PD ABI-119

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
REGIONAL TRANSPORT DEVELOPMENT Dar es Salaam Corridor Project (TAZARA)	690-0240	USAID/Tanzania

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 90-1

☐ REGULAR EVALUATION ☒ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES			6. ESTIMATED PROJECT FUNDING		7. PERIOD COVERED BY EVALUATION
A. First PRC-AG or Equivalent FY 87	B. Final Obligation Expected FY 87	C. Final Input Delivery FY 94	A. Total	$ 50,022,000	From (month/yr.) 10/87
			B. U.S.	$ 45,950,000	To (month/yr.) 11/89
					Date of Evaluation Review 11/89

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues, cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
- USAID/Tanzania will acknowledge that one of the conditions Precedent for the Procurement of the second tranche of locomotives has been met in that TAZARA has demonstrated that it has revised its tariff structure and has the required systems in place. A PIL to this effect will be issued once TAZARA has documented that it has also met the Condition Precedent covering critical staff vacancies.	J. F. Stepanek, Director	4/90
- The EOPS conditions will be revised to reflect a more realistic assessment of the impact of the proposed inputs. Neither funding increases nor changes in the proposed implementation plan are proposed; accordingly, neither a PP amendment nor a PP supplement will be prepared, rather an action memorandum will be placed in the file to document the revisions.	J. F. Stepanek, Director	7/90

BEST AVAILABLE DOCUMENT

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- [X] Project Paper
- [ ] Implementation Plan e.g., CPT Network
- [ ] Other (Specify)
- [ ] Financial Plan
- [ ] PIO/T
- [ ] Logical Framework
- [ ] PIO/C
- [ ] Other (Specify)
- [ ] Project Agreement
- [ ] PIO/P

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. [ ] Continue Project Without Change
- B. [ ] Change Project Design and/or [ ] Change Implementation Plan
- C. [ ] Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

John C. Starnes, Project Officer

L. B. J. Chogo, Asst. Chief Mechanical Engineer (TAZARA)

Frederick J. Guymont, Project Development Officer

12. Mission/AID/W Office Director Approval

Signature: Joseph F. Stepanek

Typed Name: Joseph F. Stepanek

Date: 3/22/90

AID 1320-1S (5-78)

(Printed 7/85)

REGIONAL TRANSPORT DEVELOPMENT
Dar es Salaam Corridor Project (TAZARA)
Project Number 690-0240

INTERIM INTERNAL PROJECT EVALUATION

PROJECT EVALUATION SUMMARY (PES) — PART II

13. SUMMARY

The Project responds to TAZARA's immediate need for additional locomotive power by providing new locomotives to carry increased tonnages of cargo. At the same time, the Project is strengthening the institutional capacity and operational efficiency of TAZARA in repair and maintenance of its own fleet of locomotives by providing spare parts, tools, testing equipment, expanded workshop facilities, and on-the-job training. To increase overall management efficiency, long-term and short-term technical assistance and training are being provided to the various organizational divisions.

Among the major conclusions reached by the Evaluation Team were:

a. The need for all 17 locomotives to be financed by USAID has been clearly established. Even with the 17 new locomotives, TAZARA will still require one additional locomotive by year end 1992 and this will increase to another 16 locomotives required by 1995.

b. TAZARA's present tariff structure generates sufficient revenue to meet expenditures.

c. Traffic projections should be significantly revised downward. The present level of traffic on TAZARA of 1.075 million metric tons is much lower than the 1.64 million metric tons projected in the Project Paper.

d. Two of the three End of Project Status (EOPS) conditions should be amended and a fourth condition should be added.

e. Locomotive procurement under Host Country contracting procedures was both efficient and effective.

14. EVALUATION METHODOLOGY

The Mid-Project Evaluation, as structured in the Project Paper, addresses certain information impacting directly on the decision to exercise an option to procure an additional 9 diesel electric locomotives under the Project. Due to delays encountered in project implementation, the PACD has been extended to 1994. As the Mid-Project Evaluation will also be rescheduled, an interim internal evaluation has been conducted for the purposes of determining the

status of TAZARA in meeting the Conditions Precedent as stated in the Project Agreement.

This evaluation compared present traffic demand trends to the original Project Paper forecasts and assessed TAZARA's performance in establishing reliable and accurate cost data and its use of this data to set appropriate tariff rates. In addition, this evaluation included an implementation review and reassessed project performance indicators.

This evaluation was based upon a rapid reconnaissance by a multi-disciplined team of AID officers supporting a railway management specialist. This reconnaissance covered existing data available at TAZARA's Head Offices in Dar es Salaam and the USAID/Tanzania office in Dar es Salaam. This data was supplemented by reports developed by other donors.

15. EXTERNAL FACTORS

The changing political situation in the SADCC region is such that performance indicators for the Project will have to be reviewed periodically. Opening of new routes within the region due to peace settlements and/or increased usage of routes through the Republic of South Africa due to future improvements in relationships with SADCC members could divert significant tonnages from TAZARA.

16. INPUTS

The implementation schedules contained within the Project Paper were unduly optimistic with regard to the procurement and delivery of high value, specialized equipment. Procurements under Host Country contracting procedures have proceeded much more expeditiously than procurements under AID direct contracting procedures; this attributable mainly to the inability of the regional contracting office to respond to requirements in a timely manner due staff shortages.

17. OUTPUTS

Not pertinent at this time.

18. PURPOSE

The purpose of the Project is to strengthen and expand the capacity and improve the operational efficiency of the Southern Africa regional transport network. The subpurpose is to strengthen and expand the carrying capacity and improve operational efficiency of TAZARA within the overall SADCC Northern Corridor Transport System.

What with the delivery of the first 8 of 17 new diesel electric locomotives (the Project's major input) not anticipated until August 1990, the Railway Systems Management and Operations contractor only recently mobilized, and the delivery of new spare parts for the existing fleet of locomotives only recently completed, it is much too early to realistically assess the impact of

the Project on TAZARA's capacity and operational efficiency.

This evaluation recommends that two of the three End of Project Status (EOPS) conditions be amended as follows:

a. A 45% increase [100% in Project Paper] in cargo hauled annually, i.e., TAZARA's carrying capacity increased from 988,000 metric tons in 1986 to 1.44 million metric tons [1.9 million metric tons in Project Paper] in 1994 [1991 in Project Paper].

   Comment: Cargo hauled was only 1.08 million metric tons in FY 1988/89 (1 July through 30 June). The first 8 locomotives being financed by this Project are not scheduled to arrive until August 1990.

b. A 26% [40% in Project Paper] increase in the locomotive availability rate for the total fleet, i.e., average locomotive availability increased from 46% in 1986 to 58% in 1994 [65% in 1991 in Project Paper]; an 75% availability rate for the diesel electric locomotives achieved by 1991 [diesel electric locomotives were not addressed separately in the Project Paper].

   Comment: TAZARA's locomotive availability actually decreased to 44% for FY 1987/88 (1 July through 30 June). The program of overhaul and rebuild of the existing diesel electric locomotives should significantly improve the availability; it is anticipated that FY 1989/90 figures will begin to show some improvement.

No change has been recommended to the third EOPS condition, though its utility is somewhat limited:

c. A decrease in average wagon turnaround time, i.e., a decrease in average turnaround time of wagons (Dar es Salaam - New Kapiri Mposhi) from the current average [1986] of 35 days to 20 days by 1994 [1991 in Project Paper].

   Comment: A 17-day turnaround time was achieved by TAZARA in 1989.

It is also recommended that consideration be given to the establishment of a fourth EOPS condition:

d. A 50% increase in the locomotive utilization rate for the total fleet, i.e., average locomotive utilization increased from 51% in 1989 to 77% in 1994.

   Comment: A 50% improvement in the locomotive utilization rate would be equivalent to the acquisition of 11 additional locomotives.

The original Project Anticipated Completion Date (PACD) was 31 August 1991. The PACD has been extended twice. On 8 June 1988, the PACD was extended to 31 August 1992 as a result of delays encountered in meeting the initial set of

conditions precedent and difficulties encountered in developing procurement documents. On 7 November 1988, the PACD was further extended to 31 August 1994 as a result of the adoption of a more detailed and realistic procurement schedule for the locomotives which incorporated a 36-month period of technical services commencing with the arrival of the first locomotive.

19. GOAL

The goal of the Project is to support the development of a strong economic foundation for growth in Southern Africa.

As the major project inputs have not been delivered to date, it is too early to assess progress towards achievement of the goal.

20. BENEFICIARIES

TAZARA is the direct beneficiary of the grant. The increased locomotive availability will result in a higher carrying capacity and increases in revenues, enabling TAZARA to operate at a profit and honor its loan obligations.

Consumers in the countries which TAZARA traverses will benefit from the lower import costs of a variety of manufacturing goods, thus enhancing the quality of their life.

21. UNPLANNED EFFECTS

Not pertinent at this time.

22. LESSONS LEARNED

From the Evaluation Team's perspective, the decision to undertake the procurement of locomotives as a Host Country contract was clearly the correct one. The excellent working relationship that developed between TAZARA and USAID/Tanzania during the course of the procurement is testimony to the merits of Host Country contracting. The decision to delay release of the procurement documents until such time as the specifications were expanded to provide greater clarity and "sanitized" to insure that they were "generic" saved time in the long run by expediting the review of technical proposals and avoiding protests by unsuccessful offerors. In addition, a very competitive price was achieved due to AID's success in making the procurement truly fair and open.

23. SPECIAL COMMENTS OR REMARKS

USAID/Tanzania wishes to note that, in large part due to the excellent project design effort undertaken by USAID/Zimbabwe and REDSO/ESA, that implementation of the Project has progressed in an exceptionally satisfactory matter. The Project is an excellent balance of major commodity inputs, technical assistance, and training. The Project not only supplies TAZARA with new items of major equipment, but also encourages rehabilitation of existing equipment

and more effective utilization of existing resources. USAID/Tanzania believes that the overall project design will effectively and efficiently contribute to major improvements to the institutional capacity of TAZARA.

ID#PES1:ENGR:JCStarnes:16MAR90:2nd draft

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REGIONAL TRANSPORT DEVELOPMENT
Dar es Salaam Corridor Project (TAZARA)
Project Number 690-0240

INTERIM INTERNAL PROJECT EVALUATION
November 1989

EXECUTIVE SUMMARY

1. NAME OF MISSION: USAID/Tanzania

2. PURPOSE OF THE ACTIVITIES EVALUATED:

The purpose of the Project is to strengthen and expand the capacity and improve the operational efficiency of the Southern Africa regional transport network. The subpurpose is to strengthen and expand the carrying capacity and improve the operational efficiency of TAZARA within the overall SADCC Northern Corridor Transport System.

3. PURPOSE OF THE EVALUATION AND METHODOLOGY USED:

The Mid-Project Evaluation, as structured in the Project Paper, addresses certain information impacting directly on the decision to exercise an option to procure an additional 9 diesel electric locomotives under the Project. Due to delays encountered in project implementation, the PACD has been extended to 1994. As the Mid-Project Evaluation will also be rescheduled, an interim internal evaluation was conducted for the purposes of determining the status of TAZARA in meeting the Conditions Precedent as stated in the Project Agreement.

This evaluation will verify traffic demand trends in comparison to the original Project Paper forecasts and assess TAZARA's performance in establishing reliable and accurate cost data and the use of this data to set appropriate tariff rates.

This evaluation was based upon a rapid reconnaissance by a multi-disciplined team of AID officers supporting a railway management specialist. This reconnaissance covered existing data available at TAZARA's Head Offices in Dar es Salaam and the USAID/Tanzania office in Dar es Salaam. This data was supplemented by reports developed by other donors.

4. MAJOR FINDINGS AND CONCLUSIONS:

a. Traffic on TAZARA is lower than projected in the Project Paper.

b. The shortage of motive power will hinder TAZARA's efforts to achieve higher traffic load levels.

c. The Project has relatively little impact to date on TAZARA performance as technical assistance has only recently commenced and the first locomotives are not scheduled to arrive until August 1990.

d. The procurement of the second tranche of locomotives will not in itself increase TAZARA's performance unless there are commensurate improvements in TAZARA's internal operations and locomotive utilization.

Note 1: TAZARA takes exception to the linkage of the second tranche of locomotives to "improvements in ... internal operations." TAZARA contends that the second tranche is linked only to improvements in "finance and planning."

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e. TAZARA has yet to institute a cost-based tariff system: however, the setup is essentially in place to implement such a system. Tariff revisions made in 1989 do provide for various traffic types to contribute to their proportionate variable costs.

f. TAZARA is maintaining an external account with sufficient funds to procure required locomotive spare parts.

g. Locomotive procurement under Host Country contracting was both efficient and effective.

h. Performance indicators in the Project remain valid for purposes of measuring change; however, the levels should be reviewed and revised to reflect delays in project implementation and the changing political situation in Southern Africa.

