

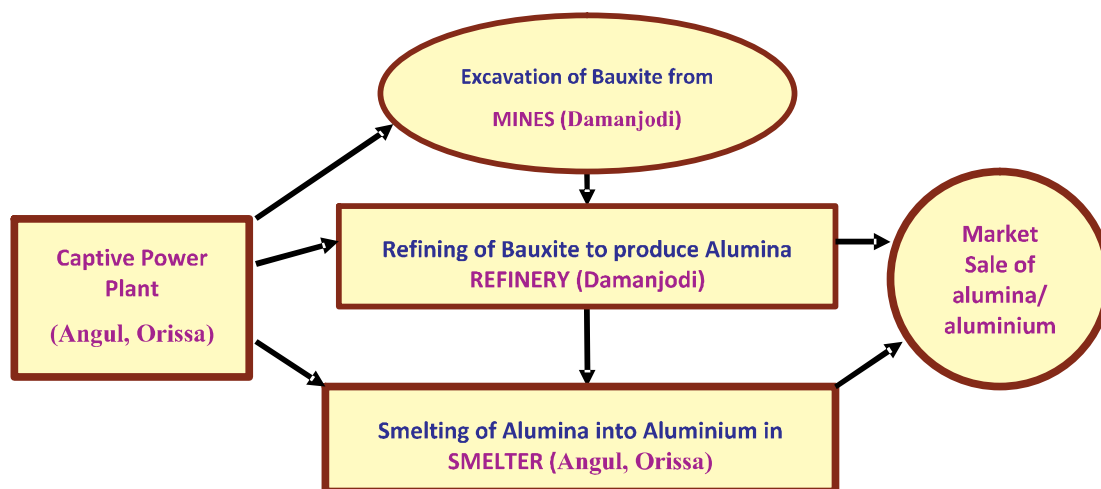
CHAPTER X: MINISTRY OF MINES

National Aluminium Company Limited

10.1 Second Phase Capacity Expansion

10.1.1 Introduction

National Aluminium Company Limited (Company), a Navratna Company, under the administrative control of Ministry of Mines, Government of India (GOI), was incorporated in January 1981 to exploit the bauxite reserves located in India for production of Alumina and Aluminium. Since inception, the Company has been adopting technology provided by M/S Aluminium Pechiney (AP), France for production of alumina and Aluminium. The chart below briefs the process of production of Alumina and Aluminium.



In order to meet the growing demand of its products, the Company for the first time expanded its production capacity in the year 2003. The Company is in the process of expanding its production capacity further through second phase expansion plan with an estimated project cost of ₹ 4091.51 crore with the aim of increasing the export and domestic sale of its products and to have a competitive edge over its global and domestic peers.

The table below indicates the initial capacity of Mines, Refinery, Smelter Plant and Captive Power Plant (CPP) and the expanded/expandable capacities after implementation of 1st and 2nd phase expansion plans.

	Mines (Bauxite)	Refinery (Alumina)	Smelter (Aluminium)	CPP
Initial	2.4 MMTPY [♦]	0.8 MMTPY	0.23 MMTPY	720 MW
First Phase	4.8 MMTPY	1.575 MMTPY	0.345 MMTPY	960 MW
Second Phase	6.3 MMTPY	2.1 MMTPY	0.46 MMTPY	1200 MW

10.1.2 Audit Scope, Objectives and Methodology

The audit reviewed the activities relating to planning, execution and monitoring of the second phase capacity expansion of the Company. The sample consisted of 25 contracts for refinery (28 *per cent*) and 10 contracts for smelter (33*per cent*) out of total of 88 contracts and 30 contracts respectively.

The audit was conducted to ascertain whether the pre-implementation planning activities were carried out diligently, the project and contracts were managed with due economy and efficiency, an effective monitoring mechanism was in place and the objectives of the project as envisaged in the expansion plan were actually fulfilled.

