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AFR/DP

PROJECT EVALUATION REPORT FACESHEET

PROJECT: 663-H-017, 017A

Ethiopia

PROJECT DURATION: March 1970 to December 1975

Highway Equipment Repair Facilities (HERF)

Date Prior PARs: 6/28/73
1/30/75

AMOUNT OF LOAN AGREEMENT	$ 4.7 million ($3.5 million (017)) ($1.2 million (017A))
TOTAL DISBURSEMENTS	$4,129,470.91
DEOBLIGATIONS	417,849.71

FINAL EVALUATION

USAID/Ethiopia: May 28, 1976

CONTENTS

		Page
I.	Evaluation Findings Summarized	1
II.	Introduction and Background	3
III.	Description	3
IV.	Evaluation Purpose	3
V.	Evaluation Procedure	4
VI.	Major Constraints Identified	4
	1) Spares	4
	2) Personnel	6
VII.	Discussion of Evaluation Findings	7
	A. Utilization of Tools/Equipment and Appropriateness of Selection	7
	B. Adherence to Project Purpose	8
	C. Effectiveness of Technical Assistance Team	10
	D. Present capability of District Shops and CRS and their ability to accommodate additional work load.	11
	1. Staffing of Shops	12
	2. District Shop Capability	12
	3. Spare Parts Problems	12
	4. Shop Tools	13
VIII.	Procurement Performance	13
IX.	Financial Analysis	14
X.	Conclusions/Recommendations	15

ANNEXES

1. Jimma
2. Alem Gana
3. Component Rebuild Shop (CRS)
4. Shashamane
5. Dire Dawa
6. Central Parts Warehouse (CWH)
7. PAR 73-5
8. PAR 75-9

PROJECT EVALUATION REPORT (Final)

Summary of Evaluation Findings

1. District Shop (DS) facilities are excellent with some District Shops not operating at optimum capacity.

2. Utilization of shop tools financed under this loan is very satisfactory.

3. District Shops and the Component Rebuild Shop (CRS) can operate effectively without external technical assistance.

4. Warehouse Management at DS level is very satisfactory.

5. Training of ERA staff in equipment preventative maintenance by TA team was partially satisfactory.

6. Training of ERA District Shop and Component Rebuild Shop personnel on shop tool operation by TA team was generally satisfactory.

7. Overall capability and performance by the TA team was partially satisfactory.

8. Performance by the ERA in developing a capability within the Central Parts Warehouse (CPW) to provide spare parts to the District Shops on a timely basis was unsatisfactory.

9. ERA District Shop personnel replacement and training availability is unsatisfactory.

10. Sub-district shop expansion by the ERA was delayed but the outcome is excellent.

11. Limited expansion and modification of specific District Shops is necessary for increased capacity.

12. Revision and expansion of the ERA's training facility at Alem Gena is required to service ERA's new construction program needs. Additionally, new training programs are needed to improve present day equipment operation and maintenance requirements (see section on personnel).

13. Availability of trained manpower is a very critical problem for ERA District Shops, the Central Warehouse and the CRS. Most District Shops were found to have (50-55%) vacancies in their authorized staffing levels.

14. All District Shops visited did not have the necessary repair and parts manuals on hand.

15. District Shops and the CRS have sufficient shop equipment to operate, however, some complimentary tools/equipment are needed to increase the shops' capabilities.

16. Training and repair manuals are needed for the specialized equipment, i.e., Sun Tester, Dinamometer.

17. End of Project Status (EOPS)

	Satisfactory	Unsatisfactory	Other
Inputs			
AID			
1. Shop technicians	X		
2. Shop tools	X		
3. Spare parts	Funding Satisfactory		Procurement unsatisfactory
GOE			
1. Personnel (staffing)			Partially satisfactory
2. Shop renovation	Excellent		
3. Shop costs	X		
Outputs			
1. ERA personnel trained for shop tool operations	X		
2. ERA personnel trained for preventative maintenance			Partially Satisfactory
3. Warehouse managment District Shop	X		
4. Central Warehouse spare parts supply		X	
5. TA team on training/ maintenance capability			Partially satisfactory
Project Purpose			
1. Reduced Unit Maintenance equipment cost		X	
2. Deadline rate (25%)			Partially satisfactory
Project Goal			
1. Increase road maintenance	X		
2. To increase the rate of completion of force account road projects	X		

II. Introduction and Background:

This report represents the third and final evaluation report for the Highway Equipment Repair Facilities Project (HERF) funded through AID Loan 663-H-017 and 017A. The first evaluation of this project was completed in September, 1972 (See Par 73-5 dated June 28, 1973, Attachment 7) covering the period March, 1970 to September, 1972. The second evaluation was completed in November, 1974 (See Par 75-9 dated January 30, 1975, Attachment 8) covering the period September 1972 to November, 1974. This third and final evaluation covers the period from November, 1974 up to the TDD of the loan (December 31, 1975) and through March, 1976. It was decided to conduct this close-out evaluation approximately six months after all US technicians have been phased-out in order to observe operations without expatriate assistance.

