**An Experience and A Review : Bulk Material Handling System in Cement Plants**

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Cement plants are ideally located where major raw material (i.e. lime stone) is available. Almost 70 to 90 % raw material is used as lime stone in cement manufacturing process. Lime Stone is considered as main bulk material which is brought to plant from nearby Mines. Other than lime stone, additives like Red Ochre / Bauxite, China Clay, Gypsum are also procured as per the requirement of Raw Mix Design. As a fuel, coal (Bituminous coal / Lignite / Petcock / Imported Thermal Coal) is also used in cement plant.

With respect to Quality and Quantity, Bulk Material Handling systems are required to achieve the production of final product as Cement. Accordingly, various types of machines are designed, installed and operated to handle different kinds of bulk material for various applications. It has been observed that the Bulk Material System performance is varying from plant to plant and actions are taken suitable to the actual conditions of respective plant. It is also experienced that machine behaviour is changed according to the environmental condition wrt to temperature / moisture.

Surprisingly, importance of Bulk Material Handling System is on second priority in comparison to main plant equipment like Kiln, Raw Mill, Coal Mill and Cement Mill. It is felt that this is common perception of the people involved at almost all level in cement plants that stoppages / problems in the RMH system does not affect much in terms of cost wrt cement manufacturing overall cost. In present scenario, almost all cement plants are having their own Coal based Captive Power Plants. Coal Handling Plant is more important than lime stone handling system.

**It is experienced and felt that Bulk Material Handling System in Cement Plant is always having some routine problems in terms of spillages, leakages, operational disturbances, jamming of chutes, damage to rotating parts, wear / tear of conveyor belting, under-utilization of capacity, change in material specifications, revised plant requirement wrt quantity and frequency of material feed and so on….People have different perspective on various problems to address for the solutions.**

The solutions for these problems are not same for all the plants. In most of the cases solutions are copied from other plants or actions are taken as per the experience of the person concerned who is looking after the system or operating the system as it is with short term action with compromise on efficiency, extra cost of spares and extra cost of manpower. It is also a fact that the Main Plant Suppliers are also not directly involved to address the problems related Bulk Material Handling System. But, looking to the scenario of competitive market and available latest technology, we must think to take suitable corrective and preventive actions for improvement for long term sustainable gain. For this, it is required detailed study of the complete Bulk Material Handling system at micro level for each equipment for all the criteria affecting the process. Accordingly action points are to be finalized.

**To get the sustainable positive results, the systematic technical approach is required. We have to address all the constraints prevailing in the plant including difference of opinion of the team members and the communication gap between decision making authority and grass root working members. In such condition, outside agency / consultant / solution-cum-service provider can play a vital role to come out from the chronic / sporadic problems persisting in Bulk Material Handling system.**

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Some final conclusions are derived from the 40 - 42 years of vast / rich experience of erection -commissioning and operation - maintenance of Bulk Material Handling system / equipment which are noted as below in brief:

1. **Equipment are not installed as per OEM’s manual / guide lines.**
2. **Equipment are operated on higher capacity to meet the plant requirement without technical upgradation. This leads to abnormal wear / tear of machine components.**
3. **Equipment operation is carried out by un-trained operating staff. This leads to severe damage to machines…sometimes beyond economical repairs.**
4. **Equipment are not maintained as per the OEM’s recommendations for smooth and sustainable operation. Maintenance practices are not standardised in line with systems.**
5. **Bulk Material actual characteristics are changed wrt to specifications which were considered while ordering the equipment.**

If above points are checked and addressed for corrective /preventive action, most of the problems can be solved. It is suggested to give importance and priority for routine maintenance activities. Corrective actions are to be taken on the deviations / defects are observed to minimize the damage to the equipment.

Hope, this short note will throw light on important aspects of Bulk Material Handling System improvement in Cement Plants. Also, awareness and training input is needed to team members who are directly involved in operation and maintenance activities for Bulk Material System.

**Brief introduction about Ravishanker Verma:**

* Qualification : Diploma in Mechanical Engineering
* Experience :
* **10 years erection / commissioning** of Bulk Material Handling system / equipment with M/S. **Elecon** Engineering Co. Limited.
* **26 years operation / maintenance** of Bulk Material Handling system / equipment for Lime stone, Coal, Additives, Fly Ash, Cement etc. **with Ultra Tech Cement Ltd.**
* **Since last 4 years - Freelancer Consultant** for Bulk Material Handling System and Trainer for Behavioural aspects and Technical topics related to Bulk Material Handling system : Services rendered to **M/S. KHD** for Bhutan Cement Plant and **M/S. Nirma Limited** for Nimbol Cement Plant.
* **Special highlights:**
* Certified Safety personnel on DuPont Safety System
* Expertise on managing / monitoring turnkey projects including Civil Construction
* Expertise in Breakdown analysis and improvement through CQI methodology
* Trained system auditor for Quality Systems like ISO-9001, ISO-18001, SA-8000 and ISMS ( Information Security Management System ).

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