Presenter Name:
Paper name:

PRESENT AFFILIATION	**R&D Centre for Iron and Steel, SAIL, Ranchi**
AREAS OF INTEREST	**Refractory Technology, Thermal Engineering, Furnace and Combustion Technology, Energy Conservation**
Education	**B. Tech in Chemical Engineering**
Experience	• **6 year as a Process Engineer in an Integrated Cement Plant.** • **8 year as a R&D Engineer in RDCIS, SAIL Ranchi working in Energy Conservation Group, Thermal Engineering Group & Refractory Group of RDCIS.**
Projects:	• **Quality improvement & Energy Effeciency in Lime And Dolomite Calcination Plant.** • **Infrared thermal imaging.** • **Burner development & modifications.** • **Steel plant waste utilisation.** • **Furnace refractory and process modifications.**
Publication/ Patent	**3 Publications & 1 patent as co-inventor.**

Introduction of newly designed ladle heating system to reduce the arcing time for improved performance of refractory

Md. Sharique Aman, Shyam Jee, INP Gupta,
I. Roy, M. K. Kujur

R&D Centre for Iron and Steel
Steel Authority of India Limited
Ranchi

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Introduction

- Steel Melting Shop (SMS) of DSP is equipped with a ladle preheating bay for heating of green ladles prior to tapping of steels into it.

- For reducing the tapping temperature from the converters, it is necessary to provide sufficiently heated ladles with consistent ladle temperature.

- The circulation ladles are placed on the Steel Transfer Car (STC) for tapping after fixing slide gate and making minor repairs.

