

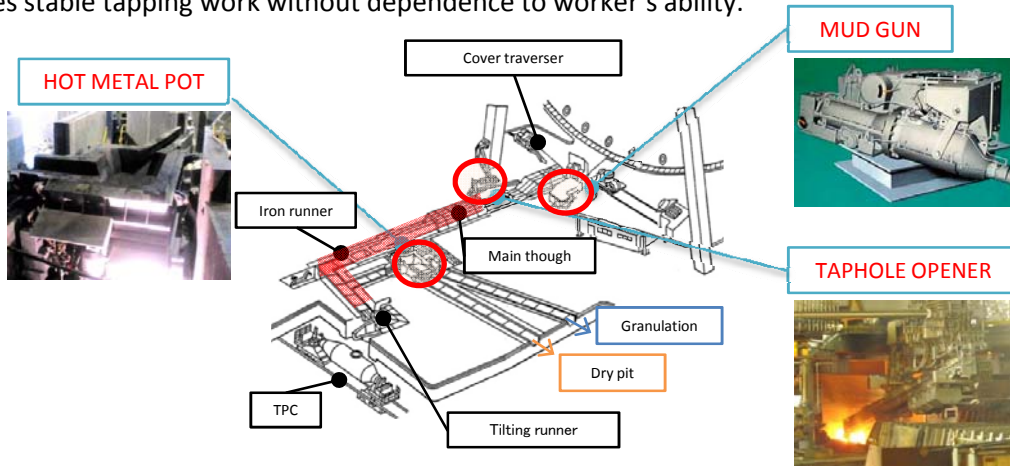
Casthouse Machinery



Casthouse Machinery

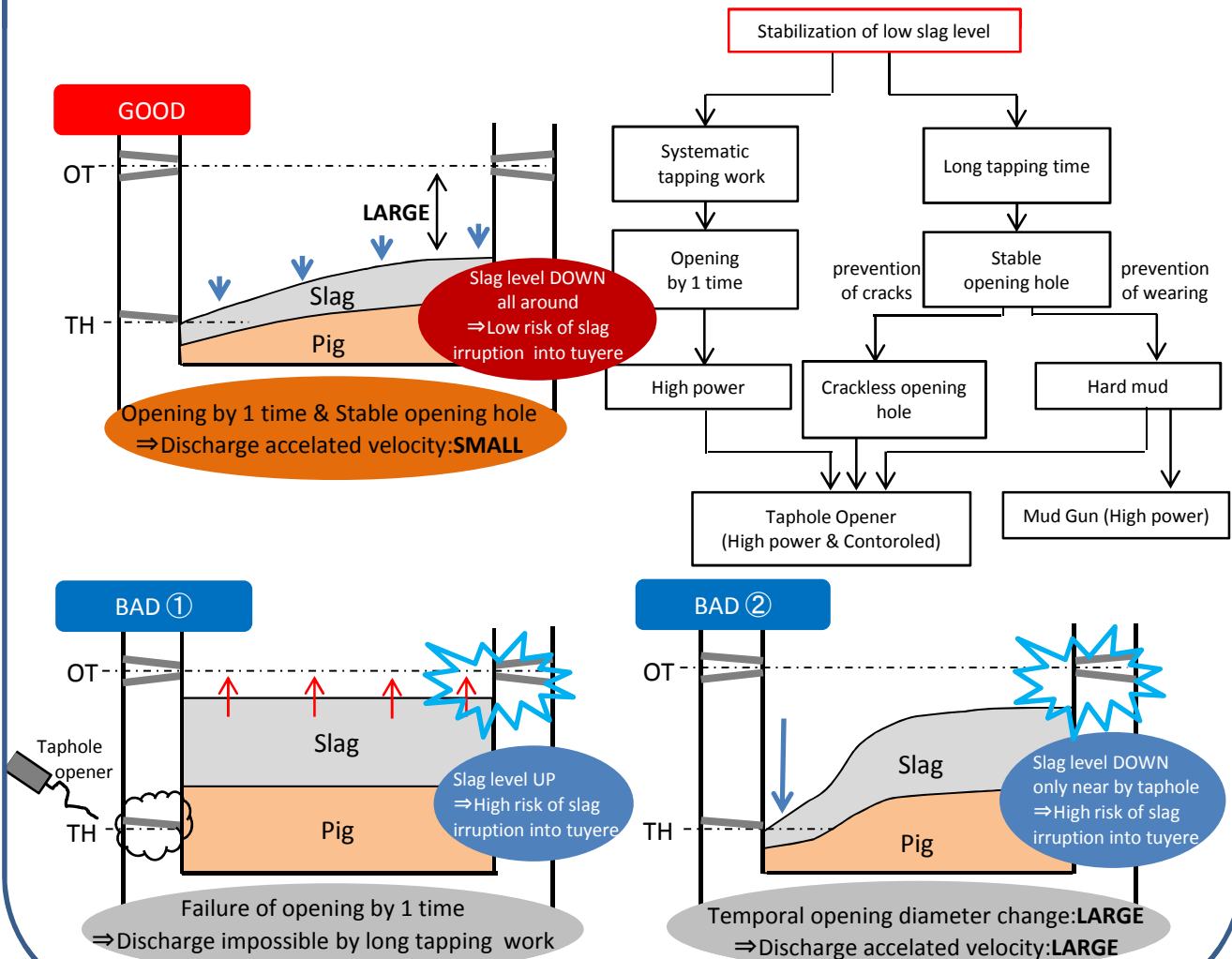
What is casthouse machine?