5. MAJOR RECOMMENDATIONS:

a. A concerted effort needs to be made to address managerial and operational constraints that negatively impact on locomotive utilization.

b. The traffic projection for the EOPS should be revised downward to 1.44 million metric tons at PACD (1994).

c. The projected increase in the locomotive availability rate should be revised downward to 58% for the total fleet, but a goal of 75% should be established for the diesel-electric fleet.

d. PCMCD should acknowledge that part of the Conditions Precedent for the procurement of the second tranche of locomotives have been met in that TAZARA has demonstrated that it has revised its tariff structure and has the required systems in place.

e. TAZARA needs to make more effort to fill key positions in finance and operations with qualified personnel and have adequate incentives in place to retain staff in these positions.

f. TAZARA should make more effort to market services to present and prospective customers, including the design and implementation of specialized train services for individual customers.

BASIC PROJECT IDENTIFICATION DATA

1. Country/Entity: Tanzania-Zambia Railway Authority (TAZARA). TAZARA is jointly owned by the Government of the United Republic of Tanzania and the Government of the Republic of Zambia.

2. Project Title: REGIONAL TRANSPORT DEVELOPMENT - Dar es Salaam Corridor

3. Project Number: 690-0240

4. Project Dates:

   a. First Project Agreement: 30 September 1987
   b. Final Obligation Date: FY 87 (actual)
   c. Most Recent Project Assistance Completion Date (PACD): 31 August 1994

5. Project Funding:

a.	A.I.D. Bilateral Funding (grant)	US$ 45,950,000
b.	Other Major Donors	US$ 204,000
c.	Host Country Counterpart Funds	US$ 3,868,000
d.	Total	US$ 50,022,000

6. Mode of Implementation:

   a. Host Country Contracts:

Contractor	Description	Amount
GENERAL ELECTRIC	Spare Parts and Technical Services	$ 3,953,372
GENERAL ELECTRIC	Special Tools and Testing Equipment	$ 261,044
GENERAL ELECTRIC	Diesel Electric Locomotives and Related Commodities and Services	$17,254,500

   b. A.I.D. Direct Contracts:

Contractor	Description	Amount
COOPERS & LYBRAND	Inventory Control System Computerization	$ 91,339
STV ENGINEERS	Locomotive Procurement Assistance	$ 103,718

LOUIS BERGER	Railway Systems Management and Operations	$ 1,999,814
STV/LYON ASSOCIATES	Mbeya Workshop Design	$ 260,243

7. Project Designers: USAID/Zimbabwe and REDSO/ESA

8. Responsible Mission Officials:

   a. Mission Director(s): Joseph F. Stepanek (30 SEP 87 - present)
   b. Project Officer(s): Zachary M. Hahn (30 SEP 87 - 19 JUN 88)
      John C. Starnes (20 JUN 88 - present)

9. Previous Evaluation(s): none

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Glossary

AID	Agency for International Development
AID/W	Agency for International Development/Washington
CBD	Commerce Business Daily
COP	Chief of Party
DE	Diesel-electric locomotives
DH	Diesel-hydraulic locomotives
EMD	Electro-Motive Division of General Motors Corporation
EOPS	End of Project Status
FY	Fiscal Year
GE	General Electric Company
HP	Horse Power
KfW	Kreditanstalt fur Wiederaufbau (West German development finance agency)
LOP	Life of Project
PACD	Project Assistance Completion Date
PIL	Project Implementation Letter
REDSO/ESA	Regional Economic Development Support Office/East and Southern Africa
RFP	Request for Proposal
RFQ	Request for Quotation
SADCC	Southern Africa Development Coordinating Conference
SARP	Southern Africa Regional Projects
SIDA	Swedish International Development Agency
SOW	Scope of Work
TAZARA	Tanzania-Zambia Railway Authority
TISCO	Tanzania Industrial Studies and Consulting Organization
USAID	United States Agency for International Development (generally denotes bilateral missions)
ZR	Zambia Railways

REGIONAL TRANSPORT DEVELOPMENT
Dar es Salaam Corridor Project (TAZARA)
Project Number 690-0240

INTERIM INTERNAL PROJECT EVALUATION

1.0 BACKGROUND

1.1 OVERVIEW

The Tanzania-Zambia Railway Authority (TAZARA) Project is part of the southern Africa regional strategy to reduce the dependency of the frontline states on South Africa. A.I.D. is working to expand the capacity and improve the efficiency of TAZARA with regard to service to the landlocked countries in the region.

The AID-financed Project responds to TAZARA's immediate need for additional locomotive power by providing new diesel electric locomotives to carry increased tonnages of cargo. At the same time, the Project is strengthening the institutional capacity and operational efficiency of TAZARA in repair and maintenance of its own fleet of locomotives by providing spare parts, tools, testing equipment, expanded workshop facilities, and on-the-job training. To increase overall management efficiency, long-term and short-term technical assistance and training are being provided to headquarters, regional, training school, workshops, and operational divisions.

1.2 PROJECT STRATEGY

The project strategy is to increase TAZARA's overall locomotive availability in order that it can haul its projected increases in tonnage.

1.3 PROJECT PURPOSE

The purpose of the Project is to strengthen and expand the capacity and improve the operational efficiency of the Southern Africa regional transport network. The subpurpose is to strengthen and expand the carrying capacity and improve operational efficiency of TAZARA within the overall SADCC Northern Corridor Transport System.

1.4 END OF PROJECT STATUS

According to the Project Paper, the following conditions are expected to exist by the end of the Project:

1.4.1 CARGO HAULED

Near 100% increase in cargo hauled annually, i.e., TAZARA's carrying capacity increased from 1.0 million metric tons in 1986 to 1.9 million metric tons in 1991.

1.4.2 LOCOMOTIVE AVAILABILITY RATE

40% increase in the locomotive availability rate, i.e., average locomotive availability increased from 46% in 1986 to 65% in 1991.

1.4.3 WAGON TURNAROUND TIME

Decrease in average wagon turnaround time, i.e., from the current [1986] average of 35 days to 20 days by 1991 for Dar es Salaam-Kapiri Mposhi.

1.5 PROJECT OUTPUTS

The following outputs are to be achieved by the Project:

1.5.1 NEW LOCOMOTIVES

Additional new diesel electric locomotives in service.

1.5.2 EXISTING LOCOMOTIVES

Existing GE/Krupp diesel electric locomotives overhauled and damaged locomotives repaired and operating.

1.5.3 MAINTENANCE PROGRAM

Maintenance program operating efficiently for entire fleet of diesel electric locomotives.

1.5.4 MBEYA WORKSHOP

Mbeya workshop remodelled and in use to maintain diesel electric locomotives only and to store spare parts.

1.5.5 MAINTENANCE PROCEDURES

Improved maintenance procedures developed and being implemented for diesel locomotives.

1.5.6 OPERATING PROCEDURES

Rail system operating procedures developed and implemented including those for overall planning, traffic forecasting, demand analysis, and tariff setting.

1.5.7 COST ACCOUNTING PROCEDURES

Cost accounting procedures computerized and in use as basis for determining operating costs.

1.5.8 OPERATING COST

Data on operating cost presented to TAZARA management as basis for a realistic tariff structure.

1.5.9 SYSTEMS CONTROL

Production, quality, and inventory systems control established.

1.5.10 ON-THE-JOB TRAINING

TAZARA artisans and technicians in mechanical engineering received on-the-job training.

1.5.11 ACCOUNTANTS' TRAINING

TAZARA's accountants received training.

1.5.12 PERFORMANCE OF MANAGEMENT STAFF

Improved performance of TAZARA's management staff.

1.5.13 LONG-TERM TRAINING

Long-term participants trained in critical railway management and operations areas.

1.6 PROJECT BUDGET

Input Category	Projected Cost*
LOCOMOTIVES/SPARES	$ 38,360,000
TOOLS AND EQUIPMENT	$ 1,261,000
CONSTRUCTION	$ 700,000
TRAINING	$ 1,168,000
TECHNICAL ASSISTANCE	$ 3,586,000
MONITORING/EVALUATION	$ 150,000
CONTINGENCY	$ 725,000
TOTAL	**$ 45,950,000**

* As approved by Project Steering Committee on 28 March 1989.

2.0 PURPOSE OF EVALUATION

The Project Grant Agreement was signed on 30 September 1987. Though originally conceived as a 4-year project, the Project Assistance Completion Date (PACD) has been extended twice as a result of delays encountered in the procurement of locomotives and other project inputs. The Life of Project (LOP) is now 7 years. Accordingly, it is now proposed that the Mid-Project Evaluation which was originally scheduled for October 1989 be delayed until at least October 1990. However, the Mid-Project Evaluation, as structured in the Project Paper, addresses certain information impacting directly on the decision to exercise the option for 9 additional diesel electric locomotives.

The delivery of the first tranche of 8 locomotives is due in August 1990, and delivery of the additional 9 locomotives is conditional on verification of traffic demand. In addition, a Condition Precedent to disbursement of funds for procurement of the second tranche of 9 locomotives is provision in form and substance satisfactory to AID of "evidence that the TAZARA tariff structure is adequate to cover operating costs and generate a net profit on operations to the Authority or that a proposal has been accepted to revise the tariff structure taking into account the recommendations following from technical assistance financed by the project".

This evaluation will, in addition to verification of traffic demand trends in comparison to the original Project Paper forecasts, also assess TAZARA's performance in establishing reliable and accurate cost data and the use of this data to set appropriate tariff rates.

Therefore, USAID/Tanzania has conducted a special interim internal project evaluation to address those issues impacting on the exercise of the option to procure the second tranche of locomotives.

3.0 EVALUATION METHODOLOGY AND TEAM COMPOSITION

3.1 STUDY METHODS

This evaluation was based upon a rapid reconnaissance by a multi-disciplined team of AID officers supporting a railway management specialist. This reconnaissance covered existing data available at TAZARA's Head Offices in Dar es Salaam and the USAID/Tanzania office in Dar es Salaam. This data was supplemented by reports developed by other donors.

The Study to Determine Future Motive-Power Demand on TAZARA prepared by Joint Venture GERI Engineering GmbH - GOPA Consultants for Kreditanstalt fur Wiederaufbau (KfW), dated November 1988, was reviewed, validated, and updated to serve as the basis for "Verification of Traffic Demand Trends".

To assess TAZARA's progress in establishing a reliable cost information data

base for the purposes of tariff structure calculations, the team reviewed TAZARA's accounting documents and financial records at headquarters.

The working files of the Project Officer in USAID/Tanzania were used to evaluate one host country procurement and one AID direct procurement for the "Implementation Review". The host country procurement reviewed was the procurement for the new locomotives which represents approximately 73% of the value of the entire Project. The AID direct procurement reviewed was the procurement of technical services for Railway Systems Management and Operations which is both the largest AID direct contract and the major technical assistance effort under the Project.

The KfW-financed Study to Determine Future Motive-Power Demand on TAZARA, supplemented by the latest available TAZARA records, was also the main basis for "Review of Project Performance Indicators".

3.2 TEAM COMPOSITION

The team for this internal evaluation was composed of the following individuals:

Richard H. Wiersema, Railways Management Specialist - Mr. Wiersema is presently Chief-of-Party for the Railway Systems Management and Operations contract. Mr. Wiersema served as team leader for all technical aspects of the evaluation. Mr. Wiersema was the principal contributor for the two major parts of the evaluation which covered "Verification of Traffic Demands" and "Review of Project Performance Indicators".

Benjamin Mutiti, Transport Economist - Mr. Mutiti is with the USAID/Zimbabwe Mission. Mr. Mutiti was the principal contributor for the major part of the evaluation which covered "Assessment of TAZARA's Performance in Establishing Reliable Cost Data". In addition, Mr. Mutiti collaborated with Mr. Wiersema on "Verification of Traffic Demands".

John Peevey, Commodity Management Officer - Mr. Peevey is a Regional Commodity Management Officer with REDSO/ESA and has been involved with two major procurement activities under this Project. Mr. Peevey was the principal contributor for the major part of the evaluation on "Implementation Review". Mr. Peevey was not directly involved in the two procurements which were selected for review as part of this evaluation.

Gregg Wiitala, Project Development Officer - Mr. Wiitala is a Project Development Officer with REDSO/ESA. Mr. Wiitala had primary responsibility for the drafting of this report. Mr. Wiitala collated the data compiled by the team leader to develop the overall conclusions and recommendations of this study.

John C. Starnes, Project Officer - Mr. Starnes is an Engineering Officer with USAID/Tanzania and has overall responsibility for the management of the Project. Mr. Starnes was responsible for developing the scope of work for this evaluation and the overall format of the study. Mr. Starnes coordinated the efforts of the team members and took responsibility for all administrative aspects of the evaluation.