The project under Loan 017 (1969) provided US$ 3.5 million to the Ethiopian Roads Authority, ERA (formerly the Imperial Highway Authority/Ethiopian Highway Authority) for technical assistance and for the procurement of shop tools and spare parts for the support of previously AID funded road equipment.

The loan was increased by loan amendment 017A (1973) by US$ 1.2 million for the continued funding of these components.

III. Description of Project

The project consisted of the procurement of shop tools and equipment, spare parts, and technical assistance services to assist the ERA in developing its heavy equipment repair and maintenance capabilities. As part of the project, the ERA agreed to renovate and/or build repair shop facilities at 9 (nine) District Shops and the Component Rebuild Shop in Addis Ababa. Additionally, ERA was to improve equipment management, reorganize the CRS and improve the warehouse operation for procurement of spare parts.

IV. Purpose of Evaluation

The purpose of this evaluation was to:

1. determine the utilization of AID financed tools/equipment and appropriateness of selection,

2. assess the degree of adherence to the original project purpose,

3. determine the effectiveness of the T.A. team,

4. examine the present capabilities of District Shops and the CRS and assess their ability to accommodate additional work load, and

5. to conduct an analysis of special needs and problems.

V. Evaluation Procedure

This final evaluation was conducted in two phases: Phase I consisted of site visits to the following ERA field and central facilities during March, April and May, 1976:

1. Component Rebuild Shop - Addis Ababa, March

2. Central Parts Warehouse - Addis Ababa, May

3. ERA District Shops

   a. Jimma - March
   b. Alam Gana - March
   c. Shashamane - March
   d. Dire Dawa - March

Phase I of the evaluation was conducted with:

ERA: Ato Yohannes Wolde Selassie, Equipment Engineer
USAID: Mr. John Hicks, Assistant Program Officer
REDSO/EA: Mr. Albert Karian, Engineer
REDSO/EA: Mr. David Gephart, Engineer
CRS/CWH and District Shop visits were in company with the shop superintendents, and ERA district managers at the sites visited.

Phase II of the evaluation (May 19, 1976) consisted of discussions of the project and the findings of this joint evaluation at ERA headquarters in Addis Ababa with the following representatives from ERA, USAID, and REDSO/EA:

ERA: Ato Hailu Shawel, General Manager
Ato Yohannes Wolde Selassie, Equipment Engineer
Ato Keletta Tesfa Michael, Chief, Parts and Supply, CWH
Ato Beshah Azmite, Chief, Procurement Division

USAID: Mr. Barry Riley, Program Officer
Mr. John Hicks, Assistant Program Officer

REDSO/EA: Mr. David Gephart, Engineer
Mr. Albert Karian, Engineer

This report represents the joint efforts of the Phase I and Phase II participants and all of the findings/recommendations have been agreed upon in principle.

VI. Major Constraints Identified

1. Spare Parts

The District Shops and the Component Rebuild Shop shows severe limitations of repair and rebuild operations due to the lack of spare parts and a poorly functioning distribution and procurement system. This constraint is the

direct responsibility of ERA's Central Warehouse and the Procurement Division. This problem has persisted throughout the life of the project primarily for the following reasons:

a. All procurement for the ERA is done by the Procurement Division of ERA. The Central Warehouse which has the responsibility of filling all orders received from the District Shops plays no role in procurement or following up once the requisition is submitted to the Procurement Division. As a result long lead times are experienced from submission of requisition to receipt of the item by the Central Warehouse.

b. The local dealers are hesitant to stock large inventories of spare parts due to large amounts of foreign exchange required for this purpose. (Ries Engineering, representing Caterpillar Company, is the only exception to this rule.)

c. When placing an offshore order for spare parts a considerable amount of time is required to receive the parts from overseas suppliers.

d. The ERA presently has more than 300 (three hundred) different makes of equipment. This requires maintaining an inventory of spare parts, sufficient to support this wide range of equipment. This also exacerbates the spare parts problem.

e. ERA has not in the past earmarked sufficient funds, within its budget, to cover the procurement of spare parts. However, it is anticipated that the next ERA budget will contain a spare parts and equipment line item and perhaps this problem will be overcome.

f. Although the Central Warehouse does have a severe spare parts problem, it is believed that the problem is complicated by poorly or untrained personnel responsible for filling parts requisitions. In many cases the parts requested or interchangeable parts may be available but not identified by the individual responsible for filling the requisition. Also interchangeable numbers for parts are not always provided by the suppliers.

The ERA is cognizant of the spare parts problem and has begun to take concrete steps to resolve it. During the Phase II discussions the ERA General Manager revealed that, in an effort to address/correct the problem of spare parts availability the following steps have/will be taken: (1) The Council of Ministers has recently approved a request of the ERA for a special revolving capital fund for the Central Warehouse. This will enable the Central Warehouse to purchase spare parts through the ERA Procurement Branch and sell directly to the District Shops. The fund will also make spares procurement independent of annual budget requests. (2) To the extent feasible equipment will be standardized by districts to facilitate the flow of spare parts and to solve the problem of having several different types of equipment in the same area. A problem which complicates the maintenance operation. (3) In discussing the spare parts problem, the

General Manager noted that sup management at the Central Warehouse was a key problem, and that the management system must be revamped. He also indicated that this was a difficult problem and would take considerable time to resolve. (4) The Central Warehouse is in the process of installing a computerized spare parts monitoring system. (5) A system is currently being developed whereby spare parts stock will be maintained on the basis of equipment age.

