

Q3-INTELLIGENCE  
SUCCESS STORY  
NUCOR STEEL  
SOUTH CAROLINA

NUCOR

DANIELI AUTOMATION







THE CUSTOMER

Nucor Steel South Carolina is a premier producer of angles, channels, flats, rounds, rebar and hexagons. Nucor also produces rod, bar, and hex in coil. The facility is located in Darlington,

South Carolina, United States. Since beginning of operations in 1969 as Nucor Corporation's first bar mill, Nucor Steel Darlington has grown to become the largest bar producer in the Southeast.



Nucor Steel South Carolina's facility consists of two high efficient bar rolling mills that produce special bar quality, merchant bar quality, and reinforcing bar products with over 600 distinct steel grades. Being the quality a priority for the rolled products, it became essential to have a centralized repository able to correlate the process information to the finished products in order to use analytical

tools to support the mill output. The Q3-Intelligence System accomplished the need to merge heterogeneous sources into a single data warehouse, transforming data streams into useful information to optimize the whole process.

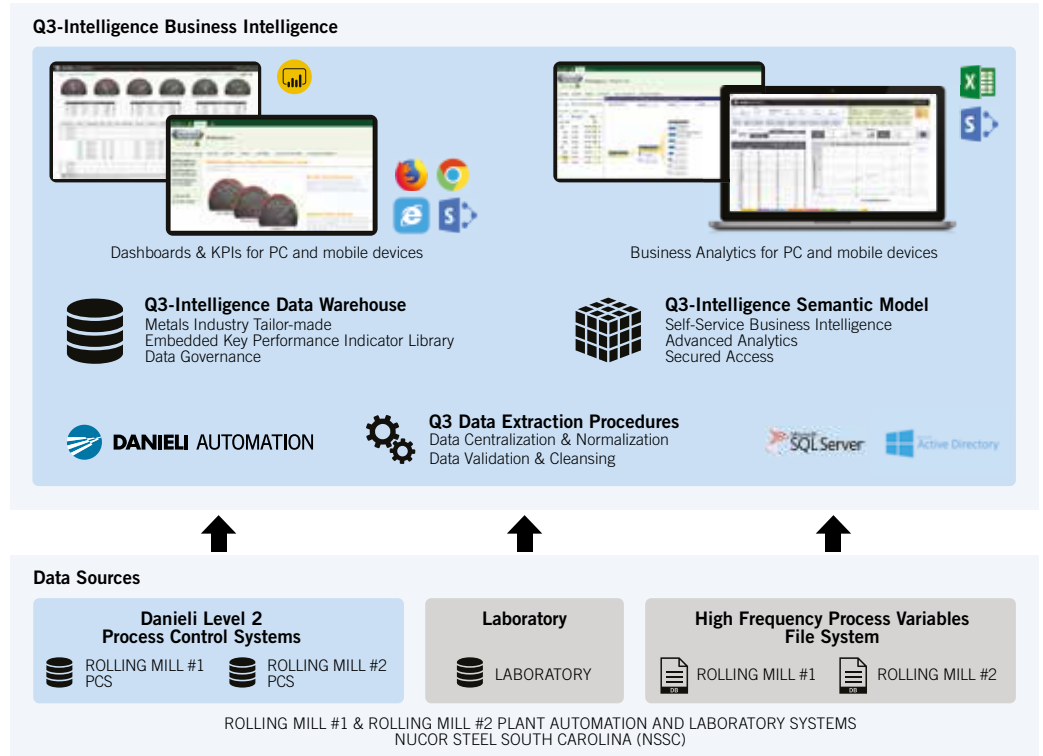
THE CHALLENGE

# THE SOLUTION

The Business Intelligence (BI) vertical solution for the metals industries developed by Danieli Automation is a real time data monitoring system and data analysis platform. Q3-Intelligence is based on the Microsoft BI and Analytics platform using SQL

Server to support IT-developer-centric data management, reporting and administration requirements, while business-user data analysis needs are delivered by the web dashboards and through Microsoft Excel via the custom Q3-Intelligence data

analysis templates and the exhaustive KPI library. Q3-Intelligence extends information delivery systems towards being complete decision platforms by combining operational data streams with advanced analytical tools.



