More than 100 million tonnes of oxide pellets and lump ores from over 40 sources have been used in MIDREX Plants.

High Unit Productivity

DRI production rates as high as 12 tonnes per day per cubic meter of active furnace volume (t/d/m³) have been achieved in commercial operation.

High Plant Availability

Midrex rates plant capacity based on 7,500 hours per year (h/y) of operation; however, commercial operation in excess of 8,000 h/y has been achieved by several MIDREX Plants.

Short Operator Learning Curve

The straightforward, uncomplicated nature of the MIDREX Process coupled with effective Midrex training programs facilitates rapid attainment of full production and commercial success.

Uniform, Consistent Product Quality

Typical metallization (percentage of total iron present as metallic iron) of DRI/HBI produced with MIDREX technology is 92-95 percent. Product carbon content can be adjusted independently of metallization within a range of 1.0-2.5 percent (1.0-1.5 percent for HBI). Simple charging and discharging systems minimize fines generation.

Low Environmental Impact

The MIDREX Process is compatible with most industrial environments and meets strict environmental standards.

Essar Steel plant in Hazira, India.
(top photo)

MINORCA plant in Puerto Ordaz, Venezuela.
(bottom photo)

MIDREX direct reduction technology can be adapted to a wide range of applications. The following options enable Midrex to design plants to meet specific site and/or market conditions.

Iron Ore

MIDREX Plants can be operated with 100 percent iron oxide pellets, 100 percent lump ore, and various mixtures of the two. Up to 10 percent of sized oxide fines can be metered into the charge to maximize yield. MIDREX Plant owners are free to select the iron ore suppliers and combination of oxide pellets and lump ore that best suit their particular requirements.

Energy

In addition to natural gas, MIDREX Plants can use most hydrocarbon gases as reductant and fuel. These include coke oven gas, by-product gas, coal gas, naphtha, and liquified natural gas. Midrex has performed extensive investigations of potential energy sources and can offer recommendations on the suitability of specific energy options.

Reformer

The MIDREX Shaft Furnace can be coupled with many types of reformers. Options include a stoichiometric gas reformer (as at most MIDREX Plants), a conventional steam reformer (as at MINORCA in Venezuela), a plasma reformer, and a partial oxidation reactor. Midrex is adapting stoichiometric steam reforming technology, which will significantly lower energy consumption versus conventional steam reforming.

Module Capacity

MIDREX Plants are designed as modules that can be combined to meet customers' capacity requirements. Single module production capacities range from 350,000 to 1.2 million t/y.

Product Discharge

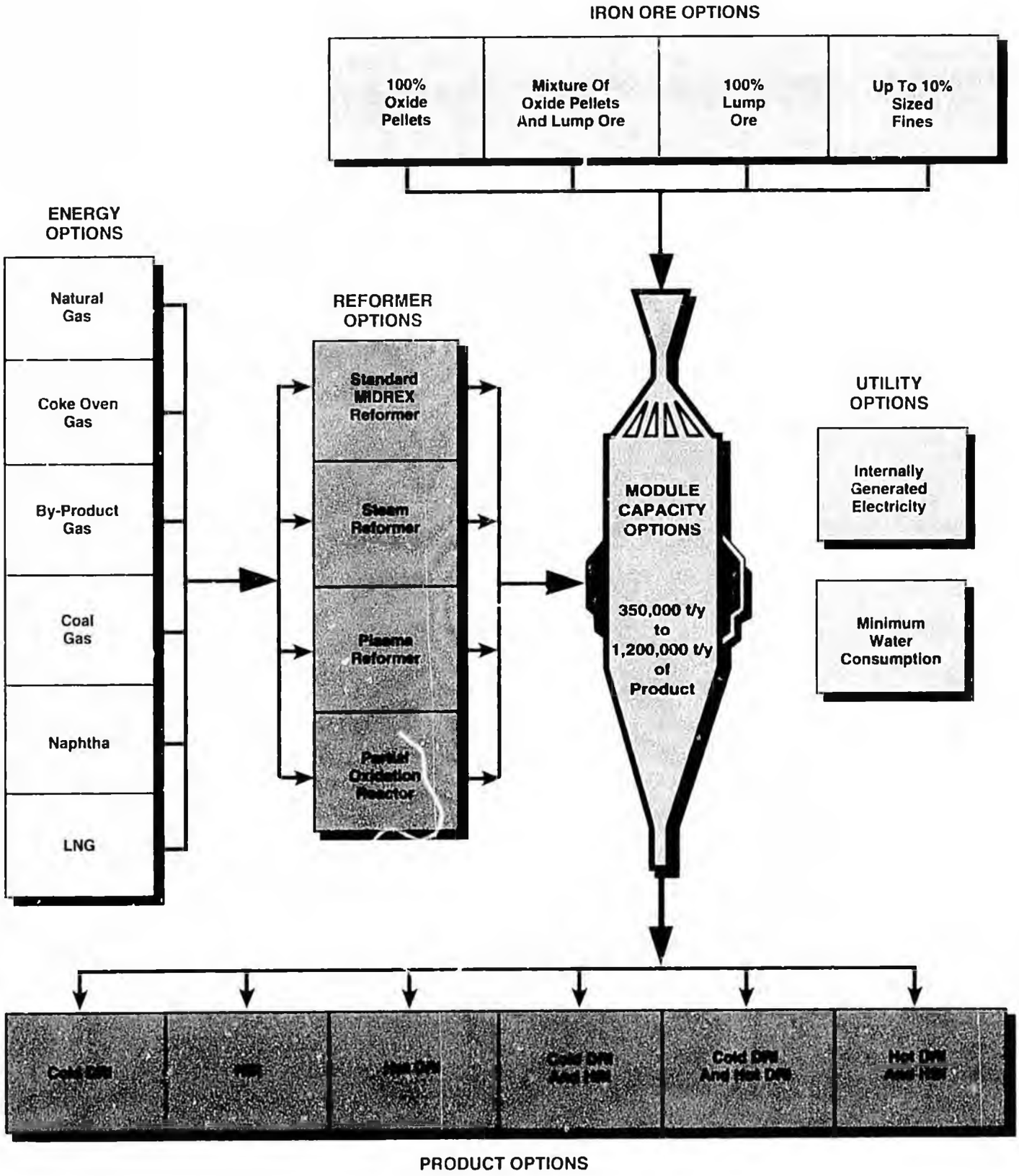
In addition to the standard cold DRI and HBI options, MIDREX Plants can be designed to produce hot DRI for charging a nearby melting furnace, for simultaneous discharge of cold and hot DRI, or for various combinations of discharge options.

Utilities

MIDREX Plants can be designed with 100 percent internally-generated electricity. For plant sites where fresh water availability is a problem, sea water heat exchangers can be used to minimize fresh water consumption.

Plant Retrofits

Midrex can retrofit existing direct reduction plants of its design or those based on other process technologies. The two-module MIDREX Plant operated by Essar Steel was originally erected in Germany as a DRI plant and subsequently dismantled, converted to produce HBI, and installed in India. The idled MINORCA plant in Venezuela was reactivated by installing a new MIDREX Shaft Furnace and extensively renovating the three original steam reformers.


IRON ORE OPTIONS
100% Oxide Pellets
Mixture Of Oxide Pellets And Lump Ore
100% Lump Ore
Up To 10% Sized Fines
ENERGY OPTIONS
Natural Gas
Coke Oven Gas
By-Product Gas
Coal Gas
Naphtha
LNG
REFORMER OPTIONS
Standard MIDREX Reformer
Steam Reformer
Plasma Reformer
Partial Oxidation Reactor
MODULE CAPACITY OPTIONS
350,000 t/y to 1,200,000 t/y of Product
UTILITY OPTIONS
Internally Generated Electricity
Minimum Water Consumption
Cold DRI
HBI
Hot DRI
Cold DRI And HBI
Cold DRI And Hot DRI
Hot DRI And HBI
PRODUCT OPTIONS

Engineers and designers adapt MIDREX direct reduction technology to specific customer requirements. (top photo)

Experienced trainers provide classroom and hands-on instruction in efficient plant operation and product utilization. (bottom photo)

Midrex Corporation is staffed by highly skilled engineers and technicians and experienced international marketing and sales professionals. The scope of Midrex activities covers all phases of a direct reduction project — from preparing a project prospectus to providing technical assistance in the use of DRI and HBI.

Project Development

Midrex supports direct reduction project developers with technical and commercial feasibility studies, market studies, cost estimates, and detailed proposals.

Project Financing

Midrex has business contacts at commercial banks, investment firms, development banks, and other financing institutions around the world to assist customers in locating and securing project financing.

Project Execution

Midrex has relationships with highly regarded plant engineering and construction companies throughout the world, thus providing the greatest possible flexibility for project execution. The expertise of Midrex and its construction partners assures that plants are commissioned and started up on schedule and within budget. Performance guarantees are met promptly and full commercial operation is achieved within a matter of weeks in most cases.

Although equipment and materials are sourced worldwide, maximum possible use is made of local equipment, materials, and services. This allows customers to optimize their capital investment and construction schedule to meet project-specific requirements.

Midrex typically provides the following scope of supply for the core direct reduction plant:

- Basic engineering
- Selected detail engineering
- Imported equipment
- Training of operating personnel
- Advisory services for erection, commissioning, and start-up

Midrex can provide a progressively larger scope of supply, through turnkey, in cooperation with its construction partners.

Technology Transfer

The MIDREX Process License provides plant owners access to the process innovations and improvements derived from ongoing development programs at the Midrex Technical Center and MIDREX Plants, as well as the operations data, applications information, and troubleshooting methods compiled by Midrex from operating plants. In addition, Midrex hosts an annual plant operations seminar in Charlotte or at an operating plant site, where operators have the opportunity to meet and exchange ideas with each other and key Midrex personnel.

Plant Services

Midrex has trained technical personnel dedicated to providing services after start-up, including safety and performance audits, plant modifications and expansions, and information exchange.

Iron Ore Testing and Sourcing

Midrex has a comprehensive program that evaluates existing raw material sources and investigates possible new sources. The Midrex Technical Center is fully equipped to assess the suitability of iron oxide pellets and lump ores for direct reduction use. Midrex also works with iron ore suppliers to develop new and improved sources of raw materials and with plant operators to evaluate iron ore sources for their particular needs.

Product Application Assistance

Staff metallurgists and technicians work with customers to optimize their use of DRI and HBI. Midrex makes available this assistance to potential clients in determining the feasibility of a direct reduction project.

On-site technical assistance allows Midrex customers to assume total operational control quickly and effectively. (top photo)

Technicians test iron ore samples at the Midrex Technical Center. (bottom photo)

Typical Characteristics of MIDREX DRI

	DRI
Fe Total*	90-94%
Fe Metallic	83-89%
Metallization	92-95%
Carbon	1.0-2.3%
P*	0.005-0.09%
S*	0.001-0.03%
Gangue*	2.8-6.0%
Cu, Cr, Ni, Mo, Sn, Pb, and Zn	Trace
Bulk Density	1.6-1.9 t/m³
Apparent Density	3.5 t/m³

Typical Characteristics of MIDREX HBI

	HBI
Fe Total*	90-94%
Fe Metallic	83-89%
Metallization	92-95%
Carbon	1.0-1.3%
P*	0.005-0.09%
S*	0.001-0.03%
Gangue*	2.8-6.0%
Cu, Cr, Ni, Mo, Sn, Pb, and Zn	Trace
Bulk Density	2.4-2.8 t/m³
Apparent Density	5.0-5.5 t/m³

* Depends on the iron ore source

DRI in lump and pellet forms. (top photo)

HBI at SGI plant in Labuan, Malaysia. (bottom photo)

MIDREX Plants produce a premium quality, low residual metallic iron for use as a charge material in steelmaking and ironcasting. At present, DRI is available in pellet and lump forms or in a compacted form known as HBI (hot briquetted iron). Midrex is considering additional forms of direct reduced iron for development.

The levels of metallic residuals and volatiles contained in DRI and HBI produced with MIDREX technology are very low, making it a highly effective diluent of other furnace charge materials that contain undesirable elements. The high metallic iron content, consistent chemical and physical characteristics, and carbon content of MIDREX DRI and HBI provide steelmakers broad flexibility in selecting their furnace charges while maintaining normal operating procedures.

For those who wish to sell some or all of their product, a MIDREX Plant equipped to produce HBI is the answer. HBI is easy to handle, ship, and store in all types of weather because of its high density and convenient size. HBI is very resistant to oxidation, even when stored uncovered. It occupies less space than scrap, and its size and shape allow it to be handled and charged with the same equipment as scrap.

Typical Applications Of MIDREX DRI And HBI

Electric Arc Furnace

MIDREX DRI and HBI are excellent charge materials for making clean, high quality steel. They can easily be batch or continuously charged to control residuals. They melt quickly and easily with scrap and can be used without expensive shop modifications. They can effectively densify the charge.

Basic Oxygen Furnace

MIDREX HBI can be used as a trim coolant, which provides higher yields and improved operating control versus iron ore or limestone. MIDREX HBI is an excellent material for dynamic temperature control.

Foundry Furnaces

MIDREX HBI can be used as an economical substitute for pig iron and/or scrap in the production of high quality ductile iron, malleable iron, steel castings in cupola furnaces, induction furnaces, and electric arc furnaces.