Tapping work is important because it is essential for securing the BF output and, therefore, this work must be done stably. Unstable iron tapping causes troubles such as slag irruption into tuyere, leading to Fuel Ratio increase. Nippon Steel & Sumikin Engineering's casthouse machine is automated and realizes stable tapping work without dependence to worker's ability.



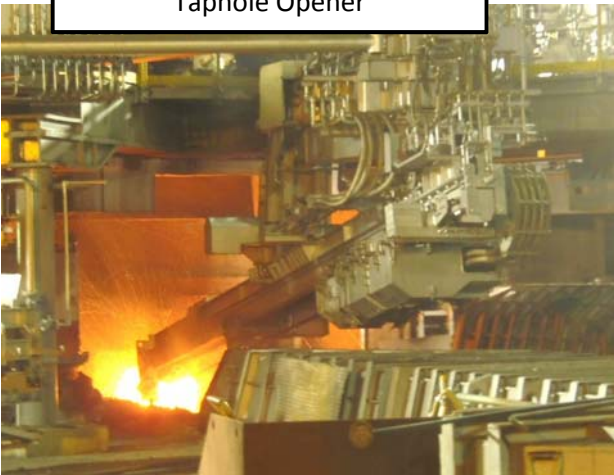
For the realization of stable iron tapping

Stabilization of slag level enables stable tapping. Because, high slag level cause slag irruption into tuyere as BAD①② diagram below indicates, and have to reduce blast volume or shut down. Blast volume reduction or shut down cools down the furnace inside. In order to restore the original condition, additional fuel not required originally must be used, causing Fuel Ratio increase.



Casthouse Machinery

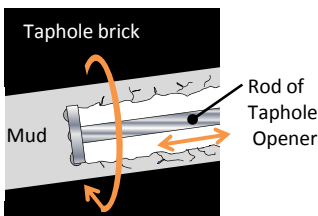
Taphole Opener



Feature

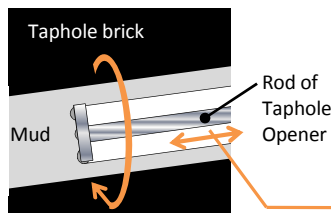
- Adaption to hard mud
- Anti-Jamming System
⇒ Hydraulic pressure of the feed motor to be controlled to avoid the jamming between the drill and mud.
- Idle Impact Prevention System
⇒ Impact pressure to be controlled according to the hydraulic pressure of the feed motor in order to prevent rod break from the idle impact.

< Un-Controlled >



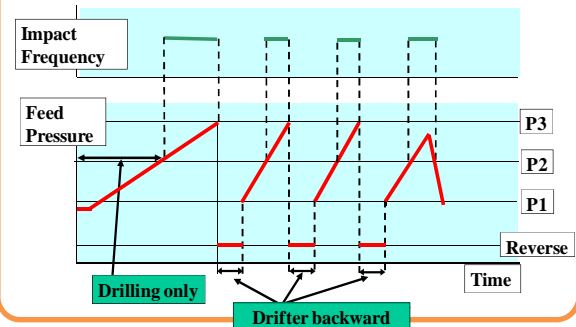
Strong hammering power
⇒ Cracks inside opening hole
⇒ **Fragile** opening hole

< Controlled >



Suitable hammering power
⇒ Smooth surface inside opening hole
⇒ **Stout** opening hole

<Anti-jamming System>



Mud Gun



Feature

- Adaption to hard mud
- Mud barrel & Cylinder cooling shield
⇒ protection from main trough radiant heat
⇒ Prevention of mud solidification in barrel

