As a number of cutting-edge ICT solutions incorporated AI technology are commercialized these days, JFE Steel hopes to make business reforms by utilizing those solutions proactively. However, without being influenced by any uncertain or exaggerated information, our systems division needs to ascertain with certainty those solutions, particularly from the aspect of information security. Our mission is to achieve our sixth medium-term business plan by addressing issues with decisions and actions based on constantly ensuring that our systems are consistent with our customers’ needs as well as our corporate management needs. This will result in the promotion of JFE Steel’s DX (digital transformation).

Global leadership in IT, creating customer-focused value, and responding quickly to changes through continuous reform and strategic IT

Hironori Fukushima Senior Vice President

Global leadership in IT, creating customer-focused value, and responding quickly to changes through continuous reform and strategic IT

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JFE Steel’s IT Vision and Three Strategic Themes

JFE Steel’s IT Vision

Be a global steel supplier that always creates new value and grows with customers

Provide restructuring support for better business management

Address the needs of management and business divisions

JFE Steel’s IT Vision

Global leadership in IT, creating customer-focused value, and responding quickly to changes through continuous reform and strategic IT

1. Execute IT structural reforms
   - Upgrade systems at steelworks
   - Realize a flexible, change-intelligent IT structure

2. Raise our level of IT use
   - Promote business reforms and the latest advancements in IT
   - Improve dramatically in speed of business operations

3. Reinforce our IT risk management
   - Enhance security and standardized controls
   - Enhance the security environment for IT

Synergistic effects

IT Innovation Leading Department

To address key business issues and also structural issues related to our business operations, our department works with other business divisions to facilitate the use of the latest ICT and to implement business reforms. This is competitive IT. We are also working to establish a secure IT environment in terms of infrastructure as well as application systems and then enhance this environment even further. This is defensive IT.

Business Process Innovation Team

Upgrading legacy systems is a management issue that we are making every effort to address. We are using the latest ICT and promoting data science and other forms of sophistication of data use to steadily reform our operations and build flexible systems that can adapt to operational changes. This is a huge project, the likes of which have not been seen before.

System Division Structure

Development

- IT Innovation Leading Department
  - Upgrade mission-critical systems at steelworks

- Business Process Innovation Team
  - Address the needs of management and business divisions

- Data Science Project Department
  - Create and implement strategies for technological development using data science

Maintenance

- Plant Control Department
  - Promote overall process control at steelworks

IT Innovation Leading Department

- Companywide, headquarters, steelworks
- IT strategy, system planning, development and operations
- Information security and governance

Data Science Project Department

- We take a companywide perspective in efforts to systematically and efficiently apply ICT technologies, AI, and data science mainly for equipment, processes, and operations. We have begun by strengthening our data collection platforms for all kinds of processes, and are working to raise quality assurance and quality control levels through data usage consistent across multiple processes, while also using data seamlessly throughout the company to boost operating efficiency and cut costs.

Akira Kazama Vice President

Note: The Steel Research Laboratory is responsible for R&D in each area.

Management

- System Division Structure

Information systems

- Operations
- Management

Target system axis

Business type axis

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The IT Innovation Leading Department’s mission is to encourage reforms in business operations using the latest technologies, see that changes are implemented and then track the results in terms of IT optimization, particularly for infrastructure and security. What is important for us right now as an IT division is to work as a team, with each business division designating key themes in management and business operations. Together, we implement solutions that tie in the latest research in ICT and possible applications. Significant projects require coordination with the basic IT strategies of our IT Steering Committee and have the management team sign off on the plan before solutions are implemented.

We encourage reforms in business operations using IT, see that changes are implemented and then track the results in terms of IT optimization. In this context, the IT Innovation Leading Department’s mission is to encourage reforms in business operations using the latest technologies, see that changes are implemented and then track the results in terms of IT optimization. For the new accounting system project, the key themes are as follows:

- **Business operations**: Enact reforms in business operations using IT.
- **IT Innovation Leading Department**: Ensure that changes are implemented and then track the results in terms of IT optimization.
- **IT steering committee**: Coordinate with the basic IT strategies of our IT Steering Committee and have the management team sign off on the plan before solutions are implemented.

**Powerful solutions built on latest technologies**

We are upgrading legacy systems and promoting DX (digital transformation), while also building and transforming our IT platform into one that can respond swiftly to external changes.

### JFE Steel’s Companywide (Corporate) IT Strategy

We are upgrading legacy systems and promoting DX (digital transformation), while also building and transforming our IT platform into one that can respond swiftly to external changes.

#### Cycle of reforms in business operations using IT

- **IT Innovation Leading Department**: Identify and analyze newest technologies.
- **Business operations**: Enhance business operations using IT.
- **IT steering committee**: Coordinate with the basic IT strategies of our IT Steering Committee.
- **IT steering committee**: Ensure that changes are implemented and then track the results in terms of IT optimization.

**Innovating and standardizing operations by upgrading groupwide accounting system**

By introducing the world’s latest ERP, upgrading mission-critical systems and pursuing business reform 81 companies including JFE Holdings and JFE Steel are standardizing accounting operations.