Ladle Metallurgy Facility

The low residual contents, compact size, high thermal conductivity, and density of MIDREX HBI make it an attractive coolant for adjusting the temperature of molten steel.

Blast Furnace

Adding MIDREX DRI or HBI to the blast furnace burden provides increased productivity and lower coke consumption.

DIRECT FROM MIDREX

1st Quarter 1993
Volume 18, Number 2

In This Issue

Operating With HBI/DRI At Nueva Montana Quijano, S. A. — A Case History

Toward Establishing The Value Of DRI/HBI – Reader Responses

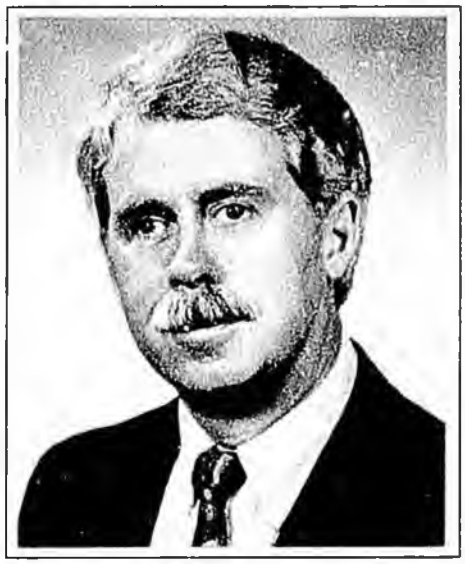
1992 DRI Production Statistics

MIDREX® Direct Reduction Plants

Commentary

DIRECT REDUCTION IS "IN"... WHAT HAPPENS NOW?

By Winston L. Tennies
President
Midrex Direct Reduction Corporation



Winston L. Tennies

It's in the headlines of the steel industry press. It's in the technical programs of steel industry forums. It's in the plans of mini mill and integrated steel executives. What is it? ... it's direct reduction.

Today, in the midst of direct reduction's renaissance, it's hard to believe that little more than 10 years ago this method of producing iron units for steelmaking found acceptance only in scrap-deficient regions and among electric furnace-based steelmakers producing basic steel products. Through the pioneering efforts of mini mills such as Georgetown Steel Corporation, Sidbec-Dosco, and Siderca, the value of direct reduced iron (DRI) in producing high grade wire, flat, and tube products was demonstrated. The high profile introduction of thin slab casting by Nucor at its Crawfordsville, Indiana, and Hickman, Arkansas, sites, and the use of DRI in these mills to meet quality specifications has garnered even more attention.

The movement of electric furnace-based steel mills into product grades once reserved for traditional integrated producers has increased the requirement for low residual iron units. Continuous casting is severely impacting home scrap generation throughout the steel industry, and now integrated steel operations are looking at DRI as a means to boost productivity as blast furnaces require relining and coke capacity is shut down. Merchant sources of DRI and HBI are in high demand.

OPCO and FIOR in Venezuela, which primarily supply the U.S. market, have fully committed their 1993 production and are seeking ways to increase output or add capacity. Oskol Electrometallurgical Combinat (OEMK) in Russia announced earlier this year its intention to export up to 600,000 metric tons of DRI — and much of it to the U.S. Yet potential demand for DRI in the U.S. alone easily outdistances the merchant supply.

Mini mill operators such as Nucor are meeting the situation head-on by investing in direct reduction plants of their own. Market-driven iron ore and scrap brokers are responding to the changing face of the U.S. steel industry by seeking involvement in new direct reduction projects. Fossil fuel producers and transportation companies are beginning to investigate the role direct reduction could play in their future business.

At Midrex, we are seeking ways to establish industry-wide standards for DRI products. We are promoting the need to determine a value for DRI that is based on its own merits rather than a comparison with scrap. This issue of *Direct From Midrex* includes the first reader responses to the article on establishing a value from DRI/HBI, which appeared in the 3rd Quarter 1992 issue.

We are providing the capability to adjust the carbon level in MIDREX® Iron to meet a broad range of steel product applications. In addition, Midrex is designing a low capital cost gas-based plant sized to the annual requirements of a single mini mill operation.

In the area of solid fuel technology, we are commercializing the FASTMET℠ Process, which could stimulate DRI production in North America, and participating in development of the HISMELT® Process, one of the foremost new ironmaking projects.

Yes, direct reduction is "in" ... and this time it's here to stay!

Contents

Departments **Page**

Commentary
Direct Reduction Is "In"... What Happens Now? 2

Features
Operating With HBI/DRI At Nueva Montana Quijano, S. A. — A Case History 3

Toward Establishing The Value Of DRI/HBI – Reader Responses 7

1992 DRI Production Statistics 8-9

MIDREX® Direct Reduction Plants 10

Midrex News & Views 11

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OPERATING WITH HBI/DRI AT NUEVA MONTANA QUIJANO, S. A.

A Case History

Introduction

Nueva Montaña Quijano, S. A. (Nuquisa) is a Spanish steel producer of high quality wire rod and wire products. Nuquisa is located in Santander on the northern coast of Spain. The plant is near an excellent deep water seaport, which facilitates the receipt of raw materials and the export of finished products.

The steel plant has a rated capacity of approximately 550,000 tonnes per year of prime billets. Carbon steel is produced in a UHP electric arc furnace with a nominal capacity of 115 tonnes and refined in a ladle furnace. One six-strand continuous casting machine produces square billets. The billets are further processed in Nuquisa's rolling and fabricating facilities into wire rod: low, medium, and high carbon wire; and low carbon wire products.

Before 1980, Nuquisa produced steel using a blast furnace/open hearth facility. Since 1980, Nuquisa has operated a modern EAF/continuous casting production facility. In converting from hot metal-based steelmaking to EAF steelmaking, raw material alternatives were evaluated to insure the continued capability to produce high quality, low residual steel grades. Since HBI/DRI was a logical raw material for this application, an HBI/DRI continuous feeding system was incorporated in the design of the new EAF meltshop.

Product Mix

Nuquisa's product mix is focused on high quality, low residual wire rod applications. Typical applications include: tire cord, tire bead, welding wire, spring and rope wire, cold heading quality, and the complete spectrum of commercial quality rod and wire.

About 70 percent of Nuquisa's production has the following maximum residual limits: Cu, 0.12 percent; Ni, 0.08 percent; Cr, 0.08 percent. Some applications are even more restrictive. For example, some products require 60 ppm maximum nitrogen content in the final product.

Raw Materials Practice

Nuquisa tailors the scrap charge to the end product application. When producing steel for applications without residual restrictions, Nuquisa charges 100 percent scrap. A typical charge composition includes approximately 30 percent plate and structural, 30 percent factory bundles, 20 percent busheling, 10 percent turnings, and 10 percent home scrap. These heats require three bucket charges.

As end use quality requirements become more restrictive, Nuquisa reduces the percentage of scrap in the charge and uses hot briquetted iron (HBI) or direct reduced iron (DRI) as a source of dense, low residual iron units. For commercial quality applications, Nuquisa uses approximately 18 percent HBI/DRI. The HBI/DRI is continuously charged through the "fifth hole" in the furnace roof via an automated material handling system. These heats require only two bucket charges.

For special quality applications, Nuquisa uses approximately 45 percent HBI/DRI, which also is continuously charged. These heats are charged with only one bucket of scrap.

The effects of using fewer scrap bucket charges when including HBI/DRI in the raw materials practice are:

- Energy savings
- Lower electrode oxidation
- Shorter heat times
- Increased productivity.

Influence of HBI on Steel Chemistry

HBI is a manufactured charge material intended for use in combination with scrap as a diluent of residual metals or as a scrap substitute in times of limited supply or wide price swings. The effect of HBI on residual chemistry of Nuquisa's steel products is summarized in Table 1. The HBI used by

		All Scrap	2-Bucket Charge with OPCO HBI	1-Bucket Charge with OPCO HBI
% DRI in Charge		0.0	18.1	45.9
Final Test				
%Cu	average	0.140	0.110	0.061
	std. dev.	0.022	0.025	0.011
%Ni	average	0.078	0.062	0.046
	std. dev.	0.016	0.008	0.006
%Cr	average	0.046	0.034	0.025
	std. dev.	0.015	0.007	0.007
%Mo	average	0.016	0.011	0.010
	std. dev.	0.007	0.002	0.000
%Sn	average	0.013	0.011	0.011
	std. dev.	0.004	0.002	0.002
ppm N_2	average	91	80	63
	std. dev.	9	8	10

Heats alloyed with chrome were excluded from the data set

Table 1 Nuquisa - Influence of HBI on chemistry

Nuquisa during the period in which the data in Table 1 was collected was produced by Operaciones al Sur del Orinoco, C.A. (OPCO) in Puerto Ordaz, Venezuela, using MIDREX™ Direct Reduction Technology.

Final chemical analysis of five residual metals were examined: copper, nickel, chromium, molybdenum, and tin. The final analyses for all five of these residuals demonstrate a very simple linear dilution that can be used to determine the expected residual content of a heat of steel for a given percentage of HBI used in the charge. The HBI can be averaged into the charge mix as containing essentially zero percent of each of the residual metals.

Copper

Histograms for final copper analysis are shown in Figure 1. Figure 1(a) shows the distribution of copper for heats charged with 100 percent scrap. Figures 1(b) and 1(c) show the distribution of copper when approximately 18 percent and 46 percent respectively, of HBI is used in the charge.

Figure 2 shows a straight line curve fit for final copper analysis vs. percent of HBI in the charge. The correlation coefficient,"R," value of .832 indicates a very high probability (99.9+ percent) that the correlation is valid. Figure 2 demonstrates the simple dilution relationship. Use of 20 percent HBI will lower copper levels about 20 percent, and 45 percent HBI will lower copper levels about 45 percent.

Nickel

The nickel analyses are plotted in Figure 3. As with the copper analyses, the averages of these values correlate well with a straight line curve fit representing zero percent nickel in the HBI.

Chromium

The analyses for chromium are plotted in Figure 4. The dilution effect for chromium is similar to that for copper and nickel.

Molybdenum and Tin

For both molybdenum and tin, the baseline values of the residual content is so small that the effect of dilution by HBI is not as easily seen. For molybdenum, the analysis declines from an average of 0.016 percent with an all scrap charge to 0.010 percent with 40-50 percent HBI. For tin, the average

