# DIRECT FROM MIDREX 1ST QUARTER 2019

# SPECIAL ISSUE Midrex Global Solutions





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# COMMENTARY

# MIDREX GLOBAL SOLUTIONS 2.0

# HARNESSING THE POWER OF DIGITALIZATION

**By David Durnovich,** General Manager – Midrex Global Solutions



**One** of the things that separated Midrex from other US industrial companies doing business internationally in the 1970s was the decision to enter into two-way licensing agreements rather than to build, own, and operate plants. This innovative approach involved the sharing of technology, know-how, and field experience among Midrex and the operators of MIDREX<sup>\*</sup> Plants. It allowed Midrex to focus on what it did best – design and supply direct reduction process technology and proprietary equipment – while



cooperating with its customers to make improvements based on actual plant operations. The results speak for themselves.

For the first 20 years, Midrex primarily provided technical advice and managed the transfer of technology. In 1990, Professional Services International (PSI) was established as a subsidiary of Midrex to more actively support the growing number of MIDREX° Process Licensees and to provide procurement and logistics services to Kobe Steel, parent company of Midrex. The decision was made in 2004 to integrate PSI into Midrex and Midrex Solutions was formed, which soon was renamed Midrex Global Solutions (MGS). In 2018, the benefits of digitalization were added to the toolbox – thus the MGS 2.0 relaunch.

How well a plant is maintained and serviced is instrumental in determining its performance, reliability, and longevity. Plus, the larger the capital investment, the more important the selection of an aftermarket services provider becomes. Midrex Global Solutions goes beyond supplying spare parts and materials. As both the provider of process technology and an OEM equipment supplier, Midrex has a comprehensive understanding of customer needs from which to develop practical and sustainable solutions in cooperation with operators of individual MIDREX<sup>\*</sup> Plants.

This issue of *Direct From Midrex* will introduce MidrexConnect<sup>™</sup>, a Webbased platform for viewing and analyzing process variables needed to make fast, informed, and accurate operational and maintenance decisions. The second article in this issue will present examples of how two other MGS programs, Plant Services and Proprietary Equipment & Parts, are using the power of digitalization and the process expertise of Midrex to provide reformer management and catalyst optimization solutions for quality and performance assurance.

Midrex has assembled a team of experienced engineers and plant operators with the expertise and experience to quickly diagnose situations and create timely, sustainable solutions which are specific to each customer. MGS is the only plant services provider that can guarantee that its solutions are designed, manufactured, and installed to exact MIDREX\* Process specifications and backed by 50 years of dedication to the continued success of its process licensees.



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# **DIRECT REDUCTION IN THE DIGITAL AGE**



By Charles Cotton, Global Solutions Program Manager - MidrexConnect™

#### INTRODUCTION

he Greek philosopher Heraclitus of Ephesus (c. 500 BC) said, "Change is the only constant in life," which has been popularized as, "The only thing constant is change." However, it doesn't really matter whether we see change as an always-to-be-expected condition or as something that is occurring continuously; it's how we respond to change that makes the difference.

Industrialization is an example of change, when agricultural societies turned to producing manufactured goods and services on a wide scale. The first so-called Industrial Revolution began in the mid-1700s, with the transition from hand production methods to machines. In the late 1800s, machines advanced to become more efficient and gave rise to the second Industrial Revolution, known as the Technological Revolution. Despite significant advances in the design and capabilities of machines, it took 20-30 years for the processes that make use of these machines to change and usher in the third Industrial Revolution, characterized by computerized automation. Today, a fusion of technologies is blending computerized automation with digital data exchange to create the "smart factory," which promises to take manufacturing to new levels of performance and efficiency. This is being called Industry 4.0 – the fourth Industrial Revolution.