Recognizing the need to review its IT backbone to support business development in Japan and overseas, comply with International Financial Reporting Standards (IFRS) and make operations smoother and more efficient, the JFE Group upgraded the mission-critical J-FACE system in February 2018. Under a strict policy of building new operations and systems that make maximum use of products’ special features, the system was introduced at JFE Steel and JFE Holdings over nine months, and we were able to complete the rollout at 79 group companies in the short time of 11 months. The groupwide accounting system reduced the number of servers used by 75% and achieved a reduction in running costs. This project was highly recognized outside the company as well, receiving awards at the SAP Innovation Awards 2018 and the Japan Institute of Information Technology’s Special IT Award (System Integration Prize).

<table>
<thead>
<tr>
<th>Project concept</th>
<th>Swift construction of a simple accounting system to be used as the de facto product at many major companies in Japan and overseas to support global management.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project results</td>
<td>Quality: Zero major setbacks! Costs: Within initial budget! Delivery: JFE Steel: 9 months/Group: 11 months</td>
</tr>
</tbody>
</table>

**Zero problems in fiscal 2018 year-end settlements**

Operations that previously differed at each plant or group company have been standardized, reducing handovers smoothens when staff are transferred.

**More than 10 years have passed since the introduction of the J-FACE, groupwide accounting system, and this was a major change of the mission-critical system that users had become very familiar with.**... Going forward, we hope that J-FACE will be helpful in increasing convenience for users and innovating operations.

<table>
<thead>
<tr>
<th>Project team worked as one to upgrade the mission-critical accounting system in a short time!</th>
<th>JFE Voice!</th>
</tr>
</thead>
<tbody>
<tr>
<td>More than 10 years have passed since the introduction of the J-FACE, groupwide accounting system, and this was a major change of the mission-critical system that users had become very familiar with. We therefore, faced with the issues of sufficiently explaining the purpose and reasons for the upgrade and training users in the use of the new system, within a short period of time, and almost everyone involved in the project participated in these activities. Going forward, we hope that J-FACE will be helpful in increasing convenience for users and innovating operations.</td>
<td>Minako Nakai, Accounting Department</td>
</tr>
</tbody>
</table>

| JFE Steel: 9 months/Group: 11 months | As initially planned! |

Zero problems in fiscal 2018 year-end settlements
Reform mission-critical systems at steelworks using the latest ICT
Create new value through reforms in business operations

We are reforming mission-critical systems at steelworks under the following policy: (1) Rebuilt a system platform using the latest ICT. (2) Redefine operational processes to pass on manufacturing expertise and introduce standardized operations; and (3) Create an integrated database with a standardized data structure.

Through this system upgrade, we aim to create an operating platform that shares and uses all companies’ data with all employees, and to transform work styles to create new value.

New work styles realized through system upgrades

Enhanced production control
JFE Steel fell behind in its systemization of offline operations but has been working to reverse the situation and realize standardization, and also link the movement of objects and equipment at manufacturing sites in real-time using advanced IoT options. The company-wide integrated database puts together all this information for the formulation of ideal overall production targets and the realization of integrated production control beyond the domestic network of steelworks.

Hierarchical dashboard
Optimized company-wide production through prompt decision making and action

SCM* that connects customers and company in real time
Facilitates better responses to customer needs, from marketing to production

Companywide, integrated database
+ Real-time information + Sharing + Visualization

Data science
Spreads up development of technology through innovative staffing

IoT
Populates production and logistics statuses in real-time using smart devices

Domestic JFE steelworks

Entire process monitoring
Detects overall anomalies from changes in correlation of variables in several thousand process variables

Color mapping
Easy-to-view display of the variables which have anomaly behavior and of the timing of when anomaly behavior occurs

Individual facility monitoring
Detects stand-alone anomalies through analysis of principal components

JFE Voice!
Kenta Taguchi, Tatsuo Inomata, Daisuke Enoki, Business Process Innovation Team

DS technology deepening technologies used at worksites

Using data science to detect even small, difficult-to-identify anomalies
Achieving stable operations in steelworks processes!

It is important to maintain sound and stable operations in all steel manufacturing processes, which encompass many upstream and downstream processes. We have developed a framework to warn maintenance operators to detect even small, unanticipated, difficult-to-identify anomalies by using advanced statistical analysis, and are working to introduce this in all processes.

Automated monitoring for anomalies in both the level of the entire process and individual facilities in manufacturing processes

DS technology deepening technologies used at worksites

I am currently developing technologies to diagnose equipment anomalies using big data analysis technologies.

As we implement the concept of preventive maintenance, we are developing proprietary systems that automatically detect anomalies and announce methods for addressing and possible causes of the anomaly, to accelerate the on-site response.

Tatsuhiro Sue, Hot Rolling Technology Section, Hot Rolling Department, West Japan Works (Kurashiki)

Contributing to the construction of a system platform for the future

Since joining the company, we have been responsible for manufacturing thick steel plates. Now, we are working on the project to reform the mission-critical system for thick steel plates, with responsibility for designing the screens for operation-use terminals and supporting the development of related functions. Along with reforming a system that is easier to understand and easier to use, we are contributing to the construction of a system platform that can enhance operations and make them more efficient in the future.