10.1.3 Audit Findings

10.1.3.1 Delay in Completion of Project

The second phase expansion project which included expansion of Refinery, Smelter and Captive Power Plant, was scheduled to be completed by December 2008 but audit noticed that due to various gaps and inadequacies in planning and execution of project, the completion of expansion of Smelter, Captive Power Plant and Refinery was delayed by 12 months, 23 months and 36 months respectively. Audit analysed the reasons for these delays and observed the following shortcomings in implementing the project:

(i) Belated adoption of improved technology

In the first expansion plan, the Company used AP technologies viz. AP-18 for smelter and conventional gravity clarifiers for refinery. The technologies used being old, the Board of Directors (Board) of the Company while reviewing the status of expansion plans directed the Management (January 2002) to interact with AP for exploring availability of improved technologies before preparing the Detailed Project Report (DPR) for second phase expansion .

Audit, however, observed that though the improved technologies were available with AP, the Company, without exploring their availability, awarded the work of preparation of DPR with existing technology (30 January 2002) to Engineers India Limited (EIL) which was finally prepared in June 2002 and approved by the Board in July 2002.

Subsequently, AP, in a meeting (December 2003) with the Company, followed by a written confirmation (March 2004) intimated the availability of improved technology for production of Alumina and Aluminium and suggested its adoption in second phase expansion. The proposed technologies were stated to optimize capital expenditure, operating cost and space. The Board of the Company while according (March 2004) 'In Principle Approval' decided to engage EIL again for conducting a techno-feasibility study on the suggested improvement which submitted its report in August 2005 and after

[♦] *Million Metric Tonnes Per Year*

clearance from GOI, the order on AP was placed on December 2005. AP submitted its Basic Engineering Packages¹ (BEP) between February 2006 and September 2006.

Audit observed that the delay in exploring improved AP technology resulted in delayed finalization of DPR by 17 months² which had a cascading adverse impact effect on the completion of project. Consequently, the entire project schedule got delayed and the works for basic civil & structural jobs at Refinery and Smelter, the critical activities³ could only be awarded in March 2007 after a delay of 19 months from the scheduled date of completion.

Management stated (October 2011) that the Company came to know about the availability of improved technology of AP only in December 2003 and had they waited for improved technology, the entire process of preparation of the DPR and various statutory approvals would have been delayed further.

The reply is not acceptable as the improved technology was already available prior to July 2002 and the Company did not explore the same by interacting with the supplier (AP) despite such directions by the Board. The Management's contention that exploring the improved technology would have delayed the commissioning of the Project is also unfounded as the Company ultimately adopted the improved technology at a belated stage.

Management, however, agreed to explore the availability and use of improved technology in future projects.

(ii) Award of the Contracts without considering the Past Performance of Contractors

Audit observed that the Company did not consider the past performance of the contractors in executing earlier contracts before awarding fresh contracts for critical activities. As a result, a number of contracts were awarded to inefficient contractors who failed to adhere to the contractual time schedule, thus, leading to abnormal time overruns as discussed below:

(a) Civil & Structural Works at refinery and smelter

The Company had awarded (February 2006) the civil and structural works for potrooms at smelter to M/s. Era Infra Engineering Limited (ERA) for ₹ 19.71 crore to be completed by April 2007. Despite the fact that the contractor had delayed in mobilization of resources, the Company, after receiving commitments for early mobilization of resources, awarded three more contracts to ERA in May 2006 and June 2006 for civil & structural works at Refinery and Smelter. The Contractor could achieve only 49 per cent of progress by March 2007 against the target of 70 per cent. Ignoring the under-performance, the Company awarded two more contracts (March 2007 and May 2007) for civil and structural works at a total cost of ₹ 27.36 crore.

¹ *Comprehensive technical data that allows a third-party contractor to carry out the detail design engineering and procurement/supply of equipments*

² *From July 2004 (appointment of EIL to carry out feasibility study for adopting AP's improved technology) to December 2005 (placement of order on AP).*

³ *The sequence of activities that must be completed on schedule for the entire project to be completed on schedule. If an activity on the critical path is delayed by one day, then entire project will be delayed by one day.*

The Contractor could complete only two works (Package – I & II) of refinery with a delay of 34 months and the other four contracts (Package - III of refinery and three works of smelter) were still to be completed (July 2011) even after a delay of 38 to 47 months.

Audit observed that the progress of contracts in all these cases was slow mainly due to failure of contractor in deploying adequate resources at widely dispersed sites (537 kms). As these civil and structural works were critical for timely completion of the Project, the performance of the contractor in the earlier contracts should have been considered before awarding any subsequent contracts.