#### **INDUSTRY 4.0 SOLUTIONS**

Industry 4.0 draws from the advancements of processes, methods, and strategies across multiple industries and integrates them into collaborative information platforms, providing access to information for many different consumers to use. These consumers can be human or machine, as both now can learn from the information being gathered. In parallel it leverages the recent leaps made in computing technologies, cloud infrastructure, enhanced internet connectivity, and virtualization, to build cyber-physical representations of our physical world. Overlay of these two areas; information platforms and virtualized physical worlds is yielding a revolution called Digital Transformation, which in short is the harnessing of these technologies to find and implement new competitive advantages that were once unthinkable to customers.

Industry 4.0 strategies look different across various

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industries. The oil & gas industry uses condition-based monitoring to determine asset health, predictive maintenance to automatically create workorders and generate purchase orders for replacement parts, and remote assistance to solve real-time problems. In the airline industry, condition monitoring and situational awareness are used to notify airline pilots when a system is outside of normal range and to help them make faster decisions, while predictive maintenance allows better management of asset downtime, and remote analysis & assistance is available via satellite. The utility industry uses predictive maintenance to access the impact of required maintenance and plan accordingly and situational awareness tools to filter "noise" and focus on critical metrics.

However, common across all industries is the need for a collaborative information sharing platform (*Figure 1*).



FIGURE 1 Information components of a collaborative information sharing platform

#### INTRODUCING MidrexConnect<sup>™</sup>

Midrex has developed MidrexConnect<sup>™</sup>, a collaborative services platform to centralize the viewing and analysis of asset and operational data essential for plant operators to achieve their goals, whatever they may be – productivity, availability, quality, or longevity. MidrexConnect<sup>™</sup> can access plant data in real time from the Midrex home office by Web-based viewing of process variables that impact plant performance and can interact with all areas of the production process. This enables Midrex to provide plant operators the information they need to make fast, informed decisions.

The MidrexConnect<sup>™</sup> platform integrates three key information hubs: Asset Management (AM), Operational Management (OM), and Maintenance and Materials Management (MM), as shown in *Figure 2*. Each hub includes data and information from Midrex, MIDREX<sup>®</sup> Plants, industry partners, and vendors. Clients can choose what type and how much data to make available to other parties.



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FIGURE 2 *MidrexConnect*<sup>™</sup> *platform overview* 

#### Asset Management

An interactive digital portal allows plant personnel to access valuable information including engineering documents and data, training and operations manuals, maintenance records, and vendor documentation. The information is displayed in 3D, which creates an immersive plant experience and results in increased asset efficiency.



#### **Operational Management**

The operational portal provides a real-time view of the health of the plant by displaying on-demand the thousands of data points generated by the distributed control system (DCS), laboratory systems, and water quality system. The information is arranged in apps that focus on key functional areas, resulting in increased plant production and reduced downtime.



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The operating plant has thousands of asset types, each with unique replacement parts and service needs. The Maintenance and Materials portal allows teams to track service history, schedule work orders, manage permitting, and verify spare part availability. This portal integrates with Condition Monitoring and Predictive Maintenance solutions to present a full understanding of the health of operating assets. Greater visibility of this data allows the maintenance team to take a proactive approach to ensuring facility uptime and focus their attention on time critical maintenance items, thus reducing maintenance time for non-critical tasks.

#### WHY MidrexConnect<sup>™</sup>

MidrexConnect<sup>™</sup> is a subscription-based suite of tools that complement the skills and expertise of MIDREX<sup>®</sup> Plant operators. The tools can be configured to the specific requirements of each client, and the data of each client is isolated in per plant containers wrapped in robust security.

Midrex has assembled a dedicated team – Midrex Global Solutions (MGS) – to identify opportunities and work with the plants to create effective, sustainable solutions built upon the MidrexConnect<sup>™</sup> platform.

#### MGS is focused on four key areas:



Productivity is the tons of DRI produced per hour and availability is the hours per year DRI is produced. Optimization of both is essential for plant profitability. For example, what if downtime for maintenance and remediation of water systems could be reduced by 50-75% and the effective life of reformer tubes and catalyst could be extended.