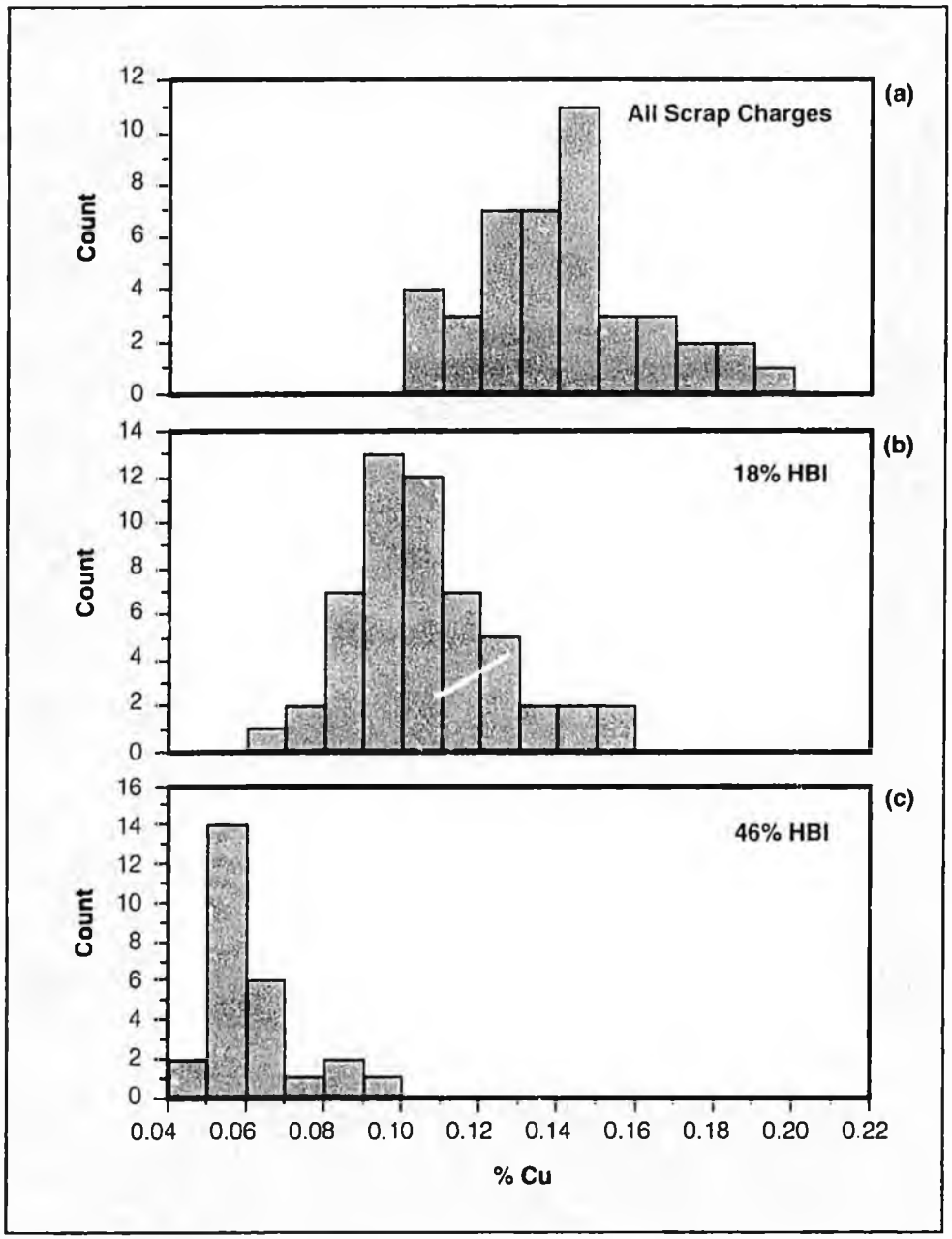


Figure 1 Copper histograms

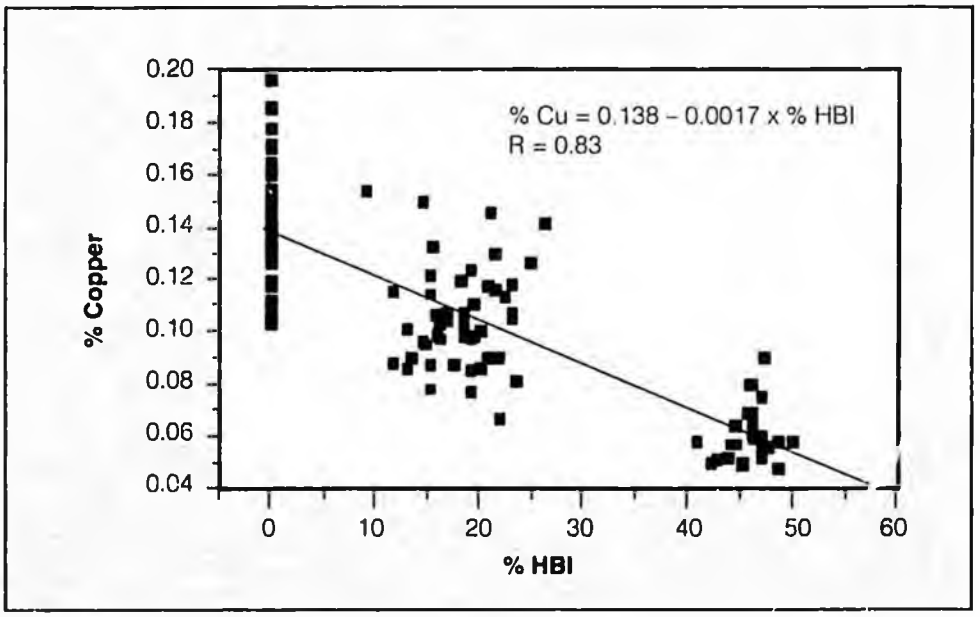


Figure 2 Final copper vs. % HBI in the charge

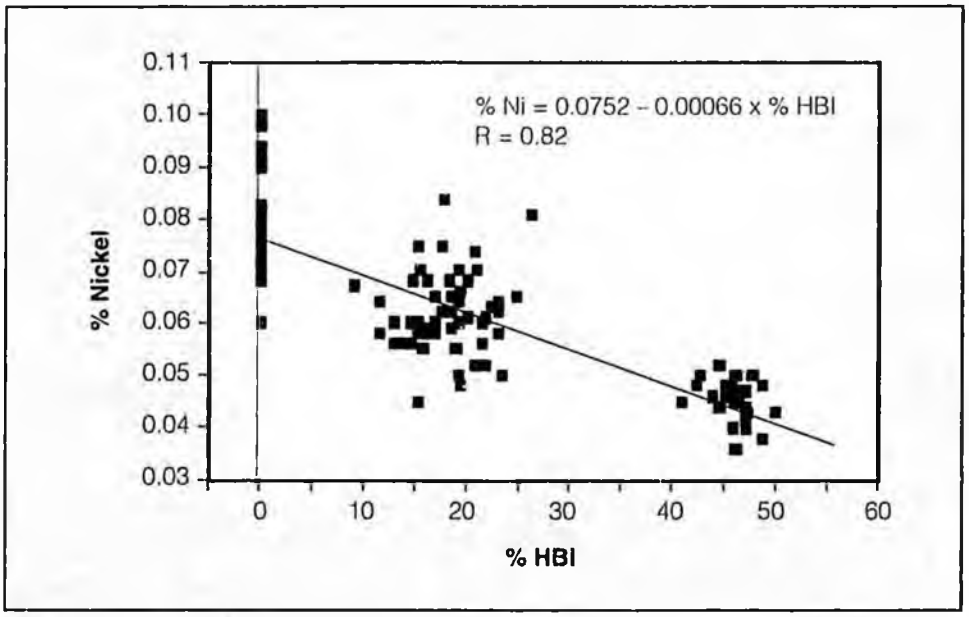


Figure 3 Final nickel vs. % HBI in the charge

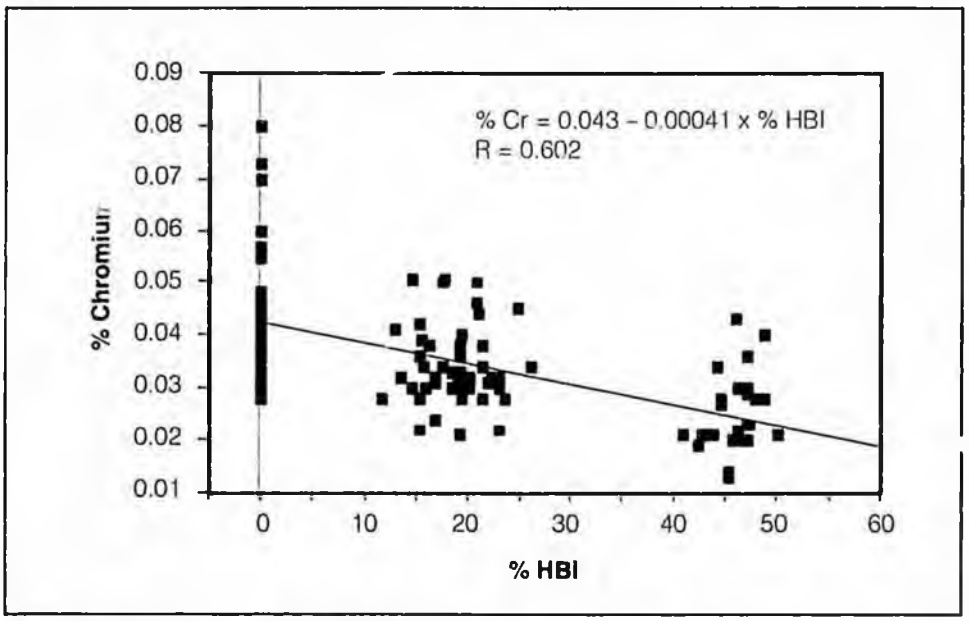


Figure 4 Final chromium vs. % HBI in the charge

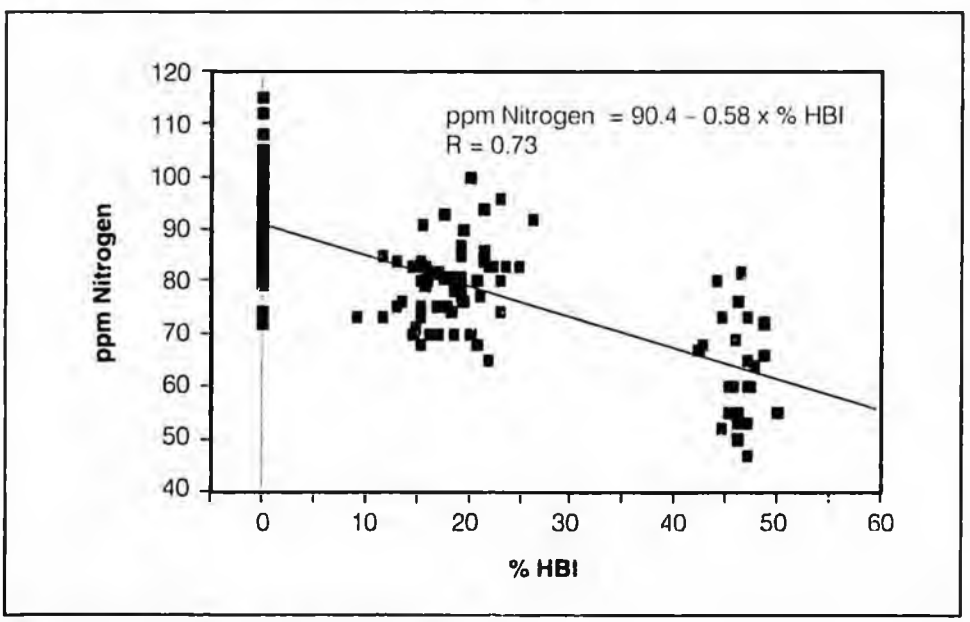


Figure 5 Final nitrogen vs. % HBI in the charge

declines from 0.013 percent with all scrap to 0.011 percent with 40 50 percent of HBI.

Phosphorus

There was little effect from use of HBI on phosphorus, as shown in Table II on the following page.

Sulfur

There was little effect from the use of HBI on final sulfur, as shown in Table III.

The sulfur level at the time of the initial test is lower when HBI was charged than for the all scrap charge, but the final test indicates that the average results are similar. However, the standard deviation is greater for the all scrap charge than it is for the heats charged with HBI.

Nitrogen

There was a significant effect from the use of HBI on nitrogen, as shown in Table IV on the following page.

Even though the mechanism for decreasing the nitrogen content of steel by using HBI in the charge is completely different from the dilution effect through which it decreases the content of residual metals, it is interesting to note that the results of the nitrogen analyses from this study give a good curve fit to a straight line proportional to the amount of HBI in the charge.

This is illustrated in Figure 5. The 91 ppm average nitrogen level experienced with all scrap is lowered to 63 ppm average when 46 percent HBI is continuously charged. This effect has been verified in other melt shops using HBI.

Influence of HBI on Melting

On the following page, Table V shows Nuquisa's actual results when charging HBI at 18 percent and 46 percent of the charge compared to 100 percent scrap.

Yield

Yield was calculated based on weight of prime cast billets divided by total charge weight. The yield for those heats charged with HBI was superior to the heats charged with 100 percent scrap:

- 89.4 percent yield for the 18 percent HBI charges
- 88.2 percent yield for the 46 percent HBI charges compared to
- 86.1 percent yield for the 100 percent scrap charges.

	All Scrap	18% HBI	46% HBI
Initial Test			
Average (%)	0.010	0.009	0.011
Standard Deviation (%)	0.002	0.002	0.002
Final Test			
Average (%)	0.010	0.011	0.011
Standard Deviation (%)	0.003	0.002	0.002

Table II Phosphorus analyses - rephosphorized heats were excluded from the data set

	All Scrap	18% HBI	46% HBI
Initial Test			
Average (%)	0.045	0.039	0.037
Standard Deviation (%)	0.011	0.005	0.010
Final Test			
Average (%)	0.015	0.015	0.014
Standard Deviation (%)	0.006	0.004	0.002

Table III Sulfur analyses

	All Scrap	18% HBI	46% HBI
Final Test			
Average (ppm)	91.0	80.0	63.0
Standard Deviation (ppm)	9.0	8.0	10.0

Table IV Nitrogen analyses

Tap-to-Tap Time and Productivity

These heats charged with 18 percent HBI resulted in the shortest tap-to-tap times and highest production rate of prime cast billets:

- 69.4 minutes tap-to-tap and 99.9 billet tonnes per hour

compared to

- 72.7 minutes tap-to-tap and 90.5 billet tonnes per hour for 100 percent scrap charges.

The heats charged with 46 percent HBI resulted in tap-to-tap times of 76.2 minutes and a productivity rate of 89.2 billet tonnes per hour.

Electrical Energy Consumption

Line 7 of Table V shows the electrical energy consumption in kWh/charge tonne. These values do not reflect other operating variables that influence electrical energy consumption such as oxygen consumption, lime usage, and final temperature. Lines 8 through 13 show calculated adjustments so electrical energy consumption can be compared on a consistent basis.

