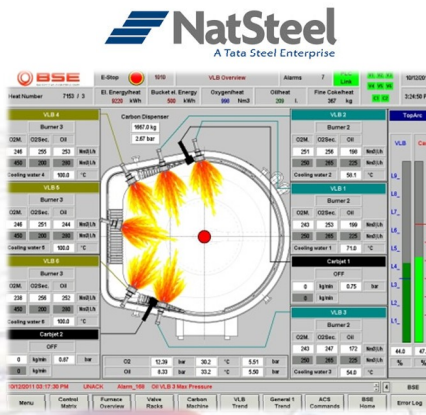


## Application of oxygen technology for shaft furnace and metal powder production furnace

Replacement of conventional burners at shaft DC furnace at NatSteel Holdings (Singapore) and AC furnace for iron powder production at North American Höganäs (U.S.A.)

### NATSTEEL

NatSteel operates an 80 tons shaft furnace in Singapore. The furnace was equipped with BSE Chemical Energy technology (including 3 Virtual Lance Burners) and 4 conventional burners from a different manufacturer inside the shaft. The limited regulation of the conventional burners led to high oil consumption (e.g. in small flame mode).



**Proper visualisation giving valuable information to operators and helping engineers to further optimise the process**

### BSE SCOPE OF SUPPLY

The existing 4 conventional burners in the shaft were substituted by 3 Virtual Lance Burners (VLB) operated in burner mode. BSE also supplied basic engineering for 3 additional lines for the existing valve rack. According to the installation of the additional VLBs the operation profile was adapted and modified.



**VLBs with copper case integrated in shaft furnace side wall**

### RESULTS / BENEFITS

The expected savings of 1 litre oil per ton was achieved immediately after installation / commissioning in October 2011. Also, the improved melting behaviour reduced skull formation and electrode breakages. In the meantime NatSteel has adjusted some parameters and has achieved an even higher value of oil savings.

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### HÖGANÄS

The 50 tons AC furnace for production of iron powder at the plant in Hollsopple, Pennsylvania (U.S.A.) was equipped with two supersonic and one conventional burner

### BSE SCOPE OF SUPPLY

The existing burners will be replaced by injection tools for oxygen (3 VLBs) as well as carbon (1 CarbJet) installed in the furnace side wall. Furthermore, BSE will supply one Lance Manipulator type 2 (LM.2). The LM.2 will provide further injection of oxygen and carbon through the slag door, plus it features a device for temperature measuring and sample taking.

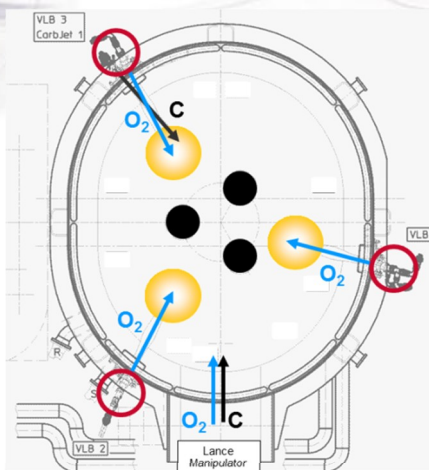
### RESULTS / BENEFITS

Besides an increase of overall productivity, the injection of oxygen from the side wall and slag door area is expected to improve the homogenisation of the steel bath and therefore reduce specific energy consumption. An equally important benefit of the LM.2 is increased safety for the operators.

Installation and commissioning of the complete system is scheduled for September 2012.

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### North American Höganäs



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