#### **OPTIMIZATION & LONGEVITY** Extending the value horizon

Optimization is the primary method for keeping a plant at peak operating efficiency and plant personnel at maximum effectiveness. How a plant is optimized can take many forms: minimizing process variation and human error, reducing waste, improving energy efficiency, ensuring equipment is operated properly, and upgrading the knowledge and skills of personnel. Dedicated, consistent measurement of the performance of installed equipment, systems, and staff facilitates informed decision-making.



#### **PRODUCT QUALITY ENHANCEMENT** Getting what you want when you need it

DRI is known for its low impurities content, but what about its flexibility. Adjustments can be made to vary the degree of metallization and carbon content, as well as the production rate to accommodate changes in market conditions or plant goals. Reducing the number of transfer points and the freefall distance can lessen fines generation.



#### ASSET & QUALITY MANAGEMENT Increasing awareness of lurking problems

Protecting assets and quality management go together. A plant operated and maintained by well-trained personnel will be more productive and less likely to require costly repairs. The use of guaranteed Midrex OEM parts, equipment, and materials is instrumental in keeping the plant running as designed and at the lowest cost. The use of advanced monitoring and signaling devices allows plant personnel to collect and more quickly analyze large amounts of data on which to make critical decisions that affect plant performance, product quality, safety, and environmental impact.

#### MAKING DATA AVAILABLE FOR ADVANCED TROUBLESHOOTING & DIAGNOSTICS

Reducing the time spent searching for data and information is critical to cost-effective plant operation and maintenance. When and how quickly plant data can be retrieved, analyzed, and acted upon can be the difference between trouble-free operation and unscheduled downtime. Remote Professional Services (RPS), powered by the MidrexConnect<sup>™</sup> digital platform, provides plant operators a second set of eyes to identify

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potential upset conditions before they develop, as well as to transform problems into opportunities. RPS allows Midrex experts to review process variables and equipment settings in real time. This data is available digitally for analysis and evaluation, which leads to recommendations for preventive or corrective actions. RPS can be applied in any of the MGS areas of focus.

#### **BUILT UPON A SOLID FOUNDATION**

Midrex is committed to developing, designing, and supplying innovative technological solutions that are high-performing, flexible, and reliable. This commitment is based on a set of principles which have guided Midrex for almost 50 years:

- Innovations and improvements must be relevant to client requirements.
- Designs must be simple, reliable and in step with technology advancements.
- Technology retains its advantage and relevance through interactive information flow.
- Empowering people to take ownership of ideas and responsibility for actions produces a stronger company.

MidrexConnect<sup>™</sup> is in lockstep with these principles, embracing the strategies of Industry 4.0 that are most relevant to the direct reduction industry and providing the tools that empower MIDREX<sup>®</sup> Plant operators. ■











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# **QUALITY & PERFORMANCE ASSURANCE:** Reformer Management & Catalyst Optimization



By Brad Cantrell, Global Solutions Program Manager – Proprietary Equipment & Parts and John Linklater, Global Solutions Program Manager – Plant Services

#### **INTRODUCTION**

xcept for our homes, the motor vehicles we drive usually are our largest and most important purchases. Therefore, we want to keep them in good working condition so they operate reliably and at peak performance for as long as we own them.

We have options for servicing our vehicles, as well as for replacing parts and equipment. We can go to where we purchased them for service and to buy replacement parts or we can shop for a mechanic and parts that fit. When making these decisions we look for value – what it will cost weighted against performance expectations, supplier reputation, and peace of mind. Seldom are value decisions made on price alone.

Multiply the price of an automobile by 10,000 and that is approximately the investment involved in a direct reduction plant. So, is it worth taking a long-term risk for a short-term gain when choosing a services provider and buying replacement parts and materials?

