New integrated NSSMC pushes the to new success levels

A lot has happened since the Nippon Steel Corporation and Sumitomo Metal Industries, Ltd. merged to form the Nippon Steel & Sumitomo Metal Corporation (NSSMC) in October 2012. The integration of the two companies not only led to the formation of a world-leading integrated steel producer but also safeguarded it as a world leader in the market of special tubes. Stainless Steel World recently revisited the company to talk about the impact of the integration, the advantages it has brought and is bringing, as well as continuing company ambitions with Mr. Tomohiko Ogura, Head of Division, Specialty Tubular Products Marketing Division, Pipe and Tube Unit; Mr. Takeo Watanabe, Head of Department, Chemical & Shipbuilding Tubular Products Marketing Department, Pipe and Tube Unit, and Mr. Satoshi Matsumoto, Head of Department, Specification & Quality Control Department, Quality Control & Technical Service Division, Amagasaki Works.

By John Butterfield and Gillian Gane

"The future is bright for the Nippon Steel & Sumitomo Metal Corporation," begins Mr. Tomohiko Ogura "for we are the world's leading integrated steel producer, as well as being No.1 seamless stainless steel pipe manufacturer. The advantages that both the Nippon Steel Corporation and Sumitomo Metals Industries, Ltd. held before the merger have certainly not only helped us to sustain our impetus but also to gain ground together in the marketplace. For example, before the merger Sumitomo Metals was very strong in the field of

seamless tubes & pipes whilst Nippon Steel's forte was in welded tubes and pipes so combining the two different business fields into one company has been of great benefit in strengthening our ability to compete on a wider front. It is just one of the synergies that we have experienced."

"Further, the two separate steel works – Sumitomo's Amagasaki Works and Nippon Steel's Hikari Works have both brought their synergies and strengths to our production of tubes in that they complement one another," says Mr. Satoshi Matsumoto. The Amagasaki works produces very high-end material like nickel-based alloys whereas the Hikari Works produces the more common 'bread-and-butter' grades such as 304, 316. And both Works produce independently of one another on a very competitive scale. We are therefore in the lucrative position that we are able to select the most suitable works for each quota depending on the material grade."

In the future, the company will also work more closely with the Nippon Steel & Sumikin Stainless Corporation (NSSC), which is in its own right is a specialized, leading producer of stainless steel plates and sheets. When the customer requests not only tubes and pipes, but also plate and sheet, NSSMC and NSSC may complement each other.

To date this combination also has already been used to produce tubes and plates in DP28W™, duplex stainless steel which NSSMC jointly developed with Toyo Engineering Corporation for urea plants."

NSSMC's best quality tubes are produced by strictly controlled heating furnace.

Various stainless steel and Ni-based alloy tubes can be extruded based on NSSMC's abundant material data and experience.

Chemical and petrochemical industries

For chemical and petrochemical industries the company intends to focus on the production of nickel-based alloys, particularly UNS N08825, N06625, and N10276.These have already been used to great advantage in the production of a wide range of pipes used in heat exchangers, but also for the energy industry, and in the oil & gas, and offshore industries. The grades are effective for end-users whenever they move into harsher and more hostile working environments. "Certainly," says Mr. Tomohiko Ogura "we are looking to expand our market share in these branches of industry. One of our major strengths is the chemical and petrochemical industries in our enormous capabilities with regards to R&D, which concentrate original, new materials," continues Mr. Satoshi Matsumoto. "We have two major R&D centres – the one at our Amagasaki Works (which originally was the Sumitomo Metals R&D Centre), employs around 400 personnel, whilst that located close to Tokyo employs an additional 600 staff."

"Our line-up of nickel-based alloys includes both common grades like N08825 and N06625 as well as our originally developed Ni-based alloy like NSSMC™ 845. NSSMC™ 845 is standardized as ASME Code Case 2794 and UNS N06845. While its chemical composition has less nickel and molybdenum contents than N06625, since it is controlled to have well balanced corrosion resistance in both

oxidizing and reducing environments, it is expected to extend its application widely to various harsh environments."
"In addition, with regard to the petroleum industries, the company intends to focus on the offshore, and oil & gas industry through the production of materials like 25Cr super duplex stainless steel. 25Cr super duplex is used wherever high corrosion resistance is required, for example to protect against corrosion from seawater or in high-pressure, high-temperature environments such as in heat exchangers."
"25Cr super duplex is particularly used at topside locations on FLNGs and FPSOs as well as in umbilical tubing, and in subsea systems," says Mr. Takeo Watanabe "and we are currently producing the material at our Amagasaki works, Hikari works which mainly produce smaller diameter pipes and Wakayama works for larger diameter pipes".
For a number of years now NSSMC has further had a very good sales record with the production of umbilicals in DP3W(UNS S39274), originally developed 25Cr super duplex stainless steel and it is anticipated that sales will not only continue to do well in this grade but will expand during the coming period as end-user companies continue to take their production into ever deeper subsea environments. As a result, NSSMC is looking to expand their capabilities to produce umbilicals in the mid-term, adds Mr. Ogura.
Moreover, with NORSOK increasingly becoming the standard for the offshore industry and being incorporated into ISO standards, NSSMC find that more and more of their customers are requesting it in their specifications. As such they are also proceeding to gain NORSOK approval for their offshore grades.