The Management while pleading (October 2011) that the existing manual and procedures of the Company did not permit the rejection of L 1 offers, assured to consider the incorporation of 'Bid Capacity Assessment' in the Contract manual to address the issue raised by Audit.

(b) Mechanical and Piping work at refinery and composite works at mines

- The contract for mechanical & piping job at the refinery was awarded to M/s. Kirloskar Construction & Engineering Limited (KCEL) in August 2007 at a cost of ₹ 20.88 crore with scheduled completion by October 2008. Though in March 2008, the progress of this work was only 7.40 per cent as against the scheduled progress of 67 per cent, another contract for civil, structural & mechanical (composite) works at mines was awarded to KCEL at a total value of ₹ 11.53 crore for completion by March 2009. This contractor could only execute 22 per cent of Refinery works (April 2009) and 8 per cent of the works at Mines (June 2009). In view of its slow progress of work, the contract was terminated in June 2009 but at the request of the Contractor, termination was withdrawn in August 2009. As even after resumption of work, the contractor failed to improve its performance and could complete only 21 per cent work at Mines (April 2010) and 30 per cent work at Refinery, the Company ultimately had to terminate these contracts in April 2010 and June 2010 respectively.

Thus, non-consideration of the poor performance of the contractor before awarding fresh contracts and delay in termination of the contract adversely affected the overall completion schedule of the second phase expansion by 28 months*.

Management stated (October 2011) that the subsequent contract was awarded to the KCEL due to poor response against the tender.

- For the balance civil, structural and mechanical portion of the composite works estimated at ₹ 11.97 crore, three parties quoted their rates and the offer of M/s. Zeppelin Mobile Systems India Ltd. (Zeppelin) for ₹ 3.97 crore was the lowest while the offers of other two parties were 92 and 132 per cent higher than the estimated price respectively. Though Zeppelin being a contractor in the field of communication towers and shelters only had no experience in Mining works, the contract was awarded (December 2010) to Zeppelin. The contractor failed to mobilize adequate manpower and other resources and could achieve less than 1

* From scheduled date of completion (March 2009) to July 2011

per cent progress of the work; The Company, as such, had to terminate the contract in May 2011. The new contract was yet to be awarded (January 2012).

Thus, due to selection of an inexperienced contractor at an abnormally low price, the progress of expansion project works at mines was further adversely affected.

The Management contended (October 2011) that (i) the nature of work involved did not require any special experience and (ii) the approved procedures of the Company do not permit rejection of abnormally low offers.

The plea of the Management is unfounded as quoting of unreasonable and abnormally lower rates (33 per cent of the estimated cost) by the bidder was indicative of their inexperience. Acceptance of such unworkable rates ultimately resulted in losses to the contractors and consequential stalling of the work. The procedures of the Company, therefore, need revision.

The Management accepted the audit recommendation and assured to formulate fresh guidelines for monitoring poor performing contractors and take remedial measures.

(c) Inordinate delay in commissioning of mining equipment

The DPR for 2nd phase expansion plan envisaged concurrent mining at Central Block Sector-I (CB I) and North Block Part-II (NB II) in Panchpatmali Mine in equal ratio from 2008-09. As per the existing mining practice, the excavated bauxite is transported to the primary crusher by dumpers for crushing to facilitate transportation of the same to the refinery by conveyor belt. However, as the distance between the mining faces and the primary crusher in case of NB II was more, in order to save the transportation cost, it was decided that the excavated bauxite would be crushed by a Semi-Mobile Crusher Plant (SMCP) and dispatched to the primary crusher through a 4.5 km. Fixed Long Distance Conveyor (FLDC). Accordingly, the Company procured SMCP and FLDC at a cost of ₹ 42.15 crore and ₹ 60.94 crore respectively for commissioning by September 2008.

Audit, however, observed that these equipments were not yet commissioned (January 2012).

The inordinate delay in commissioning of the equipments had the following adverse consequences:

- The delay in commissioning of SMCP and FLDC defeated the very purpose of their procurement at a total cost of ₹ 103 crore as the progress of the works was very slow and till January 2012 only 48 per cent of the work of SMCP was completed. By the time the work of SMCP and FLDC would be completed, the mining faces may reach the SMCP area and the advantage of installing the equipment may be lost.
- The expenditure of ₹ 3.74 crore* already incurred by the Company towards civil, structural, mechanical, electrical and insulation works for SMCP and FLDC would also remain unutilized till these equipments are commissioned.

