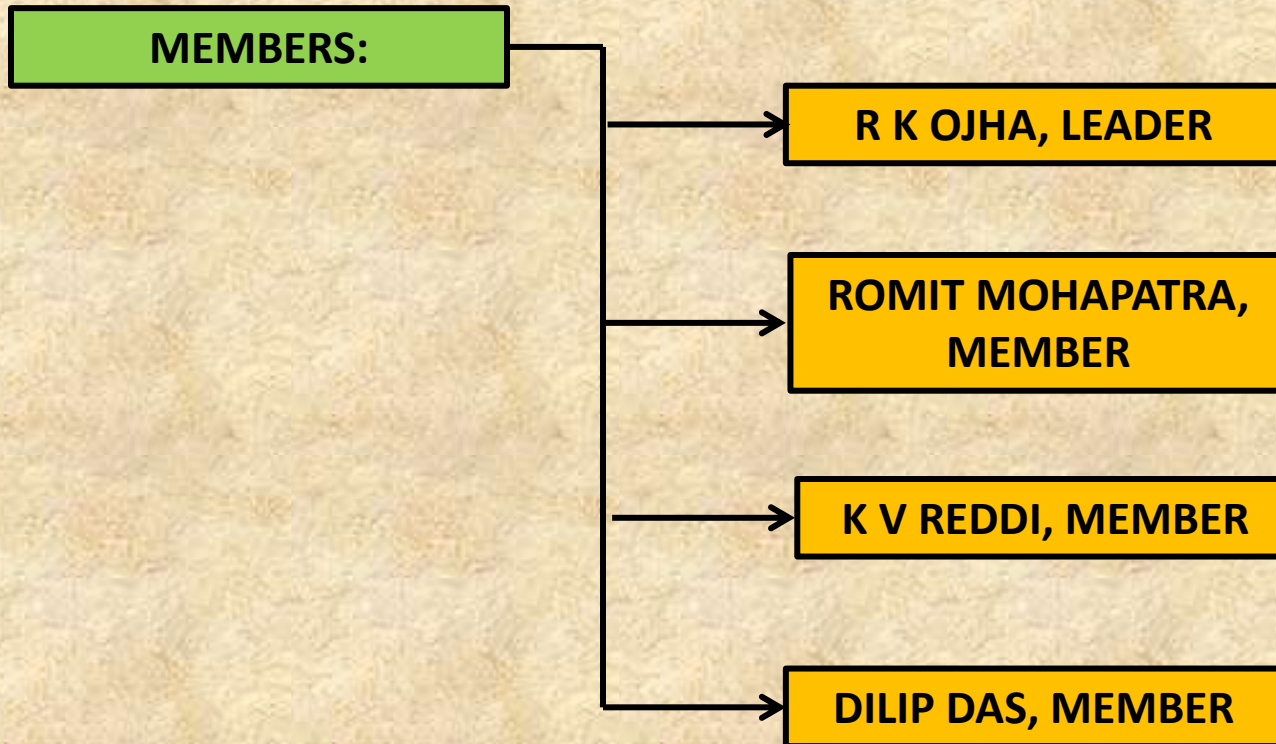


**WELCOME
TO
THE KNOWLEDGE
EXCHANGE PLATFORM
ON ENERGY
MANAGEMENT**

PROCESS LEVEL ENERGY MANAGEMENT TEAM ON ASH HANDLING PLANT



NALCO AT A GLANCE



WIND POWER PLANT



CORPORATE OFFICE



SOLAR POWER PLANT



BAUXITE MINES



ALUMINA REFINERY



ALUMINIUM SMELTER



CAPTIVE POWER PLANT



ROLLED PRODUCT UNIT



PORT FACILITIES



SALIENT FEATURES

BAUXITE MINES:

- ❖ Area of deposit – 16Sq.KM
- ❖ Resource – 310 MT
- ❖ Capacity – 68.25 Lakh TPA
- ❖ Transport – 14.6KM long cable belt conveyor

ALUMINA REFINERY:

- ❖ Capacity – 22.75 Lakh TPA
- ❖ Atmospheric pressure digestion
- ❖ Pre-desilication & inter-stage cooling for higher productivity
- ❖ Co-generation – 4X18.5MW power

ALUMINIUM SMELTER:

- ❖ Capacity – 4.60 Lakh TPA
- ❖ 180KW Cell technology
- ❖ Micro-processor based pot regulation system
- ❖ Ingot, wire rod, billet, strip casting

CAPTIVE POWER PLANT:

- ❖ Capacity – 1200 MW
- ❖ Micro-processor based burner management system
- ❖ Automatic turbine run-up system
- ❖ Specially designed barrel type high pressure turbine

ROLLED PRODUCT UNIT:

- ❖ Capacity – 50000 MT/ annum
- ❖ Products – Cold rolled sheets, coils from continuous caster route
- ❖ Technology – FATA Hunter of Italy

PORT FACILITIES:

- ❖ Location: Visakhapatnam
- ❖ Export - Alumina
- ❖ Import – Caustic Soda
- ❖ Mechanised storage and ship handling facilities

WIND POWER PLANT:

- ❖ Capacity – 50.4 MW, A.P., commissioned in Dec'2012
- ❖ Capacity – 47.6 MW, Rajasthan, commissioned in Jan'2014

SOLAR POWER PLANT:

- ❖ Capacity – 260 KW
- ❖ Commissioned roof top solar power plant at Corporate Office

ALUMINA REFINERY

ALUMINA MAKING PROCESS

STEAM GENERATION PROCESS

BOILERS:

Make – M/s BHEL

Capacity – 4 Boilers of 200TPH
– 1 Boiler of 250TPH

Type - VU40, Bi-drum, natural circulation, oil/ p.f. fired, fixed tangential corner fired

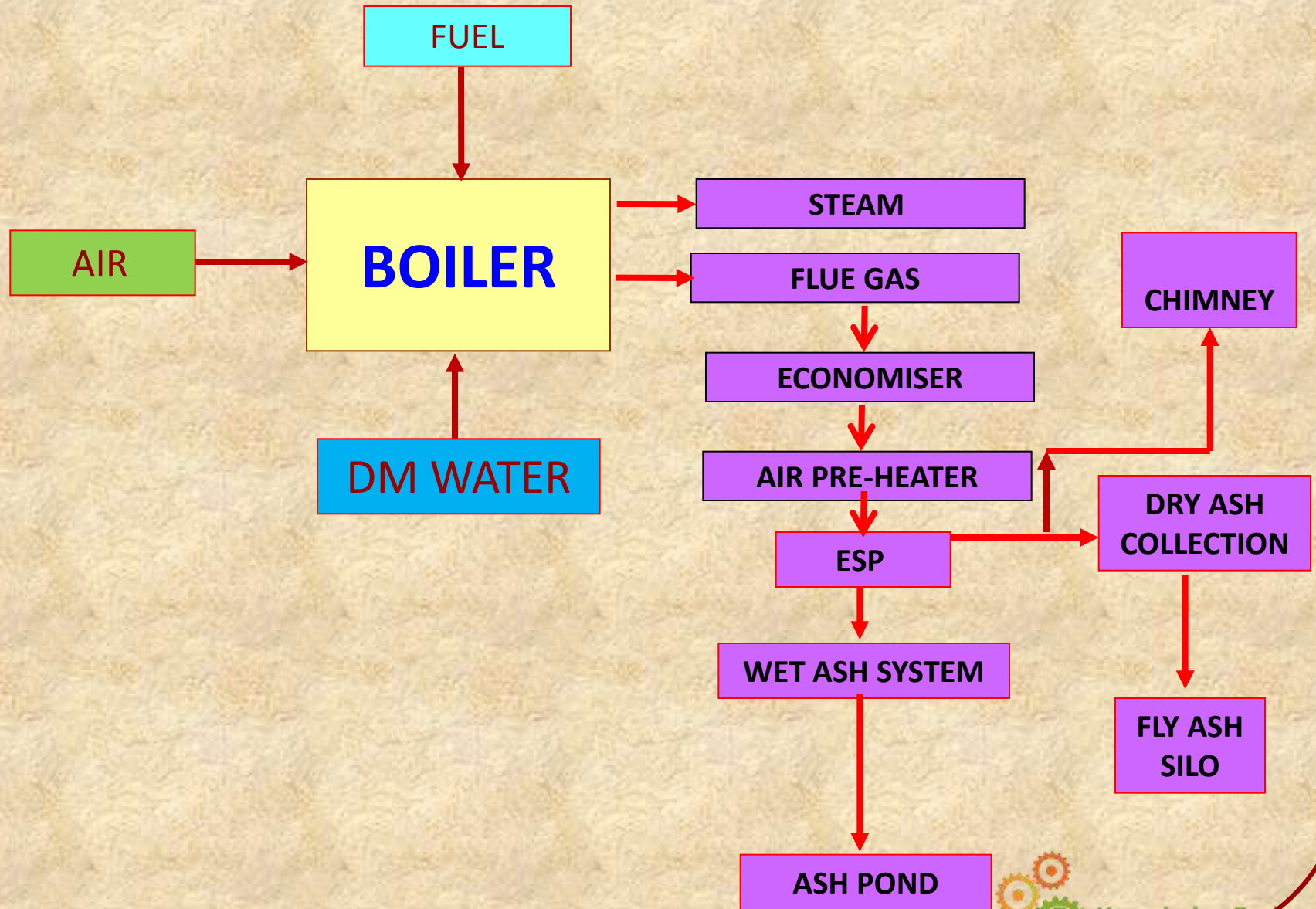
TURBOGENERATORS:

Make – M/s BHEL

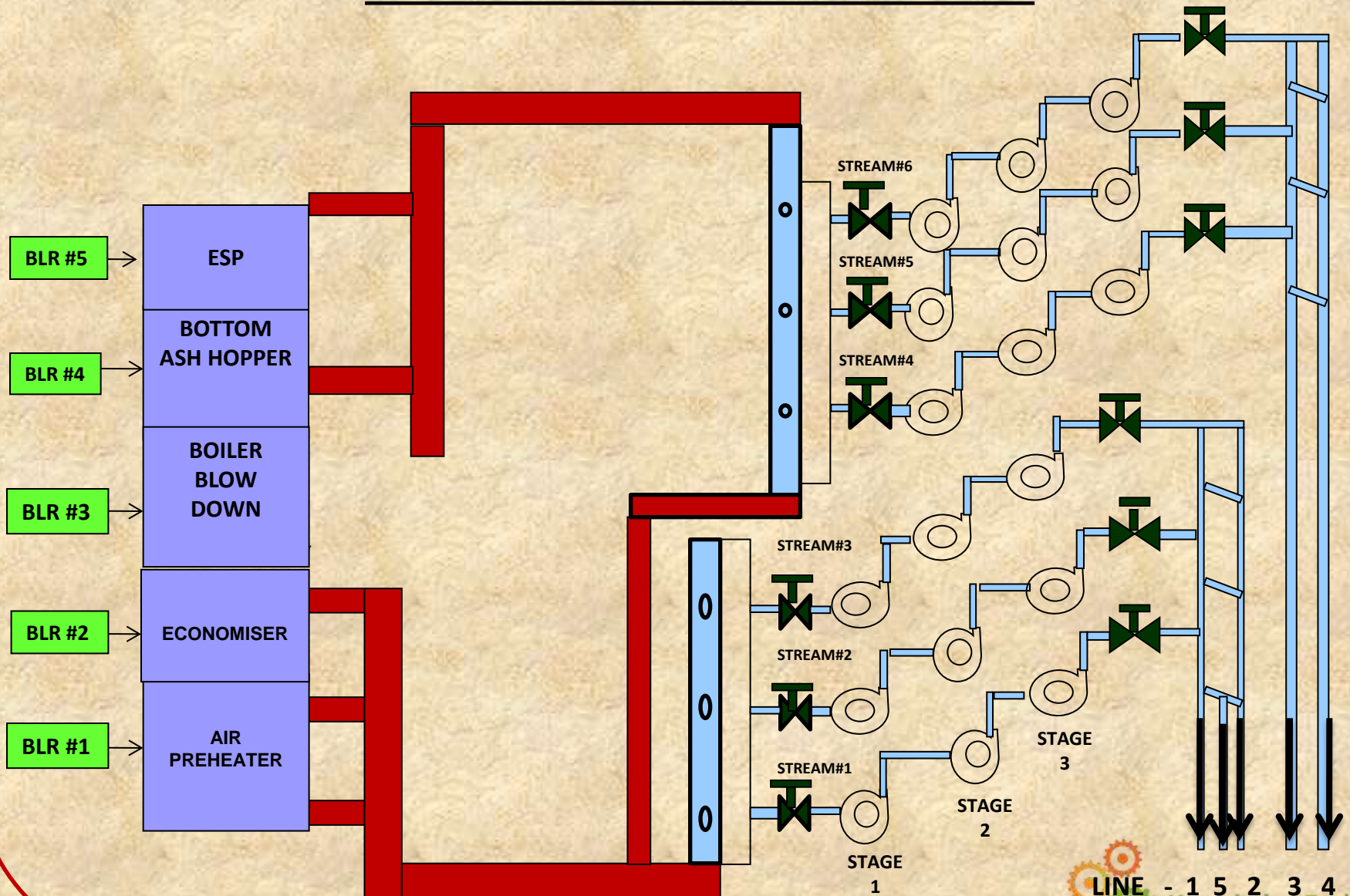
Capacity – 4 TGs' of 18.5MW
Type - Extraction back pressure TG

