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Satisfying Financial Institutions for Major Capital Projects

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Abstract

Major capital investments in the aluminum sector require significant financing, often in the hundreds of millions of dollars. Lenders are understandably conservative about transactions of this magnitude, and impose not only contractual and financial obligations, but technical ones as well. A project must be technologically sound, properly staffed and managed, and environmentally acceptable – to the satisfaction of the banks – before they will disburse the required capital. With permission from the Billiton Group, two recent examples are presented to illustrate these concepts: the construction of the Hillside smelter in South Africa, and the acquisition of Worsley Alumina in Australia.

Major Capital Investments

Major capital investments in the aluminum sector, such as greenfield projects, acquisitions, and mergers require significant financing. The necessary loans, which can run in the hundreds of millions of dollars, are usually provided by a consortium of private banks and/or public development agencies.

Lenders are understandably conservative about loans of this magnitude, and impose technical requirements on the borrower over and above the usual contractual and financial obligations[1]. Because financial institutions are not in the engineering business, they must rely on the objective input of an independent technical advisor to monitor these projects.

"Project Monitoring" for Greenfield Projects

For greenfield projects, such as a new aluminum smelter, technical reporting to the banks is known as "Project Monitoring". The main purpose is to ensure that conditions spelled out in the feasibility study are actually met – the most obvious being construction cost and start-up date. Other issues include technology selection, adherence to environmental and other standards, staff and training, and final certification that nameplate production capacity has indeed been attained. A typical scope of work for this type of assignment is shown in Table 1.

Generally, the Lender's Technical Consultant follows the project from Board approval through to final commissioning, meeting with project personnel and visiting the construction site on a regular basis over several years. Initial responsibilities are to assess and comment upon certain aspects of the project feasibility, and the development of the final completion criteria. The responsibilities continue with the review of the commissioning progress, the start-up of operations and the certification of final completion. Cooperation with the project's operational and financial staff is essential to the success of this exercise.

Findings are systematically reported to the lead lender in the banking consortium, and any discrepancies are immediately highlighted. Periodic progress reports are issued to the lenders on construction, engineering and procurement, capital cost status and the identification of potential risk factors. The scheduled disbursement of capital to the borrower is contingent on the lenders' satisfaction with the progress of the project.

"Due Diligence" for Acquisitions/Mergers

For acquisitions and mergers, the equivalent exercise is known as "Due Diligence". Usually in such cases the aim is to confirm the worth of assets that are changing hands, or which are being offered as security for loans. A very broad range of issues are evaluated, including status of technology used, plant maintenance, labor relations, power contracts, supplier contracts, market reliability, infrastructure, and historical environmental liability.

The consultant produces a report detailing these questions, geared to a non-technical readership, and often produces a financial model to predict the economic performance of the going concern in question over the period of the loan – eight years, for example. Many of the recommendations in the Due Diligence report can eventually become explicit conditions of the loan agreement. Table 2 gives a typical table of contents for these reports, which can run in the hundreds of pages.

The importance of confidentiality in the case of these transactions cannot be exaggerated. Often the very existence of a possible deal is not publicly known, and the consultant must maintain the strictest standard of secrecy. In the case of share creation, for instance, divulging the existence of the transaction beforehand could even have legal implications. Some banks have their own environmental standards, which are often more strict than those of the countries themselves. The best known example is the World

Bank Group, whose internal environmental standards are the benchmark used in many developing countries where equivalent legislation does not exist. In other cases, banks will require adherence to U.S. standards, regardless of geographical location. Of course, financial institutions are not in the business of monitoring environmental compliance, so this becomes a key element of the Due Diligence exercise as well.

To illustrate these concepts, we have selected two recent examples with the permission of the Billiton Group:

- Project Monitoring: The construction of Hillside Aluminium, a greenfield smelter in South Africa.
- Due Diligence: The acquisition of Worsley Alumina, an existing bauxite/alumina operation in Western Australia.

Project Monitoring Example: Hillside Smelter

With a nominal capacity of 466,000 t/a, Hillside Aluminium in Richards Bay, South Africa, is the largest greenfield pre-bake smelter ever built. Board approval for this billion-dollar-plus project was given in November 1992, the first sod was turned in June 1993, and the first ingot cast in June 1995. The financing was provided by a consortium of lenders based in Johannesburg, South Africa.

Hatch's Project Monitoring assignment lasted from May 1993, prior to construction, until October 1996, after start-up. Reports were issued every three to four months to the lead bank, which distributed copies to the other lenders in the Alusaf Banking Consortium. After the Project Monitoring was completed, Hatch addressed a general meeting of the consortium to discuss critical issues.