*“The role based access to the data makes it simple for our team to use Q3-Intelligence”*

*Ben Souther, Rolling Mill Supervisor, Nucor*

### Q3-Intelligence set up and methodology

Danieli Automation’s Level 2 System commissioned modules comprises the Production Module, that manages the flow of data from the time billets are charged into the reheating furnace up to the end of the mill lines; the Downtime Module, that tracks and categorizes scheduled and unscheduled downtimes; the Quality Control System Module, that aims to automatically identify the quality level of the rolled products on the basis of measurements collected during the process and the application of a set of pre-defined quality evaluation

rules; the Roll Shop Module, that provides regular and timely roll and setup shop management information to operators. Through automated tasks, all this data is centralized into the Q3-Intelligence System data warehouse, that thanks to the predefined and built-in interfaces towards Danieli Automation’s Level 2 System, makes it a plug & play application. The software commissioning was carried out throughout different steps by means of several visits on site, in which the integration of new modules and system tuning were performed gradually according to Nucor’s standards. Each phase involved specific

Nucor personnel to properly configure the system. Due to the needs to centralize and correlate Danieli’s Level 2 system data with a third-party system (laboratory data), an interface to exchange data was studied and design on site to import the laboratory test results into the Q3-Intelligence centralized repository. Finally, the wide usage of the Microsoft SharePoint framework led to the integration of the Q3-Intelligence modules into Nucor’s SharePoint portal, leveraging the usage of the centralized data model thanks to its native compatibility with such environment.

**Custom-tailored management of data**

Gigabytes of information that were previously stored across several independent relational databases are now inserted into a custom-tailored data warehouse and analysis data models. One-click access to process data which had previously taken hours to track down is now instantly available.

**Enhanced real-time production monitoring**

Real-time data visualization tools, showing graphical snapshots and historical trends enabling end users to instantly be informed about the status of both production lines. The web dashboards are fully configurable, allowing to monitor specific production KPI's and metrics according to single user's needs. Visualization is enhanced with the adoption of a top down dashboard design that starts with the automatic evaluation of individual Key

Performance Indicators (KPIs) and then tracks down the production to single day/shift details or to production order details, with ready access to specific custom reports.

**Boosted data analysis capabilities**

Analytical data structures and data models are constantly updated with production data, overcoming the need to easily and immediately correlate any information, from timings to quality and process variables, throughout different perspectives, aiding decision-making activities. This data structure architecture permits to historize the information, giving the ability to compare production trends and performances over the time as well to correlate the product's quality to any process of its process variables. All this information can be accessed from the company's intranet through the ready-to-use Excel dynamic analysis templates or

through the SharePoint portal by means of several features such as Excel Web Services.

**Role-based access to data**

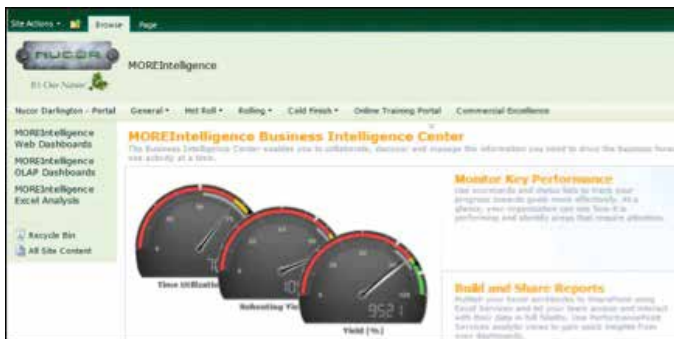
The need for high level restrictions to certain information is easily fulfilled using the Q3-Intelligence integrated security functionalities, based on Active Directory. For both systems, the web dashboards and Excel analysis workbooks, it is possible to rapidly set up roles with customizable privileges, thus preventing unauthorized accesses. Finally, any configured security role is automatically inherited by SharePoint, making it simple to handle security accesses.

**BI power to staff in order to improve the business**

Nucor Steel Darlington recognizes the additional value Q3-Intelligence brings to its users. This is guaranteed thanks to the use of a wide-ranging data analysis platform comprising multiple data analysis tools for different needs, which permits the correct analyses of the data that is gathered. It is a powerful tool for production teams, quality assurers, process engineers and other business process key users, and allows such to focus on the monitoring and analysis of process data, thus reducing the time needed to reveal the underlying reasons for production anomalies.