Higher cycle efficiency due to co-generation

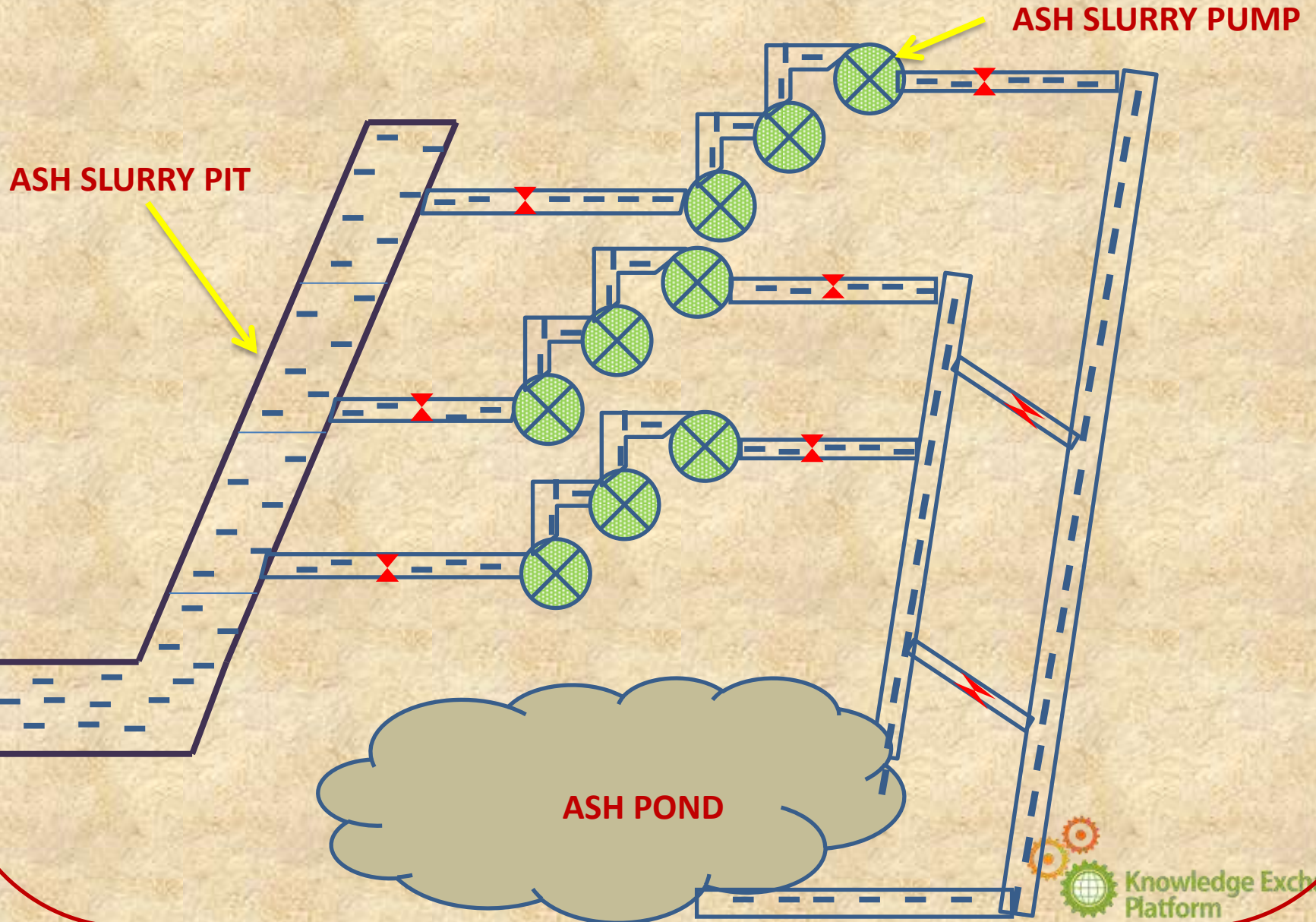
PROCESS FLOW DIAGRAM



WET ASH DISPOSAL SYSTEM



ASH DISPOSAL PUMP HOUSE



UPGRADATION OF ASH SLURRY PUMPS

ASH DISPOSAL PUMP HOUSE

ADPH-I

- NO. OF STREAMS : 03
- ASH SLURRY PUMPS: 09NOS
- SERIES PUMPING
- CAPACITY: 635M³/HR
- HEAD: 44MTRS
- MOTOR: 150KW

ADPH-II

- NO. OF STREAMS : 03
- ASH SLURRY PUMPS: 09NOS
- SERIES PUMPING
- CAPACITY: 350M³/HR
- HEAD: 50MTRS
- MOTOR: 110KW

ADPH-I

UPGRADATION OF ASH SLURRY PUMP IN STREAM-1 OF OLD ADPH

- ORIGINAL PUMP
- EFFICIENCY : 67%
- POWER CONS : 120KW
- UPGRADED PUMP
- EFFICIENCY : 76%
- POWER CONS : 106KW

POWER SAVING

- INSTANTANEOUS POWER SAVING : 14KWH
- POWER SAVING PER DAY : 336KWH
- POWER SAVING PER ANNUM : 122640 KWH
- SAVING OF POWER @Rs 3.20/- : Rs 3,92,448/- (PER PUMP PER ANNUM)