In performing these adjustments, the 100 percent scrap charges were assumed to be base case, and variation in oxygen, lime, and temperature were estimated in plus or minus kWh/tonne units. For example, reference line 9. The oxygen consumption for the 100

	3-Bkt. Charge 100% Scrap			2-Bkt. Scrap Charge Plus OPCO HBI			1-Bkt. Scrap Charge Plus OPCO HBI		
		Adjusted Energy			Adjusted Energy*			Adjusted Energy*	
	Avg.	±kWh/Tonne	Adj Value	Avg.	±kWh/Tonne	Adj Value	Avg.	±kWh/Tonne	Adj Value
1. Percent OPCO HBI in Charge	0			17.9			46.0		
2. Charge Weight – Tonnes	127.4			129.2			128.4		
3. Billet Weight – Tonnes	109.7			115.5			113.3		
4. Percent Yield	86.1			89.4			88.2		
5. Tap-to-Tap Time – Minutes	72.7			69.4			76.2		
6. Billet Tonnes per Hour	90.5			99.9			89.2		
7. kWh/Charge Tonne	454			450			497		
8. Oxygen-m³/Charge Tonne	17.2			14.2			15.8		
9. kWh/Charge Tonne Adj. for O_2*		0	454		-9	441		-4	493
10. Lime & Dolo Lime Kg/Chg. Tonne	18.3			24.0			44.0		
11. kWh/Chg. Tonne Adj. for Lime*		0	454		-4	437		-18	475
12. Arrv. Temp. at Ldle. Furnace °C	1563			1539			1575		
13. kWh/Chg. Tonne Adj. for Temp*		0	454		11	448		-6	469

* Compared to 100% Scrap Heats

Table V Nuquisa operating results

percent scrap charges was higher than for either the 18 percent or the 46 percent HBI charges. The lower oxygen consumption for the 18 percent and 46 percent HBI charges required additional electrical energy to compensate for the energy supplied by the oxygen in the 100 percent scrap charges. If the oxygen had been held the same as the 100 percent scrap charges, the 18 percent HBI charges would have used approximately nine fewer kWh/tonne. The 46 percent HBI charges would have used approximately four fewer kWh/tonne. The adjustments for lime and temperature were made in a similar manner.

After adjustment for oxygen, lime, and temperature the resultant calculated electrical energy consumptions are shown on line 13. The base case, 100 percent scrap charges, used 454 kWh/charge tonne, while the 18 percent HBI heats were estimated to have required 448 kWh/charge tonne, and the 46 percent HBI charges 469 kWh/charge tonne on a comparable basis.

Conclusions

Use of HBI decreased copper, nickel, chrome and other residuals in the steel products in proportion to the percentages of HBI used in the charge. Sulfur and phosphorus were maintained at the same levels compared to an all-scrap charge. In addition, HBI was effective in lowering nitrogen levels.

In addition to the beneficial chemical effects, HBI use also resulted in increased charge to billet yield, an increase in productivity, and comparable electric energy consumption levels.

This article was developed from a paper titled, "Operating Experience Using OPCO HBI at Nueva Montaña Quijano, S.A.," by Javier Hierro Sierra and Pedro Amando Vazquez of NUQUISA, and Franz L. Sammt and Robert L. Hunter of Midrex Direct Reduction Corporation (on behalf of OPCO) at the 4th European Electric Steel Conference, November 3-6, 1992, in Madrid, Spain.

DFM Readers Offer Their Views

Toward Establishing The Value Of DRI/HBI

Direct From Midrex published an article in the 3rd Quarter 1992 issue that proposed a method for establishing the value of DRI and HBI independent of ferrous scrap. Readers were invited to comment on the subject for publication. We are pleased to present the principal viewpoints of *Dr. J.R. Stubbles, Manager of Technology, Charter Steel,* and *Mr. R.P. Dhar, Chief Engineer, MECON (Steelmaking Division).*

"The problem with 'categories' occurs when chemistries are close to the designated boundaries; i.e., if my DRI contains 81.5 ± 1% metallic iron (and there must be some variability), does it get priced as a '78' and/or '82' material? Since metallic iron content is the overriding value factor, I would still prefer to see a basic cost/contained metallic ton with a factor for the rest of the chemistry. And physically, HBI should probably have a premium value relative to DRI, the magnitude of which has yet to be determined.

... I am opposed to grades and favor a sliding scale relative to dollar-per-ton for 100% Fe, and take the form:

$$\$\left(\frac{x}{y/100} + (100 - M)\right)$$

where: x = base price of DRI,
y = % total Fe in DRI,
M = % metallic Fe in DRI.

This gives you credit for 100% iron recovery, and only penalizes you $1/ton DRI per percent of nonmetallics, whatever their form ... the DRI industry can set 'x' at any level if they choose to ignore the scrap market and still arrive at a relative value for various DRI products."

Dr. J.R. Stubbles

"... The suggested grading (78/86, 82/89, 86/92, etc.) is the best possible today.

Since gangue, particularly acid gangue, in DRI/HBI is of concern to a steelmaker, there should be some means of codifying this along with Fe metallic and Fe total. A possible way of doing this could be acid gangue/total gangue as, say, 4/7. Hence DRI/HBI with 83% metallic Fe, 90% total Fe, 4% acid gangue, and 7% total gangue could possibly be designated as 83/90; 4/7."

R.P. Dhar

We are interested in your comments and suggestions relating to the value of DRI/HBI. Address your viewpoints to the Editor of Direct From Midrex, c/o Midrex Direct Reduction Corporation, 2400 Charlotte Plaza, Charlotte, NC 28244, USA, Fax: (704) 373-1600; Telex: 6827031 MIDRX UW.

Editorial Correction

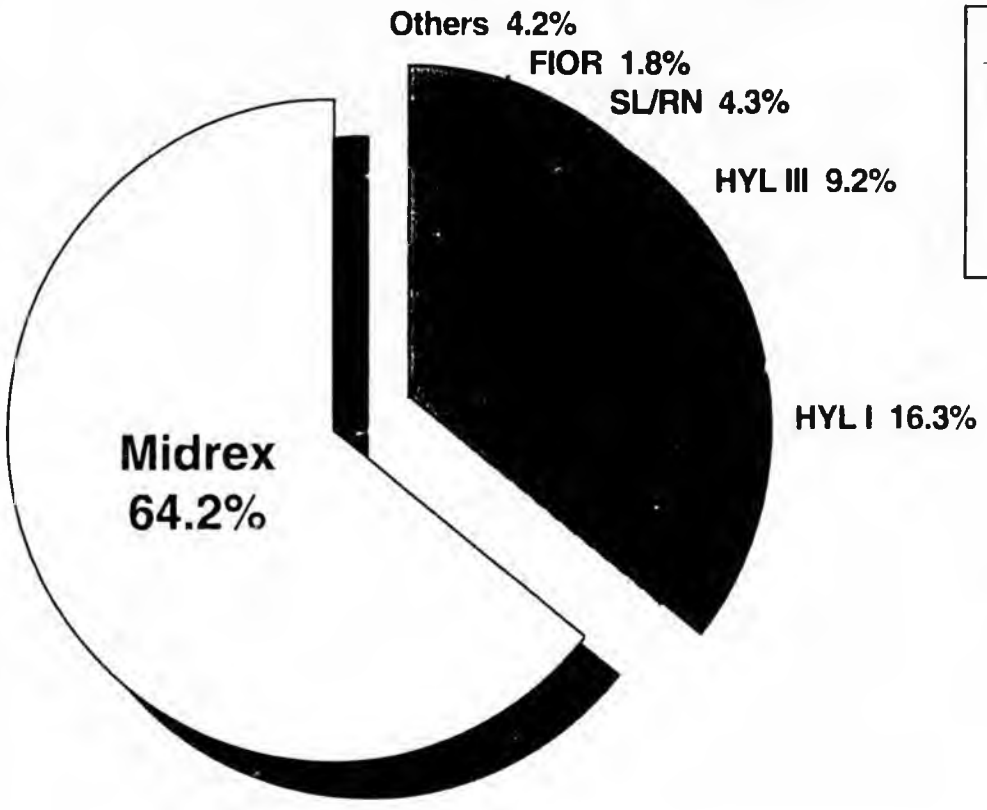
The editors wishes to correct two errors that appeared in recent issues of *Direct From Midrex*. We regret these typographical mistakes and trust that the following information will relieve any confusion they may have caused.

- In Table VI on page 5 of the 2nd Quarter 1992 issue, the heading for the rightmost column of data should read "100% DRI."
- On page 4 of the 3rd Quarter 1992 issue, the second subhead in the body of the article should read "2. Are the values of DRI/HBI you describe (78/86, 82/89, and 86/92) the most widely traded?"

We wish to thank Mr. Milind Sanzgiri, Deputy General Manager, Essar Steel, and Mr. R.P. Dhar, Chief Engineer, MECON (Steelmaking Division), for bringing these errors to our attention.

1992 DRI Production Statistics

1992 WORLD DRI PRODUCTION BY PROCESS



	1991	1992
Midrex	62.5%	64.2%
HYL I	19.2	16.3
HYL III	8.7	9.2
SL/RN	4.4	4.3
FIOR	1.9	1.8
Others	3.3	4.2

Total World Production 20.72 Mt

Worldwide DRI/HBI Production Reaches 20 Million Tonne Milestone

MIDREX Plants Account for 64 Percent of Total in 1992

World production of direct reduced iron (DRI) and hot briquetted iron (HBI) reached an all-time high of 20.7 million metric tons (Mt) in 1992, demonstrating the increasing importance of these high purity scrap substitutes. The production total, compiled by Midrex Direct Reduction Corporation from figures supplied by all major process suppliers, was a 7 percent increase over 1991. HBI production represented 3.1 Mt of total output, an increase of 5 percent versus 1991.

In 1992, MIDREX® Direct Reduction Plants accounted for 13.3 Mt, which was 64 percent of the total DRI/HBI produced. During the year, MIDREX Plants with a combined capacity of over 2.3 Mt/y were started up in Saudi Arabia, India, and Iran. Several coal-based plants in India also began operations during the year.

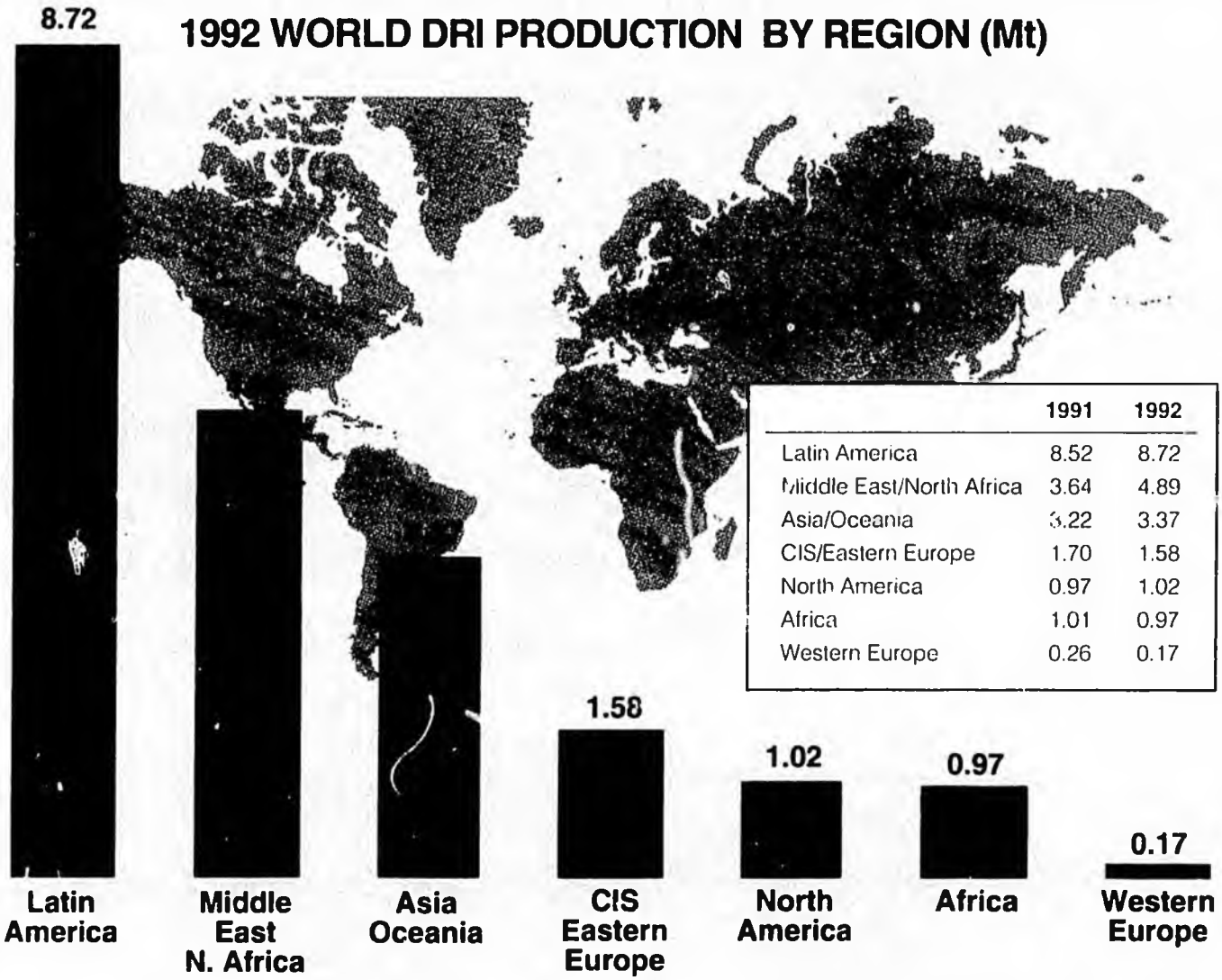
Plants using HYL I technology produced 3.4 Mt, and those using HYL III technology 1.9 Mt. The FIOR Process represented 0.4 Mt, and coal-based technologies accounted for 1.7 Mt, 8 percent of the total.

Trade in DRI and HBI continued to increase in 1992, with 3.6 Mt shipped. This represents an increase of 0.4 Mt versus 1991. This product was used in steel mills and foundries throughout the world.

