

## Reforms and Progress Aimed at Expanding Organic Growth

### Stepping up pursuit of *monozukuri* innovation

The *monozukuri* innovation that the Hitachi Metals Group is focused on pursuing seeks to activate employees and generate cash through the fusion of "GEMBA (workplace) reforms" and technological innovation in areas including productivity, materials processes, machine processing, and the Internet of Things. In the area of GEMBA reforms in particular, we established a new GEMBA Innovation Management Division in April 2018 as a cornerstone for these activities. Working in cooperation with the Technology, Research & Development Division, this new division will further accelerate GEMBA reforms at all Group locations around the world.

# Manufacturing Innovation

#### Case 1

### Using IoT technologies to lay a foundation for plant reform

At the Specialty Steel Company's Yasugi Works, operational reform is proceeding under YoT (Yasugi's Internet of Things), with data visualization and the use of IoT technologies operating side by side in what we call the YoT Project.

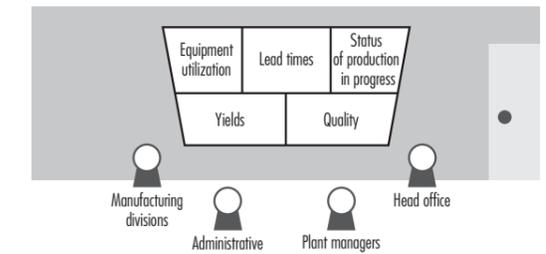
Within the Hitachi Metals Group, specialty steel manufacturing is known as producing small lots of a large number of product types. Because processes including melting, hot processing, and cold processing are completely separated, production management to date has been carried out by material and process. This has meant that even if we tried to manage the plant's overall production on an integrated basis, discussions with common parameters for optimization of product management could not take place. Therefore, as a way of visualizing data, we began to build a common, cross-division platform to understand the plant as a whole, including the utilization of main equipment, the status of production and production in progress for each process, lead times and yields, and occurrence of defects.

This made it possible for all manufacturing divisions, administrative divisions, and plant managers to access data from the same screen, facilitating appropriate identification of issues and formulation of countermeasures. In addition, the

use of IoT technologies allowed us to transfer inventory operations for raw materials from pen and paper to smart devices, which succeeded in reducing the time involved by half. We are also moving forward with the use of sensing to collect equipment data automatically.

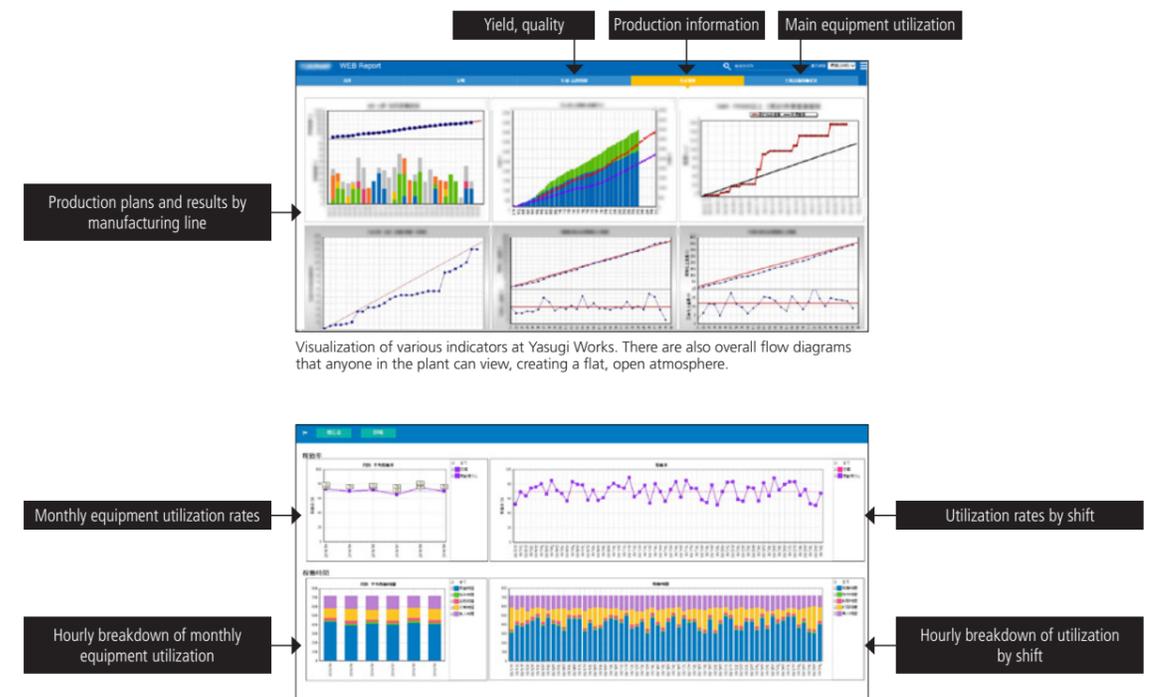
This YoT Project is one framework whereby we are using technology to make advances on the plant floor. Going forward, we will make further advances in the use of this framework for *monozukuri* innovation and enhancing productivity and safety.

