

MANGANESE

By Ian Robinson

The world manganese industry continues to be characterised by oversupply and weak prices. This led to both cutbacks in production capacity and the imposition of anti-dumping duties during 2001. It also provided further impetus to the ongoing trend towards consolidation and integration in the world industry as Mexican ore and alloy producer Minera Autlan was forced to seek a partner or buyer in order to survive.

There are no reliable figures for world production of manganese ore and alloys but it is estimated that world production of ore remained stable at between 18 and 19 Mt and alloy production fell by up to 5% to about 7 Mt.

Both ore and alloy prices showed little movement throughout the year. Prices of metallurgical ore remained in the range US\$1.94-2.03 per metric tonne unit (mtu) and there were only marginal changes in the Metal Bulletin quotations for high-carbon (HC) ferromanganese and silicomanganese in Europe which ended the year in the ranges DM960-1,000 and DM990-1,020/t, respectively. In the US, the prices of silicomanganese received a boost from anti-dumping duties and the Metal Bulletin quotation rose from the range US\$0.20-0.23/lb to US\$0.245-0.25/lb at the end of the year.

Several alloy producers in different countries implemented cutbacks in response to the weak demand. The world's largest producer of manganese alloys, France-based Eramet Manganese, closed furnaces in Italy, France and Norway. Minera Autlan ceased production at its plant in Puebla State in Mexico, and Chinese producers cut back on production of both silicomanganese and HC ferromanganese.

Chinese production of ferromanganese is becoming increasingly orientated towards the domestic market owing to the continuing

growth in steel production and the lack of high-grade ore reserves in China.

In a preliminary ruling in November, the International Trade Administration (ITA) of the US Department of Commerce found that imports of silicomanganese from Kazakhstan, India and Venezuela should be subject to anti-dumping duties in the US as they are being sold at less than fair market value. Total shipments to the US from the three countries had tripled in 2000 to 166,000 t.

Consolidation

In the Metal Bulletin's 3rd Asian Ferro-Alloys Conference in Hong Kong in March 2001, chairman and chief executive José Antonio Rivero predicted that Minera Autlan could participate in the ongoing consolidation in the world ferro-alloys industry. This possibility moved closer to reality as the company struggled to survive in the face of a decline in export earnings as a result of the unexpected strength in the Mexican peso, high production costs because of a rise in energy costs (natural gas) and a decline in demand from local steelmakers. In July, Minera Autlan reached a debt agreement with its creditor banks and appointed BNP Paribas as its exclusive agent in its search for a strategic partner.

In August, the company closed two of its three ferro-alloy plants, leaving Tamos in Veracruz Province as the only plant still in production. By the end of the year, Brazil's CVRD proposed the purchase of Minera Autlan as a further step in its campaign to develop its manganese ore and alloy operations since it gained full control over Vupsa, which is Brazil's largest manganese alloys producer, in late 1999. CVRD also bought a 35% share which had been held by Usinor in the French manganese alloys producer Seas, now renamed Rio Doce Manganese Europe (RDME). CVRD is also consolidating its manganese mining activities in Brazil.

Samancor Manganese

BHP Billiton's Samancor Manganese, with mining and alloy operations in both South Africa and Australia, focused on maintaining its low production costs following the restructuring of its Metalloys smelter in South Africa during 2000 and 2001. This restructuring reduced production capacity through the closure of seven small loss-making furnaces with significantly improved cost competitiveness and efficiency. During the financial year ended June 30, 2001, Samancor increased production of manganese ore by nearly 5% from 3.6 Mt to 3.77 Mt. However, the company reduced production of manganese ferro-alloys by 5% from 676,000t to 642,000 t.

Samancor's Temco smelter in Tasmania, Australia, blends South African ore from Hotazel with Australian ore from Gemco's mine on Groote Eylandt in the Northern Territory to achieve improved alloy quality as well as increased furnace efficiency. Similarly, Australian ore from Gemco has been shipped to Metalloys for blending with ore from Hotazel. Samancor believes that blending the two complementary types of ore gives the company a unique advantage in quality and efficiency in the smelting process.