* ₹ 3.59 crore paid to M/s. KCEL and ₹ 0.19 crore to M/s. Lloyds (upto May 2011)

- The Company incurred a recurring transportation cost of ₹ 55.60 crore¹ during the period from September 2008 to March 2011 for transporting excavated bauxite (5.42 MMT) from the mining area to the primary crusher.

The Management attributed the delay to unsatisfactory performance of the contractors and maoist attack (April 2009) at mines and pleaded that since considerable quantity of bauxite still remains to be excavated where these equipments will be used, the investment has not gone waste. As regards additional transportation cost due to non-commissioning of the equipments, the Company admitted that it would have incurred transportation cost of ₹ 29.18 crore for crushing and transporting the excavated bauxite of 4.56 MMT.

The contentions are not acceptable as:

- Non completion of civil, structural, mechanical, electrical and insulation works which delayed the installation of SMCP and FLDC was on account of flawed contract management as already discussed in the preceding paragraphs.
- There would be limited scope of utilization of the equipment in NB-II as the mining faces were approaching close to the SMCP area.
- The Annual Progress Report of the Company for the year 2010-11 indicated that the delays in commissioning of the equipments would defeat the very purpose of their procurement.
- Due to the delay in commissioning of mining equipments, the Company incurred an extra expenditure of ₹ 26.42 crore².

(iii) Absence of Component-wise Milestones in Consultancy Agreement

The Company engaged (March 2005) EIL for providing Project Management, Basic Engineering, detailed Engineering, Tendering, Procurement Services and Supervisory Commissioning Assistance for implementation of Second Phase Expansion Project at a lump sum fees of ₹ 129.60 crore, enhanced subsequently to ₹ 134.82 crore due to addition in the scope of work. In terms of the agreement, the expansion works of Mines, Refinery and Smelter were to be completed by April 2008, August 2008 and December 2008 respectively.

Audit observed that the agreement entered with EIL was in contravention of the CVC guidelines (November 2002) as it did not include component-wise schedule. In the absence of such a clause in the agreement, the Company was not able to monitor the progress of component wise milestones of the project. Resultantly, despite inordinate delay in completion of various components of work as discussed in preceding paragraphs, the Company could not hold EIL responsible for the delay.

Further, due to delay in completion of project, the Company had to extend the services of EIL beyond the contractual completion date for which the Company had already agreed (September 2011) for a compensation of ₹ 30 crore and so far (January 2012), has released an adhoc payment of ₹ 17 crore to EIL.

¹ Cost per MT per Km. = ₹22.80 (₹5.2 crore cost for transporting 4.56 MMT of bauxite for 500 meters). Therefore, cost for transporting 5.42 MMT for 4.5 Km = ₹55.60 crore

² (₹55.60 crore - ₹29.18 crore)

The Management assured (October 2011) to prepare component-wise schedule in future projects.

Conclusions

The second capacity expansion plan was very vital for the growth of the Company and also for the Country for attaining self sufficiency in the field of Aluminium. Audit observed a number of inadequacies and gaps in formulation and implementation of the plan. While formulating the Project, the Company did not explore the availability of improved technology as a result, the DPR had to be revised which led to delayed commencement of project which had a cascading effect on the completion of the Project. While awarding the contracts, the Company did not learn from its past experience and awarded the critical contracts to the contractors having a poor track record in executing earlier contracts. The Company also awarded the contract for another critical activity to an inexperienced contractor by accepting its abnormally low offer. These system weaknesses contributed significantly in delaying the completion of the project. Further, due to delay in completion of related civil and electrical works, the mining equipment procured in the year 2008 at a cost of ₹ 103 crore for saving transportation cost of bauxite could not be commissioned so far (January 2012).

The above gaps and inadequacies in project formulation and project execution point towards a Governance deficit in the Company which needs to be addressed appropriately.

The matter was referred to the Ministry (November 2011); their response was awaited (May 2012).