4.0 EVALUATION QUESTIONS/ISSUES

This evaluation will specifically address the following questions/issues:

4.1 VERIFICATION OF TRAFFIC DEMAND TRENDS

This internal evaluation focuses on the verification of traffic demand trends in comparison to the forecasts used during the preparation of the Project Paper. This verification will help determine the number of new diesel locomotives needed to cover demand through the Year 1993. At the time of the Project Paper design, then existing forecasts indicated a need to procure 17 new locomotives to meet 1993 traffic levels.

4.2 ASSESSMENT OF TAZARA'S PERFORMANCE IN ESTABLISHING RELIABLE COST DATA

This internal evaluation assesses TAZARA's performance in establishing reliable and accurate cost data and the use of this data to set appropriate tariff rates.

4.3 IMPLEMENTATION REVIEW

This internal evaluation briefly addresses implementation matters such as the timeliness of delivery of project commodities and contracting for technical services.

4.4 REVIEW OF PROJECT PERFORMANCE INDICATORS

The objective project performance indicators, such as turnaround time, locomotive availability, and annual cargo hauled, have been reviewed to assess trends at this stage of the project. This review is based on TAZARA's data, studies by others, and actual observations by the evaluation team.

5.0 FINDINGS

5.1 VERIFICATION OF TRAFFIC DEMAND TRENDS

5.1.1 PROJECT SETTING AND REVIEW RATIONALE

At time of project design, traffic flow projections up to 1992/93 indicated a

need for additional 17 new locomotives. The supply/demand scenario as determined in the original AID project design is summarized below:

Table 1

Summary of Mainline Locomotive Requirements

Year	Forecast Freight Traffic (Million Tons)	Computed Locomotive Requirement(1) (DE Equivalent)	Existing Locomotive Fleet(2) (DE Equivalent)	Locomotive Deficit (DE Equivalent)
1986/87	1.20	22	21	1
1987/88	1.50	27	21	6
1988/89	1.64	30	23	7*
1989/90	1.77	32	23	9
1990/91	1.91	35	23	12
1991/92	2.01	37	23	14
1992/93	2.12	39	23	16**
1993/94	2.23	41	23	18
1994/95	2.35	43	23	20
1995/96	2.44	45	23	22

(1) Assumes 2 passenger trains per week
(2) In 1986/87 two U30C locomotives were under repair and were expected to be operational in 1988/89
* Anticipated delivery of first tranche of 8 locomotives
** Anticipated delivery of second tranche of 9 locomotives

Source: Project Paper, July 1987

5.1.2 REVIEW OF PERFORMANCE

Freight traffic handled by TAZARA to date is summarized in the table below:

Table 2

Goods Traffic Carried by TAZARA 1976/77 - 1988/89
(000's metric tons)

Year	From Port	Towards Port	Local Traffic (Tanzania)	Local Traffic (Zambia)	Total
1976/77	429	500	168	38	1,135
1977/78	425	596	236	16	1,273
1978/79	271	393	251	8	923
1979/80	204	228	325	33	790
1980/81	235	312	185	20	752
1981/82	252	328	174	42	796
1982/83	241	391	150	42	824
1983/84	294	431	190	58	973
1984/85	284	491	266	55	1,096
1985/86	181	357	385	65	984
1986/87	337	537	289	58	1,221
1987/88	334	501	307	62	1,204
1988/89	375	400	245	55	1,075

Sources: TAZARA Ten Year Corporate Plan, February 1988;
TAZARA's General Manager's Report for the quarter ended 30 June 1989

The significant drop in traffic during the period 1978-84 was largely attributed to politically motivated destruction of a bridge which took one year to reconstruct in 1979/81, severe landslides and track blockages during 1978/79, and shortage of locomotives until start of the MTU re-engining program and the delivery of new Krupp/GE locomotives between the second half of 1982/83 and the last half of 1983/84. The upward trend which had started from 1981/82 was interrupted in 1985/86 when the line was closed for 20 days due to destruction of culverts by rain. More recently, there has also

been a declining trend between 1986/87 to 1988/89 due mainly to decrease of Zambian copper exports because of wagon shortages, and a drop in local traffic in the Tanzania region due to accidents and shortage in supply of empty wagons for loading commodities like fertilizer and sugar.

The table below portrays the picture for passenger traffic, showing a steady growth up to 1979/80 (1.4 million) and the lowest decline in 1982/83 (1/2 million). The subsequent decrease in number of trains allocated for passenger services due to motive power shortage correspondingly reduced the number of passengers carried. Currently, demand outstrips supply.

Table 3

Number of Passengers Carried by TAZARA
Dar es Salaam/New Kapiri Mposhi 1976-1989

Year	Tanzania Region	Zambia Region	Total Passengers	Pairs of Trains/Wk.
1976/77	472	354	826	4
1977/78	581	553	1,134	6
1978/79	671	641	1,312	6
1979/80	864	533	1,397	6
1980/81	600	424	1,024	2 - 3
1981/82	603	384	987	2
1982/83	315	249	564	1
1983/84	789	409	1,198	2
1984/85	634	431	1,065	2 - 3
1985/86	723	437	1,161	3
1986/87	817	518	1,335	3
1987/88*	840	560	1,400	3
1988/89	928	749	1,677	3

*Estimated

Sources: TAZARA Ten Year Corporate Plan, February 1988;
Study to Determine Future Motive Power Demand on TAZARA, GERI/GOPA, November 1988.

In actual performance terms, freight traffic carried by TAZARA in 1988/89 (1.075 million tons) was below the Project Paper 1986/87 forecast traffic of 1.2 million tons, and even far below the Project Paper forecast 1988/89 traffic of 1.64 million tons. This phenomenon was further reflected in the train working performance, motive power availability, and locomotive productivity and utilization.

5.1.3 TRAIN WORKING PERFORMANCE

The following is a summary of the current status for train working performance indicators (See Annex 6):

5.1.3.1 Locomotive Turnaround Time

Average turnaround time is no longer calculated for the railroad as a whole. Based on figures for the Zambia Region, it is possible to make some estimates. During the 1976/77 to 1985/86 period, estimated average turnaround time increased from 31.4 hours to 41.4 hours. (In February 1987 when this project was being designed, average turnaround time was 45.7 hours). Current turnaround time (August-September 1989 is 47.3 hours). It should be noted that turnaround time is highly sensitive to the volume of traffic and the number of trains being operated. As interchange with Zambia Railways has declined in recent months, the number of trains has been reduced, resulting in increased turnaround times.

5.1.3.2 Tonnage Loaded per Day

In fourth quarter of 1988/89, traffic carried had declined from 2,821 tons/day to 2,669 tons/day (based on corresponding 1988/89 quarter).

5.1.3.3 Wagons Loaded per Day

The year 1988/89 had 77.3 wagons/day less than for 1987/88.

5.1.3.4 Wagons in Operation

Due to decrease of Zambia Railways wagons on TAZARA, the number decreased from 1,616 (4th quarter of 1987/88) to 1,370 (4th quarter of 1988/89).

5.1.3.5 Wagon Turnaround

Although currently the performance is at 17 days which is a significant reduction from 35 days in 1987, this was accomplished with fewer wagons and less overall traffic on the line.

5.1.3.6 Wagon Detention Time (Zambia Railways Wagons on TAZARA and vice versa)

There was an increase of detention times on both Zambia Railways and TAZARA.

Comparison of fourth quarter periods of 1987/88 and 1988/89 shows that detention time of TAZARA's wagons on Zambia Railways increased from 19.5 days to 34.9 days, with a corresponding increase from 23.9 days to 27.5 days for Zambia Railways wagons on TAZARA.

5.1.4 FUTURE TRAFFIC DEMAND

The "realistic" assumption adopted in the GERI/GOPA study is premised on a slight traffic increase (about 3.5% p.a.) and a more or less status quo on the SADCC regional corridors. It is also assumed that delivery of additional locomotives will have some positive impact on the carrying capacity of TAZARA.

Table 4

Basic Forecast of TAZARA Traffic
(000's tons)

Traffic	1987/88	1988/89		1990/91		1995/96		2000/01	
	Actual	Pot.	Actual	Pot.	Real.	Pot.	Real.	Pot.	Real.
A. Through Traffic									
Zambia									
to port	-	490	370	510	490	510	500	500	500
from port	-	335	365	370	350	450	400	550	450
Zaire									
to port	-	30	30	100	30	200	50	200	80
from port	-	10	9	50	20	90	40	100	50
Subtotal	839*	865	774	1030	890	1250	990	1350	1080
B. Local									
Tanzania	281	430	245	645	330	975	380	1375	500
Zambia	52	125	55	160	70	200	100	260	150
Subtotal	333	555	300	805	400	1175	480	1635	650
C. Malawi (DSM-Mbeya)	-	20	1	55	50	100	70	200	120
TOTAL(A+B+C)	1172	1440	1075	1890	1340	2525	1540	3185	1850

*Detailed breakdown not available

Source: Study to Determine Future Motive-Power Demand on TAZARA, GERI/GOPA, November 1988.

5.1.5 MOTIVE POWER DEMAND POSITION

Based on above traffic projections and other operations improvement remedies (including delivery of 17 USAID funded locomotives), future motive power requirements were determined as in the table which follows (See Annex 8 for detailed analysis):

Table 5

Locomotive Requirements

	SERVICEABLE FLEET		AVAIL(2) PRES PRACT		AVAIL(3) IMPR PRACT		REQUIRED		GAP(4) DE EQV	
	DE	DH	DE	DH	DE	DH	DE	DH	PRES	IMPR
1991/92(1)	29	46	20	18	20	20	21	24	4	3
1991/92(5) Restructured Operation	29	46	20	18	20	20	21	17	1	-
1995/96(5) Restructured Operation	27	24	17	8	19	10	21	28	14	11
2000/01(5) Restructured Operation	26	-	15	-	17	-	47	-	32	30

DE: Diesel-electric locomotives (3,000 HP)
DH: Diesel-hydraulic locomotives (2,000 HP)

Assumptions:

(1) Assumes 17 USAID locomotives delivered and in service.
(2) Assumes no change in present locomotive availability except diesel-electrics increased to 70%.
(3) Assumes improved maintenance procedures which increase availability by approximately 8%.
(4) Assumes one diesel-electric is equivalent to two diesel-hydraulics.
(5) Assumes operations are restructured to maximize locomotive utilization.

Sources: TAZARA Mechanical Engineering Department;
Study to Determine Future Motive-Power Demand on TAZARA, GERI/GOPA, November 1988.

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In making these estimates, GERI/GOPA assumed a normal service life and availability pattern based on historical records and TAZARA experience. As locomotives age, the frequency of repair increases and availability declines. In developing future locomotive requirements, it has been assumed that all diesel-hydraulics, including those repowered, will have reached the end of their service lives and been reti' ' prior to the year 2000.

5.1.6 CARGO PROJECTIONS

GERI/GOPA consultants, as a part of their determination of TAZARA's future locomotive requirements, made a detailed evaluation of the market available for railroad services. Projections were made for the total market and the tonnage which TAZARA could reasonably expect to transport. This analysis is well done and represents the best information obtainable on cargo which is likely to be moved by rail in the TAZARA corridor.

GERI/GOPA estimated that TAZARA would handle 1.22 million tons in 1988/89 out of a potential market of 1.47 million tons. They further estimated that TAZARA would handle 1.54 million tons out of a potential of 2.92 million tons in 1995/96.

In preparing estimates for this review the GERI/GOPA projections have been adjusted downward. This is based on the fact that TAZARA in 1988/89 actually handled 1.08 million tons, or 89% of the GERI/GOPA estimate. The failure to achieve the GERI/GOPA level is attributed by TAZARA to shortages of locomotives and wagons, a conclusion which appears valid.

Table 6

Projected TAZARA Cargo
(millions of metric tons)

Fiscal Year	Low Estimate	Most likely Estimate	High Estimate
1990	1.12	1.19	1.27
1991	1.16	1.25	1.31
1992	1.20	1.31	1.36
1993	1.24	1.37	1.40
1994	1.28	1.44	1.45
1995	1.32	1.50	1.50

Many of the management and operational problems identified in the GERI/GOPA study will be addressed under the Railway Systems Management and Operations contract which should improve TAZARA's potential to achieve the levels projected in GERI/GOPA study. The table below projects tonnage at three levels: a low or pessimistic basis, that considered most likely, and a high or optimistic basis. The low estimate assumes that TAZARA traffic will increase at 3.5% per year, reflecting the growth in the market. The high estimate is the adjusted GERI/GOPA "realistic" projection, based on the total market and TAZARA's estimated market share. The most likely estimate assumes that TAZARA's market share will increase from the present level to the GERI/GOPA projected level over five years and assumes improvements in operations resulting from the USAID project.