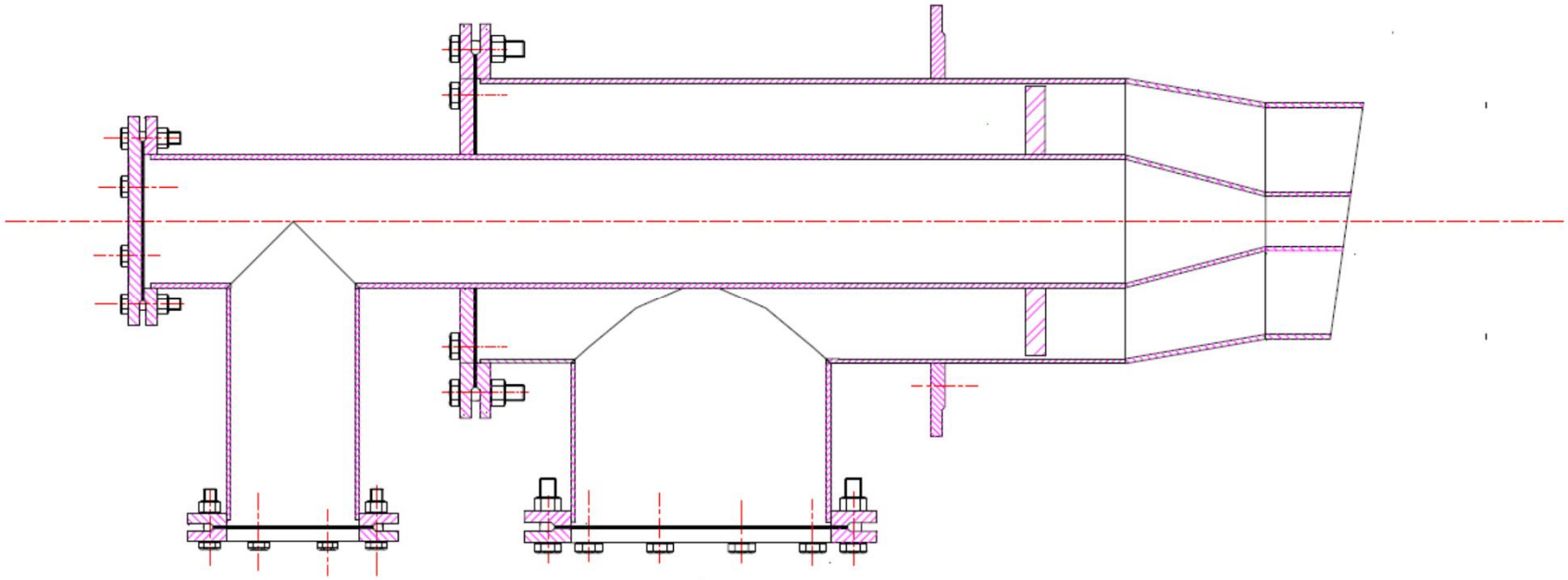
Introduction

- Most of the circulation ladles are in semi-heated condition by the time they reach convertor for tapping with ladle temperature of about 750-900 ^{o}C.
- As a result, the steel temperature drop of more than 50 ^{o}C in ladle was found for about 60% heats.
- Hence, a heating facility for ladle on STC was introduced for giving service to one of the convertor in SMS of DSP to arrest further fall in ladle temperature as well as maintaining the ladle to its required temperature before tapping.

Thermal state of Ladle

- There is cyclic heating and cooling of working lining in ladle during its operation.
- The working lining of magnesia-carbon is exposed to large temperature change at tapping and immediately after tapping.
- These sudden changes in temperature may develop a crack in lining which is detrimental for ladle lining life.

Ladle Heating System

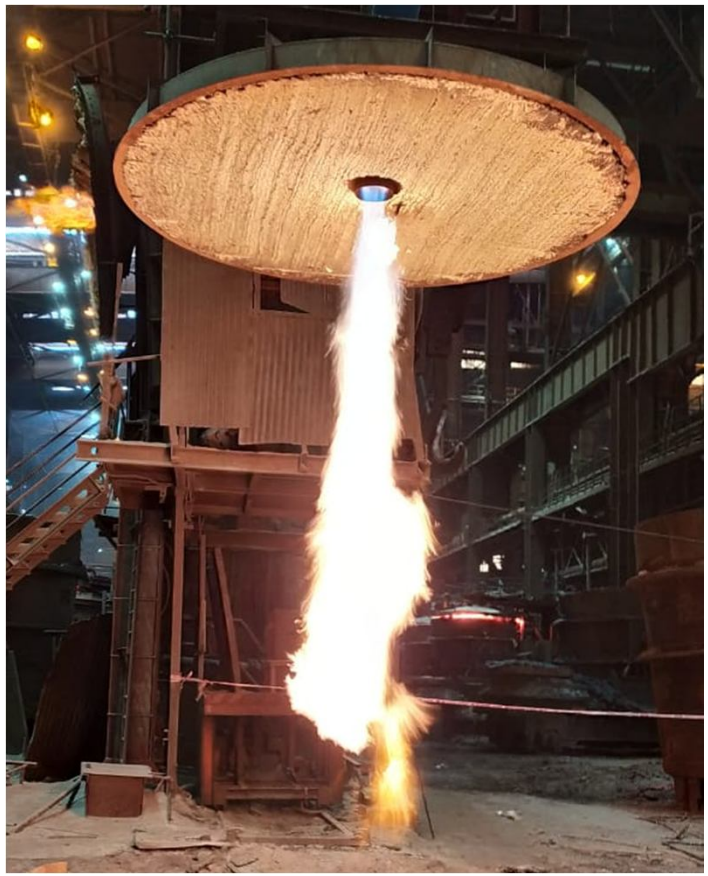


Burner designed for the ladle heating system

- Firing capacity of the burner is 600 Nm3/hr of COG at about 150 mmWC pressure.
- The burner capacity is designed to reheat the circulation ladle with 2.5 GJ in 15 minutes to recover the heat loss during the waiting period.

Performance of Ladle Heating System

- Flame generated was found to be more than 3 meters length.
- Flame was visually examined for different air and gas flow rates.



Conclusion

- The high velocity burner is capable of generating a stable flame with high thrust.
- It is expected that the enhanced ladle temperature obtained from the new ladle heating stand may result in lowering the steel temperature drop in ladle.
- It will reduce the arcing time to increase the steel temperature for casting.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