#### **INNOVATIVE TECHNOLOGY TRANSFER**

Contrary to the typical practice of US companies in the 1970s, Midrex sought to enter offshore markets through cooperative technology transfer agreements rather than direct investment and control of production plants. As a result, the customer service function has evolved alongside the global expansion of the MIDREX<sup>®</sup> Process. As the number of plants increased over the years, Midrex tailored its customer service function to maintain regular communication, close cooperation, and an open dialogue with plant operators. Today, two groups are designated to support MIDREX<sup>®</sup> Plants: Technical Services and Global Solutions.

The Technical Services staff consists of experienced professionals, most of whom have worked in MIDREX<sup>®</sup> Plants and understand first-hand how plants are operated and maintained. They are uniquely qualified to interact with plant management and staff to diagnose and troubleshoot problem areas and make recommendations that can improve productivity, reliability, product quality, and safety.

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When more in-depth assistance is needed, Global Solutions has dedicated program managers who work closely with the plants to develop sustainable solutions. They are equipped with a platform of advanced digital tools (see the article, "DIRECT RE-DUCTION IN THE DIGITAL AGE Introducing MidrexConnect" in this issue of *Direct From Midrex*) and the body of knowledge and experience that has been developed over 50 years of designing and servicing MIDREX<sup>®</sup> Plants.

#### THE REAL DEAL

Two examples of how Midrex uses digital technology and a keen sense of purpose to benefit clients involve the MIDREX<sup>®</sup> Reformer. The reformer is the engine room of a MIDREX<sup>®</sup> Plant, where the reducing gases that power the reduction reactions in the MIDREX<sup>®</sup> Shaft Furnace are produced. The MIDREX<sup>®</sup> Reformer is a refractory-lined, gas-tight, welded steel box, which is kept at slightly negative pressure to prevent gas leakage. The reformer contains hundreds of catalyst-filled alloy tubes, which are anchored at the roof of the reformer and allowed to expand downward. The bottom of the tubes is covered by a flexible expansion seal to prevent air intrusion into the combustion chamber of the reformer. The reformer box is anchored in the center and is allowed to expand freely lengthwise in either direction on a series of lubricated bearing plates.



#### View inside a MIDREX® Reformer in operation

Together, tubes and catalyst comprise about 78% of the cost of a MIDREX<sup>®</sup> Reformer (*Figure 1*) and are usually replaced every 8-10 years. Only Midrex has the first-hand design knowledge and process expertise to look beyond the materials to how they affect overall plant performance.



#### FIGURE 1 Cost Breakdown of a MIDREX<sup>®</sup> Reformer

As the developer of the MIDREX<sup>®</sup> Process, Midrex has the knowledge, expertise, and vision to manage the health of the entire plant. Remote Professional Services (RPS), powered by the MidrexConnect<sup>™</sup> digital platform, can detect issues before they become problems and provide the basis for solutions that prolong the useful life of the tubes and catalyst, as well improve overall plant performance.

#### **REFORMER MANAGEMENT**

RPS, which digitally transforms data into actions, is at the core of Midrex reformer management solutions. As its name implies, RPS allows Midrex engineers in the Charlotte home office to look at all areas of a MIDREX<sup>\*</sup> Plant in real-time for process variables or equipment settings that impact reformer performance or equipment and materials longevity. With RPS, data is collected digitally for analysis and evaluation, which leads to recommendations for adjustments or other optimization actions, the effects of which are remotely observed, and the data continues the cycle *(next page, Figure 2)*.

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FIGURE 2 Reformer Management Solution Cycle

RPS reviews data on tube and catalyst conditions in realtime and creates a profile of the reformer's operating history that can be viewed on-demand. The data includes reformer tube roof and floor thermocouple temperatures and thermal reversals,  $\rm H_2/CO$  ratios, gas quality (ratio of reductants to oxidants), and hydrocarbon levels. The data collected is used during the analysis phase to check for thermal imbalance of the reformer at various operating conditions and to avoid carbon buildup on the catalyst. Midrex is developing real-time measurement of tube growth. This would make possible more accurate skin temperature measurements during operation, which result in more precise theoretical vs. actual creep calculations. "Pop-up" warnings of high thermocouple temperatures will eliminate the possibility that an imbalance might be missed, and easier-to-read system screens (*Figure 3*) will facilitate quicker identification of a problem area and predictive cost-saving corrective actions.