One issue that arose shortly after start-up was a decision by Hillside to run the potlines at an amperage higher than nominal, raising concerns about premature pot failure. Both potlines were being operated at 312 kA, while the AP-30 design criteria for the line amperage was 295 kA. Although this was mainly a technical issue, reduced potlife could have increased the specific relining costs from about $40 U.S. per tonne of aluminum produced to over $100, thus impacting on the project's economic performance.

Hatch's concern was essentially that while the higher amperage level was making more salable metal, it could also cause additional cathode stress. Higher amperage increases the current density of the anode, the cathode blocks, the collector bars and internal voltage drops. Although the anode-cathode distance is normally reduced to compensate, to avoid increasing the bath temperature, the total energy input to the pot increases.

An important criterion that is used to judge technical risk is whether the technology has been proven in prior applications. In the case of Hillside, four previous smelters had been built with AP-30 technology, but at that time none had operated at 312 kA. It was generally agreed that the AP-30 technology would probably operate successfully at a higher amperage, but this had not yet been demonstrated commercially.

In May 1996, Hatch produced an economic model to quantify the risks and potential rewards of running at a higher amperage for the length of the loan period. For a range of LME prices, the effect of changes in the pot lining life were expressed in terms of the net cash generation, after taking into account incremental production and revenue gain, variable cost, incremental relining cost and lost production.

The conclusion of the cash flow analysis – based on relatively conservative LME prices – was that the pot life would have to drop to less than three years to have a major financial impact. If the potlife were above four years, the net economic impact would be positive, due to increased revenue from the additional metal produced.

The next step was to review the performance of the AP-30 pots to ascertain whether potlife would indeed attain this 3-year minimum. By this time, the oldest pots at Hillside had already been operating for almost a year. Hatch reviewed the performance results, along with other relevant data from the new smelter, and recommended that Hillside step up its side ledge monitoring program.

Hatch also met with representatives from Pechiney, the technology supplier, to discuss changes made to the cathode design. Silicon carbide blocks had been installed in the Hillside pots, instead of anthracite, to provide additional heat loss through the side walls and thus a thicker and more stable side ledge.

Following this investigation, Hatch concluded that the potlife would indeed attain the three-year benchmark. On October 31, 1996, Hatch issued the Certificate of Final Completion to the banks, indicating that the smelter was now running under "normal and sustainable operating conditions".

Today, Hillside's production has topped the 500,000-t/a mark, and the smelter is recognized worldwide as a great success, from both a technical and a financial perspective. For Hatch this has also been a success of another kind, having led to a similar Project Monitoring assignment for the new MOZAL smelter in Mozambique. MOZAL now joins Hillside and the Alouette and Deschambault smelters in Canada as successful Project Monitoring assignments for Hatch in the primary aluminum sector.

Due Diligence Example: Worsley Alumina

This asset was evaluated in 1993 as part of the acquisition of Shell's metallurgical division, Billiton Metals, by the South African mining house Gencor. The international banking consortium that financed this transaction was based in Zurich, Switzerland.

The Worsley operation is located in Western Australia, south-east of Perth. It comprises both a bauxite mine and an alumina plant, so the range of issues involved was quite vast. Hatch therefore assembled a multidisciplinary team consisting of a geologist, a mining engineer, an alumina production expert, a maintenance engineer, an environmental specialist and a management consultant, plus the team leader. The team spent one week at the site, and several weeks reviewing company documents and internal reports.

One of the most critical environmental issues at that time was excessive noise from the 51-kilometre-long conveyor carrying bauxite from the mine to the alumina plant. This cable-belt conveyor ran next to seventeen private landholders, with some residences only 200 meters from the conveyor corridor. Local residents were putting pressure on government authorities to limit the use of the conveyor to certain periods of the day, or even to close it down.

Worsley, on the other had, was intending to increase conveyor utilization as part of an expansion plan. At one point, the conveyor noise issue actually prevented the facility from receiving environmental approval for the proposed expansion, meaning that they would have been limited to the 2 million tonnes per year of alumina granted under the existing permit. Again, this was a technical problem with potentially severe financial consequences, as there is no other practicable way to move the bauxite from the mine to the refinery.

This issue was highlighted in Hatch's Due Diligence report, which among other things proposed a worst-case cost corresponding to completely enclosing sensitive sections of the conveyor and/or buying out the neighbors. Part of Worsley's operations was located within a National Forest, considered an ecologically sensitive area. It was thus also necessary to interpret some of the 'softer' issues of government and public relations – not always easy to translate into the bottom line.

An important task of the Due Diligence was to evaluate the likelihood of success of Worsley's efforts to address the noise problem. Over the years, many corrective measures had been taken by the company, including modifying the conveyor (canvas covers, plastic wheels, and polyurethane sleeves), discussing compensation with affected neighbors, and lobbying the government for changes to the unrealistic noise level requirements that were being imposed.

In the end, Hatch concluded that Worsley would likely succeed with these efforts, and this was the finding of the Due Diligence report delivered to the banks. The transaction went forward on this basis.

