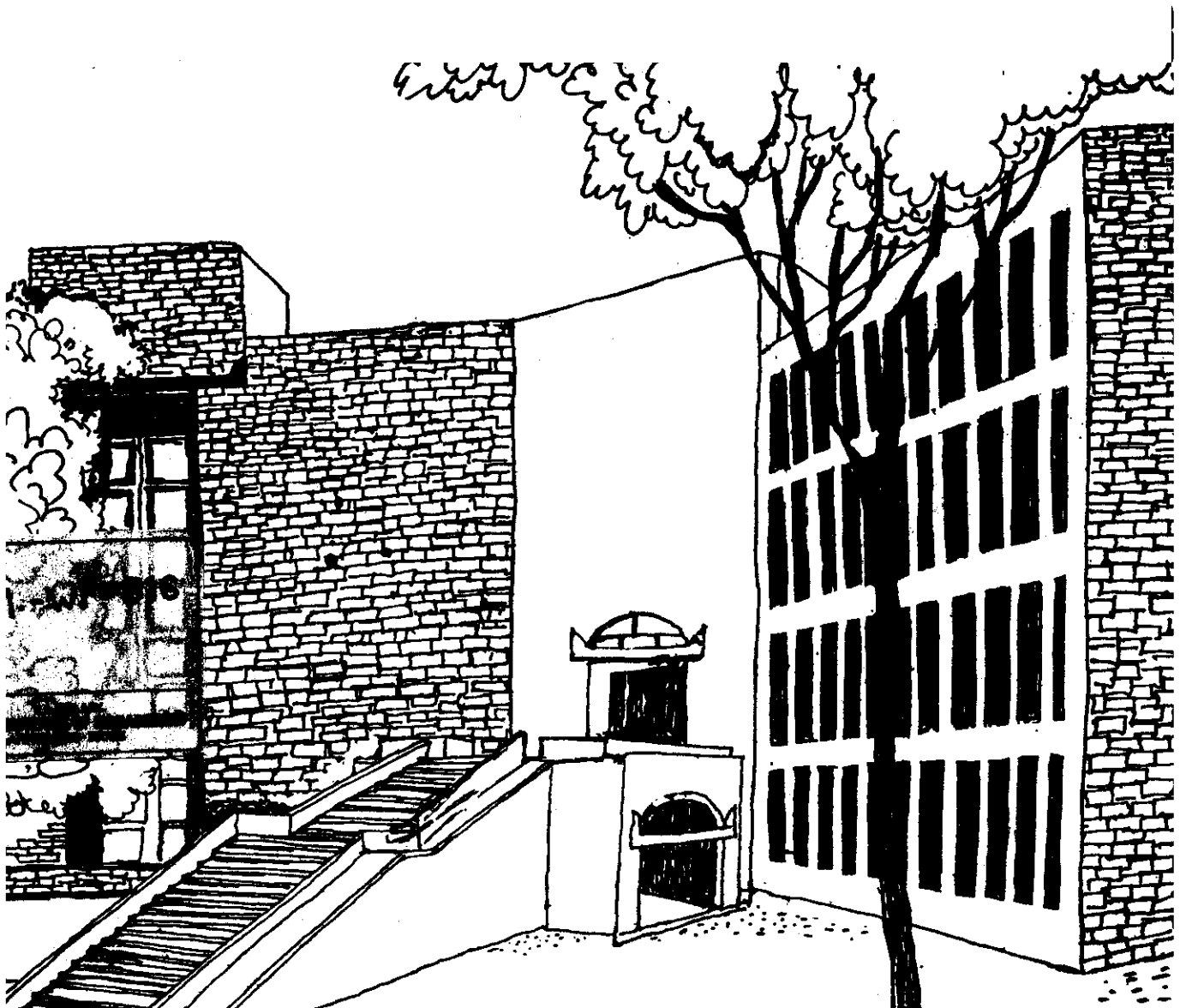




Working Paper



**MEGA PROJECTS IMPLEMENTATION :
ISSUES FOR TOP MANAGEMENT
(EXPERIENCES FROM IFFCO'S AONLA
FERTILISER PROJECT)**

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MEGA PROJECTS IMPLEMENTATION : ISSUES FOR TOP MANAGEMENT
(Experiences from IFFCO's Aonla Fertiliser Project)

Project implementation is a complex job. The entire field of project management can be broadly classified into three phases; (i) project planning, (ii) project implementation, and (iii) project operation. Certain amount of success has been achieved in the area of project planning in this country though lot needs to be done. But there is hardly anything good to talk about the performance in the project implementation and the project operation phases. This has also been recognised by the government and accordingly the Ministry of Programme Implementation was formed in 1984 to improve our performance in these areas.