5.1.7 LOCOMOTIVE AVAILABILITY

Poor locomotive availability has been a major problem for several years. This has resulted from lack of spare parts, tools, and inadequate maintenance procedures. These problems have been compounded by the increasing age of the diesel hydraulic locomotives which result in an increasing rate of failures. The project design calls for an increase in locomotive availability from 46% to 65%. However, average availability will not adequately reflect problems expected for each specific locomotive type. Each locomotive type will be discussed separately.

The following table shows a worsening of the motive power situation, due mainly to accidents and an aging of the existing diesel-hydraulic fleet:

Table 7

Average Locomotive Availability
(expressed as percent)

Locomotive Type	Quarter Ended 30 JUN 89				Quarter Ending 30 SEP 89
	Budget	Actual	Under/ Awaiting Repair	Unser-viceable	Forecast
DFH2 Conv.	42.4	48.2	51.8	-	45.5
DFH2 rep.	52.0	42.0	50.0	8.0	40.0
DE	53.8	50.0	27,7	23.1	53.8
Total Mainline	47.9	46.3	46.8	7.0	45.1
DFH1	-	64.3	35.7	-	-

Source: TAZARA, October 1989.

5.1.7.1 Diesel Electric Locomotives

Seventeen diesel-electric locomotives, spare parts for these and the older diesel-electric locomotives, special tools, and technical assistance in recommended maintenance procedures will be provided under this USAID funded project. It is anticipated that this will make a significant contribution to the improvement in overall availability of locomotives.

Based on routine scheduled maintenance requirements, the average diesel-electric locomotive will be out of service for 2 days per month, or 6.6% of its time. Thus, the maximum possible availability is 93.4%. This compares favorably with U.S. railroads who typically estimate 90% as the maximum practical availability.

Based on TAZARA's experience and historical patterns, locomotive availability is projected to increase from the present 62% to 70% immediately following delivery of the 17 new locomotives. Thereafter it will decline to 64% by 1995. Using historical records, the average diesel-electric locomotive has been out of service for 9.4 days per month for casual repairs. With an improved supply of parts, proper tools, training and improvements in shop management (see Sections 5.1.8 and 5.1.10 which follow), it should be possible to reduce this time by 50% or to 4.7 days. Including routine maintenance, the average locomotive would be out of service for 6.7 days per month, or 22%; this results in an availability of 78%. This is considered the maximum availability which will occur immediately after delivery of the 17 new locomotives. This will decline at a rate of 1% per year, reaching 75% in 1994 (PACD).

5.1.7.2 Diesel - Hydraulic Locomotives, Repowered

The diesel hydraulic road locomotives, DHH2, repowered with MTU engines, are out of service for scheduled maintenance an average of 12 days per month, or 40%. This results in a maximum availability, without casual repairs, of 60%. Actual availability of these units has been about 50% which appears to be the maximum achievable with present practices. This is based on present schedules which appear excessively long. Present availability is projected to decline to 36% in 1994, reflecting the age and condition of the locomotives (see below).

5.1.7.3 Diesel - Hydraulic Locomotives, Not Repowered

The non-repowered diesel-hydraulic locomotives require 14.5 days per month for scheduled maintenance, or 48% of total time. Thus the maximum availability is 52%. In recent years, availability has ranged between 34% and 39%. Availability is projected to decline rapidly, reaching 25% in 1992. Based on average locomotive life, the last of these units should be retired in 1993.

5.1.7.4 Projected Availability

The table below shows projected overall availability for the TAZARA locomotive fleet, excluding unserviceable locomotives:

Table 8

Projected Locomotive Availability

Fiscal Year	Diesel Electric		Diesel Hydraulic (MTU)		Diesel Hydraulic		Total Fleet	
	#	%	#	%	#	%	#	%
1990(1)	20	78	26	50	25	32	71	52
1991(2)	29	78	26	48	20	30	75	55
1992	28	77	25	46	12	25	65	55
1993	28	76	25	42	-	-	53	60
1994	28	75	25	38	-	-	53	58
1995	27	74	24	36	-	-	51	56

(1) Assumes first 8 locomotives to be provided by USAID arrive.
(2) Assumes second 9 locomotives to be provided by USAID arrive.

This table reflects improvements in availability for only the diesel-electric locomotives. The increase in availability in 1993 is due solely to the retirement of older locomotives.

5.1.8 WORKSHOP IMPROVEMENTS

The above table reflects a substantial improvement in diesel-electric utilization resulting from the technical assistance provided under the General Electric contract and the closely related KfW (German funded) assistance.

For the main workshop and the diesel hydraulic locomotives, Work Order No. 7 under the Railway Systems Operations and Management contract will address shop organization procedures and equipment, with emphasis on the diesel-hydraulic locomotives. One of the objectives of this analysis is to determine if improvements in diesel-hydraulic locomotive availability can result from changes in maintenance procedures. As the results of this effort are not available at this time, no estimate can be made for the contribution of improved workshop procedures to an increase in the availability of locomotives.

5.1.9 LOCOMOTIVE UTILIZATION

Based on present information, TAZARA locomotives are in use for 51% of the available hours. A minimum of 26% of available time is currently

nonproductive which to a great extent appears to result from present operating and scheduling practices. An increase in available locomotive time in use to 77% would have the same impact as the purchase of 11 new diesel-electric locomotives. Substantial improvement in this area appears possible. This will be addressed under the Railway Systems Operations and Management contract.

5.1.10 OPERATIONS AND MANAGEMENT

There are a number of actions planned under the Railway System Management and Operations Contract during the next six months which should impact on performance indicators.

A preliminary review by the Railway System Management and Operations contractor indicates that substantial improvement can be made in operations which will result in greater efficiency and wagon utilization. For example, TAZARA presently handles no more than one-third of the output of the Mufindi Papermill, due to a shortage of wagons. Conversion of this movement to scheduled "Unit Train" movement would permit TAZARA to handle the present output of the mill with a fleet of approximately 30 wagons. A doubling of output by the mill, as is projected, could be handled by the present fleet of 50 wagons being acquired with SIDA financing. This could increase TAZARA's tonnage from the Mufindi Papermill from approximately 20,000 tons per year to 60,000 tons with no added investment. Similar opportunities exist for other commodities.

Note 2: TAZARA advises that conversion of movement of output from the paper mill via "Unit Train" or "Merry-Go-Round Train" may not maximize the utility of the wagons serving the mill. After off-loading paper at Dar es Salaam, some wagons are loaded with Makambako bound traffic which results in breaking up the train. However, TAZARA believes that traffic out of the paper mill could be run to Dar es Salaam via a "Unit-Train."

Note 3: TAZARA wishes to note that only one of the 50 covered wagons being financed by SIDA has actually been delivered to TAZARA. TAZARA believes that it will be able to handle most of the Mufindi Paper Mill traffic when these wagons are delivered.

Work Order No. 7 under the above contract covers an in-depth study of the Mechanical Engineering Department, including organization, equipment, tools and procedures. It will focus on the locomotive and wagon workshops. It will also evaluate the availability and reliability of the diesel-hydraulic locomotives. This study is expected to recommend a number of changes in maintenance procedures which will, if implemented, improve workshop efficiency and increase locomotive and wagon availability.

Note 4: TAZARA has pointed out that Work Order No. 7 will accomplish its objective of improving the efficiency and effectiveness of the workshop facilities by establishing a comrpehensive system of production planning, production control, and quality control. Expected changes would be in "production management procedures" as opposed to "maintenance procedures."

A future work order, currently being drafted, will address the issue of wagon control and utilization, as well as traffic department organization, train scheduling and related matters. This activity is scheduled to start in early 1990.

These two work orders address the major problems in increasing TAZARA's capacity, shortages of locomotives and wagons, and poor wagon utilization. Implementation of the recommendations which are expected to result from these work orders should result in significant improvement in performance indicators.

It is expected that substantial improvements will be made during the next year as management and technical assistance begins to have an impact on operations.

5.2 ASSESSMENT OF TAZARA'S PERFORMANCE IN ESTABLISHING RELIABLE COSTING DATA

5.2.1 PROBLEM CONTEXT

For a tariff structure to adequately cover operating costs and generate a net profit on operations, it must enable contribution to variable costs (i.e. costs directly attributable to movement of that particular commodity) and also cover total fixed costs required by the total transport system. The Condition Precedent in the Project Agreement that TAZARA should adopt a tariff structure that is adequate to cover operating costs and generate a net profit on operations to the Authority is premised on that principle.

5.2.2 DEVELOPMENT OF CURRENT TARIFF SYSTEM

On inception of the railway in 1976, various TAZARA railway tariffs were determined in terms of their competitiveness to alternative corridors. These tariffs are based on 11 categories, with the majority falling under category 11 (e.g. grains, fertilizers, cement, chemicals, coal etc). Loaded containers are under category 4 while metal exports move under "special rates".

Tariff changes that have taken place since inception of the railway up to now, have been through adjustments to make up for devaluations of the Tanzanian Shilling and the Zambian Kwacha. The procedure is initiated by comparing budgeted revenue and accumulated expenditure whenever there is a currency devaluation. In order to cover the anticipated shortfall of the accumulated operating expenses budget, the budgeted passenger and goods traffic revenues

are adjusted by the appropriate percentages that will generate the additional funds needed. Tariff adjustment are then made on a selective basis, making sure that accumulated operational expenses are covered by the generated revenue, and on an across the board basis. The selective tariff adjustment is guided by the following considerations:

- minimum increases on traffic that is hard to get (tariffs 1-10);
- larger increases on commodities readily available for rail transport (tariff 11 and special rates);
- what the market can bear for passenger traffic.

Note 5: TAZARA advises that tariff changes are of two types: (1) a scheduled review every July and (2) adjustments as a result of devaluations of the currencies of Zambia and Tanzania.

The tariff increase effective 1 July 1989 included increases of 10% on all foreign traffic; 20% on tariffs 1-3 and 6-10; 25% on tariffs 11 including livestock; 30% on tariffs 4-5 and all special rates; and 30-100% on passenger fares. The revenue to be generated by the increase, was determined as follows:

Table 9

Revenue to be Generated
by Rates and Fares Increase

Tariff	Tonnage/ Passengers Planned	Proposed Budget 1988/90	% Increase	Revenue (TShs)
1 - 3	--	--	20	--
Transit	51,790	386,770,377	10	425,447,415
4 - 5	67,220	373,191,800	30	485,149.340
6 - 10	204,500	628,914,138	20	754,696,966
11 and livestock	503,140	1,687,843,282	25	2,109,804,103
Metals	388,500	1,573,405,165	30	2,045,426,715
	1,215,150	4,650,124,762	25	5,820,524,539
Miscellaneous charges		107,419,818	25	134,274,773

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Table 9
(continued)

Subtotal		4,757,544,580		5,954,799,312
Passengers	1,510,000	274,128,584	65	452,312,164
GRAND TOTAL		5,031,673,164	27.3	6,407,111,476

Revised revenue rate	6,407,111,476
Previous revenue projection (budget 1988/90)	- 5,031,673,164
Additional revenue to be generated (new rates):	1,375,438,312

Source: TAZARA Tariff Review, 1989.

As can be seen, this system of calculation does not address the requirement that various traffic types contribute their proportionate variable costs. The implication is that there is no basis for effective marketing strategy of retaining at least the traffic that makes a contribution to variable costs.

Note 6: TAZARA comments that the various traffic types should also make "a contribution to fixed costs."

5.2.3 COSTING DATA ELEMENTS AND THEIR GENERATION

All costs attributable to the system are accumulated on a departmental basis under different accounting codes. There are currently some 23 coded classifications, with sub-codes for each, examples are as follows:

Expenditure Type	Starting Code
1. Direct operating Expenditure:	
- Salaries and Allowances	0001
- Holiday Allowance	0002
- etc.	

2. General Management Expenses:
   - Consultant Fees 0127
   - Auditors' Fees & Expenses 0128
   - etc.

3. Capital Expenditure Expenses
   - Land 0127
   - Buildings 0128
   - etc.

4. Etc.

When the Tanzania Industrial Studies and Consulting Organization (TISCO) undertook a review of the accounting and system design, they concluded that the TAZARA's system of accumulating all costs under determined cost codes was quite comprehensive and adequate and that what was needed was a further analysis in the form of relating these total costs to other data parameters e.g. traffic movements , TISCO then outlined the steps to be taken in costing mainly:

(1) relating operating costs to movements,
(2) determining what are variable costs and what are fixed costs,
(3) choosing measures that indicate effort or time, e.g.
   - gross ton - kilometers
   - train kilometers
   - locomotive kilometers, etc.
(4) relating costs to measures of inputs/effort, e.g.
   - maintenance costs to gross ton kilometers
   - cost of train services to train kilometers, etc.
(5) apportionment of various administrative and overhead costs to various cost units,
(6) determining unit cost of each measure of input.