Hatch returned to Worsley in 1997, when Billiton shares were floated on the London Stock Exchange. This provided an excellent opportunity to follow up on many of the issues that had been identified, including conveyor noise. By this time the problem had been resolved, through a combination of equipment modifications to reduce noise levels, agreements with the government specifying realistic noise limits, and settlements with the closest neighbors to the conveyor. As result, Worsley had successfully obtained authorization from the environmental authorities to expand to a capacity of 3.5 million tonnes per year of alumina.

In the end, the Billiton transactions were highly successful, to the satisfaction of both the company and the lenders. Jumping ahead to 2000, Worsley Alumina is now poised to double its capacity with a major expansion that is already underway.

Conclusion

We are accustomed to thinking that aluminum starts with bauxite, but it really begins with financing and the lenders who provide it. It is therefore critical for corporate management to understand exactly what the banks expect in the case of these nine-figure loans. In addition to being economically worthwhile, a project must be technologically sound, properly staffed and managed, and environmentally acceptable before the financial institutions will disburse the required capital.

The crucial message is that, to get financing, the promoter must be able to demonstrate adherence to all these requirements – to the satisfaction of the lenders.

Acknowledgments

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References

1. "Evaluating Investment Opportunities – Making the Right Decisions", D. Clarry, W. Berends, 13th International Aluminium Conference, Instanbul, Turkey, Sept. 6-8, 1999.

Table 1: "Project Monitoring" Report
Typical Contents

Overall Project Review
Overall Plant Design
Site and Soil Study
Process Technologies
Product Mix
Process Parameters
Expected Plant Performance
Likelihood of Meeting Design Specifications

Environmental Review
Permits and Regulations
Adequacy of Environmental Measures
Environmental Control Equipment
Projected Releases to the Environment
Evaluation of Environmental Impact
Monitoring Program

Construction Schedule Review
Reasonableness of Construction Schedule
Construction Procedures and Organization
Manpower Requirement and Availability
Engineering and Procurement Schedule
Permits and Regulations
External Influences on Schedule
Likelihood of Construction Delays

Construction Monitoring
Construction Status and Comparison with Schedule
Engineering and Procurement Status and Comparison with Schedule
Capital Cost Status and Comparison with Budget
Construction Comparison with Design and Specifications
Identify Potential Risk Factors

Mechanical Completion
Review Project Procedures of Project Manager
Review Operation of Facilities
Review Turnover Packages
Identify Potential Risk Factors
Certify Mechanical Completion

Monitoring of Start-Up Period
Start-Up Monitoring and Comparison with Schedule
Status of Technology Performance
Status of Technical Problems and Action taken
Status of Training and Qualification of Personnel
Identify Potential Risk Factors

Certification of Final Completion
Preparation of Completion Test
Establish Starting Date and Mode of Test
Establish Length of Test Period
Assist the Banking Consortium concerning Completion Guaranties
Preparation for Final Completion Test
Discuss Test Procedures with Project Personnel
Establish Date of Normal and Sustainable Operation of Plant
Start Test Period
Monthly Review and Reporting during Test Period
Conclusion of Test
Preparation and Issue of Completion Certificate

Table 2: "Due Diligence" Report
Typical Contents

Mining Operations	**Human Resources and Management**
Audit of reserves and resources and determination of data quality	Comparison of management structures and with similar operations
Review of local geology and assessment of geological model	Historical safety performance records
Comparison between production rates/grades achieved and predicted	Industrial relations and potential conflicts
Mining methods, plans and costs	
Mine maintenance systems	**Financial Model**
Impact and feasibility of exploration projects	Historical and future operating and capital costs
	Cost curve comparison
Mineral Processing & Smelting Operations	Design of financial model for the operations
Detailed technical review of technology used	Capital expenditures and production costs
Evaluation of overall process in terms of suitability, flexibility and efficiency	Appropriate sensitivity factors for key risks and issues.
Review of metallurgical accounting system	
Verification of material and energy balance closures	**Potential for Improvement**
Comparison between actual production/recovery rates and planned	Quality, age and appropriateness of the existing equipment
Plant maintenance systems	Identification of areas for improvement
	Costs and benefits of efficiency improvements
Services and Infrastructure	Consequences of not undertaking improvements
Adequacy of services and infrastructure	
	Industry and Market Assessment
Environmental Review	Assessment of consumption trends, prices, distribution and competitive position
Comparison of pollutant discharges to those achieved by similar operations	Long-term risks and issues including substitution risk through other products
Methods used to prevent or minimize pollution	Assessment of proposed marketing strategies and policies
Comparison of local environmental regulations with international criteria	Flexibility of each operation to respond to market changes
Landfills and potential soil contamination	Current and future competitiveness of each operation
Other areas of potential financial risk	