

- 1 -

BRAZIL - CARAJÁS IRON ORE PROJECT

AIDE-MEMOIRE

A World Bank Project Completion Mission, consisting of Messrs, Stephen von Klaudy, Leopoldo Mataboli and Shelton Davis, visited Brazil January 9-20, 1989. The Mission's objective was to carry out a retrospective review of the Carajás Iron Ore Project with CVRD and Government authorities. Messrs, von Klaudy and Maraboli visited CVRD's installations in Carajás and São Luís and Mr. Davis visited various Amerindian reservations, which were included in the Amerindian Special Project, financed by CVRD in the context of the Carajás development. The main findings of the mission are summarized below.

Project Implementation

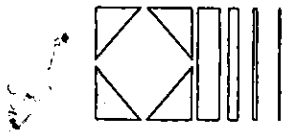
The project was implemented on schedule and in accordance with high standards of design and execution. Schedule revisions took place mainly as a reaction to a weakening iron ore market and delayed project start-up by only six months compared to the 1982 appraisal estimates. Due to its dedicated and highly qualified staff, and its previous experience in implementation of other large projects, CVRD managed project implementation effectively, coordinating engineering consultants, supervising contractors and procuring goods and services under a wide variety of financing arrangements. As a result of successful project implementation and outside factors, including inflation differentials and exchange rate movements, total project costs were about 25% lower in US\$ terms than forecast made at the time of appraisal.

Operations

Management of current operations is sound and corresponds to practices generally applied in open pit mining and in transport operations. Good standards are also being followed in administration of the Carajás townsite, in environmental protection in the mining concession, and in pollution control in the Ponta da Madeira port area.

The production components currently operate at a rate of about 30 Mtpy of iron ore concentrates, 5 Mtpy below design capacity, which provides an ample safety margin. With production expected to eventually reach full capacity, this safety will become smaller and optimization of operations will be required.





AIDE-MEMOIRE (cont.)

The mission thinks that the period of low capacity utilization should be used to accelerate this optimization process and make the necessary adjustments in the use of equipment and installations. These measures would not only result in cost reduction and thus increases in the project's financial benefits but may also lead to some increase of production capability beyond nominal capacity; at minimal additional investments, which would give CVRD more flexibility to react to market changes. Some specific comments on the Carajás operations are summarized below.

Optimization of the mine operations could be achieved by actions in the following areas: (i) modelling of ore reserves to improve the ongoing process of downsizing of interpolated mineral blocks from 200 m to 50 m; (ii) more generalized use of various modern open pit planning techniques via computers; (iii) various operational mining improvements discussed with mine staff on site, including supervising monitor tower with radio capability and truck dispatching. In the plant, further efforts are needed for improving its present recovery (about 85%). The existing losses amounting to about 4.5 Mtpy of beneficiated ore could be significantly decreased with only very minimal investments, that would have a favourable impact on Carajás' profitability.

In rail transport safety margins are particularly noted in locomotives, rolling stock and support facilities. One of the immediate priorities is to put the CTC system into operation for the whole extension of the railway. This would permit optimization of the system, provide flexibility for increases in iron ore transport as well as transport of other goods and passengers, and create the necessary margin in the medium and long term, when equipment availability decreases because of age. For the port, the mission sees the priority in updating and revising the existing port master plan. First, such work should reflect updated knowledge on actual port operation as well as currents, and should focus on optimizing use of existing facilities, and minimizing time losses from vessel switch, perhaps, through consideration of a closer turning basin. Second, it should address longer term requirements concerning port growth. For this consideration should be given to design criteria for: (i) additional berths to meet increases from shipments of iron as well as other products; (ii) utility berth requirements; and (iii) possible zoning criteria for shore areas (stockpiles and shore facilities).

With regard to environmental protection measures in CVRD's operations, the mission was impressed by the establishment of dams for settling of mine wastes and concentrator tailing, which compacting of waste material to develop stable benches, contrary to practices applied in many contour strip mines. The monitoring systems introduced show that these measures minimize



AIDE-MEMOIRE (cont.)