#### What RPS Does:

- Observes reformer operation continuously
- Assists plant personnel in standard data collection
- Evaluates data based on Midrex design and operating philosophies using the MIDREX<sup>®</sup> SuperData program and proprietary diagnostic software
- Facilitates periodic inspections
- Issues daily, weekly or on-demand reports

#### How RPS Is Used:

- Confirms that scheduled maintenance adjustments were made
- Suggests when mechanical adjustments are needed, such as to support springs
- Checks that reformer is thermally balanced
- Avoids carbon buildup on catalyst



FIGURE 3 Example of Enhanced RPS System Screen

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- Determines when catalyst needs to be topped or replaced
- Identifies and monitors problem tubes
- Provides basis for recommended actions and operational adjustments

The Midrex Reformer Management Program can benefit a plant in a variety of ways. Performance of reformer tubes and catalyst can be watched over their entire life cycle, which reduces the risk of unplanned shutdowns, unexpected maintenance issues, and premature tube and catalyst failure. Tubes that are suspected of having problems are readily identified, evaluated to determine the best corrective action, and monitored closely. RPS data provides easy to follow diagnostic analysis that shows if tube changes are of a technical nature or are time-related or if gas ratios or quality are affecting catalyst activity. This aids in making informed mechanical decisions and operational adjustments that can improve reformer performance and extend tube and catalyst life. Access to real time, on-demand data takes much of the guess work out of planning for purchasing equipment and materials and the allocation of plant human resources, which translates into greater plant productivity and overall cost savings.

The digital power of RPS, backed by the process design and integration expertise of Midrex, provides plant managers the peace of mind that the mechanical condition and operational performance of their reformer is being properly monitored, managed, and maintained.



MIDREX<sup>®</sup> Reformer Tubes are designed and manufactured for long operating life and superior performance. Midrex offers several types of alloy tubes made from high performance metals backed by value assurance programs to assist in arranging financing and in managing reformer operation.

Traceability, a unique feature of Midrex supply of reformer tubes, is a prime example of how Midrex brings added value to the client relationship. Midrex maintains serial numbers and other markers that identify where and when tube assembly took place and even who performed the welding through installation of the tubes. A portion of the tubes are marked and installed in a specific manner to allow for better observation and more accurate eddy testing. This, coupled with a running log of tube performance, allows issues to be traced back to their source to facilitate timely corrective action.

#### CATALYST OPTIMIZATION



Midrex has a long history of developing catalyst formulations and creating loading profiles to match the operating practices and business goals of MIDREX<sup>®</sup> Plants. As performance demands have increased, Midrex has responded with modern, high efficiency catalysts and the skills and expertise to maximize their value. As shown earlier in *Figure 1*, catalyst makes up about 28% of the cost of a MIDREX<sup>®</sup> Reformer, and throughout the life of a MIDREX<sup>®</sup> Plant the catalyst will need to be added to or replaced several times. Catalyst manufacturers can tell a plant what the expected life of the catalyst is under "normal operating conditions," but what if conditions are not "normal" or the catalyst profile in use is not the optimal solution.

For example, Global Solutions received a tender document from a MIDREX<sup>\*</sup> Plant for replacing its catalyst based on a profile developed many years earlier, when the plant configuration was different. Upon discussion with the client, it was learned that the plant has a history of changing conditions (including operating temperature, compressor capacity, natural gas quality, and heavy hydrocarbons), Midrex decided to ask about the plant's operational goals and the current operating conditions, such as feed materials and gas quality and ratios.