5.2.4 OBSERVATIONS ON DATA RELIABILITY AND ACCURACY

Statistical performance data which formed the basis for refining financial accounting data used in unit costing was found by the GERI/GOPA study to be generally good in terms of ground level input, recording and transmission. However, some reservation was expressed in using theoretical wagon payloads instead of "static" (actual) loads. The data base also needed updating as it was felt that this was not done as frequently as required.

A weighbridge has already been installed at Yombo in order to facilitate calculation of tariff charges on the basis of actual cargo carried. In addition, installation is still in process for the other two weighbridges at Kurasini and New Kapiri Mposhi.

Based on records, TAZARA has been able to present budgets in an efficient and timely manner. Expenditures are controlled to the extent that the various departments, which are required to abide by very strict expenditure limits, are responsible for their department-related expenditures. The TAZARA accounting department, though, keeps a check and queries expenditure variances that may occur.

Since there is no updated assets register, the basis on which depreciation is calculated is questionable. To address this, a tender has been floated for the evaluation of all assets. At this time of review, bids have been received and are being evaluated. TAZARA has increased depreciation in its financial statement for FY 1988/89 to TSh 400 million from TSh 130 million for FY 1987/88.

5.2.5 STATUS OF CURRENT COST-BASED TARIFF SYSTEM

As of now TAZARA has not actually instituted a cost-based tariff system. However, the setup for a reliable costing data system is essentially in place and would require improvement or changes in only certain specified areas. There is a stated willingness on the part of TAZARA to establish a cost-based tariff system, although a severe shortage of required skills and back up facilities like computer hardware and software have hindered implementation.

The Condition Precedent requires that TAZARA provide evidence that their tariff structure is adequate to cover operating costs and generate a net profit on operations. The Project's technical assistance contractor is specifically identified to assist TAZARA with this undertaking. Work Order No. 4, recently approved by TAZARA, calls for the technical assistance contractor to assist TAZARA in undertaking a preliminary analysis of cost information and recommendations regarding tariff structure. The technical assistance contractor will make recommendations regarding the development of a revised tariff structure which ensures that TAZARA covers both operating and capital replacement and expansion cost in the future.

5.3 PROJECT IMPLEMENTATION AND PROCUREMENT

The original project was conceived as a four year project. It became apparent soon after project start that this time frame was unrealistic especially for a project mainly concerned with the procurement and delivery of high value specialized equipment. The PACD was thus extended by three years and the schedules for locomotive and technical assistance procurement adjusted accordingly. Much of the project implementation activity to date relates to procurement activities. Therefore this section of the evaluation will focus on implementation activities related to project procurement.

5.3.1 PROJECT IMPLEMENTATION STATUS

The first 8 of the 17 new diesel electric locomotives are due for delivery by 11 August 1990, and an option for another 9 is valid until 11 May 1990.

Preparatory work for institution building, mainly financial management, is now being completed, with actual implementation expected to begin towards the end of calendar year 1989. At time of this review, the following Project inputs were in place:

5.3.1.1 Tools

All tools delivered and put to use.

5.3.1.2 Spare Parts (for normal running maintenance, 4-year locomotive overhaul program and rehabilitation of locomotive DE1006)

90% of consignment now delivered and being put to use.

By end of FY 1989/90 six locomotives will have been overhauled.

Preparatory work for rehabilitating locomotive DE1006 is in progress and work due to start in January 1990.

Under 4-year overhaul program, locomotives DE1001 and DE1005 have already been completed.

Manual on utilization of existing spares completed and awaiting computerization.

5.3.1.3 GE Service Engineer

In place and assisting TAZARA personnel fulfill maintenance tasks.

5.3.1.4 Training

Civil engineering works for training facilities in Mbeya 90% complete.

5.3.1.5 Mbeya Workshop Expansion and Upgrading

Field investigations have been completed and preliminary design is being prepared.

5.3.2 PROCUREMENT OF DIESEL ELECTRIC LOCOMOTIVES

The initial order of eight locomotives is now expected to arrive dock-side in Dar es Salaam no later than August 1990. The revised schedule has been able to accommodate concerns and issues (specifically the inclusion of extensive technical assistance) by both TAZARA and USAID during the procurement process. Locomotive procurement was done through a Host Country contract (Handbook 11, Chapter 3).

The Project Paper proposed the use of formal competitive bidding using a two-step Invitation for Bid (IFB); however, engineering consultants advising

TAZARA recommended informal competitive procurement as the two-step process was thought to be too time consuming. In March 1988, USAID/Tanzania (with REDSO/ESA concurrence) and TAZARA agreed that a one-step negotiated procurement would be used and that TAZARA would issue the Request for Quotations (RFQ). AID/W was appraised of this decision. Because of the dollar value and complexity of this procurement, AID/W decided to play an active role in assisting the Mission and TAZARA on the form and substance of the final procurement document. As a consequence extensive communications/discussions were needed by AID/W, USAID/Tanzania, REDSO/ESA, and TAZARA to reach consensus on the form of the solicitation document to be used.

In May 1988, it was agreed by all parties that a two-step variation of the negotiated procurement procedure would be used for locomotive procurement. REDSO/ESA proceeded with the preparation of a draft Request for Proposals/Request for Quotations (RFP/RFQ) which called for the initial submission of a technical proposal from each offeror to be later followed by a submission of quotations. In June 1988, the USAID/Tanzania Mission engineer arrived at post. Concurrent with work on the terms and conditions of the solicitation document, the Mission engineer focused on technical specifications for the locomotives as AID wished to encourage as free and open competition as possible. The engineer was concerned that the specifications developed by TAZARA (with assistance from consultants) were not truly generic for open competition.

With the known suppliers of U.S. manufactured diesel locomotives limited to General Electric (GE) and Electro-Motive Division (EMD) of General Motors Corporation, and TAZARA having already procured G.E. locomotives build under license by Krupp of West Germany, USAID/Tanzania was concerned that the locomotive specifications might unduly favor General Electric. USAID/Tanzania obtained the services of a second engineering consultant to refine the specifications to the maximum extent possible. By October 1988 the documents were completed and the RFP/RFQ was advertised in the Commerce Business Daily (CBD) on 7 November 1988. A pre-proposal conference was held in TAZARA's Dar es Salaam office and at the Mbeya workshop between 15-20 November which was attended by representatives of both GE and EMD. A number of issues were raised at this conference and prior to the final date of submission, 5 addenda were issued. On 16 January 1989, GE and EMD delivered their technical proposals to TAZARA. Following independent reviews of both documents by TAZARA, USAID/Tanzania, REDSO/ESA and the consulting engineers, TAZARA appointed a negotiating team to review the technical proposals.

Between 30 January and 16 February 1989, separate negotiating sessions were held with both offerors to review how closely their technical proposals conformed with both conditions of the contract and the technical specifications of the RFP/RFQ. Addendum No. 6, TAZARA's final position with regard to the technical proposals, was submitted to both GE and EMD as a consequence of what stemmed from the previous two weeks of negotiations. This addendum prompted comments/requests for clarifications from both offerors. On

3 April TAZARA issued Addendum No. 7 in response to the questions raised concerning Addendum No. 6. Price quotations were due on 13 April and subsequently reviewed by representatives of TAZARA, USAID/Tanzania, and REDSO/ESA at a public bid opening in TAZARA's office.

Offers were received from both GE and EMD, with the tender board initially concluding that GE's offer was apparently responsive while EMD's was not. EMD had taken exception to the 15-month delivery requirement. Also, GE's price quotation was lower than EMD's. After the public bid opening TAZARA appointed an evaluation committee to conduct an evaluation of both offers. GE had indeed been determined to be the responsible offeror which submitted the lowest responsible offer. As such, GE was recommended for award. USAID/Tanzania conveyed approval of the proposed award to GE to TAZARA's General Manager via PIL No. 18 on 9 May 1989. On 12 May TAZARA informed GE by telex that they had been awarded the contract.

In just over six months from the date the RFP/RFQ was advertised in the CBD an award had been made. This is a significant accomplishment considering the number of different interests that had to be accommodated as well as the complexity of the procurement in question.

Some astute decisions by TAZARA, USAID/Tanzania, and REDSO which initially prolonged the process clearly saved time at the end. An example would be the decision to bring in a second engineering firm to assist with the specifications. This took an additional two months; however, the outcome resulted in more generic specifications. EMD later commended TAZARA for having developed excellent specifications. The chairman of the evaluation panel expressed the view that the additional time spent improving the specifications not only helped avoid protests but also helped bring the price of the locomotives down. GE bid a very competitive price, according to this official in large measure because of AID's success in making the procurement truly fair and open.

As indicated in AID guidance concerning the selection of the responsible contracting entity, several entities may be chosen from. In this situation a decision was made to procure through a Host Country contract (Hand Book 11, Chapter 3) rather than an AID direct contract. When assigning contracting responsibility, AID is expected to take into account such factors as: (a) project design and objectives; (b) grantee preference: (c) procurement capability of the grantee; (d) relative costs; (e) systems and procedures for effective contract support; (f) availability and experience of AID support staff, and (g) effects on establishment of desired institutional or professional relationships.

From the evaluation team's perspective, the decision to undertake the procurement of the locomotives as a Host Country Contract was clearly the correct one. The excellent working relationship that developed between TAZARA and USAID/Tanzania during the course of this procurement is testimony to the merits of the host country contracting. The mutually complementary skills of

both parties ensured that this procurement was undertaken in an exemplary manner.

5.3.3 TECHNICAL ASSISTANCE PROCUREMENT

Procurement of technical assistance under the TAZARA Project did not proceed as expediently as for the locomotives. The sequence outlined in the Project Paper for acquiring technical services was like that originally for the locomotives, unduly optimistic. The Project Paper specified that the solicitation documents for Railway Systems Management and Operations contract be prepared during the same month as the Project Agreement signing and that the technical assistance team would arrive in country nine months later. These tasks however did not start until the second quarter of calendar 1988 and the contractor technical assistance team Chief-of-Party (COP) is scheduled to locate in Tanzania on a full-time basis in January 1990.

Part of the reason for this delay is that USAID/Tanzania had to rely on REDSO/ESA for contracting action, and as the contracting office in REDSO was unable to respond in a timely manner to USAID/Tanzania requests due to staff shortages. Another factor affecting timeliness can be attributed to the slowness with which the contractor mobilized its personnel. After contract award, months were lost because the contractor failed to provide a suitable COP within the time frame called for in the contract.

The above impediments were beyond the control of either USAID/Tanzania or TAZARA. From a review of Mission documents, it is evident that once the solicitation RFP had been finalized the Mission moved promptly to ensure that the contracting process was completed in a timely manner and in accordance with AID regulations and procedures. As in the case of the locomotive procurement, the Mission's files pertaining to this contract were of the highest professional standard.

Twenty-five firms requested copies of the RFP and five submitted proposals by the offer deadline. A Technical Evaluation Committee was convened composed of representatives of TAZARA, USAID/Tanzania, and REDSO/ESA. The committee met on July 29, 1988 to discuss their findings and rank the proposals. The rank ordering showed a considerable spread between the high and low scores. Because of this point spread a "sensitivity" analysis (to determine whether any committee member's score was distorting the results) was carried out. This analysis did not fundamentally change the relative relationship of the scores.

After concluding that no single offer stood out in all categories, the report of the Technical Evaluation Committee to REDSO contracting office requested that direct discussions be held with the proposed COPs of the three firms that fell within the competitive range established by the Committee. The Committee, while acknowledging that it was not their place to establish a competitive range, felt it was "appropriate to recommend such a range to the Contracting Officer in order not to cause organizations to incur expenses

associated with travelling to East Africa for discussions." In other words, the Committee concluded that only three of the five proposals were technically strong enough to warrant further examination. The Committee proposed in a cable to REDSO/ESA dated August 9, 1988, that these discussion be held in Nairobi with the REDSO/ESA Contracting Officer in attendance. For reasons noted earlier, the response from REDSO was delayed. In a cable dated October 21, 1988, the Contracting Officer decided to seek clarification (via cable) from all five offerors ruling out interviews with any of the COPs.

The Committee rightly noted in their report to the Contracting Officer that the Federal Acquisition Regulations (FAR), which governs direct contracting, permits technical panels "to hold discussions with some or all of the offerors or their key personnel for purposes of clarifying proposed project performance." Comments sent to the Contracting Officer from the offerors were conveyed to the Committee in November. These additional comments did not change the overall ranking of the proposals.

