

LESSONS FROM THE INCREDIBLE DELHI METRO PROJECT

(Though recently there has been some set backs in the Delhi Metro project, it is a sterling example how a project should be run- there are many lessons to be learnt from Shri. E. Sreedharan and his team;

Read on –it is an amazing case study)

Distinguishing features of the project in a nutshell:

- Thorough planning
- Effective project design
- **'We mean business'** culture
- Organisation culture based on punctuality, honesty and strict adherence to deadlines

The major features of the different aspects of the project which contributed to its stupendous success have been briefly discussed below:

Organisation Structure:

- The GoI and GNCTD constituted the Delhi Metro Rail Corporation Ltd (DMRC) as a company incorporated under the Companies Act for construction of the project and Mr. Sreedharan was appointed MD.
- The DMRC had two departments – project organization and operation & maintenance in what is known as a lean organisation structure.
- Selected group of professionals were **trained at Hong Kongs's** Mass Rapid Transit Railway Corporation (MTRC)
- **Complete freedom** was provided to Mr. Sreedharan to recruit people of his choice and build a team.
- **Each candidate was personally interviewed** by him after a thorough review of their track records with emphasis on integrity.
- Most of the employees were in the **age group of 18 to 30 years**.
- The stress was on **effective contract awarding and procurement processes** in order to prevent corruption.
- The contract awarding process was made **simple and transparent**, the procurement processes **'fair and just'** by **removing all traces of subjectivity** from tender evaluation.
- The MD was given **complete autonomy** on all matters and was the last authority on tenders.

Review and Supervision:

- Every individual would be accountable for his/her role in the project. **Each employee had to prepare a Detailed Project Report (DPR)** with particulars regarding the work assigned and work completed **each day** to be submitted to the respective supervisors. In case of any **deviations, the employees had to give reasons** for the same and steps for rectification.

- **Every Monday**, the heads of departments had to **meet** to review progress, set new targets or revise targets.
- The stress was **on adherence to schedules with reverse clocks** to indicate the number of days left before important deadlines.
- Due to delay in setting up of the organisation the first phase of the project commenced three years after the scheduled date, but the **original deadline was not revised** and the **project duration was reduced from 10 years to 7 years to make up for the delayed start**.
- The Delhi Metro Railway (Operation & Maintenance) Act, 2002 was enacted, superseding the local municipal laws of Delhi and the **lower courts were barred from issuing stay orders**. **A group of lawyers was engaged** to make sure that the courts did not grant such stay orders.

Cost Control measures:

- The total expenditure was split into 3 heads – **manpower, energy and materials** including maintenance, each accounting for one-third of the total project cost.
- The DMRC employed **only 45 persons per kilometre of track** to adhere to international norms. This was only a third of the number of persons employed in the Kolkata Metro Rail project which was the only other such project in India before Delhi.
- To cut **energy costs, a special agreement** was entered into with the Delhi Transco Ltd to source power at low rates.
- Project duration was controlled by use of **special construction technologies** like trench-less digging, use of ballast-less tracks, etc.

Primavera Project Planner:

- A **special software** – Primavera Project Planner, was used for project planning and monitoring. The resource planning module of the project alerted users in case of excess or shortage of resources while the cost planning module provided a complete cost breakup of the project.
- The software was also used to **keep track** of project activities, quantum of work completed at different levels, the time lost or gained etc.
- **Information regarding all critical and upcoming activities** was also available to facilitate tracking and rescheduling of activities where necessary.
- All this was necessary as the loss incurred **if one day of work is lost is about 5 million rupees**.

Quality Assurance:

- A **special quality assurance team independent of the field executives** was appointed to ensure quality in construction.
- All personnel working at the construction site were required to wear helmets and other **appropriate safety gear**.

- Consultancy and contracts was undertaken by a **global bidding program** which required at **least one Indian partner**, to ensure technology absorption by Indian firms and for localisation and re-engineering of technology.
- The **technology used was the best and the latest available**. Multinational engineering corporations from across the globe worked on the project.
- A five member consortium led by the Pacific Consultants International (PCI) was constituted to provide **overall consultancy** for the project.
- **Work on utility diversion was undertaken much before the commencement of work** on a particular section. The concerned consortium surveyed the area for utilities (water pipes, sewer, water pipes, etc) to submit a written report to DMRC which completed the work within the prescribed period.

Managing the stakeholders - Government, contractors, funding agencies and general public:

- **Autonomy of the DMRC was ensured** in the recruitment process, promotions, contract awarding and land acquisition. It took a stand that any change in any decision would be made only if it was required from a technical or professional angle and not simply because somebody wants it.
- **Cordial relationship** was maintained **with the contractors** by making **payment on time**. The contractors were grateful for **not having to give bribes** to secure the contracts which ensured their full co-operation and completion of the project ahead of schedule in certain sections because of their suggestions.
- The officials of **JBIC** which provided a major part of the funding for the project were **involved in all major events concerned** with the project to maintain cordial relations with them.
- **All utilities were diverted well in advance** so as to ensure minimum inconvenience to the general public. Community interaction programmes were organised to inform and seek solutions from the public.
- **Alternate traffic arrangements** were made for the roads affected by the construction with the assistance of the Indian Institute of Technology, Delhi. This was done by building new roads or by widening of existing roads.
- **The ISO 14001 certification**, which deals with standards for minimising the adverse effects of the operational processes on the environment, was obtained. **New York Metro is the only other metro to have obtained this certification**. It also obtained the **OHSAS 18001** certification for its environment, occupational health and safety management system.

Excerpted from an ICMR case study