The 20.7 Mt total for 1992 compares with 1970 global production of just 0.7 Mt. This continued growth has been largely fueled by the movement of EAF steelmakers into high quality products such as special bar quality, high quality wire rod, and flat products. These mills have found the use of DRI a necessity for producing "clean" steels. Operators of basic oxygen furnaces and blast furnaces also are increasing its use as a cost-effective source of low residual iron.

Direct reduction plants are under construction in India, Indonesia, Iran, Libya, and Malaysia. Midrex forecasts world DRI/HBI production of 28 Mt by 1995 and 35 Mt by 2000.

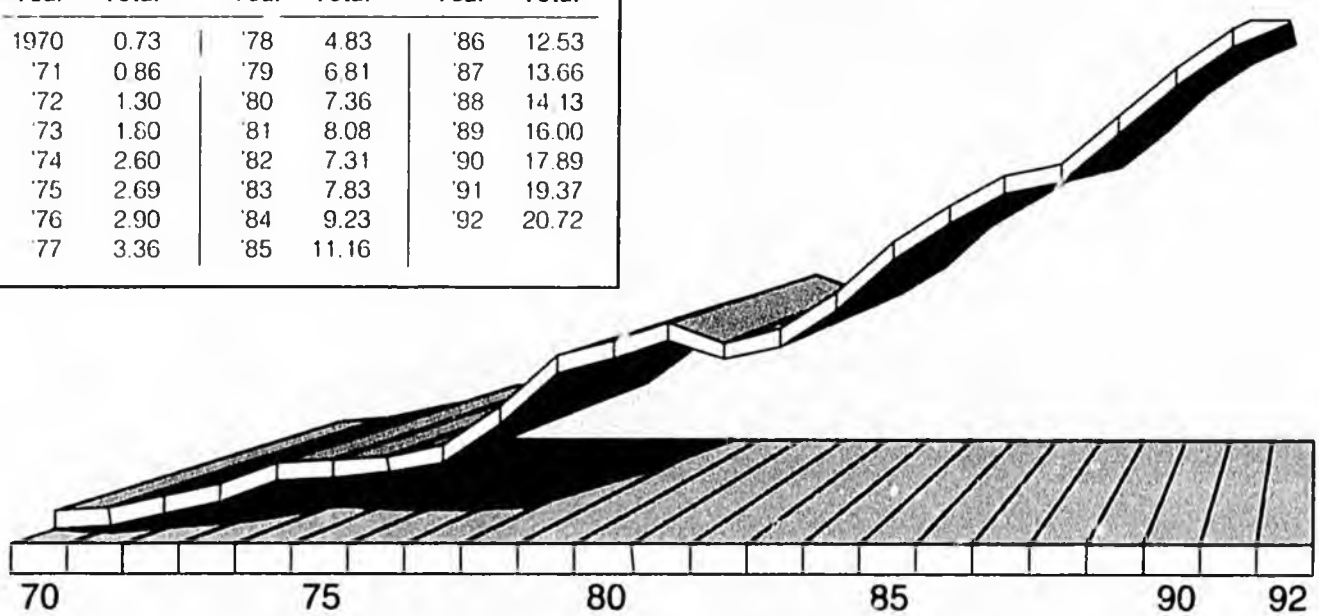
1992 WORLD DRI PRODUCTION BY REGION (Mt)



	1991	1992
Latin America	8.52	8.72
Middle East/North Africa	3.64	4.89
Asia/Oceania	3.22	3.37
CIS/Eastern Europe	1.70	1.58
North America	0.97	1.02
Africa	1.01	0.97
Western Europe	0.26	0.17

WORLD DRI PRODUCTION BY YEAR (Mt)

Year	Total	Year	Total	Year	Total
1970	0.73	'78	4.83	'86	12.53
'71	0.86	'79	6.81	'87	13.66
'72	1.30	'80	7.36	'88	14.13
'73	1.80	'81	8.08	'89	16.00
'74	2.60	'82	7.31	'90	17.89
'75	2.69	'83	7.83	'91	19.37
'76	2.90	'84	9.23	'92	20.72
'77	3.36	'85	11.16		



MIDREX® Direct Reduction Plants

Customer	Location	Capacity (000 t/y)	Modules	Product	Start-Up	Status
	Middle East/North Africa					
QASCO	Umm Said, Qatar	400	1	DRI	1978	Operating
ASCO	Ahwaz, Iran	1,200	3	DRI	1985-92	Operating
Hadeed I	Al-Jubail, Saudi Arabia	800	2	DRI	1982-83	Operating
Hadeed II	Al-Jubail, Saudi Arabia	650	1	DRI	1992	Operating
ANSDK	El Dikheila, Egypt	716	1	DRI	1987	Operating
LISCO I	Misurata, Libya	1,100	2	DRI	1989-90	Operating
NISCO	Mobarakeh, Iran	3,200	5	DRI	1992-93	Operating (2) Commissioning (1) Construction(2)
	Asia/Oceania					
SGI	Labuan Island, Malaysia	650	1	HBI	1984	Operating
Essar Steel I & II	Hazira, India	880	2	HBI	1990	Operating
Essar Steel III	Hazira, India	440	1	HBI	1992	Operating
NDIL	Raigad, India	1,000	1	HBI	1994	Construction
	Latin America					
SIDERCA	Campana, Argentina	330	1	DRI	1976	Operating
SIDOR I	Matanzas, Venezuela	350	1	DRI	1977	Operating
SIDOR II	Matanzas, Venezuela	1,275	3	DRI	1979	Operating
Acindar	Villa Constitucion, Argentina	600	1	DRI	1978	Operating
ISCOTT I & II (CIL)	Point Lisas, Trinidad & Tobago	840	2	DRI	1980-82	Operating
MINORCA (OPCO)	Puerto Ordaz, Venezuela	830	1	HBI	1990	Operating
VENPRECAR	Matanzas, Venezuela	600	1	HBI	1990	Operating
	North America					
Georgetown Steel	Georgetown, SC, USA	400	1	DRI	1971	Operating
Sidbec-Dosco 1	Contrecoeur, Que., Canada	400	1	DRI	1973	Idle
Sidbec-Dosco 2	Contrecoeur, Que., Canada	600	1	DRI	1977	Operating
	Western Europe					
HSW	Hamburg, Germany	400	1	DRI	1971	Operating
British Steel	Hunterston, Scotland	800	2	DRI	1979	Idle
	CIS/Eastern Europe					
OEMK	Stary Oskol, Russia	1,667	4	DRI	1983-88	Operating
	Africa					
Delta Steel	Aladja-Ovwian, Nigeria	1,020	2	DRI	1982	Operating (1) Idle (1)
		21,148	42			

Midrex News & Views

Midrex Unveils DR Plant Sized to Mini Mill Needs

Midrex engineers have designed a gas-based direct reduction plant that is sized to the annual requirement of a mini steel mill for "clean" iron units and priced to be competitive with other currently available direct reduction technologies of a similar capacity.

"The MIDREX MINIMOD™ Plant, with a nominal 300,000 t/y capacity, satisfies the need for a basic direct reduction plant that is sized to one steelmaker's annual need for low residual iron units," Midrex president, Winston L. Tennies, said. "A mini steel mill in North America that uses DRI typically mixes it with scrap to produce premium quality wire and flat products. In such applications, DRI generally makes up 20-25 percent of the total charge," Tennies observed. "Therefore, a 250,000-to-350,000 t/y direct reduction plant could nicely satisfy such a mill's requirement."

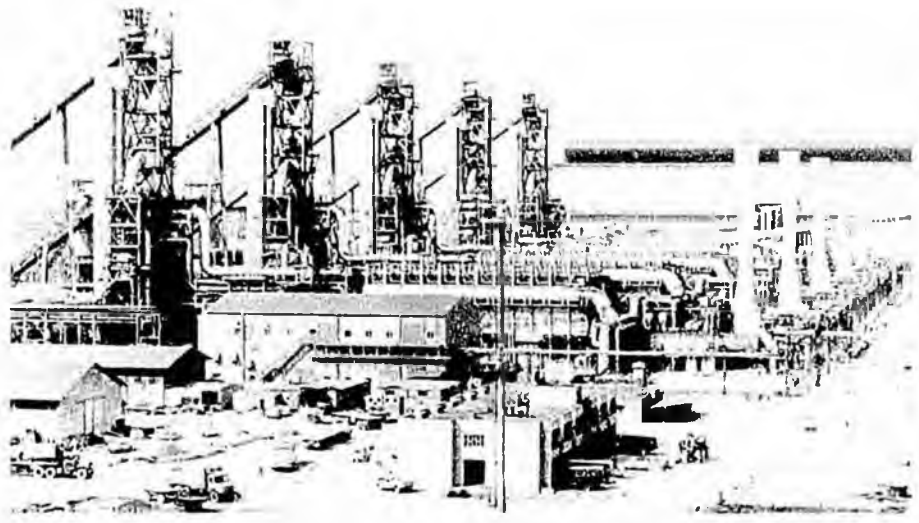
The pioneering movement into high value products by some North American EAF steelmakers has produced a growing concern for the future availability and price of high grade scrap and DRI. As a result, a number of mini mill operators are taking a fresh look at investing in direct reduction plants.

"Although new technologies such as the Midrex solid reductant FASTMET℠ Process and the gas-based iron carbide process are poised to become commercial realities, the widely used MIDREX® Direct Reduction Process is a documented success and should be given strong consideration," Tennies said.

The MINIMOD Plant incorporates the operating reliability and flexibility, for which MIDREX® Direct Reduction Plants are known, in a design that makes it an attractive capital investment. Midrex estimates that a MINIMOD Plant can be constructed in North America for approximately $50 million, depending on site considerations and production capacity.

"We have designed the MINIMOD to serve as a 'starter' plant," Tennies explained, "that is, one that can grow with your steelmaking operation and adjust to changing production requirements." The modular concept, basic to all MIDREX Plants, allows for future capacity increases, and the inherent operating flexibility provides an effective response to market conditions and steelmaking needs such as production of high carbon DRI.

The MIDREX MINIMOD™ Plant can be equipped with a variety of optional systems available in other MIDREX Plant designs including: hot discharge/hot briquetting, alternate flowsheet (for operating with high sulfur ores), hot transport/hot charging, low water/low electricity operation.



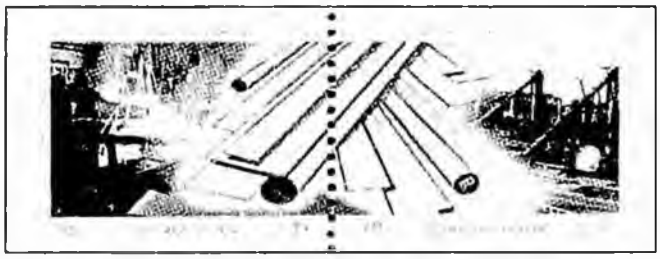
Three Modules Start-Up in 1992

Three of the MIDREX™ Series 600 Modules at the National Iranian Steel Corp. (NISCO) plant in Mobarakeh, Iran started up during 1992, with module C passing its performance guarantee test during October. The remaining two modules of the 3.2 million tonne per year cold discharge facility will comprise up to 90% of the furnace charge to eight 180 tonne electric arc furnaces at the adjacent steel mill. NISCO will have an annual capacity of 3.0 million tonnes of carbon and low alloy sheet products.

High Carbon DRI Possible with the MIDREX Process

Midrex researchers have determined that by increasing the residence time of the oxide material in the reduction zone of the MIDREX™ Shaft Furnace and a few minor changes in process conditions, the carbon level in the resulting DRI can be enhanced. In most cases, no additional equipment or modification of existing equipment is necessary. Just a few adjustments in operating parameters is all that is required to produce DRI with carbon levels up to 6 percent, mostly in carbide form.

Under normal operating procedures, about 85 percent of carbon in the DRI produced with the MIDREX Process is in carbide form. A similar ratio is expected in high carbon MIDREX® Iron.



Midrex Philately

The Republic of Iran has featured two of the five MIDREX™ Direct Reduction Modules at the Mobarakeh plant of NISCO (National Iranian Steel Corp.) on a postage stamp that was issued in 1992.