#### Overview of use of common cross-division platform



Multifaceted understanding of situation and resolution of issues across divisions

#### Common cross-division platform screens



Visualization of various indicators at Yasugi Works. There are also overall flow diagrams that anyone in the plant can view, creating a flat, open atmosphere.

The utilization analysis screen makes it possible to identify discrepancies between utilization times and work operation times for main equipment.

## Advancing “2S-3F” activities from the workplace for the workplace

The Hitachi Metals Group is rolling out “2S-3F” activities as a Companywide initiative at the core of *monozukuri*, as we work to improve workplace environments and increase inventory turnover rates through the two “S” initiatives of Sort Out and Set In Order, and three “F” initiatives of Fixed Location, Fixed Quantity and Fixed Item at manufacturing sites.

For example, various 2S-3F activities are being implemented at the Cable Materials Company’s Ibaraki Works with a basic concept of “creating an environment where it is easy to work.” By rearranging the layout of the rewiring line for machinery cables for optimal line of flow, conveyance times during operations were reduced by roughly half. In cable end

processing operations, which are prone to produce inconsistent quality, making our own work chassis and tool rod have made it possible to reduce the roughly 4-kilogram electric saws to 1.2-kilograms load on the tool rod, resulting in significant improvements in operational efficiency and quality.

Implementing improvements based on feedback from the workplace is the starting point of 2S-3F activities, and by having the workplaces themselves implement the improvements, progress is being made through detailed improvements. This continuous activity is leading to dramatic improvements in workplace environments, and is improving operational efficiency ratios.

Rewiring line for machinery cables



## Disseminating the successes of workplace reforms through external exhibitions and presentations

The Hitachi Metals Group is proactively disseminating the successes of workplace reforms through various external venues.

The Company displayed eight exhibits at the Karakuri KAIZEN® Exhibition 2017, held by the Japan Institute of Plant Maintenance. Karakuri KAIZEN aims to use old technologies and principles based on leverage and gravity to improve operations using simple mechanisms. One of our exhibits, “Is it comfortable? (an inspection platform that uses spherical bearings and springs to easily and freely set an inspection surface without supporting it by hand)” was selected as one of “10 items of note” in the organizing committee’s brochure.

In addition, two teams from Hitachi Metals participated in the Japan Iron and Steel Federation’s 79th Voluntary Control Activity Seminar. The Yasugi Works inspection group’s

presentation on its Inspection Efficiency Up Project, demonstrating a peripheral visual inspection method, was awarded a top prize in recognition of its improved operability and quality through reevaluating how visual inspections should be done.



\* Karakuri KAIZEN is a registered trademark of the Japan Institute of Plant Maintenance.