Boiler products

There is a strong demand for NSSMC's boiler tubes and pipes not only in Japan but also overseas as they have earned an outstanding reputation. They are widely recognized as meeting the most stringent standards. This achievement owes much to the company's systematic research and development of systems ranging from raw materials to products. At present, for example, in order to achieve a further leap forward the company is proceedings with research into: high-temperature creep strength properties, high-temperature corrosion protection materials, coal-fired steel tube materials, weldability and workability, manufacturing processes for quality stability, and non-destructive inspection and measurement technologies.
The company has, moreover, developed the alloys SUPER304H® and HR3C for ultra-supercritical boilers and the materials are recognized as being world standards in this field. For almost thirty years the temperatures and pressures of the steam produced in coal-fired boilers remained constant and their design changed very little. However, at high temperatures and pressures the boilers work more efficiently hence NSSMC's development of these two grades. Currently, they are incorporated in a number of standards including ASME, and although they are nowadays manufactured by followers, the grade remains a brand of NSSMC. Mr. Ogura: "We do not intend to rest on our laurels, however, since we will continue to develop materials for this critical sector of industry."
For the next generation coal-fired boilers, NSSMC has developed HR6W to against much higher steam temperature and pressure.
HR6W has been evaluated by their customers and also obtained a worldwide reputation for use in advanced ultra-supercritical boilers.
"New technology developments for other sectors also receive considerable attention at NSSMC," Mr. Takeo Watanabe tells us. "For the solar energy industry we are busy developing grades for the high-end of the market. Additionally, we also deliver established grades for this sector like N06617. Solar energy is a field that we are increasingly turning to, particularly since we receive more and more queries from Southern Europe,

HR6W pipes manufactured for advanced USC boilers.

NSSMC's Ni-based alloy tubes.

DP3W, 25Cr super duplex stainless steel is widely used for offshore piping systems as well as umbilical tubes.

Middle East, USA, where solar energy is becoming increasingly important. The company is particularly proud of the composite tubes that it makes and certainly there are few manufacturers that are equally proficient in making them to date. Mr. Matsumoto takes up the story: "composite tubes are produced in an amalgamated form to reduce the overall costs of making the tubes used for a particular application. For example, the outside layer of the tube or pipe may be made of a low-grade steel because it has little risk of being corroded whilst the inner layer must be produced of a much more corrosive resistant material, (800 or 304 are examples), because this layer needs to be able to stand up to the corrosive influence of the gases or fluids that pass through it. The main use for composite tubes is in the pulp & paper industry and it is a very stable market for us. However, composite tubes are also increasingly being used in coal gasification processes and we anticipate that their sales will increase considerably in the future, particularly to China."

Nuclear industry

Since the Fukushima nuclear disaster in March 2011, the number of new nuclear builds on a worldwide scale has slowed considerably. As such the main product that NSSMC has been delivering for the nuclear industry in recent times has been steam generator tubing. This is quite a specialized activity for which there are only three major suppliers in the world. Not surprising though, because of current public opinion towards the nuclear industry, demand has been quite slow. The company's main focus with regard to nuclear power stations has been the provision of replacement pipes and tubes which have a low cobalt content. "Our cost advantage in their production," says Mr. Matsumoto "is that we are an integrated steel mill so we can chose the best melting method to obtain low cobalt steel." A further advantage for them is that they do not purchase raw materials from other suppliers, instead they make their own. Turning to the future and new technological developments, the company has also received an ISOE technical award from the International Atomic Energy Agency for its development of steel-tube film-coating technologies. NSSMC has pioneered manufacturing material which reduces the content of cobalt to a minute amount and has developed a film coating technology by which the oxidized film formed on the inner surface of tubes helps to reduce the release of metals ions including cobalt and nickel from tubes. This will help contribute to the reduction in occupational radiation exposure.

NSSMC continue to develop new high-end materials at its Amagasaki R&D facilities.

High-end focus

"One of our major aims," says Mr. Ogura "is to continue to develop high-end materials by making full use of our strong R&D facilities to further accelerate our progress and differentiate ourselves from competitors. Internally, we regularly organize meetings between our R&D groups to talk about materials so that we not only share knowledge and data but exchange ideas and thoughts that help us on the road to developing new materials as well."

Conclusion

"In conclusion there is a lot of exciting developments going on within the company," says Mr. Ogura "so we do not intend to become complacent but will continue to be there for our clients and help provide the solutions and new materials that will improve their businesses and their competitive base. It is, moreover, important to us that our clients know that when they come to us they can be assured of the highest quality, and that we can achieve this goal because of our very strong manufacturing base and exceptional R&D centres."
"And of course when we think of ambitions we intend to be the No. 1 company in the world," concludes Takeo Watanabe.

Facts & Figures

Name:	NIPPON STEEL & SUMITOMO METAL CORPORATION
Incorporated:	October 1, 2012 (Business integration)
Production:	Steelmaking and Steel Fabrication: - Steel Materials, steel sections, flat-rolled products, pipes and tubes, railway, automotive and machinery parts, specialty steels, secondary steel products, pig iron, steel ingots, engineering and construction, chemicals, new materials, system solutions
Crude steel output:	48 million tons
No. of employees:	24,152
Website:	http://www.nssmc.com or http://www.tubular.nssmc.com

Amagasaki works

Founded:	1919
Products:	Seamless pipes & tubes
Materials:	Carbon, alloy, stainless steels and nickel-based alloy
Dim. pipes & tubes:	6-952.5mm
No. of employees:	638

Oita works Hikari area

Founded:	1955
Products:	Seamless stainless pipes & tubes
Dim. Pipes & tubes:	6-168.3mm
No. of employees:	1,960 (Oita works)