

Prevention of collision between Twin Boom Stacker (TBS) and Blender Reclaimer (BRC) in Sinter Plant

Introduction: In Sinter Plant, sinter is produced by incipient fusion of different raw materials like iron ore fines, lime stone, dolomite, coke breeze and metallurgical waste in sinter machines. Sinter is a porous iron bearing material which is being charged in Blast furnace to produce Hot Metal. 80% of sinter requirement in Blast Furnace is fulfilled by 3nos of sinter machines. Following are the capacity of three sinter machines.

	Area(M2)	Bed height(mm)	Capacity(MT)
Sinter m/c-1	378	650	3.6
Sinter m/c-2	312	500	2.6
Sinter m/c-3	408	700	3.6

Different belt conveyors are used for transportation of above mentioned raw materials in huge quantity. Different yard equipments like Blender Reclaimers, Twin Boom Stackers etc are used for stacking and reclaiming of basemix and sinter in the open yard. Sinter machine is an endless chain of pallet cars. Where basemix is charged and its top layer is ignited and air is being sucked from the bottom of the sinter machine. Then sinter is being formed layer by layer till the bottom of the pallet cars. This sinter is being crushed and screened for different sizes. Different mat size screens are used in the before sending the required size of sinter to Blast Furnace.

Current Scenario:

Different raw materials like Iron Ore Fines(-10mm size), Lime Stone(-3mm), Dolomite(-3mm), Coke Breeze(-3mm), Metallurgical Waste(-8mm) etc are mixed in certain proportion in a drum called Primary Mixing Drum and then sent to open yard for stacking. This mixture is called Basemix. This Basemix is again reclaimed from the open yard called basemix yard, which is 400mtrs long. This basemix is sent to Sinter machine to produce sinter. This basemix is the basic raw material for sinter making. Twin Boom Stacker (TBS) is the heavy movable equipments used in the yard for stacking of Basemix. Whereas, Blender Reclaimer (BRC) is used for reclaiming of basemix. The stacking and reclaiming of basemix takes place round the clock. While stacking, TBS will move to and fro at a speed of 10mtrs/min for a length of 400mtrs. At the same time, BRC will reclaim the basemix from the same yard. As both the TBS and BRCs are moving in the same yard side by side track, there is a chance of collision of both the

heavy structures due to brake failure of luffing booms of TBS. The damage repair usually takes 4 to 5 days. The production loss is in the range of 50,000Tons, which costs around 30crs.

Required Solution:

Any sensor based on IOT or AI may be used to avoid collision. This should give alarm well in advance to the operators and in the control room also so that major damages can be avoided.



Twin Boom Stacker (TBS)



Blender Reclaimer (BRC)