- SAVING OF POWER FOR ONE STREAM:Rs 11,77,344 /- (PER ANNUM)

CALCULATION OF PAY BACK PERIOD

- COST OF REPLACEMENT OF ONE PUMP : Rs 6,15,282/-
- COST OF REPLACEMENT OF ONE STREAM : Rs 18,45,846/-
- SAVING OF POWER FOR ONE STREAM:Rs 11,77,344 /- (PER ANNUM)
- PAY BACK PERIOD : 1.6 YEARS

**THE PAY BACK PERIOD IS ABOUT ONE YEAR APART
FROM IMPROVED LIFE OF COMPONENTS**

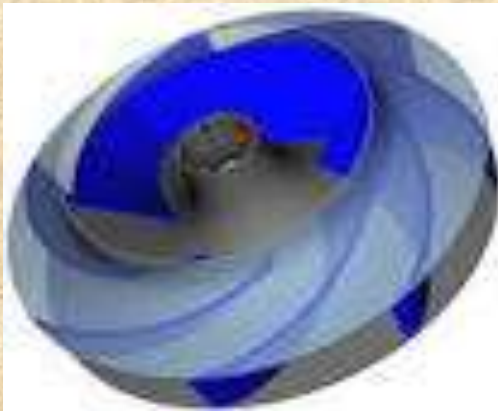
$$\text{EFFICIENCY OF PUMP} = \frac{\text{WATER HORSE POWER}}{\text{SHAFT HORSE POWER}}$$

REASON FOR INCREASE IN HYDRAULIC EFFICIENCY

- **FLOW PATTERN CHANGED FROM RADIAL FLOW TO MIXED FLOW**
- **TWISTED VANE IMPELLER**
- **MODIFIED HYDRAULIC ASSEMBLY**



MIXED FLOW



TWISTED VANE IMPELLER



MODIFIED HYDRAULIC ASSEMBLY

CONCLUSION

- EFFICIENCY INCREASED BY 9%
- POWER SAVING PER STREAM – 122.64 MW
- NET SAVING IN TERMS OF MONEY – Rs. 11,77,344 /-

THANK YOU