Over the years, in discussing project management experience in the country, main theme has been the time and cost overruns and their impact on economy. Only lately, serious attempts at analysing the project implementation experiences in large projects is being attempted. A considerable wealth of experience and knowledge is emerging in the country in this area. As critical observers of some of these large projects, we feel there are important lessons to be learnt and assimilated. Some of the innovative project management practices, we believe, can definitely contribute to the improvement in project management. The need to conceptualise and consolidate these experiences and appropriateness of the time to do it now, cannot be overemphasised considering the number of large project to be built in the next decade. The 2200 TPD gas based fertiliser plant of IFFCO on HBJ pipeline, situated at Aonla, 250 kms east

of Delhi, has recently completed one year of commercial production. An assesment of project management practices, highlighting some of the distinct and innovative aspects, is presented here.

Aonla was the second fertiliser project to be implemented on HBJ pipeline route, commencing six months behind NFL's project at Guna in Madhya Pradesh. Zero date for the project was Oct-1-1984 and scheduled time for the start of commercial production was 42 months. Initial project cost estimate was Rs 730 Crores with Rs 277 Crores in foreign currency. Principal consultant for ammonia and urea processes, for all the gas - based fertiliser plants, on HBJ, including Aonla was Snam Progetti and its Indian associate PDIL was the joint consultant.

Issues in Project Management

A project has three parameters:

- (i) Time
- (ii) Cost
- (iii) Performance

During the implementation phase, efforts are primarily directed towards control on time and cost. The control on performance is ensured through proper selection of equipments, keeping in view the details evolved at the project planning stage and ensuring quality during implementation. However, contrary to time and cost, the achievement with regard to performance parameter can be measured only during the project operation phase. The measurement is based on the productivity on output in comparison to the rated capacity during the project operation

phase. As can be seen from Tables 1, 2, and 3 below, IFFCO Aonla project has scored high on all these three parameters. In our observation, this achievement is not merely an accident but is the result of conscious management efforts. IFFCO adopted certain innovative approaches in the management of Aonla project to achieve good performance. These approaches also included developing certain amount of credibility for itself with the vendors, contractors and above all the government departments and other State agencies like Banks, etc.

In order to build upon the experience of successfully completing the Aonla project, we need to look at the conscious and innovative approaches adopted by IFFCO at different stages of project management. At the pre-implementation or the planning stage of the project, IFFCO had very little to decide or contribute to the decision process. The major areas of decision making at this stage are:

- Technology
- Raw Material
- Size
- Location
- Principal consultant
- Indian consultant
- etc.

Most of the decisions in these areas were already taken before IFFCO was involved in the project. The major role of IFFCO in the project covered the following areas:

- Mobilization of resources

- Implementation of project
- Operation of the plant for ultimate output distribution.

The actions taken by IFFCO for effective project implementation are discussed with respect to the different stages of the project implementation; viz. early stage, project mid-way and project towards completion.

PROJECT AT EARLY STAGE

The major areas of management concern at the early stage are:

- (a) Project team building
- (b) Contracting strategy
- (c) Project monitoring and information system
- (d) Manpower planning
- (e) Infrastructural planning for the construction phase.
- (f) Planning for ODC movements
- (g) Contingency planning

The performance of a project is inversely proportional to the distance between the project manager (chief of project) and the project site. IFFCO believed in this principle and from the very beginning it had a very senior person of the level of Executive Director as head of the project team located at the project site.

Project team building: IFFCO's experience of implementing three earlier fertilizer projects and also the association in the initial phases of KRIBHCO's Hazira plant as a promoter, as well as a dozen years of operating experience was utilised in building an initial project team by appointing in-company personnel at all

levels. The members of the team were very carefully chosen. This resulted in a cohesive group with no cultural shock as all of them had the background of same organisational culture. All successful project managers have attributed major part of their success to having a good project team. IFFCO started with this advantage from the very beginning.