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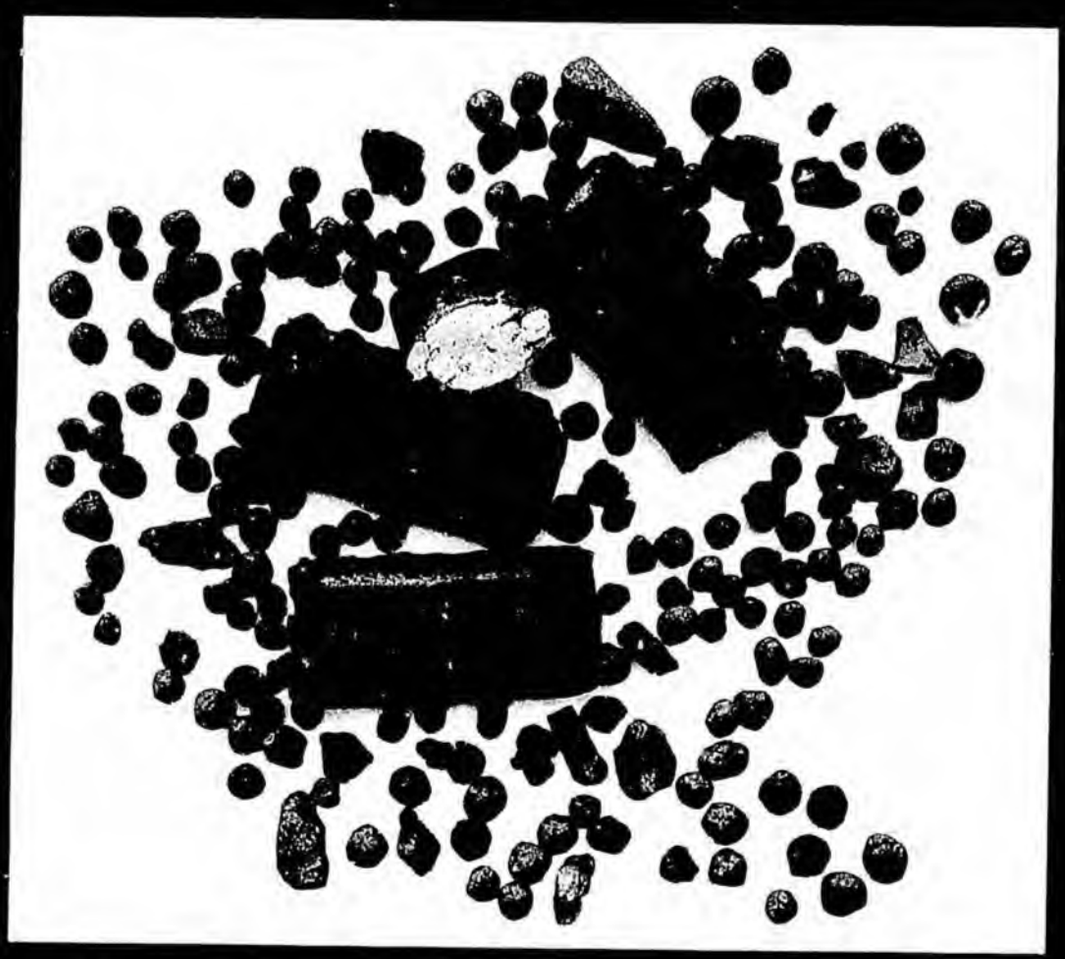


MIDREX

A Changing World. . .

Technology. Automated Manufacturing. High Quality Specifications.

These are a few of the dynamic forces that affect the industrial world today—and will drive it tomorrow.

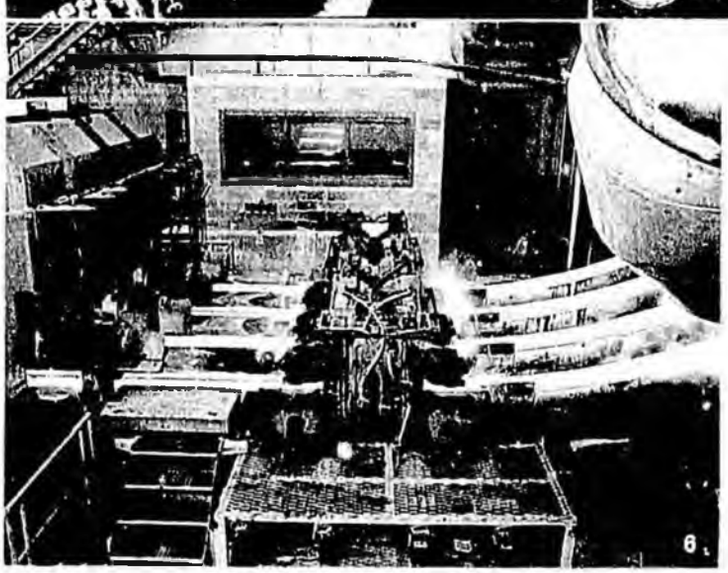
Those who recognize these emerging trends and adapt to them will succeed. Those who don't will be left behind.

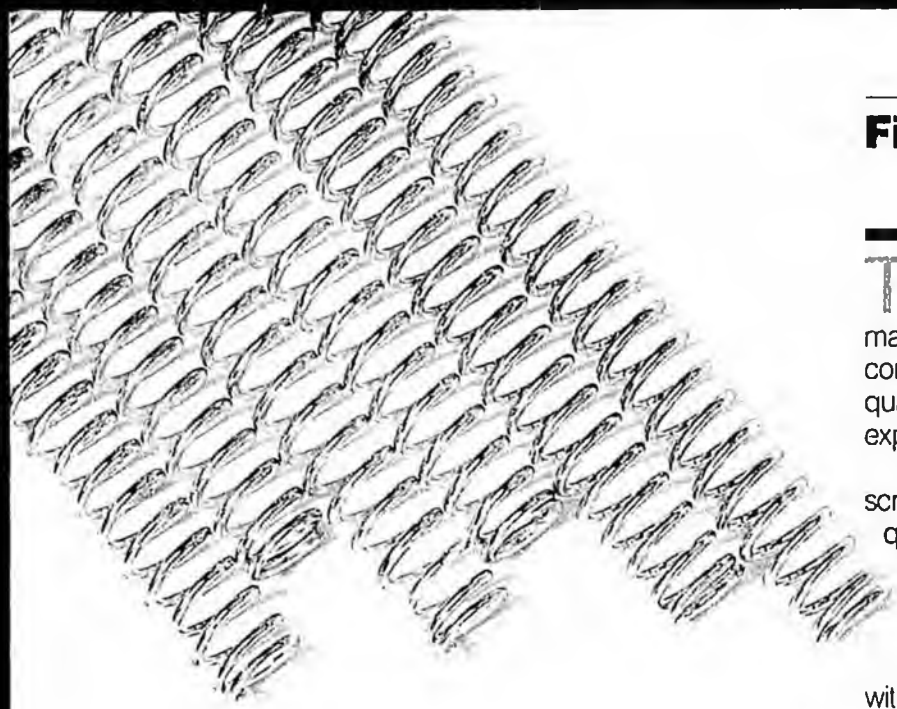
The steel industry is undergoing changes. Steels considered *high quality* a few years ago struggle today to meet stricter, more demanding specifications—and tomorrow, they will be unacceptable altogether.

The cost-effective electric arc furnace (EAF) will play an increasing role in the future of steelmaking. EAF mini-mills are well positioned to increase their market share—as long as they keep pace with the relentless demands for higher steel quality.

Captions

1. Robotic automobile welding
2. Electric arc furnace
3. Circuit design on CAD system
4. Cold drawing of wire
5. Quality control inspection
6. Continuous casting
7. High quality steel





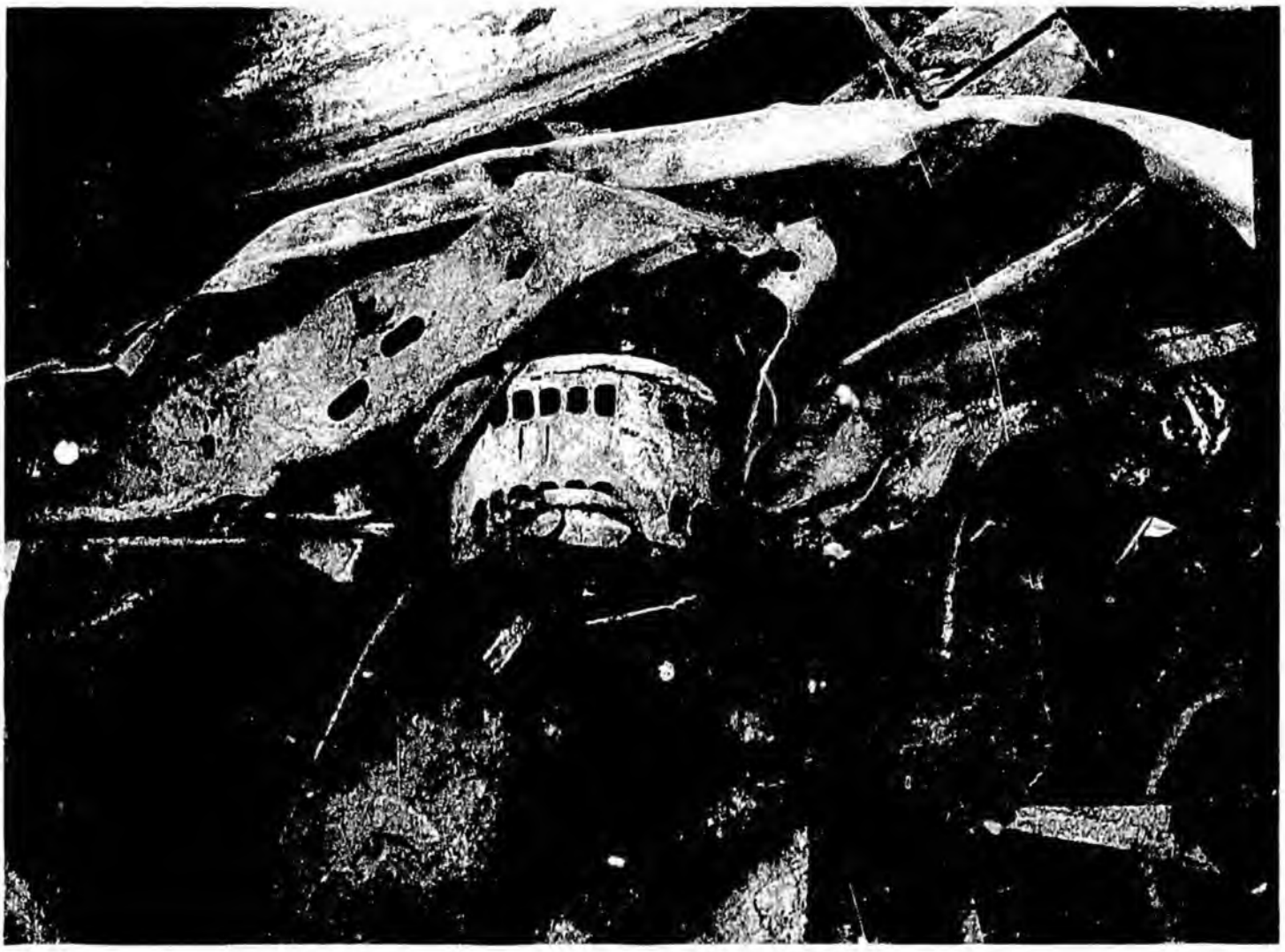
First Step To Quality. . .

To match customer demands for greater product quality, steelmakers must start with high quality raw materials. However, as ferrous scrap becomes more contaminated, the task of locating and obtaining high quality scrap will become increasingly difficult and expensive.

Steelmakers may be forced to take direct roles in scrap collection and processing to assure the necessary quality improvements—and this may mean shouldering increased processing costs in-house.

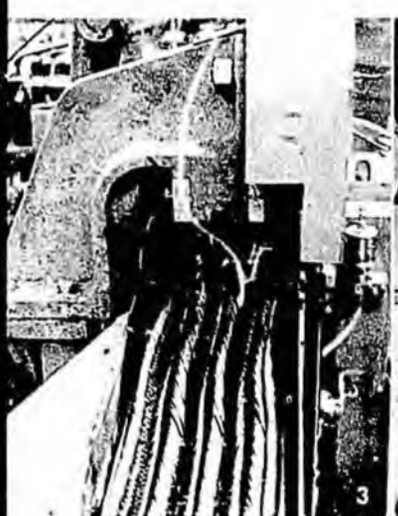
The use of virgin iron units as a scrap diluent is a much simpler and less costly alternative.

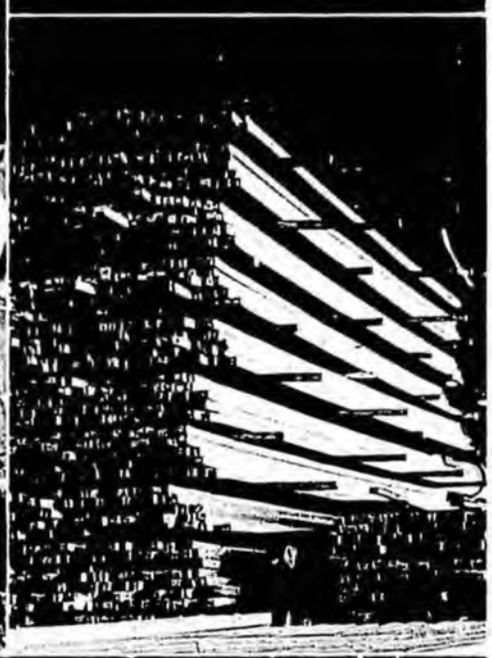
MIDREX® Iron, a high iron content metallic product with uniform chemical and physical characteristics, can reduce the level of residual elements in steel resulting from the use of readily available, cost-effective grades of scrap.