Pneumatic Opener

Hydraulic Opener

Opening Frequency

12 times

7 times

Clay Consumption

4.4 t/d

2.6 t/d

Tool Consumption

2.5 Tools/tap

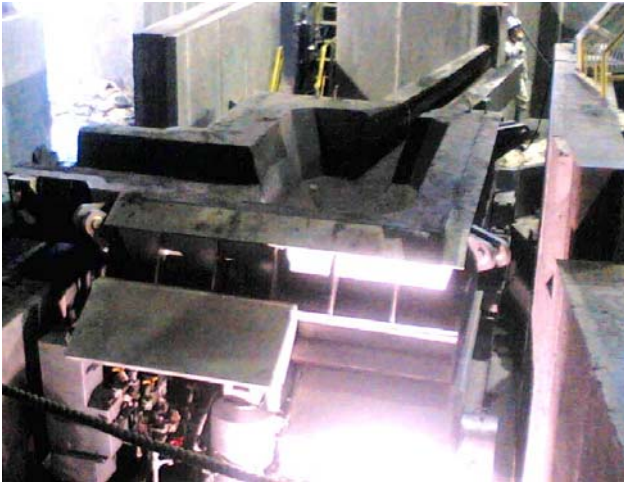
1 Tools/tap

Hydraulic Taphole Opener & Mud Gun enables;

- Tapping time: 12 times/day
⇒ 7 times/day (1M\$/Year Saving)
- Opening taphole by 1 time ⇌ 100%

Casthouse Machinery

Hot Metal Pot

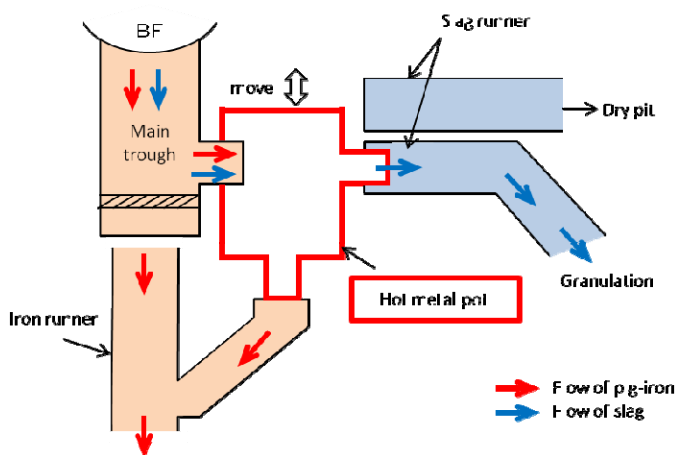


Hot Metal Pot is Nippon Steel & Sumikin Engineering's unique equipment.

This equipment is laid at the outlet of the main trough and recovers the molten iron in the slag automatically.

The recovered iron can be returned to the iron runner by this equipment.

In addition, this has a automatic function to change the slag routes to the slag granulation plant or to the dry pit



Hot Metal Pot enables;

- Prevention of a phreatic explosion in the slag granulation equipment.
- Increase in the production quantity of pig-iron.
($10^{\text{T-pig/Tap}} \times 7^{\text{Tap/Day}} = 70^{\text{T-pig/Day}}$)
- Simplification of change work of slag runner for granulation or for dry pit.

Casthouse Machinery
SUPPLY RECORD
Taphole Opener
Actual result of delivery : 76unit

* Table below covers the latest 10 cases.

Hydraulic Tap Hole Opener	1	2005	Korea	POSCO		2	sets	Pohang 4BF
	2	2006	Korea	POSCO		2	sets	Pohang 4BF
	3	2006	Japan	Kobe Steel		4	sets	Kakogawa 3BF
	4	2007	Japan	Kobe Steel		4	sets	Kakogawa 2BF
	5	2007	Japan	Nippon Steel		4	sets	Nagoya 1BF
	6	2007	Japan	Kobe Steel		2	sets	Kobe 3BF
	7	2008	Japan	Hokkai		1	set	Muroran 2BF
	8	2009	Japan	Nippon Steel		5	sets	Oita 1BF
Total	9	2012	Japan	Nippon Steel		4	sets	Kimitsu 2BF
76 Unit	10	2014	Japan	Nippon Steel	(Under designing)	4	sets	Tobata 4BF

Mud Gun
Actual result of delivery : 217unit

* Table below covers the latest 10 cases.

Mud Gun	1	2000	Japan	Nippon Steel	HG60	×	4	sets	Nagoya 3BF
	2	2001	Japan	Nippon Steel	HG30	×	4	sets	Kimitsu 3BF
	3	2001	Japan	Nippon Steel	HG40	×	2	sets	Hokkai 2BF
	4	2004	Japan	Nippon Steel	HG60	×	5	sets	Oita 2BF
	5	2007	Japan	Kobe Steel	HG60	×	2	sets	Kobe 1BF
	6	2007	Japan	Nippon Steel	HG60	×	4	sets	Nagoya 1BF
	7	2007	Japan	Hokkai	HG30	×	1	set	Muroran 2BF
	8	2009	Japan	Nippon Steel	HG60	×	5	sets	Oita 1BF
Total	9	2012	Japan	Nippon Steel	HG60	×	4	sets	Kimitsu 2BF
217 Unit	10	2014	Japan	Nippon Steel	HG60(under designing)	×	4	sets	Tobata 4BF