Product Development

Process Technology
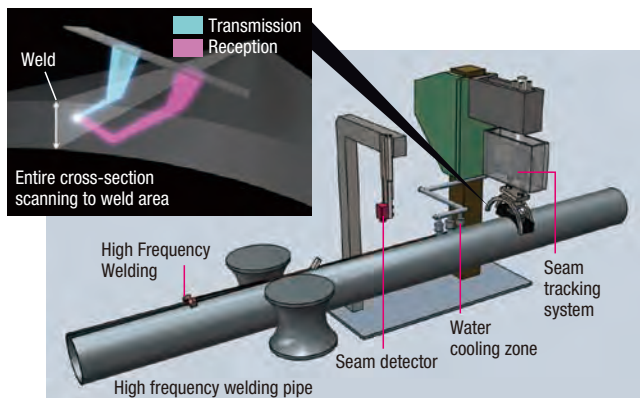
Fundamental & Applied Technology

Instrument & Control Engineering

The development and implementation of the creative sensing and controlling systems distinguish JFE's cutting-edge manufacturing processes and logistics planning, establishing the customer satisfaction with our products and services.

Non-Destructive Evaluation

Original internal flaw inspection technologies using ultrasonic or electromagnetic non-destructive testing method contribute to precise quality control and strict quality assurance of mechanical properties such as formability, toughness, strength and soundness of steel products.
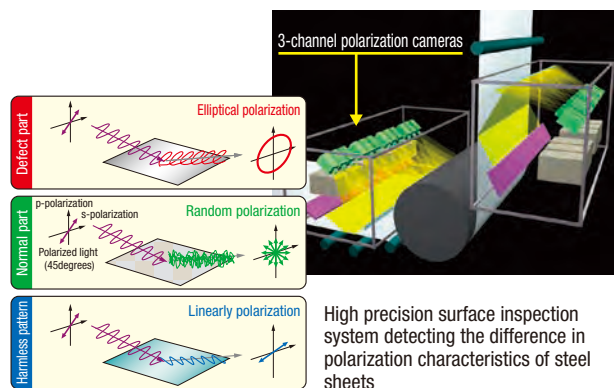
Phased array UT for detecting small oxides

Transmission
Reception

Weld

Entire cross-section scanning to weld area

High Frequency Welding

Seam tracking system

Water cooling zone

Seam detector

High frequency welding pipe

Online high sensitive inspection system for welding part of HFW pipes (11th Prize for Promoting Machine Industry Award)
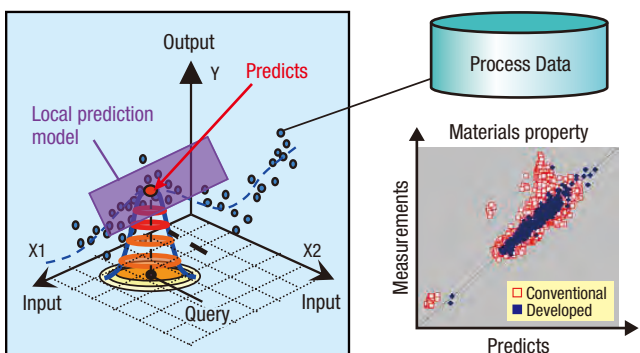
Optics & Image Processing

Various surface inspection systems using leading edge technologies include optics, imaging, signal processing are developed to upgrade surface quality assurance of our products. Accurate thermometry sensor systems for hot materials (for example, more than1000°C) are developed in order to optimize our product line.

3-channel polarization cameras

Defect part — Elliptical polarization

Normal part — p-polarization / s-polarization — Random polarization — Polarized light (45degrees)

Harmless pattern — Linearly polarization

High precision surface inspection system detecting the difference in polarization characteristics of steel sheets

Surface Inspection System "Delta-Eye" using 3-channel polarization cameras (Okochi Prize 2001 Memorial Technology Award)
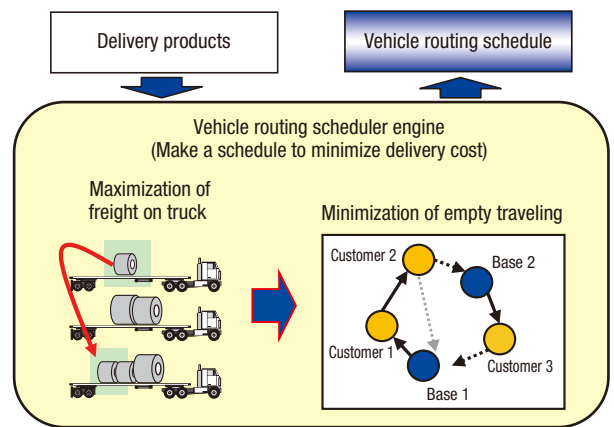
Process Control

Novel control schemes are developed and implemented in various iron and steel processes by applying advanced control theory, modeling methodologies, on-line optimization techniques and statistical analyses to improve control accuracy of process variables such as temperatures, gauges and mechanical properties for higher product quality.

Output

Y

Predicts

Local prediction model

$X1$

$X2$

Input

Query

Input

Process Data

Materials property

Measurements

Predicts

Conventional
Developed

High-Precision Mechanical Property Prediction through Just-In-Time Modeling

Optimal Scheduling & Logistics

Optimizing systems utilizing the latest search methods are developed to improve productivity and efficiency at various scenes of steel business such as determining production order in works, designing groups and routes in products delivery.

Delivery products

Vehicle routing schedule

Vehicle routing scheduler engine
(Make a schedule to minimize delivery cost)

Maximization of freight on truck

Minimization of empty traveling

Customer 2 — Base 2

Customer 1 — Customer 3

Base 1

Vehicle routing scheduler