Early in the year, Samancor expressed its concern about the high transport costs of manganese ore and ferro-alloys in South Africa in a report to the South African Parliament's transport committee. A Metalloys spokesman said that the smelter's profitability over the preceding three years had been close to zero and transport costs had been a major factor because logistics had accounted for approximately 30% of total costs. Metalloys' costs of rail transport and handling of its alloy production from the smelter to the port of Durban amounted to US\$28/t compared with just US\$3/t from the company's Temco smelter in Tasmania.

Samancor's South African operations suffer from a geographic disadvantage relative to the company's Australian operations

inasmuch as both the mining and smelting operations are situated hundred of kilometres inland. This has been an important factor in the increase in exports in the form of ore rather than alloy over the past few years - in contrast to the prevailing world trend to increase exports of manganese units in the form of alloys rather than ore.

Advalloy, a joint venture between Samancor and its Japanese partners Japan Metals & Chemicals and Mitsui, is reviewing its process to produce low-carbon (LC) silicomanganese. The project, which has a facility adjacent to Metalloys, was established to produce medium-carbon (MC) ferromanganese and also LC ferromanganese and silicomanganese.

However, it is currently only producing MC ferromanganese but may resume production of LC silicomanganese if trials being conducted in the first half of 2002 are successful. The company also has the capacity to produce ultra LC ferromanganese but has ceased production of this alloy until market conditions improve.

Assmang

In contrast to Samancor's restructuring of Metalloys which reduced alloy production capacity, the other South African manganese ore and alloy producer Assmang is studying strategies to increase alloy production "in expectation of decreasing demand for ore exports". Speaking at Metal Bulletin's Southern African Ferro-Alloys Conference in South Africa in February 2002, consultant metallurgist and director of Ore and Metal Co. (a partner in Assmang) Dr Robert Howard said in his presentation 'Assmang's Position in a Changing Manganese Market' that "the trend of major integrated producers is towards increasing the proportion of alloy sales".

During the financial year to June 30, 2001, Assmang increased its sales of ore (excluding deliveries to its ferro-alloys plant) by nearly 6% to 979,000 t (926,000 t during the previous FY) but alloy sales from its smelter at Cato Ridge near Durban fell by over 6% to 193,000

t from 206,000 t. Sales of manganese alloys continued to fall in the second half of 2001 to 82,400 t (85,700 t).

Dr Howard noted that "it is difficult to contemplate large capital investment in manganese alloy where market growth expectation is so poor" and he concluded that "what is needed is a staged increase in Assmang's furnace capacity that will provide a balance of lowest cost production and flexibility of product mix". Three options to increase alloy volumes are currently under consideration:

- Toll conversion by overseas smelters.
- Productivity improvements at Cato Ridge.
- Establishment of a smelter at the mine.

Over the longer term, a move from ore export to alloy sales would require extra furnaces and the options would be limited to the construction of new furnaces in a 'brownfield' project or a greenfield project at Black Rock adjacent to the Nchwaning mine in the Northern Cape.

A greenfield smelter adjacent to the mine would have the potential to become the world's lowest cost manganese alloy producer but the "establishment of an entirely new smelting site, particularly in view of its remote location, is very difficult to initiate". Dr Howard concluded that such a project would "most likely require client partnership to absorb some baseload tonnage".

The trend towards consolidation in the world manganese industry has added further urgency to Assmang's need to increase its capacity to raise alloy sales as it has changed its relationship with one of its major customers - Elkem of Norway. The bulk of Assmang's export ore sales are to Elkem and to smelters in Japan but the purchase of Elkem by Eramet in June 1999 poses a longer term threat to Assmang's ore sales, as Eramet's Moanda mine in Gabon is likely to supply an increasing proportion of Elkem's needs, particularly since the new sintering plant at Moanda was commissioned in 2000. However, demand for Nchwaning ore is likely to continue at a high level on world markets due to its competency and its very low phosphorus content.

Assmang continued with the development of its Nchwaning No.3 shaft during the year. The decision to proceed with the development of the shaft followed an in-depth study at Assmang to optimise the utilisation of its manganese resources and the objective is to make it the lowest-cost underground manganese mine in the world. The shaft will assist Assmang to meet its two-fold strategy to reduce the production of fines and to optimise the ore feed to its smelter through producing a higher-grade ore. It is expected that the shaft complex will be completed during the second half of 2003 and will have an annual mine capacity of about 2 Mt of high-grade manganese ore.