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Through a series of discussions during which reformer tube pressure drop and prior catalyst performance were reviewed and discussed, a joint decision was made to focus on the heavy hydrocarbons and carbon formation in the reformer tubes. Because of the change in heavy hydrocarbon, it was found that frequent carbon burnouts were needed to correct carbon deposition on the catalyst. Historically, the plant did carbon burnouts almost monthly in the first year of operation, increasing exponentially to weekly by the end of the catalyst's life. A burnout is used to remove carbon that builds up in the tube and settles on the catalyst. Oxygen is introduced to increase the temperature inside the tube, which carries with it the risk of thermal cycling the tubes and catalyst. Reformed gas preparation is interrupted for 4-6 hours, which means lost DRI production.

Working with the plant personnel, Midrex was able to evaluate the situation in relation to overall plant operations and recommend changing the catalyst profile, which produced broad-reaching benefits. By slightly decreasing the activity of the catalyst, less carbon was deposited on the catalyst requiring fewer burnouts and increasing the time for producing reformed gas. Wear and tear on the tubes and catalyst was reduced, likely extending their effective life, and overall plant performance was optimized.

#### Ways Midrex Adds Value:

- Knowledge of process beyond the parts (whole is greater than sum of its parts)
- Operational knowledge (in-house and other plants)
- Custom simulations & proprietary software (MidrexConnect<sup>™</sup> digital platform)
- Manage solutions (inquire, obtain, and process information & data)
- Reach mutually rewarding conclusion

Midrex approaches every replacement equipment, spare part, and material supply opportunity with the same goal: to provide the most cost-effective solution that meets the client's goals. Plant personnel are expected to focus on their area of responsibility. Midrex is uniquely qualified as the designer of the process technology to recognize how a part, piece of equipment, or material affects the entire plant. By understanding the plant goals and partnering with clients to identify the cause and effect of issues, Midrex can bring together the right decisionmakers to craft a sustainable solution. After a solution is agreed upon and a course of action is determined, Midrex leverages its relationships with quality manufacturers and vendors worldwide to assure a competitive price and timely delivery. By functioning as a plant's representative in dealing with equipment manufacturers and vendors, Midrex frees up plant operations and administrative personnel to focus on other tasks that require their personal attention and expertise.

#### **BUILDING ON COOPERATION**

Global Solutions embodies the spirit of innovation, opportunity, and cooperation that has been at the heart of the Midrex technology transfer philosophy since start-up of the first plant in 1969 (*Figure 4*). Through the years, Midrex has provided plant personnel process knowledge, training, and assistance, and the relationship of Midrex and its Process Licensees has expanded and grown.



#### FIGURE 4 MIDREX<sup>®</sup> Plant Life Cycle

Today, Global Solutions continues to build on that tradition by working with MIDREX<sup>\*</sup> Plant personnel to address issues specific to their local conditions and business models, such as optimizing operations, improving productivity and availability, maximizing product quality, and enhancing and protecting assets – human and physical. This is why Global Solutions is the only plant services provider that can guarantee that its solutions are designed and manufactured to exact Midrex specifications and backed by 50 years of unparalleled success.

The results speak for themselves – MIDREX<sup>°</sup> Plants are the best performing plants in the direct reduction industry.

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# **MIDREX News & Views**

# **Durnovich Named to Lead Midrex Global Solutions**



DAVID DURNOVICH GENERAL MANAGER -MIDREX GLOBAL SOLUTIONS

avid Durnovich, a 40-year direct reduction industry veteran, has been appointed General Manager of the value-based Midrex customer service team known as Global Solutions. Durnovich, who most recently served as General Manager – Operations & Maintenance, has extensive experience in the operation and management of MIDREX\* Plants, which includes a key role in the success of the first MIDREX\* HBI Plant on Labuan Island, Sabah, Malaysia.

Other executive management positions held by Durnovich include Production General

Manager of Operaciones al Sur del Orinoco (OPCO) in Venezuela, Chief Operations Officer of American Iron Reduction (AIR) in USA, Vice President Operations of ArcelorMittal Point Lisas in Trinidad and Tobago, and Vice President Operations of Lion Group in Malaysia.