*"The power of Q3-Intelligence data analysis system has made it a true tool for us to use; not just another piece of software"*

*Ben Souther, Rolling Mill Supervisor, Nucor*



## THE BENEFITS

Q3-Intelligence leveraged the value of the existing process data to achieve a real-time and unified view of actual and historical plant performances. All users from both mills have now the possibility to readily browse production information thanks to a centralized repository of integrated data from multiple sources. Q3-Intelligence includes fully customizable advanced statistical tools which offer short learning curves for first time users. Q3-Intelligence has transformed reporting at Nucor by reducing the manual data access and by delivering a centralized real-time view of the production.

- > Centralized production data generated from multiple process control systems
- > Ordinary front-end tools (Web Browser and Excel) shortening learning curves
- > Improve ease of access to data in terms of front-end analyses, system performance and maintenance by internal IT personnel
- > Significantly decreased time to access internal data streams, via a unified methodology
- > Real time monitoring of plant production data together with the integration of existing reporting tools
- > Customization of advanced dynamic data analyses

- > Self-service BI that permits users to query data independently without needing extensive IT skills
- > Extranet access to information thanks to the native integration with Microsoft SharePoint Long time storage of all production data in centralized data warehouse for advanced data analysis
- > Archiving of historical data that is purged from the source systems
- > Optimize complex data accesses while avoiding any impact on the operational source systems
- > A single data model for all data regardless its source





## DANIELI HEADQUARTERS



## DANIELI

Via Nazionale, 41  
33042 Buttrio (UD) Italy  
Phone +39 0432 195 8111  
www.danieli.com  
info@danieli.com

## DANIELI AUTOMATION

Via Bonaldo Stringher, 4  
33042 Buttrio (UD) Italy  
Phone +39 0432 518 111  
www.dca.it  
info@dca.it

## WORLDWIDE DANIELI COMPANIES

### AUSTRIA

Max Planck Strasse, 5  
A - 9100 Völkermarkt  
Tel (43) 4232.51440.6101  
info@austria.danieli.com

### UNITED KINGDOM

4 Ignite, Magna Way  
Rotherham S60 1FD  
Tel (44) 1709.724300  
info@uk.danieli.com

### SPAIN

Poligono Sondikalde  
Calle Portu Bidea, 2  
48150 Sondika - Vizcaya  
Tel (34) 94.4872800  
info@spain.danieli.com

### INDIA

Technopolis Building  
Plot 4, Block - BP, 5th Floor  
Wing - B, Sector - V, Salt Lake  
700 091 Kolkata - West Bengal  
Tel (91) 33.39847777  
info@india.danieli.com

### GERMANY

Brunshofstrasse, 12  
D-45470 Mülheim - Ruhr  
Tel (49) 208.3780000  
info@germany.danieli.com

### THE NETHERLANDS

Rooswijkweg 291, 1951  
ME Velsen-Noord  
T +31 (0)251 500 500  
F +31 (0)251 500 501  
info@danieli-corus.com

### TURKEY

1. OSB Istiklal Mahallesi  
1. Cadde No. 15  
Beykoy - Duzce  
Tel (90) 380.5537110  
info@turkey.danieli.com

### INDIA

7000 Central Expressway,  
Sri City  
517588 Andhra Pradesh  
Tel (91) 8576.304000  
info@india.danieli.com

### GERMANY

Scherl 12  
D-58540 Meinerzhagen  
Tel (49) 2354.70820  
info@germany.danieli.com

### SWEDEN

Nya Ågatan, 23  
SE-77782 Smedjebacken  
Tel (46) 240.668500  
info@sweden.danieli.com

### RUSSIA

Avtozavodskoe shosse 48  
Nizhny Novgorod Region  
606000 Dzerzhinsk  
Tel (7) 8313.310310  
info@russia.danieli.com

### THAILAND

Land Plot N. K11  
The Eastern Seaboard Ind. Estate  
Tambol Pluakdaeng, Amphur  
Pluakdaeng, 21140 Rayong  
Tel (66) 38.929000  
info@thailand.danieli.com

### FRANCE

Les Mercuriales  
F-93176 Bagnolet Cedex  
Tel (33) 1.49722269  
info@france.danieli.com