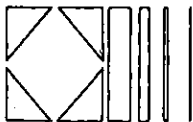
the environmental impact from mining operations. Along the railroad CVRD seems to have assured maximum protection against slope erosion with effective hydroseeding techniques. The environmental impact and dust development of stockyards and port operations appears minimal. However, a matter of concern is the apparent non-compliance by ships approaching the port with Brazilian regulations that prohibit oil spillages resulting from vessel tank washing activities. The mission understands the CVRD's environmental superintendency is preparing a special report on environmental protection in the Carajás operations which should be ready by March. On the basis of this report the Bank would then make a specific assessment of implementation of this component.

Project Financial Impact

The main issue for the project so far has been the international iron ore market development. Since the time of the Bank's 1982 appraisal, the market deteriorated and demand growth slowed, which forced CVRD to delay project start-up by six months and to limit output to 30 Mtpy instead of an installed capacity of 35 Mtpy. In addition to this 15% reduction in quantity sold, project revenues up to this year have been affected by iron ore price levels which (in nominal US\$ terms) ranged 40%-50% below those projected at the time of appraisal. The substantial deviations of both investments costs and revenues during the period justify continuous monitoring of the project's financial impact on the company. While until recently CVRD has included this analysis in its long-term financial forecasts, the mission understands that this is not any longer the case, and recommends that it be reintroduced. The mission also pointed out that the Bank routinely recalculates the rate of return of projects at time of completion and possibly at a later stage, should the project be post-evaluated by the Bank's Operations Evaluation Department. A recalculation of the Carajás' project's rate of return will be carried out during preparation of the Bank's completion report and will thus be available to CVRD.

Marketing

The mission discussed with CVRD its marketing strategy and recognized the effectiveness of the company's cautious phasing-in of project production which helps maintain market stability. While the international iron ore market is not yet ready to absorb Carajás' full capacity output, the market recovery of 1988 demonstrated the importance of the project, which already now represents close to 10% of international iron ore trade. The mission discussed with CVRD the iron ore market outlook and found that CVRD's expectations coincide with those of



AIDE-MEMOIRE (cont.)

the Bank, which are reflected in the November, 1988 commodity price projections, and call for relatively small growth and little price variation in real terms over the next decade despite the temporary recovery in 1988/1989.

Amerindian Special Project

The mission recognized the crucial role CVRD played in implementation and financing of the Amerindian Special Project. The main Achievements were a considerable improvement of the health situation, particularly malaria, of the Indian population up to 1986, and the demarcation of a considerable number of reservations. Since 1986, however, the health system introduced under the project has deteriorated, and demarcations have slowed down due to increasing weaknesses of FUNAI, the implementing agency. CVRD's agreement with FUNAI is still in effect with a balance of about US\$ 1.2 million available. The mission recommends that these funds be spent with priority on land demarcation and that CVRD use its influence with FUNAI and at the political level to accelerate the demarcation process. Moreover, the mission would consider it extremely useful if CVRD could provide some help within the framework of the agreement for "vigilância" along the fringes of the reservations, i.e. primarily serial reconnaissance of intrusions especially in the Mãe Maria and Caru/Awa reserves. The mission also recommends that part of the funds still available be used to (i) design a more durable health system for the reservations under the project, and (ii) design adequate bilingual education system. This would make it possible to define human and financial resources needed and to determine funding possibilities. Given that the Amerindian Special Project is continuing beyond completion of the main project, the Bank is interested in following its implementation and would like to be regularly informed about it. For the same reason, a more detailed Annex has been prepared on this component and its attached to this Aide-Memoire.

The mission would like to thank CVRD for its hospitality and the excellent organization of the visits and discussions. The mission enjoyed the pleasant working relationship with CVRD's staff and appreciates particularly the full attention and cooperation it was given during the second week despite the pressing requirement to assess the implications for the company of Brazil's new economic program.

Brasilia, 20 January 1988

Stephan von Klaudy

Leopoldo Maraboli

Shelton Davis