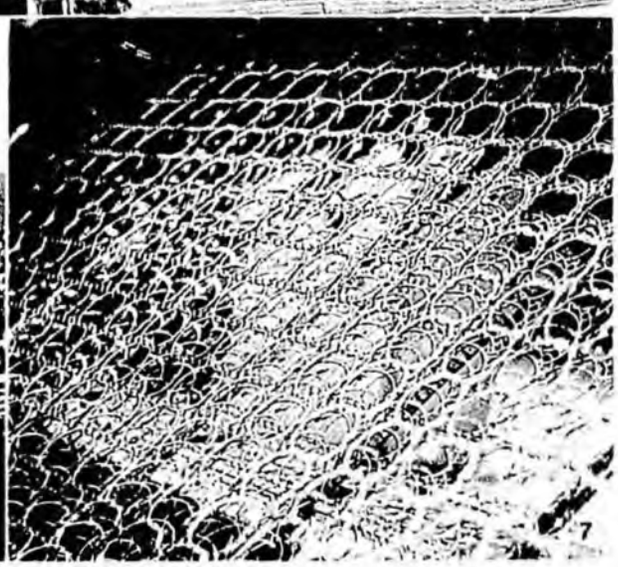


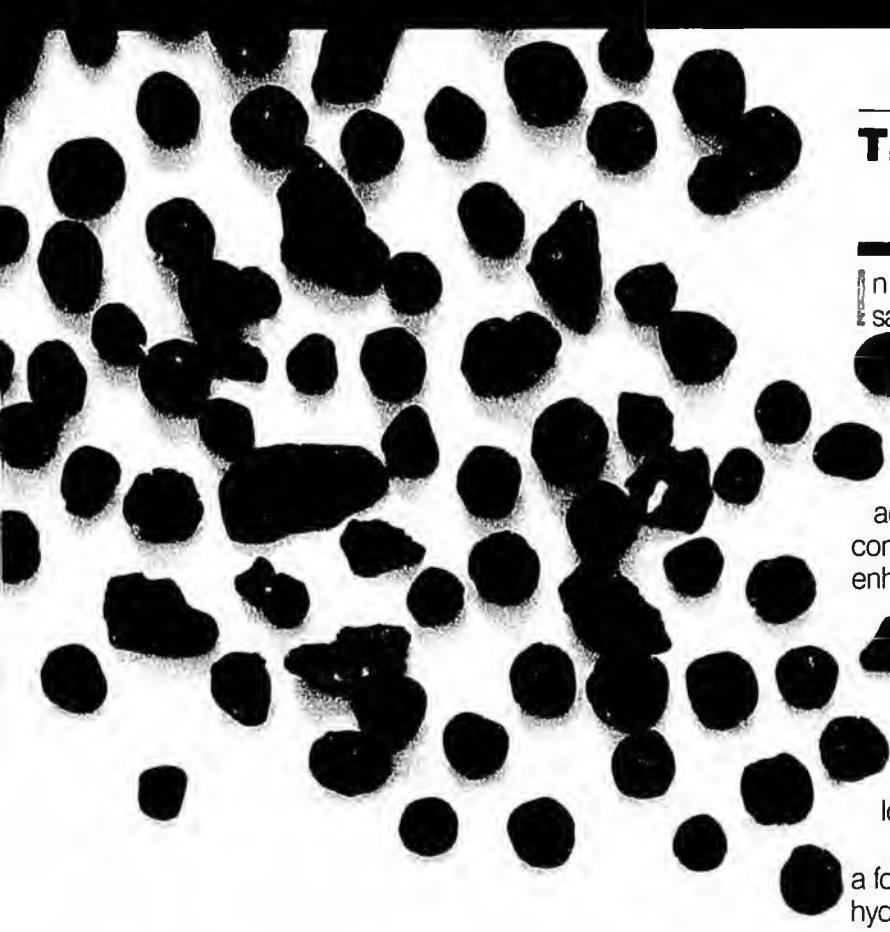
Captions

1. Final inspection of wire rod
2. Seamless tube piercing
3. Wire coiling operation
4. Sheet steel roll
5. Steel billets for shipment
6. Scrap collection
7. Steel bed springs









The Competitive Edge. . .

In the highly competitive international steel industry, savings in tap-to-tap time, intermediate refining and off-specification heats mean money—and ultimately the difference between surviving and failing. Successful steelmakers will be those who find *the competitive edge.*

MIDREX Iron can give steelmakers that edge. By adding it to the furnace charge, EAF operators gain total control over their product. Steel properties can be enhanced without increasing the grade of scrap when MIDREX Iron is used as a diluent.

Batch charging MIDREX Iron densifies the bucket bucket charge and can eliminate one or more buckets per heat. Due to its uniform size and shape, MIDREX Iron can be continuously charged to increase power-on time and lower furnace heat losses—and that means increased productivity.

The balanced chemistry of MIDREX Iron promotes a foamy slag action, which purges nitrogen and hydrogen from the metal bath and contributes to overall furnace performance. By using MIDREX Iron, even aviation and nuclear-grade and extra deep drawing grades of steel are within the capabilities of EAF facilities.

Captions

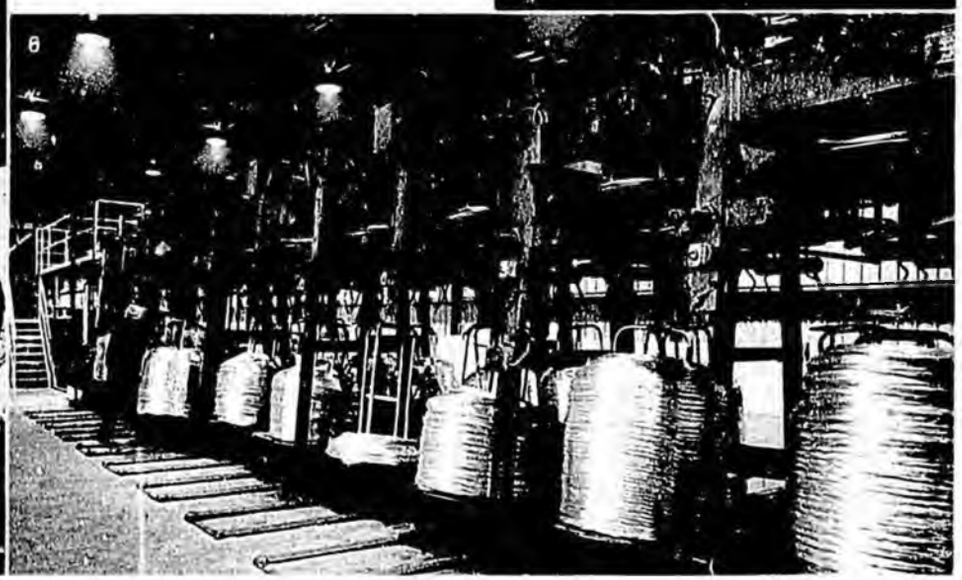
1. *Active bath in EAF*
2. *Cooling bed*
3. *Rolling seamless tube*
4. *Continuous casting*
5. *Handling MIDREX Iron pellets*
6. *Galvanized wire for nails*

TYPICAL CHARACTERISTICS OF MIDREX IRON

Chemical	Pellets/Lumps
Fe Total	91-93%
Fe Metallic	83-88%
Metallization*	92-95%
C	1.0-2.5%
SiO_2	1.0-3.5%
Al_2O_3	0.2-1.5%
CaO	0.2-1.6%
MgO	0.3-1.1%
MnO	0.1-0.2%
P	0.02-0.04%
S	0.005-0.015%
Ti	0.01-0.2%
V	0.01-0.2%
Ni, Sn, Zn, Cr, Cu, Pb	Traces

Physical	
Bulk Density	1.6-1.9 t/m³
Apparent Density	3.5 t/m³
Nominal Size	4-20 mm

**Metallization is defined as the percentage of total iron in metallic form.*



A Global Steelmaking Commodity. . .

The introduction of a highly densified form of MIDREX Iron, MIDREX® Hot Briquetted Iron, means that steelmakers worldwide can take advantage of its operational benefits.

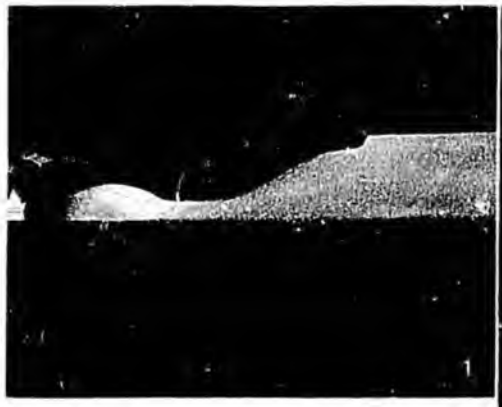
MIDREX HBI is easy and safe to ship. It can be stored outside in even the most severe conditions—and it is easier to handle than most grades of scrap.

In the furnace, MIDREX HBI melts rapidly. It serves to densify the charge when batch charged and effectively penetrates even the thickest slag when continuously charged.

MIDREX HBI also extends the operational benefits of direct reduced iron to the production of ductile iron in foundries and high quality steels in the basic oxygen furnace.

Captions

1. *Pressure casting of slab*
2. *Batch charging EAF*
3. *MIDREX HBI stored outside*
4. *Unloading MIDREX HBI*
5. *Cast iron pipe*
6. *Tapping EAF*

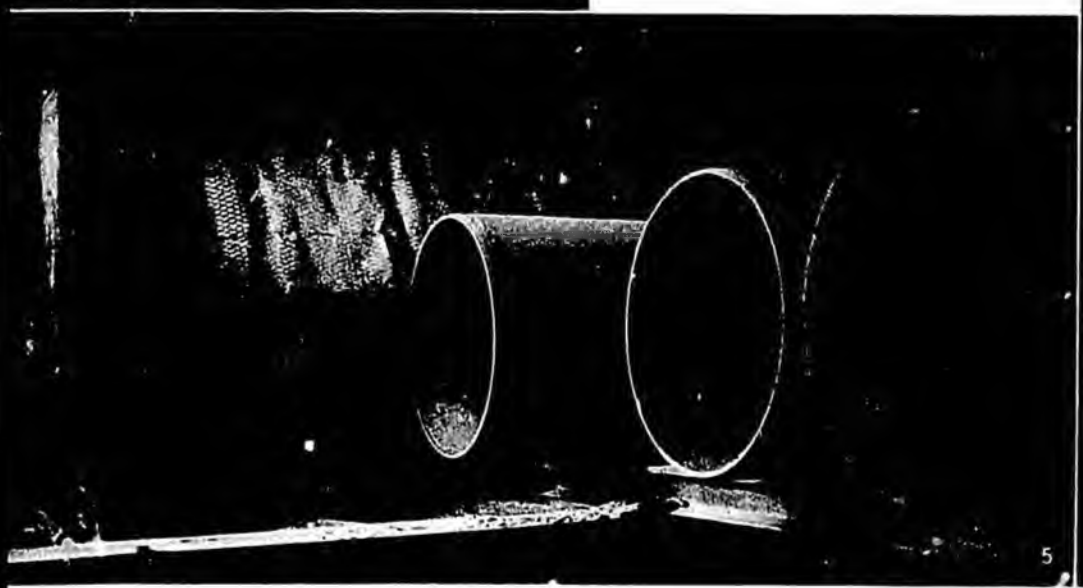


TYPICAL CHARACTERISTICS OF MIDREX IRON

Chemical	Hot Briquetted
Fe Total	91-93%
Fe Metallic	83-88%
Metallization*	92-95%
C	1.0-1.5%
SiO_2	1.0-3.5%
Al_2O_3	0.2-1.5%
CaO	0.2-1.6%
MgO	0.3-1.1%
MnO	0.1-0.2%
P	0.02-0.04%
S	0.005-0.015%
Ti	0.01-0.2%
V	0.01-0.2%
Ni, Sn, Zn, Cr, Cu, Pb	Traces

Physical	
Bulk Density	2.6-2.7 t/m³
Apparent Density	5.5 t/m³
Weight	0.5-0.7 kg
Nominal Size	30mm x 60mm x 90mm

**Metallization is defined as the percentage of total iron in metallic form.*



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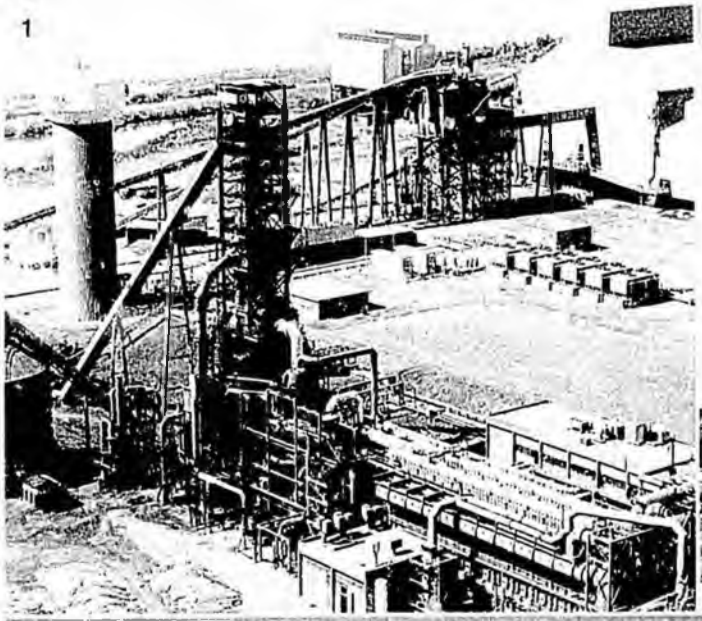

