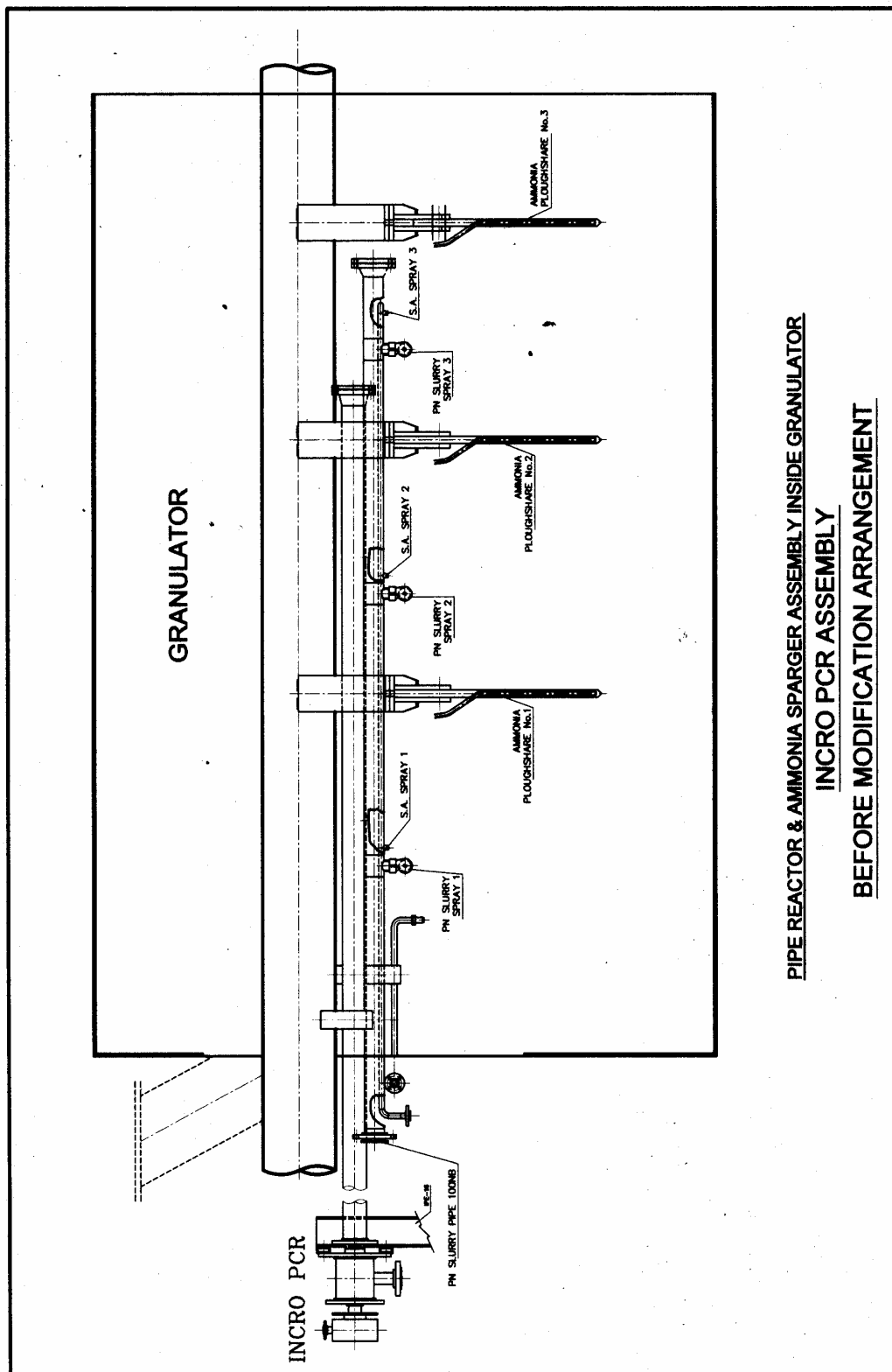


Energy Conservation Measure implemented in 2006-2007

to be filled by BEE	Title of the measure	Sector
Year to be filled by BEE	Replacing PN+PR Operation with 2PRs in Granulation plant.	Technology
<p>Description of the energy conservation measure:</p> <p>The plant has been built in 1988 with two identical trains with a capacity to produce 500 MTPD of Di-Ammonium Phosphate, with process technology of Slurry granulation Process with operation of pre- neutralizer process (PN). Subsequently in the year 2001, the plant has been retrofitted with INCRO pipe reactor (PR) technology by M/s UHDE (India) Ltd. The plant is set to operate with Pre Neutralizer (PN) and Pipe Reactor (PR) with enhanced capacity of 1265 MTPD of Di –Ammonium Phosphate (DAP) or 1210 MTPD of Ammonium Sulphate Phosphate (20:20:0). Introduction of Pipe Reactor in the system has given the greater flexibility for manufacturing of NPK fertilizers.</p> <p>Based on the operational experience of PR .The following advantages were observed</p> <ol style="list-style-type: none"> 1. The operation flexibility of PR with different sources of Phosphoric Acid 2. Higher reactor efficiency due to better mixing of reactants 3. PR discharge is adjustable to several production rates, which gives the system a great flexibility and continuous steady operation 4. Operation of PR with slurry humidity of 4-8 % compared to the operation of Pre Neutralizer with slurry humidity of 9-13% <p>Considering the above advantages, an in-depth study was carried out whether slurry header of Pre Neutralizer can be replaced with another Pipe Reactor.</p> <p>It is felt that by introducing 2nd.Pipe Reactor in place of slurry header, the moisture input into the Granulator can be reduced thereby enabling to increase feed rates to granulator.</p> <p>The advantages conceived are</p> <ol style="list-style-type: none"> 1.Reduction of hot air due to lower slurry moisture percentage 2. Better operation controls and increased through puts. <p>As no other plant in India operates on two Pipe Reactors in Granulator to produce DAP, through discussions and brain storming sessions were conducted across all levels and an in-house design of Pipe Reactor (PR) is arrived at and installed in Granulator in Train-B on trial basis in June 2005.</p> <p>The second PR operation was successful after initial teething problems. The slurry feed rate to the Granulator through both the pipe reactors improved to around 950 lpm from the previous 800 lpm of PN + PR operation and there was a substantial reduction in Natural gas consumption and increase in through put. The stack emissions are also maintained well below the stipulated APPCB norms in spite of increased throughput. Variable frequency drive was also introduced in the primary air for optimal air supply to combustion chamber, resulted in electrical energy savings</p> <p>Thus by changing from PN+PR system of Operation to 2 PR operation has resulted in saving of Natural Gas as well as achieving increased throughput.</p>		