In December of 1988, the candidate for COP for the highest ranking proposal visited Dar es Salaam. During this visit TAZARA and the Mission assessed the suitability of this individual for the position of COP. There was general agreement as to his probable suitability. REDSO/ESA was requested to finalize contract selection and in late December Louis Berger International was notified by the Contracting Officer that they were selected for award. The contract was finalized and signed in April, 1989. However, for reasons unknown at the time, Louis Berger failed to mobilize in a timely manner. Later it transpired that the proposed COP had medical problems that would prevent him from accepting the position. Subsequently an interim COP was identified and arrived in August 1989 for a 90 day appointment. In October the TAZARA Project Steering Committee approved the appointment of the interim COP to be the permanent COP for the Project. He is expected to assume his new position in January 1990. In addition to a three-year contract for the COP, an additional 108 months of short-term technical assistance will be provided under this contract.

Because of the delays experienced in the arrival of the Louis Berger COP, the USAID/Tanzania Project Manager initiated three short-term technical assistance activities that normally would have been performed by the contractor COP. These include (1) an assessment of training needs and staffing requirements, (2) inspection and testing of the locomotives in the U.S.A., and (3) a financial assessment of TAZARA. The timing of these activities were considered to be crucial to project implementation.

5.4 PROJECT PERFORMANCE INDICATORS

5.4.1 PROJECT IMPACT

The Project has had relatively little impact on TAZARA performance to date as the permanent COP for the technical assistance component is not scheduled to arrive in-country until January 1990. Furthermore, the initial consignment of

locomotives will arrive in August of 1990. Thus, it is too early to use Project indicators as a measurement of improvements in TAZARA as a direct result of project inputs. While recent deliveries of spare parts and tools for the diesel electric locomotives should improve availability, data was not available at the time of this evaluation to measure change.

5.4.2 PRESENT STATUS

5.4.2.1 Tonnage Hauled

TAZARA is currently carrying traffic just over one million tons per annum. A number of constraints, especially those related to shortage of motive power, will hinder TAZARA's efforts to achieve higher traffic load levels. Traffic carried has decreased from 1.2 million metric tons in 1986/87 to 1.075 million tons in 1988/89. The projection in the Project Paper that traffic would nearly double from the 1986 traffic of 0.98 million tons to 1.9 million tons in 1991 is not achievable. A more realistic projection for 1990/91 is 1.3 million tons out of a total potential of 1.9 million tons. The projection for cargo hauled annually at PACD should be revised downward to 1.44 million tons per annum.

5.4.2.2 Locomotive Availability Rate

The current average locomotive availability is about 46% (same level as in 1986). The situation is bound to deteriorate as some locomotives are coming to the end of their useful life while others are damaged in accidents. A recent KfW study on TAZARA's locomotive requirements has indicated a need for an additional 42 new locomotives by the year 2000. This is in addition to USAID providing 17 locomotives. This would meet the projected year 2000 traffic demand of 1.85 million tons conditional on having 70% availability. Hence, the projected 1995/96 demand of 1.5 million tons indicates an additional need of 16 diesel electric locomotives in addition to the current fleet.

Note 7: TAZARA advises that recent deliveries of spare parts and tools for diesel electric locomotives have improved availability. The average availability of diesel electric locomotives for the period April to June 1989 was 50% or approximately 6.5 locomotives. For the period July to September 1989, after delivery of spares, the average availability rate was 56.9% or 7.4 locomotives. These rates from TAZARA include unserviceable locomotives; as previously noted present availability is about 62% if unserviceable locomotives are excluded.

5.4.2.3 Locomotive Turnaround Time

On the basis of the Zambia region, it is estimated that the current locomotive turnaround time is 47 hours. In February 1987, when this project was being designed, average turnaround time was 45.7 hours.

5.4.2.4 Locomotive Utilization

Of equal or greater concern is the relatively low level of available locomotive time (total hours less out of service for repairs) which is actually spent pulling trains. Based on available data, this has been calculated at 51% with an additional 26% of available time classified as nonproductive due to current operational and scheduling practices.

5.4.2.5 Wagon Turnaround Time

Wagon turnaround times for the year 1988/89 were reported as 17.9 days. This is an improvement on the initial project goal of 20 days by 1991. The quarter ending June 30, 1989, indicated a turnaround time of 17.7 days which compares with 18.2 days for the corresponding quarter in 1988. Turnaround time for Zambia Railways wagons on TAZARA is much poorer than that of TAZARA's own wagons. This reflects the practice of holding ZR wagons for ZR loading. This turnaround time is extremely sensitive to the number of ZR wagons on TAZARA. As this is not within TAZARA's control, TAZARA actions have little influence on turnaround for ZR wagons. For the year 1988/89, ZR turnaround was 29.1 days. Recent quarters have ranged from 23.9 to 33.7 days.

6.0 CONCLUSIONS

6.1 PRESENT LEVEL OF TRAFFIC

The primary project performance indicator should be tons handled. TAZARA is being offered more traffic than it has capacity to handle; thus, any improvement in operations should be reflected immediately in an increase in traffic. The present level of traffic on TAZARA of 1.075 million metric tons is lower than the 1.64 million metric tons projected in the Project Paper. The Project Paper traffic forecast is for traffic to double to 1.9 million tons by PACD (1994); however, based on recent studies that projection should be revised downward to 1.44 million tons by PACD.

6.2 SHORTAGE OF LOCOMOTIVE POWER

The shortage of motive power will hinder TAZARA's efforts to achieve higher traffic load levels. This shortage is caused in part by a low rate of locomotive availability (46% which is the same level as 1986) and the

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relatively low level of available locomotive time actually spent pulling trains (51%). This situation will be further exacerbated as locomotives reach the end of their useful life and are retired from service.

6.3 PROJECT IMPACT TO DATE

The Project has had relatively little impact to date on TAZARA performance as technical assistance has only recently commenced and the first locomotives are not expected until August 1990.

6.4 IMPACT OF SECOND TRANCHE OF LOCOMOTIVES

The procurement of the second tranche of 9 locomotives will not in itself increase TAZARA's traffic carrying capacity or improve other performance indicators unless there are commensurate improvements in both locomotive maintenance and railway operating procedures that contribute to better utilization of locomotives.

6.5 LOCOMOTIVE REQUIREMENTS

If USAID provides all 17 locomotives currently in the Project, TAZARA will still require one additional locomotive by year end 1992, and this will increase to an additional 16 locomotives required by 1995. With the anticipated retirement of all diesel-hydraulic locomotives by 1992, the locomotive fleet will decline from a maximum of 80 units to 51 by 1995. It should be noted that in TAZARA diesel-hydraulic availability level is generally about half that of diesel-electric locomotives.

6.6 COST-BASED TARIFFS

TAZARA has not actually instituted a system of cost-based tariffs; however, the setup is essentially in place to implement such a system. The present system does generate sufficient revenue to meet expenditures. Staff shortages and insufficient computer capability will hinder implementation of a comprehensive system to calculate cost-based tariffs.

6.7 REVISED RATES AND FARES

The revised rates and fares of July 1989, and September 1989, do not address the requirement that various traffic types should contribute to their proportionate variable costs.

6.8 EXTERNAL ACCOUNT FOR LOCOMOTIVE SPARE PARTS

TAZARA is maintaining an external account with sufficient funds to procure required locomotive spare parts.

6.9 LOCOMOTIVE PROCUREMENT PROCESS

Locomotive procurement under Host Country Contracting was both effective and efficient. It took just over six months from time of RFP/RFQ advertisement to award of the contract.

6.10 TECHNICAL ASSISTANCE PROCUREMENT PROCESS

The procurement of technical assistance has encountered problems and was not completed within the time specified in the implementation plan. This has resulted in delays in implementing essential project activities. These delays were caused in part by a delay in the contracting officer responding to Mission requirements and to the subsequent failure of the contractor to mobilize as specified.

6.11 TECHNICAL ASSISTANCE PROCUREMENT PROCEDURE

Despite problems with delay beyond the control of either USAID/Tanzania or TAZARA, procurement of the services of a contractor for the Railway Systems Management and Operations Contract, appears to have been done in compliance with AID requirements for AID Direct Contracting. The Contracting Officer's decision not to adopt the Technical Committee's report concerning competitive range and the decision not to conduct interviews of the COP's in the field are within the authority of the Contracting Officer. USAID/Tanzania's initiatives to obtain short-term technical assistance mitigated some of the effects of the COP's late arrival.

6.12 TECHNICAL ASSISTANCE FOCUS

The technical assistance contract should address operational and managerial constraints which have been identified during this initial implementation phase. The impact of this technical assistance on TAZARA will depend largely on the receptivity of TAZARA to incorporate these improved procedures into their management system and operational program. The sustainability of these improvements will also depend on how successful TAZARA is in attracting and holding qualified and motivated staff.

6.13 VALIDITY OF PERFORMANCE INDICATORS

Performance indicators in the Project remain valid for purposes of measuring change; however, the projected levels of change should be reviewed and revised to reflect the delays in start of project activity and the changing political situation in the SADCC region.

7.0 RECOMMENDATIONS

7.1 LOCOMOTIVE UTILIZATION

It is recommended that a concerted effort be made to address managerial and operational constraints that negatively impact on locomotive utilization. It is unlikely that TAZARA will realize sustainable benefit from additional locomotives unless there is a commensurate improvement in operations and maintenance.

7.2 TRAFFIC PROJECTION

The traffic projection for the EOPS should be revised downward to 1.44 million metric tons at PACD (1994).

7.3 PROJECTED LOCOMOTIVE AVAILABILITY RATE

The projected increase in the locomotive availability rate should be revised downward to 58% for the total fleet, but a goal of 75% should be established for the diesel-electric fleet. Calculations of locomotive availability should exclude unserviceable locomotives.

7.4 MONITORING AND REPORTING OF LOCOMOTIVE AVAILABILITY RATE

Regular monitoring and reporting of locomotive availability should be instituted to determine what impact project inputs are having.

7.5 CONDITIONS PRECEDENT FOR SECOND TRANCHE OF LOCOMOTIVES

USAID should acknowledge that part of the Conditions Precedent for the procurement of the second tranche of locomotives has been met in that TAZARA has demonstrated that it has revised its tariff structure and has the required system in place.

7.6 KEY POSITIONS IN FINANCE AND OPERATIONS

TAZARA should ensure that key positions in finance and operations are filled with qualified personnel and that adequate incentives are in place to retain staff.

7.7 TECHNICAL ASSISTANCE CONTRACT

The USAID Project Officer should work closely with the TAZARA Project Coordinator and the COP for the technical assistance contract to monitor implementation of this contract and to assess the impact of the technical assistance on TAZARA procedures and operations.

7.8 MARKETING OF SPECIALIZED TRANSPORTATION SERVICES

TAZARA should make an effort to market transportation services to specialized users such as for the paper mill that was mentioned earlier. Establishment of this type of operation will require drastic changes in current railway operations and in the Traffic Department's organizational structure. In order to increase traffic and improve railway utilization, TAZARA must be receptive to recommended changes in organization and operational procedures. At the present time, TAZARA's management appears very receptive to these suggestions.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 87 to FY 91
Total U.S. Funding 116,100,000

Project Title & Number: REGIONAL TRANSPORT DEVELOPMENT - DAR ES SALAAM CORRIDOR (TAZARA) (690-0240)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
GOAL: To support the development of a stable economic foundation for growth in Southern Africa.	Increase in total transport costs, particularly foreign exchange, spent on transport services by SADCC members Increase in use of South Africa routes by SADCC member countries. Increase in the reliability of the SADCC regions transportation system.	SADCC international statistics on transport service expenditures and goods carried on SADCC transport system.	SADCC member states continue to cooperate for their own mutual benefits. No acts of hostility disrupt the Northern Corridor transportation system.
PURPOSE: To strengthen and expand the carrying capacity and improve the operational efficiency of TAZARA.	END OF PROJECT STATUS (EOPS): a. Near doubling in volume of cargo hauled annually, from 0.98 million mt in 1986 to 1.9 million mt in 1991;	TAZARA records of and statistics on locomotive availability, down time and turnaround time.	Cargo and passenger traffic demand for TAZARA's rail services increase as forecasted TAZARA continues normal maintenance on rail line at a level adequate to maintain a minimum track carrying capacity of 2.1 million mt/yrs. Other donor programs to improve TAZARA's performance and maintain good track condition continue and are effective. TAZARA remains committed to its 10 Year Development Plan.
	b. Increase in TAZARA's annual handling capacity to 2.1 million mt to meet anticipated 1991 traffic demand.		
	c. 40% increase in average locomotive availability rate, from 46% in 1986 to 65% in 1991;	Project Evaluation	
	d. Increase in average wagon turn around time from 35 to 20 days;	TAZARA records of goods hauled TAZARA training and manpower development records.	