"Dave has spent the bulk of his career as a Midrex customer, so he understands firsthand the demands of plant management," Mark Boedecker, Midrex Director – Sales, said. "He takes a total plant approach to problem solving with an appreciation for the value of rapid, quality deliverables, which makes him a natural to lead Global Solutions."

Interaction and cooperation with the owners and operators of MIDREX<sup>®</sup> Plants has been a basic philosophy of Midrex for more than 50 years, one which has served both the company and its clients well. Global Solutions was created to supplement the licensing and technical support activities of Midrex with the resources to analyze, diagnose, and implement programs that address specific needs in the context of how they relate to and affect the plant as a whole. Each solution is tailored to local conditions and the business strategy of the client.

The Global Solutions team is uniquely capable of working with clients to understand a challenge – whether optimizing plant availability or productivity, increasing product quality, or improving asset management – and provide a sustainable solution from a multi-faceted toolbox of digital systems, engineering expertise, and strategic relationships.



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# **GLOBAL SOLUTIONS PROGRAMS**



**ROB CHEELEY** PROPOSAL MANAGER -ENGINEERED SOLUTIONS

Plant audits and de-bottlenecking studies, process automation upgrades, customization of equipment for local conditions, and incorporation of new technologies.



#### CHARLES COTTON PROGRAM MANAGER -MidrexConnect™

Web-based digital tools including Asset Management, Operational Management, Maintenance and Materials Management.



DAVID OSWALD GENERAL MANAGER -WATER SERVICES

Recommend treatment strategies and optimize results according to design needs by using leading process indicators rather than conventional "fit for use" strategies.



#### JOHN LINKLATER PROGRAM MANAGER -PLANT SERVICES

Operations expertise utilizing Remote Professional Services (RPS) for off-site viewing of production process variables and interaction with all areas of the production process; support of all plant functions including construction management, operations, maintenance, and purchasing with skilled manpower.



#### BRAD CANTRELL PROGRAM MANAGER -PROPRIETARY EQUIPMENT & PARTS

Assist plants in developing replacement parts and consumables strategies that relate to overall plant success; manage global sourcing and timely delivery of essential spare parts and materials.

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# **MIDREX News & Views**

# ArcelorMittal Global DRI Briefed on Integrated Plant Solutions (IPS)

group of ArcelorMittal global DRI plant representatives was introduced to a comprehensive plant services strategy by Midrex at a meeting held in Rosario, Argentina, in November 2018. Dave Oswald, General Manager – Water Services and Joaquin Sanchez, Key Account Manager, presented the Integrated Plant Solutions (IPS) offering by Global Solutions. IPS is a mechanical, operation, and chemical (MOC) strategy intended to increase plant-wide availability, which results in higher annual production.

IPS includes water treatment management and associated services, which can be tailored to the local conditions of each plant. For example, Global Solutions was able to reduce total suspended solids (TSS) to < 10 ppm consistently and eliminate iron fouling and control scale in a plant's top gas scrubber, which enabled 2-year uninterrupted operation. In a plant's reformed gas cooler, Global Solutions was able to prevent microbiological mass and iron oxide fouling, which extended a 12-month service interval to 22 months.

As a result of the meeting, Midrex Global Solutions will follow up with a number of ArcelorMittal DRI plants to discuss how to proceed and develop specific IPS implementation plans.



# **Arcelor**Mittal



Dave Oswald explains Midrex water treatment management at ArcelorMittal meeting

### IPS for water treatment management addresses the following industry imperatives:

- Creating Additional Production Opportunities
  - Reducing Maintenance & Operating Costs

Protecting Critical Components

Quality Production

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# **NEXT ISSUE: MIDREX CELEBRATES 50 YEARS OF COMMERCIAL OPERATIONS**



#### Lauren Lorraine: Editor

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