Replacing PN+PR Operation with 2PRs in Granulation plant. (Before modification)

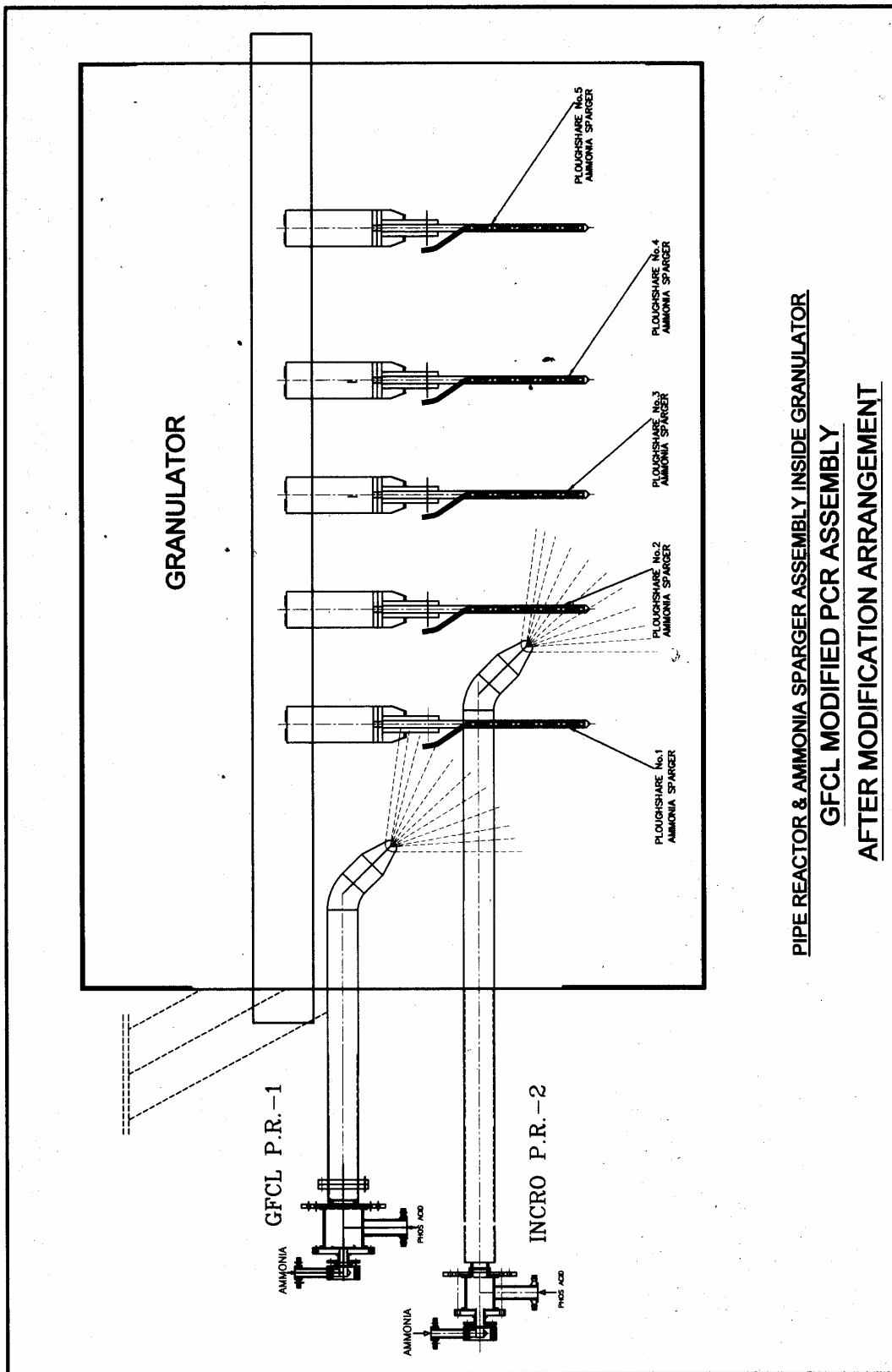


PIPE REACTOR & AMMONIA SPARGER ASSEMBLY INSIDE GRANULATOR

INCRO PCR ASSEMBLY

BEFORE MODIFICATION ARRANGEMENT

Replacing PN+PR Operation with 2PRs in Granulation plant. (After modification)



PIPE REACTOR & AMMONIA SPARGER ASSEMBLY INSIDE GRANULATOR
GFCL MODIFIED PCR ASSEMBLY
AFTER MODIFICATION ARRANGEMENT