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 87 to FY 91
Total U.S. Funding $16,100,000

Project Title & Number: REGIONAL TRANSPORT DEVELOPMENT - ASSISTANCE TO TAZARA

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
PROJECT PURPOSE:	Magnitude of outputs:		
a. Additional new diesel electric locomotives in service;	17 new diesel electric locomotives in service and being maintained.	TAZARA's records-Site inspection.	
b. Existing GE/AM, 9 diesel electric locomotives overhauled and damaged locomotives repaired and operating;	Spare parts provided for the overhaul of 11 locomotives and the repair of 2 damaged effectively used to put locomotives into operation.	Records of locomotive operations	
c. Maintenance program ensuring efficiently for entire fleet of diesel electric locos.;	Equipment and tools being used at workshops for locomotive and rolling stock repairs.	Inventory of spare parts, tools and equipment; site visits	
d. Mbeya workshop remodelled and in use to maintain diesel electric locomotives only and to store spare parts;	Heavy duty workshop constructed (with separate separated demonstrated and storage rooms) and in use	Site inspection of Mbeya workshop	TAZARA budgets FC for local construction costs of workshops.
e. Improved maintenance procedures developed and being implemented for diesel locomotives	Average duration of time locomotives are in shop for maintenance decreased by 50% over 1986 service records.	TAZARA's maintenance records and statistics.	
f. Fail-safe operating procedures developed and implemented including those for overall planning, traffic forecasting, demand analysis, and tariff setting.	Comprehensive Planning and Marketing policies developed. Procedures for traffic forecasting and demand projections developed and being used	TAZARA's policies and records. TAZARA reports/records.	
g. Cost accounting procedures computerized and in use as basis for determining operating costs.	Computerized accounting system implemented and cost accounting procedures developed, to prepare more accurate budgets and to set appropriate tariff rates.	Contractor's reports TAZARA Records	

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 87 to FY 91
Total U.S. Funding $36,100,000

Project Title & Number: REGIONAL TRANSPORT DEVELOPMENT - ASSISTANCE TO TAZARA

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
h. Data on operating cost presented to TAZARA management as basis for a realistic tariff structure;	System for setting tariff rates that reflect operating costs prepared for TAZARA's management consideration in third year of Project	TAZARA's policies TAZARA's records.	
i. Production, quality and inventory systems control established;	Inventory of all diesel spare parts accomplished Inventory system being used in all workshops.	TAZARA's workshop inventory Site visits	
j. TAZARA artisans and technicians in mechanical engineering received on-the-job training;	600 TAZARA's staff trained on operation and maintenance of diesel electric locomotives		
k. TAZARA's accountants received training;	20 TAZARA's staff trained in accounting.		
l. Improved performance of TAZARA's management staff;	180 management staff retrained	TAZARA staff development reports/ records.	
m. Long term participants trained in critical railway management areas.	6 participants staff return from long term trained and holding positions in accounting, planning and traffic forecasting.	Position held by returned participants	Participants can be identified for long term training.

INPUTS:

17 New locomotives	$ 25,500,000
20% equivalent of capital costs for Spare parts, repair parts and related technical services	$ 6,100,000
Workshop tools/equipment	$ 1,800,000
Training	$ 1,075,000
Construction	$ 400,000
Technical Assistance	$ 5,436,000
Evaluation/monitoring	$ 150,000
Sub Total	$-0,461,000
Contingency/inflation	$ 5,489,000
SUBTOTAL	$-5,950,000

- Purchase orders an letters of Commitments/Cre services
- TAZARA's receiving reports
- Site visits
- Quarterly report
- Evaluation reports
- Completion reports

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PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 87 to FY 91
Total U.S. Funding $16,100,000

Project Title & Number: REGIONAL TRANSPORT DEVELOPMENT - ASSISTANCE TO TAZARA

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
TAZARA (equivalent in local currency)			
Incentives-spare parts	$ 500,000	Site Visits	
Retrofitting/refurbishment	$ 700,000	TAZARA's Reports	
Construction	$ 900,000	Evaluation Reports	
Training	$ 365,000		
Technical Assistance	$ 800,000		
Project Monitoring & Evaluation	$ 100,000		
	$ 3,365,000		
Contingency and Inflation	$ 503,000		
SUBTOTAL	$ 3,868,000		
OTHER DONORS (Equivalent in US$)			
Construction	$ 50,000	Site Visits	
Training	$ 25,000	Evaluation Reports	
Technical Assistance	$ 80,000		
Project Monitoring & Evaluation	$ 20,000		
Contingency and Inflation	$ 175,000		
	$ 29,000		
SUBTOTAL	$ 204,000		
GRAND TOTAL	$ 50,022,000		

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TAZARA PROJECT - INTERIM INTERNAL EVALUATION

Annex 2

EVALUATION SCOPE OF WORK

RAILWAY SYSTEMS MANAGEMENT AND OPERATIONS

WORK ORDER NUMBER 2

INTERIM INTERNAL PROJECT EVALUATION

OBJECTIVE

The objective of this activity is to perform an interim internal evaluation for the Dar es Salaam Corridor Project (TAZARA) which will address the effectiveness, significance, and efficiency of the project.

BACKGROUND

The necessary components of TAZARA's physical infrastructure are basically in place, but need rehabilitation. The management is dynamic, the operational structures of the Authority are relatively sound, and the two governments which own TAZARA are committed to its success.

The AID-financed project responds to TAZARA's immediate need for additional locomotive power by providing new diesel electric locomotives to carry increased tonnages of cargo. At the same time, the project is strengthening the institutional capacity and operational efficiency of TAZARA in repair and maintenance of its own fleet of locomotives by providing spare parts, tools, testing equipment, expanded workshop facilities, and on-the-job training. To increase overall management efficiency, long-term and short-term technical assistance and training are being provided to headquarters, regional, training school, workshops, and operational divisions.

The Project Grant Agreement was signed on 30 September 1987. Though originally conceived as a 4-year project, the Project Anticipated Completion Date (PACD) has been extended twice and the project is now scheduled for a 7-year period. Accordingly, it is now proposed that the Mid-Project Evaluation which was originally scheduled for October 1989 be delayed until at least October 1990. However, the Mid-Project Evaluation, as structured in the Project Paper, addresses certain information impacting directly on the exercise of the option for 9 additional diesel electrical locomotives. Therefore, USAID/Tanzania proposes to conduct a special interim internal project evaluation which will address those issues impacting on the exercise of the option.

METHODOLOGY

It is proposed that a multi-disiplined team of AID officers supporting a railway management specialist conduct a rapid reconnaissance of TAZARA's Head Offices in Dar es Salaam and the USAID office in Dar es Salaam. It is anticipated that this internal evaluation will rely heavily on a review of studies by other donors and USAID/Tanzania working files.

The interim internal evaluation will consist of the following major parts:

Verification of Traffic Demand Trends

This internal evaluation will focus on the verification of traffic demand trends in comparison to the forecasts used during the preparation of the Project Paper. This verification will help determine the number of new diesel locomotives needed to cover demand through the Year 1993. At the time of the Project Paper design, then existing forecasts indicated a need to procure 17 new locomotives to meet 1993 traffic levels.

Eight locomotives are included in a contract with the General Electric Company. An option for nine additional locomotives will not be exercised until verification of traffic demand trends.

Assessment of TAZARA's Performance in Establishing Reliable Cost Data

This internal evaluation will assess TAZARA's performance in establishing reliable and accurate cost data and the use of this data to set appropriate tariff rates.

A Condition Precedent to the disbursement of funds for the second order of locomotives is evidence that the TAZARA tariff structure is adequate to cover operating costs and generate a net profit on operations to the Authority or that a proposal has been accepted to revise the tariff structure.

Implementation Review

This internal evaluation will briefly address implementation matters such as the timeliness of delivery of project commodities and contracting for technical services.

Review of Project Performance Indicators

The objective project performance indicators, such as turnaround time, locomotive availability, and annual cargo hauled, will be reviewed to assess trends at this stage of the project. This review will be based on TAZARA's data, studies by others, and actual observations by the evaluation team.

Based on the results of the KfW Study, it may be appropriate to amend the conditions which are expected to exist at the end of the project.

PERTINENT STUDIES BY OTHERS

KfW Study

The Study to Determine Future Motive-Power Demand on TAZARA prepared by Joint Venture GERI Engineering GmbH - GOPA Consultants for Kreditanstalt fur Wiederaufbau (KfW), dated November 1988, reviews traffic forecasts and calculates locomotive requirements.

This study indicates that TAZARA should be able to attract for itself by 1995/96 a volume of 1.5 million tons out of an overall potential of 2.2 million tons of cargo. One of the end of project conditions forecast for the AID-financed project is a near 100% increase in cargo hauled annually, i.e., TAZARA's carrying capacity increased from 1.0 million metric tons in 1986 to 1.9 million metric tons in 1991.

The KfW study concludes that TAZARA will require 81 serviceable locomotives (90 if current availability rates prevail) to meet 1995/96 requirements; the study estimates that TAZARA will have 52 serviceable locomotives with the assured delivery of 17 new U.S. locomotives.

Study of the Financial Viability of SADCC Transport Corridors

USAID, the Netherlands, and the World Bank are in the process of analyzing the financial viability of the various corridor projects that the donor community is financing in SADCC. It is anticipated that this study will review traffic forecasts and may be available in the fall of 1989.

Training Needs Assessment and Staff Development Plan

Work Order Number 1 performed under the Railway Systems Management and Operations contract has provided a training needs assessment and staff development plan for TAZARA. The training needs assessment includes an analysis of institutional weaknesses, an assessment of existing and proposed training efforts, and a department-by-department identification of critical training needs.

The staff development plan which includes the training needs assessment is presently available in draft form.

Financial Management Assessment

Work Order Number 4 to be performed under the Railway Systems Management and Operations contract will provide a detailed assessment of TAZARA's Finance Department. This assessment will include a preliminary analysis of cost information and make recommendations regarding TAZARA's tariff structure.

It is expected that this activity will not commence until the latter stages

the internal evaluation. It is anticipated that partial information may be available for inclusion in the final report of the internal evaluation team.

SCHEDULE

This work order will be conducted over an 8-week period. It is anticipated that work will commence not later than 23 October 1989 and will be completed by 15 December 1989.

Task	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8
Verification of Traffic Demand Trends	D	D	D	.	D	D	.	.
Assessment of TAZARA's Performance in Establishing Reliable Cost Data	D	D	.	.	.	.	D	D
Implementation Review	.	.	D	.	.	.	D	.
Review of Project Performance Indicators	D	D	.	.	.	D	D	D

Note: D = Dar es Salaam, Tanzania

Job Skill	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Wk7	Wk8
USAID/Tanzania Project Officer	D	D	D	D	D	D	D	D
Railways Management Specialist	D	D	D	D	D	D	D	D
Transport Economist	D	D	.	.	.	.	.	.
Commodity Management Officer	.	.	D	.	.	.	.	.

Job Skill	Wk1	Wk2	Wk3	Wk4	Wk5 (cont'd)	Wk6	Wk7	Wk8
Project Development Officer	.	.	.	.	.	.	D	.

PERSONNEL

Level of Effort

The internal evaluation team will consist of 5 persons — 4 of whom will be provided by AID and one of whom will be provided under the project-financed Railway Systems Management and Operations contract.

It is proposed that the team be staffed as follows:

USAID/Tanzania Project Officer (0.50 person-months)

The USAID/Tanzania Project Officer will have overall responsibility for the management of this activity. The Project Officer will coordinate the efforts of the team members and shall be responsible for all administrative aspects of this activity. The Project Officer will have primary responsibility for preparing the Project Evaluation Summary (PES).

Railways Management Specialist (1.00 person-months)

It is proposed that the Railway Management Specialist be the Chief-of-Party under the project-financed Railway Systems Management and Operations contract. This individual will serve as the Team Leader for all technical aspects of the evaluation and shall be responsible for ensuring the quality of the data collected. The Team Leader will have responsibility for compiling all data for the final report.

Transport Economist (0.50 person-months)

It is proposed that USAID/Zimbabwe provide a Transport Economist. This Team Member will have primary responsibility for verification of traffic demand trends and the assessment of TAZARA's performance in establishing reliable cost data.

Commodity Management Officer (0.50 person-months)

A Commodity Management Officer from REDSO/ESA will have primary responsibility for the implementation review.

Project Development Officer (0.50 person-months)

A Project Development Officer from REDSO/ESA will assist in the implementation

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review. This Team Member will, with the assistance of the Team Leader, write the final report.