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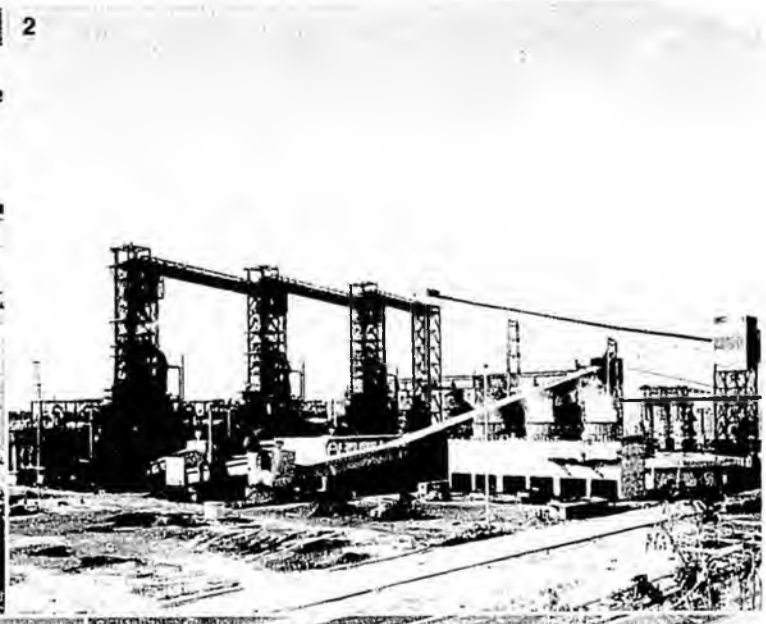

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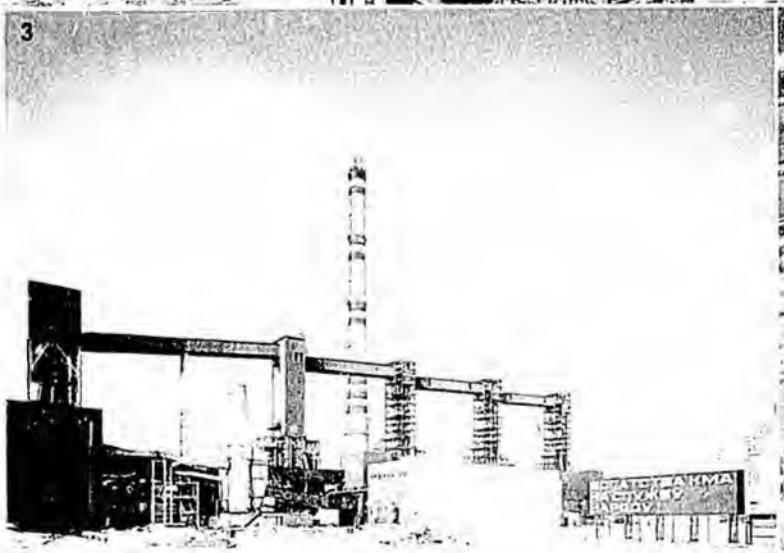

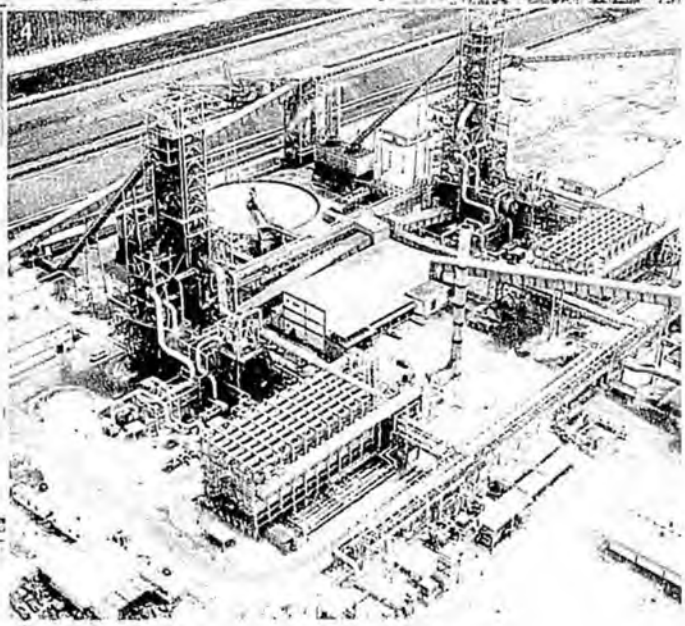

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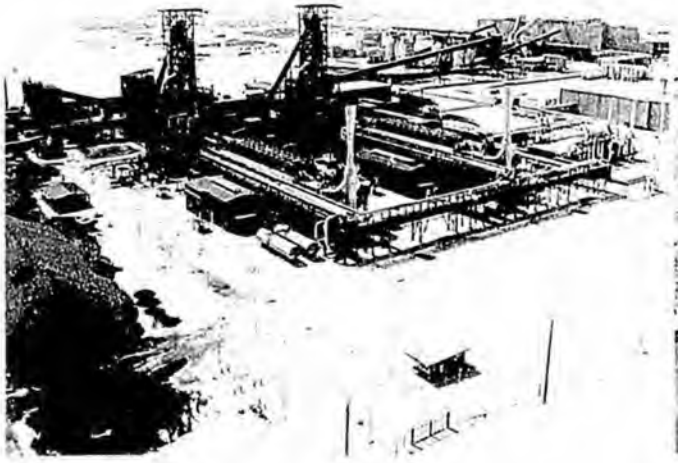

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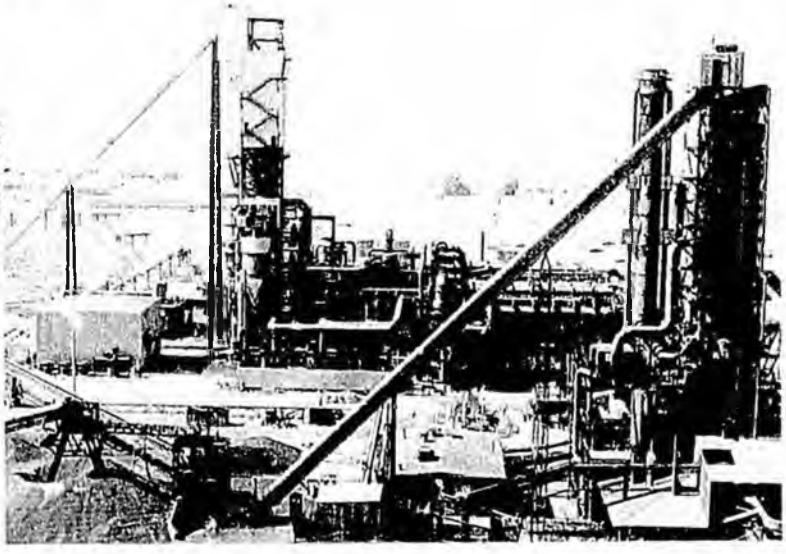


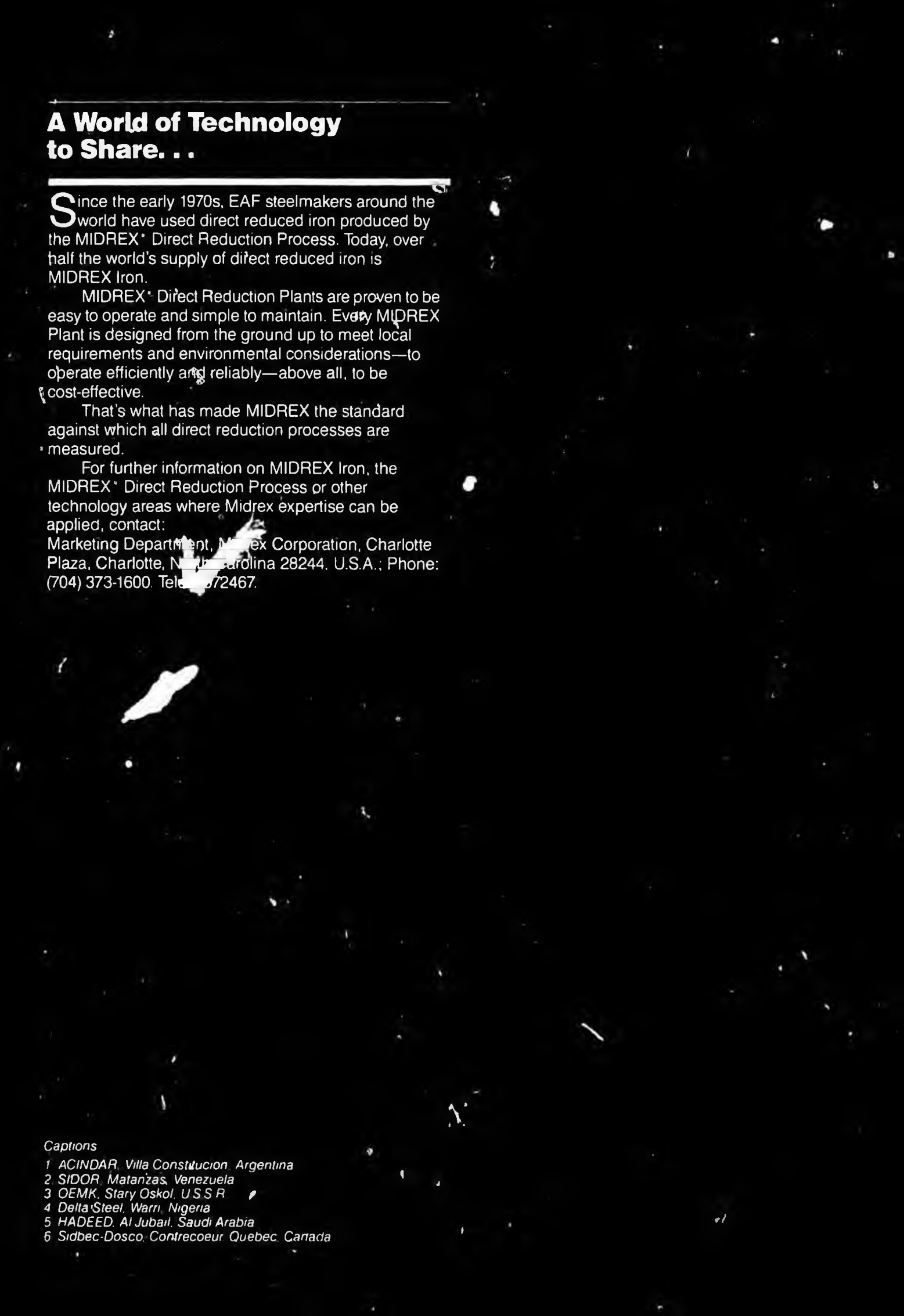
A World of Technology to Share. . .

Since the early 1970s, EAF steelmakers around the world have used direct reduced iron produced by the MIDREX® Direct Reduction Process. Today, over half the world's supply of direct reduced iron is MIDREX Iron.

MIDREX® Direct Reduction Plants are proven to be easy to operate and simple to maintain. Every MIDREX Plant is designed from the ground up to meet local requirements and environmental considerations—to operate efficiently and reliably—above all, to be cost-effective.

That's what has made MIDREX the standard against which all direct reduction processes are measured.

For further information on MIDREX Iron, the MIDREX® Direct Reduction Process or other technology areas where Midrex expertise can be applied, contact:
Marketing Department, Midrex Corporation, Charlotte Plaza, Charlotte, North Carolina 28244, U.S.A.; Phone: (704) 373-1600. Telex 572467.



Captions

1 ACINDAR, Villa Constitucion, Argentina
2 SIDOR, Matanzas, Venezuela
3 OEMK, Stary Oskol, U S S R
4 Delta Steel, Warri, Nigeria
5 HADEED, Al Jubail, Saudi Arabia
6 Sidbec-Dosco, Contrecoeur, Quebec, Canada

The Midrex Project at Point MacKenzie

The Midrex Corporation, a wholly-owned subsidiary of Japan's Kobe Steel, has been conducting a feasibility study for the development of a direct reduction iron plant at Point MacKenzie. Plants using the natural gas-based Midrex process account for more than half of the world's direct reduced iron (DRI) production. The process converts iron ore into a highly metallized iron product for use in steelmaking and foundry applications.

The Midrex facility at Point MacKenzie will be a privately-built $200 million capital project, built on a turnkey basis. The plant will create 120 full-time jobs. An additional 12 to 15 port jobs would also result from this project.

Midrex was attracted to the Point MacKenzie site for a number of reasons. The most important advantage we offer is an abundant supply of natural gas, available on a long-term basis with negotiated price increases. Unlike the lower 48, where natural gas can be shifted around the country through interstate pipelines, Alaska's natural gas exists within a closed market. An existing pipeline with sufficient capacity already transits Point MacKenzie to supply Anchorage.

Point MacKenzie also offers ample industrial land, a deepwater port site and adjacent utilities. The Matanuska-Susitna Borough has a sufficiently large labor pool for the project.

This industrial site is strategically placed for emerging foreign and domestic markets on the Pacific Rim. There are currently 42 Midrex plants world-wide; but none on the west coast of the American Continent.

Most Midrex facilities are located in third-world countries due to the availability of inexpensive natural gas on long-term contracts. These Midrex facilities are subject to political instability wheras the stable politics of North America are attractive to Midrex.