Contracting strategy: IFFCO decided against awarding any turnkey contracts for the major areas of the fertiliser plant. The decision was based upon the desire to build on the cumulative experience gained by IFFCO in running the country's first gas based urea plant at Kalol, and in running the naptha based fertiliser plant at Phulpur and the complex fertilizer plant at Kandla. IFFCO was keen on avoiding the drawbacks experienced in other plants and incorporating the improvements effected in other plants. This was achieved through greater involvement of IFFCO's technical experts in the project team at all stages of design, drawing and preperation of equipment specifications.

Project monitoring and information system: Decision to have a computer based scheduling, monitoring and control system was taken at the early stage of the project. It is very difficult to introduce computer based project monitoring system at a later stage in the project, unless a decision to this effect is taken initially. This is largely due to the efforts required in designing computer based project monitoring system coupled with the limited time frame of the project life cycle. Initially, milestone reporting for level-1 and master networks reporting for level-2 was introduced. The computerised

monitoring system had both time monitoring as well as cost monitoring.

Manpower planning: The manpower requirement for the AONLA project was assessed in the initial stage. The extent to which senior and middle level personnel could be inducted to AONLA from the existing operating plant was also considered. These personnel from the existing plant were then inducted in the project team at different stages of project implementation. They were actively involved during the project implementation phase and took over the operation of the plant after implementation. This resulted in smooth transition from project implementation to project operation phase. The fresh manpower was inducted in various batches. These batches were put through a training programme including training in IFFCO's operating plants and also other fertiliser plants in the country. The schedule was well planned to have the personnel ready to take over the operation on completion of the project implementation.

Infrastructural planning: In keeping with the current practices, IFFCO expected its contractors to mobilise all resources. However, in order to facilitate the working and to avoid delays, IFFCO provided stand-by diesel generator, compressors, welding machines, cranes, etc. These were made available to contractors from time to time on rent to facilitate their work. This proved to be very useful during peak phase of implementation.

Planning for ODC movements: AONLA is one of the most interior

point from sea on HBJ pipeline. Detailed analysis for Over Dimensioned Consignment (ODC) movements by three different routes was carried out. First time in India, ODC movement was planned over river Ganges from Bay of Bengal Ports to Varanasi/Allahabad.

Contingency plans: The areas of uncertainty were analysed and various contingency plans were developed to avoid delay in completion of the project. This was done keeping in view the fact that changes in the original plan if carried out at a later stage are likely to be highly expensive. Out of the various contingency plans, the one to provide dual firing of the boiler was accepted at later stage for incorporation. This proved to be very useful during the pre-commissioning and commissioning of the plant when gas supply from HBS pipeline was actually delayed.

TOP MANAGEMENT ROLE AT INCEPTION STATE

In all above issues, IFFCO's, Top Management had major role. Decision for having Computer based monitoring and installation of micro computers at sites was made early. Top management team consciously used IFFCO's experience of operating three other fertiliser plants in terms of project team appointments and also in deciding contracting strategy. IFFCO had considerable involvement with engineering contractors in terms of scrutinising basic drawing and suggesting technology changes in some cases. In case of Aonla project, due to IFFCO's greater involvement, PDIL played greater role compared to for NFL plant where Snam's responsibility was greater. In comparison, for Indo-gulf project at Jagdishpur, Snam had a turnkey contract including responsibility for equipment selection. Top executive team headed by E.D. (Aonla Project) was moved to site early and

building township was given a high priority.

Top management had involvement in detailed contingency planning for various uncertainties. For example a contingency plan was made for HBJ pipeline delay. This included installation of a dual - firing system (cost Rs 5 Crores) in case of short term delay (upto 6 months) and a naphtha cracker (cost Rs 50 Crores) in case of longer delay. Existence of this plan itself was a motivation factor for project team not to slacken their schedules in consideration of possible external dependencies.

PROJECT AT MIDWAY:

At midway (July '86), the project was on time in terms of scheduled versus actual physical progress. The computerised project monitoring for level-1 and level-2 was already implemented in the initial stage. At Midway of the project, the peak of construction activities, necessitated level-3 monitoring. For the first time in India, micro computers were being used extensively at the remote project site for such a large project. The necessary software for the level-3 monitoring was developed in-house with marginal assistance from external agencies. The level-3 monitoring, which included subnetwork reporting, proved to be very effective and all the managers at site took full advantage of these monitoring reports for timely completion of the erection job.