COORDINATION

Counterparts

The Corporate Planning Manager shall be the principal counterpart for this activity. The team will also work closely with the Chief Mechanical Engineer, the Traffic Manager, the Finance Manager, and the Supplies Manager. It is anticipated that these members of TAZARA's executive staff will provide the bulk of the data upon which the evaluation shall be based.

The USAID/Tanzania Project Officer and the Railways Management Specialist will meet with TAZARA's executive management staff prior to, during, and at the conclusion of the internal evaluation. Through these periodic meetings with the executive management staff and through coordination with the Corporate Planning Manager, TAZARA officials shall be fully informed regarding all aspects of the internal evaluation.

Project Coordination Unit

The Nordic Countries are funding a Project Coordination Unit within the Head Offices of TAZARA. The internal evaluation team should contact this unit to solicit comments regarding the management and operation of TAZARA and to obtain data generated by other donors.

SUBMISSIONS

Interim Internal Project Evaluation Report

The Team Leader will have responsibility for compiling all data for the final report. The Project Development Officer will collate the data collected by the team and the team's observations to develop a final report which shall address the five major parts of the mid-project evaluation. This report shall be finalized prior to the Railway Management Specialist's departure from Tanzania and not later than six weeks after commencement of the evaluation.

Project Evaluation Summary

The USAID/Tanzania Project Officer will complete a Project Evaluation Summary (AID Form 1330-15 & 15A) based upon the final report developed by the team.

APPROVALS

The final report and the Project Evaluation Summary are subject to the approval of both the USAID/Tanzania Project Development Officer and the Director.

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Annex 2

EVALUATION SCOPE OF WORK

LOGISTICS

USAID/Tanzania will be responsible for all logistical arrangements for team members.

BUDGET

AID will provide funding to cover all expenses associated with AID personnel participating in this internal evaluation. Costs associated with the participation of the Chief-of-Party for the Railway Systems Management and Operations contract are considered to be part of the long-term advisor/administration costs and are not separately funded by this work order.

APPROVED BY PROJECT STEERING COMMITTEE:

S.C.I. Mapara, General Manager

Date

ID#RSMWO9:ENGR:JCStarnes:18OCT89:1stDraft

Annex 3

LIST OF TAZARA PERSONS CONTACTED

Mr. M. A. Kashonda	Finance Manager
Mr. L. B. J. Chogo	Acting Chief Mechanical Engineer
Mr. S. Mumba	Traffic Manager
Mr. M. Ngonyani	Principal Planning Officer

Annex 4

LIST OF DOCUMENTS REVIEWED

1. TAZARA Ten Year Development Plan: Progress Report No. 8 (January - May 1989), TAZARA.

2. Southern Africa Transport, T.L. Kennedy, 28 July 1988.

3. General Manager's Report for the Quarter Ending 30th June, 1989, TAZARA.

4. Ten Year Corporate Plan: 1988/89 - 1997/98, TAZARA, February 1988.

5. Study to Determine Future Motive-Power Demand on TAZARA, GERI Engineering GmbH-GOPA Consultants, November 1988.

6. TAZARA Staff Development Plan (Draft), Louis Berger International Inc., October 1989.

7. Revised Ten Year Development Plan, TAZARA, August 1988.

8. Regional Transport Development: Dar es Salaam Corridor Project Paper, USAID/Zimbabwe SARP, July 1987.

9. Tanzania - Zambia Railway Authority: Review of Accounting and Systems Design Working Manual, Tanzania Industrial Studies and Consulting Organization, June 1984.

10. TAZARA Ten Year Development Plan: Documentation for Donors Conference, TAZARA, February 1989.

11. Personnel Establishment 1989-90, TAZARA, 1989.

12. Revised Operating Expenditure Budget 1988/89 TAZARA

13. TAZARA Code Vocabulary, TAZARA.

Annex 5

STUDY QUESTIONS

The following study questions have been used to conduct this interim evaluation:

1. Verification of Traffic Demand Trends

   DO PRESENT TRAFFIC TRENDS COMPARE FAVORABLY WITH THE FORECASTS USED IN THE DESIGN OF THE PROJECT PAPER?

   WHAT IS THE TOTAL NUMBER OF NEW DIESEL ELECTRIC LOCOMOTIVES REQUIRED TO MEET DEMANDS THROUGH FISCAL YEAR 1993?

2. Assessment of TAZARA's Performance in Establishing Reliable Cost Data

   HAS TAZARA ESTABLISHED RELIABLE AND ACCURATE COST DATA?

   HAVE APPROPRIATE TARIFFS BEEN ESTABLISHED FOR THE VARIOUS CATEGORIES OF GOODS AND SERVICES?

3. Implementation Review

   HAS PROCUREMENT OF THE NEW DIESEL ELECTRIC LOCOMOTIVES UNDER A HOST COUNTRY CONTRACT PROCEEDED IN A TIMELY MANNER?

   HAS PROCUREMENT OF THE SERVICES OF A CONTRACTOR UNDER THE AID DIRECT CONTRACT FOR RAILWAY SYSTEMS MANAGEMENT AND OPERATIONS PROCEEDED IN A TIMELY MANNER?

4. Review of Project Performance Indicators

   BASED UPON PROPOSED PROJECT INPUTS AND THE PRESENT STATE OF TAZARA, WHAT ARE REALISTIC TARGETS FOR CARGO HAULED ANNUALLY IN FISCAL YEARS 1991, 1992, 1993, AND 1994?

   BASED UPON PROPOSED PROJECT INPUTS AND THE PRESENT STATE OF TAZARA, WHAT ARE REALISTIC TARGETS FOR LOCOMOTIVE AVAILABILITY RATES IN FISCAL YEARS 1991, 1992, 1993, AND 1994?

   BASED ON PROPOSED PROJECT INPUTS AND THE PRESENT STATE OF TAZARA, WHAT ARE REALISTIC TARGETS FOR WAGON TURNAROUND TIMES (DAR ES SALAAM-KAPIRI MPOSHI) IN FISCAL YEAR 1991,1992,1993, AND 1994?

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Annex 6

MAJOR INDICES OF TRAIN WORKING DURING QUARTER ENDED 30 JUNE 1989

- MAJOR INDICES OF TRAIN WORKING DURING QUARTER ENDED 30TH JUNE, 1989

S/NO.	INDEX	UNIT	QUARTER ENDED 30.06.88	QUARTER ENDED 31.03.89	QUARTER ENDED 30.06.89	YEAR ENDED TO 30.06.89
1.	Tonnage loaded per day	Tonne	2,821	2,062	2,669	3,015
2.	Wagons Loaded per day	No.	85	80	77	86
3.	Wagons offloaded per day	No.	74	69	70	76
4.	Wagons in operation	No.	1,538	1,616	1,370	1,552
5.	Static Load	Tonne	33.3	35.6	34.5	34.7
6.	Workload	Wagon	85	80	77	86
7.	Wagon Kilometres:	10^3Km				
	- Loaded		10,547.3	10,430.8	9,795.1	44,697.6
	- Empty		1,627.3	866.1	1,382.9	2,865.8
	- Total		12,174.6	11,296.9	11,178.0	47,563.4
8.	Turnround time of wagons	Day	18.2	20.0	17.7	17.9
9.	Time for complete process of loading/offloading	Hr.	73.0	87.7	83.1	77.8
10.	Wagon Detention time at technical stations	Hr.	20.8	23.2	22.9	22.0
11.	Travelling speed	Km/hr.	30.1	29.3	28.5	29.3
12.	Punctuality of passenger trains:					
	(a) Departure	%	72.7	73.6	65.9	64.9
	(b) Arrival	%	29.6	26.6	23.1	21.6
13.	Punctuality of goods trains:					
	(a) Departure	%	45.7	33.4	37.3	36.4
	(b) Arrival	%	51.6	53.4	45.1	50.6
14.	TAZARA wagons on ZR/day	No.	339	408	449	387
15	Average time on ZR	Day	19.5	40.2	34.9	30.5
16.	ZR wagons on TAZARA/day	No.	614	1,067	830	940
17.	Average time on TAZARA	Day	23.9	33.7	27.3	29.1

Source: General Manager's Report for the quarter ended 30th June 1989

Annex 7

LOCOMOTIVE PRODUCTIVITY DURING QUARTER ENDED 30 JUNE 1989

- LOCOMOTIVE PRODUCTIVITY DURING QUARTER ENDED 30TH JUNE, 1989

ITEM	UNIT	4TH QUARTER 1987/88	3RD QUARTER 1988/89	4TH QUARTER 1988/89	CUMULATIVE TO 30.06.89
1. Total running kilometres	Km	1,160,779	1,080,002	1,085,615	4,635,330
(i) Goods loco enroute:	Km				
(a) Total	"	820,526	740,661	745,085	3,254,033
(b) Leading loco	"	763,249	649,679	656,112	2,857,147
(c) Assisting	"		40,588	51,426	216,139
(d) Shunting trains	"				
(e) Light loco	"	57,277	50,394	46,547	117,055
(ii) Passenger		144,007	135,225	143,350	568,115
(iii) Shunting	"	150,282	159,735	136,400	605,783
(iv) Railway Work	"	37,963	45,101	60,692	207,407
2. Light Loco rate	%	7.0	7.8	7.1	6.2
3. Total gross tonne-Km	10^4T-Km		66,868.6	67,094.3	291,960.0
(i) Goods traffic	"	50,190.3	56,102.0	54,997.8	248,110.2
(ii) Passenger traffic	"		8,201.3	8,449.2	32,851.1
(iii) Shunting trains	"		-	-	-
(iv) Railway work	"		2,565.3	3,647.3	10,999.5
4. Average Daily Running	Km	439.0	433.5	435.3	430.8
5. Average technical speed	KM/Hr.	30.7	36.0	36.1	36.2
6. Daily output	10^4T-Km	1.1	32.8	32.1	32.3
7. Average haulage	Tonne	763.0	863.5	850.2	868.4

Source: General Manager's Report for the quarter ended 30th June, 1989.

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Annex 8

DETERMINATION OF LOCOMOTIVE REQUIREMENTS (GERI/GOPA)

DETERMINATION OF LOCO REQUIREMENT

TRAIN SERVICES REQUIRED	Serviceable locos available		Available for traffic								Required for traffic						Use of serviceable locos								Total servic. locos required			
			3000 hp				2000 hp				3000 hp	2000 hp	normal t.		super.t.		3000 hp				2000 hp				3000 hp		2000 hp	
	1000 hp no.	2000 hp no.	normal t.		super.t.		normal t.		super.t.		total	total	3000	2000	3000	2000	normal		reserved		normal		reserved		normal	reserved	normal	reserved
			% of col. a	no.	% of col. a	no.	% of col. b	no.	% of col. b	no.			b-d	b-e	b-f	b-g	% av. reg.	no.	% av. reg.	no.	% av. reg.	no.	% av. reg.	no.	per	a-i	b-k	b-k
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	A	B	C	D
- Normal operation -																												
1991/92 (11 new US locos commissioned)																												
through goods trains/day 600 t (loco)	—										21																	
800 t																												
900 t																												
local goods trains/day 500 t ex Tunduma												14																
520 t ex Tunduma																												
520 t in Zambia												7																
Passenger trains 2/week through																												
1/week Tunduma																												
1/week Zambia												3																
works trains																												
Total locos 1991/92	33	46	70	21	-	-	33	68	-	-	21	24	0	1	-	-	70	0	-	-	65	10	-	-	33	-	51	-
- Improved operation -																												
1991/92 (11 new US locos commissioned)																												
through goods trains/day 600 t (loco)																												
1200t											17																	
local goods trains/day 500 t ex Tunduma												14																
500 t ex Tunduma																												
500 t in Zambia												-																
Passenger trains 2/week through											4																	
1/week Tunduma																												
1/week Zambia												3																
works trains																												
Total locos 1991/92	35	46	70	21	-	-	33	68	-	-	21	17	3	1	-	-	70	0	-	-	65	0	-	-	35	-	46	-
1995/96 - Improved operation -																												
through goods trains/day 600 t																												
800 t											21																	
local goods trains/day 1200 t																												
1x500 t in Tunduma												10																
1x500 t in Zambia												6																
Passenger trains 1/day through												3																
works trains																												
Total locos 1995/96	28	24	64	18	10	10	33	8	10	10	21	20	3	20	1	10	65	5	70	2	60	33	65	27	33	30	57	51
2000/01 - Improved operation -																												
through goods trains/day 600 t																												
800 t											21																	
1200 t																												
local goods trains/day 1x500 t in Tunduma											17																	
1x500 t in Zambia																												
Passenger trains 1/day through											6																	
works trains											3																	
Total locos 2000/01	27	0	56	15	67	18	0	0	0	0	47	0	32	0	20	0	65	49	70	47	-	-	-	-	78	69	-	-

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