### SWEDEN

Box 994  
SE-85125 Sundsvall  
Tel (46) 60.139400  
info@sweden.danieli.com

### CHINA

No. 19, Xing Gang Road, CEDZ  
Changshu, Jiangsu 215513  
Tel (86) 512 52267088  
infodcs@china.danieli.com

### USA

600 Cranberry Woods Drive  
Suite 200  
Cranberry Township, PA 16066  
Tel (1) 724.7785400  
info@usa.danieli.com

## WORLDWIDE OFFICES AND SERVICE CENTERS

### SWITZERLAND

Olsbergerstrasse 2  
4310 Rheinfelden  
Tel (41) 61.8368310  
info@switzerland.danieli.com

### TURKEY

Adalet Mah. Manas Bulvari No. 47,  
Folkart Towers, A Block, Ofis 3208,  
35580 Bayrakli, Izmir  
Tel (90) 232.4355577  
info@turkey.danieli.com

### INDIA

D-402 Lotus Corporate Park,  
Ram Mandir Road,  
Off Western Express Highway  
Goregaon (E), Mumbai 400 063  
Tel (91) 22.39917100  
info@india.danieli.com

### KOREA

Room 201, Daecheon Building  
157-4 Samsung-dong  
Gangnam-gu 135-090, Seoul  
Tel (82) 2.5626622  
info@korea.danieli.com

### CANADA

P.O. Box 24062  
Sault St. Marie  
Ontario P6C 6G7  
Phone (1) 705.9468779  
info@canada.danieli.com

### RUSSIA

Leningradskiy Prospekt 31A  
Building 1, 24th Floor  
125284 Moscow  
Tel (7) 495.9819073  
info@russia.danieli.com

### EGYPT

76 Al-Moltaka Al-Arabi Dist.  
11799 Sheraton Zone  
Heliopolis, Cairo  
Tel (20) 2.22699491  
info@egypt.danieli.com

### INDIA

Furnace Building  
1, Taratala Road  
Kolkata - 700024  
Tel (91) 33.33013510  
info@india.danieli.com

### JAPAN

42F, Yokohama Landmark Tower  
2-2-1, Minatomirai, Nishi-ku,  
Yokohama-City  
220-8142 Japan  
Tel (81) 45.651.7077  
info@japan.danieli.com

### MEXICO

Edificio Sierra Madre  
Ave. Vasconcelos Oriente 310  
Colonia del Valle  
66250 Garza Garcia, N.L.  
Tel (52) 81.83781055  
info@mexico.danieli.com

### RUSSIA

Lenin str. 130, Office 109  
Chelyabinsk Region  
445038 Magnitogorsk  
Tel (7) 3519.244043  
info@russia.danieli.com

### UAE

Najda Street, Old Nissan  
Masood Building, Flat 1003  
P.O. Box 322 Abu Dhabi  
Phone (971) 2.6812268  
info@uae.danieli.com

### THAILAND

Muang Thai-Phatra Office  
16th Floor, Tower II  
252-91 Rachadaphisek Road  
Huaykwang - Bangkok 10310  
Tel (66) 2.6933520  
info@thailand.danieli.com

### TAIWAN

26F-1, No. 31  
Hai-Bian Road  
Kaohsiung City, Taiwan 802  
Tel (886) 7.3358655  
info@taiwan.danieli.com

### BRAZIL

Rua George Rexroth, 609  
Diadema  
CEP 09951-270 São Paulo  
Tel (55) 11.35085900  
info@brazil.danieli.com

### UKRAINE

Glinky Street 2, Office 301  
49000 Dnipropetrovsk  
Tel (380) 56.7904301  
info@ukraine.danieli.com

### KSA

Silver Tower 6th floor  
P.O. Box 4867  
Al-Khobar 31952  
Tel (966) 3.8993145  
info@ksa.danieli.com

### VIETNAM

Lot A4b Industrial Park  
Tan Thuan EPZ (E-Office Park)  
Tan Thuan Dong Ward, District 9  
Ho Chi Minh City  
Tel (84) 8.35287400  
info@vietnam.danieli.com

### USA

114 Chesser Crane Road  
Chelsea, AL 35043  
Phone (1) 205.6787451  
info@usa.danieli.com