10.2 Avoidable loss due to continuation of uneconomic operation of Special Grade Alumina plant

The Company continued to operate the uneconomical SGA plant without ensuring sustainable supply of critical consumables (saggers) resulting in avoidable loss of ₹ 19.08 crore.

National Aluminium Company Limited (Company) is one of the leading alumina & aluminium producer and exporter in the Country. The Damanjodi refinery of the Company processes bauxite for producing calcined alumina, a part of which is processed further for producing aluminium and the remaining is sold directly in the market.

In 1995, in view of customers' demand, the Company decided to produce Special Grade Alumina (SGA) by processing calcined alumina and accordingly, a SGA plant of annual production capacity of 13000 MT was commissioned in Damanjodi (September 2005) at a cost of ₹ 59.18 crore. The Company also imported 15000 saggers*, which are essential and critical consumables for production of SGA, from the Original Equipment Manufacturer (OEM). The plant required 13,300 saggers annually to run at 100 per cent rated capacity.

* Ceramic, box like containers used for protecting ware in kilns and can withstand a temperature of 1600°C. Calcined alumina are filled in these ceramic containers and placed in the kiln cars for production of SGA.

Audit observed (June 2011) that though saggars were non standard ceramic items, not readily available in the market, the Company did not secure sustainable supply of the same for operating the plant at full capacity. Consequently, the Company faced shortage of saggars since inception particularly when a number of saggars were damaged during the commissioning/process stabilisation. By September 2006, the Company was left with only 6000 saggars out of 15000 procured from the Original Equipment Manufacturer. Company's efforts to procure fresh saggars from the OEM did not yield any result as the latter initially refused to deal with the Company because of unresolved commercial disputes relating to supply and commissioning of the plant and subsequently quoted higher rates which were found economically unviable by the Company. Hence, the Company could not tie-up with the OEM for long-term procurement of saggars.

Audit also observed that till 2006-07, the Company did not initiate any action for exploring any alternate source of supply of this critical item. It was only in September 2006, that the Company initiated efforts for developing indigenous suppliers of saggars and as a result, by August 2011 only three such suppliers could be developed but they were not able to supply the requisite number and quality of saggars. Consequently, due to non-availability of sufficient saggars, the capacity utilisation of the plant remained low and ranged between 17 per cent and 58 per cent only during 2006-07 to 2010-11.

Audit analysed the cost of production of all the Aluminium products and observed that the cost of production of the SGA was so high as compared to its market price that the Company could not even get the variable cost¹ of production from its sales realisation and thus had to suffer a cash loss of ₹ 7.21 crore² by way of negative contribution³ during the period from 2006-07 to 2010-11. In addition, the Company also suffered loss of profit of ₹ 16.87 which it could have earned by selling the calcined alumina directly rather than processing the same for producing Special Grade Alumina. The Company, thus, suffered a loss of ₹ 24.08 crore due to continuation of uneconomic operation of SGA plant which is indicative of weak governance and inadequate monitoring of the Company's operations by the Management. Had the Company discontinued the uneconomic operations of SGA plant even after initial stabilisation period of two years (2005-06 and 2006-07), it could have avoided a loss of ₹ 19.08 crore.

Admitting that sourcing of saggars to the required quantity and quality was a problem since commissioning, the Management stated (September 2011) that with the increased customer base and cost control initiatives such as reduction in fuel consumption, reduction in the cost of saggars by developing indigenous vendors and outsourcing a part of operations, the Company was confident of improving the profitability of the operations and also of making up the losses incurred during stabilisation period.

The fact, however, remains that the Company did not secure a sustainable supply of the critical consumable before commencing the production of SGA. Further, the contention of the Management about improvement of the profitability and making up the past losses is unfounded as the Company in its Annual Accounts for the year 2010-11 has itself recognised the plant as economically unviable. This is especially of concern as calcined alumina had a favourable market and the Company earned profit from its sales. **The**

¹ Variable cost included cost of raw material, power & fuel, consumables, repair & maintenance of the plant.

² Based on cost audit report of the SGA.

³ Difference between variable cost of production and average sales realization

avoidable loss of ₹ 19.08 crore in this case points towards a weak inventory procurement system and a general governance deficit.

The matter was referred to the Ministry (September 2011); their response was awaited (May 2012).