The contractors performances were monitored closely. Those who were behind schedule were asked to expedite their work. Certain actions like cancellation of contracts and fresh award of contracts were also carried out in extreme cases. However general approach toward contractors was to accomodate them as partners

with mutual trust and concern rather than as adversaries.

A decision to purchase a simulator for training purposes was also taken during this period. This was done with a view to cut down the gestation period during the operation phase through proper training of operators. During this period, an exercise on spares planning for the plant was carried out. It has been observed in many large projects in the country that there is over provisioning of certain spares, resulting in heavy stock of non-moving spares, and under provisioning of certain other spares resulting in lower plant availability. In case of AQNLA project. IFFCO's operating experience was a consciously utilised to avoid both these pitfalls.

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TOP MANAGEMENT ROLE AT MID WAY

Some noticeable top management policies and concerns at this stage were :

(i) In-house development of computer based monitoring system was promoted to include monitoring of contractors and vendors besides usual time and cost monitoring. A micro computer at site kept information on all contractors and nearly hundred vendors. This allowed micro level planning for each contractor, vendor and each equipment. Materials planning for piping work was also computerised.

(ii) First time in India, ODC movement was planned over river Ganga from Calcutta to Varanasi / Allahabad.

(iii) IFFCO kept its own stand-by equipments to help contractors, who got stuck due to equipment problems. Company - contractor relation were consciously groomed on mutual trust and concerns.

(iv) Township with very good facilities including a public school had been developed.

Towards Completion

Towards completion (Oct 1987), project was on time and well within revised (reduced) cost estimates (due to customs duty reduction, increase in exchange rates etc). All except one ODC, an 85 tonne stripper for urea plant, reached plant safely. In view of possible HBJ pipeline delay of two months, contingency option of dual firing system (cost Rs 5 Crores) was exercised. Towards completion stage, since most of the activities were getting critical top management interventions were more crucial and frequent.

TOP MANAGEMENT ROLE TOWARDS PROJECT COMPLETION STAGE

Some noteworthy aspects of top management policies at this stage were :

- (i) A horizontal organisational structure at project site was evolved unlike hierarchical structure in IFFCO. At the late stage of the project, project team functioning was on task force basis.
- (ii) Transition to operations was carefully planned. A simulator (costing Rs 1 Crore) was imported and staff recruitment and training was planned carefully. Detailed spares planning and materials standardisation was done on the basis of IFFCO's operating experience.

(iii) Besides the usual milestones approach for top management reporting and intervention, a target oriented approach, with only four targets (instead of more than a dozen milestones) was successfully experimented. The targets were used as major points of achievement towards which activities of all project groups were oriented. Targets served both as main points of top management intervention as well as points for motivation and commitment for all project groups.

Conclusion and suggestions

On all the three parameters - cost, time and performance - Aonla project has been a success story. However, it is not that there were no problems. Even after careful planning, there was an accident in ODC movement. There were contractor changes and gas delivery delay from HBJ pipeline. Project management is essentially a management of uncertainties. No amount of detailed planning is sufficient to overcome all problems at implementation stage. However, management of Aonla project definitely suggests that with conscious management efforts even large projects can be successfully implemented. Some of the key managerial issues such as team building, monitoring, contingency planning, contractor and vendor selection, etc. must be carefully handled by the top management. In Aonla project, through target based approach, IFFCO's top management successfully intervened in the project on selective basis.

We observe that, in the country, innovative management practices are evolving in project implementation. Aonla is one such story. There is a need to document and disseminate the experience, practices and ideas evolved in project implementation in the country. We suggest that the Ministry of Programme Implementation should evolve formal mechanisms for this purpose.

Table 1

Time Schedule Performance

	Scheduled	Actual
(i) Mechanical completion	36 months	36 months
(ii) Start of Trial Production	40 months	40 months
(iii) Start of Commercial Production	42 months	42 months

Table - 2

Cost Performance

Project Cost	Rs in Crores
Original	730
Revised	696
Final	665

Table - 3

Operating Performance (First Year of Operation)

Production	: 752000 Tonnes
Capacity Utilisation	: 104%
Highest Capacity Utilisation in any month	: 127% (Jan '89)
Energy Consumption/Tonne of Ammonia	: 7.54 MK Cal (May '89)
Contracted/Guaranteed Energy Consumption	: 7.81/8.10 MK Cal

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