2. Personnel

The ERA staffing levels at the district shops visited show a 50-55% vacancy rate for authorized positions with no short-term possibilities for improvement. The following reasons can be cited for this problem:

a. The inadequate training program at the ERA training center in Alem Gana is giving rise to an acute shortage of trained technical personnel in the ERA shop operations, equipment operations and middle level supervisors.

b. Closing of the University and other technical training institutions has exacerbated the trained manpower shortage.

c. ERA efforts to expand their operation by providing more services to rural areas has placed a greater demand on trained manpower needs.

To deal with the manpower problem the ERA plans to take the following actions:

(1) Plans are being developed to test all available in-house personnel in order to determine their present technical competence and to determine to what extent these employees can be further trained and up-graded.

(2) ERA will advertise for comprehensive school graduates with the view of recruiting and training these individuals in technical areas where shortages currently exist. It is believed that since the students are now returning from their assignments in rural areas (Development Through Cooperation Campaign) that a sufficient number of trainees will be available.

(3) In identifying trained manpower as a major constraint ERA also acknowledges that the quality of trainers is also a problem. To ease this constraint IDA funds under the Sixth Highway Program will be used for trainer-training programs both in-country and abroad.

(4) The ERA is in the process of developing a 5 year Manpower Development Plan as well as a 5 year Training Plan. It is anticipated that these plans will be complete in July/August, 1976 and implementation will start shortly thereafter.

VII. Evaluation Findings

A. Utilization of tools/equipment and appropriateness of selection

The original list of shop tools to be procured under the project was modified following loan authorization due to price increases and fund limitations. The final items selected were to provide the basic shop tool equipment for nine ERA District Shops and one centrally located Component Rebuild Shop. Under a 1969-70 IBRD funded consultant study (Public Administration Services) of the ERA, a decision was made to organize equipment maintenance operations under District Shop capabilities of 1st, 2nd, and 3rd echelon maintenance work with all major overhaul, engine rebuild, transmission rebuild, etc., of 4th and 5th echelon maintenance coming under a component exchange program between the District Shops and the Component Rebuild Shop.

With regard to AID financed shop tools and equipment selected and installed under the project, this evaluation notes the following:

1. All shop equipment was being utilized by the District Shops in an effective and useful manner.

2. The selection of some items of equipment for DS use was inappropriate for the job requirements. For example:

a. The portable steam cleaner was a lightweight unit with insufficient production capability for DS workloads.

b. The water distillation unit for the District Shops were lightweight, sensitive to operation, equipped with no safety cut-off valve, and unsuitable to shop workload due to limited production capacity.

c. The Sun Automotive Consul Engine Analyzer for the District Shops proved to be excessive to DS needs with no service and maintenance support in country. Presently three of these units (10 purchased) are partially or totally inoperable due to unavailability of parts, lack of manuals for circuit repair, and the machine's extreme sensitivity to operational use. In this case, the portable automotive testers proved to be sufficient for DS needs.

d. The engine fork frames in the CRS were found to be too small for truck engine use, although the rebuilding of engines is the major responsibility of the CRS.

e. The 50-ton drill press does not have large size chucks.

f. Lack of sufficient adapters for the lathe machines.

g. 125 amp portable welders are too small for the intended purposes, and 300 amp welders would have been more appropriate.

The overall assessment, however, indicates that the majority of the shop tools purchased were of appropriate size, most beneficial for the ongoing project needs and are being effectively utilized.

B. Adherence to project purpose

(1) Project purpose

a. Equipment deadline rate held at <25 percent.
b. External TA not required.
c. ERA maintains equipment at reduced unit costs.

(2) Means of verification

a. Quarterly Progress Reports.
b. Monthly equipment deadline report.
c. Spot check of equipment repair and management.

1. Deadline Rates

Fields visits to four District Shops and the CRS revealed that the ERA does not maintain a monthly equipment deadline report as such. A daily equipment utilization report is prepared for each major equipment item assigned to the district. These daily reports are transmitted to ERA headquarters in Addis Ababa where they are entered on IBM punch cards. Theoretically, printouts, as required by management, provide a total ERA equipment status report showing, among other things, deadline rates.

Long lag times are experienced in receiving daily equipment reports from each of the nine ERA districts to headquarters in Addis Ababa. Punch card inputs represent another lag time. Therefore, the overall effectiveness of the system as a management tool is questionable.

The timely preparation and submission of project quarterly progress reports as required by the loan ended with the Project Manager's departure in October, 1975. The quarterly reports reflected an equipment deadline rate of <25 percent for all nine District Shops during the last two years of the project. The ERA is of the opinion that the Project Manager's Quarterly Reports did not reflect actual conditions regarding deadline rates. It was stated by ERA that some of the older equipment (in excess of five years of age) were not included in computing the deadline rate and therefore a distorted picture was being presented. Attempts, during this evaluation, to establish deadline rates at specific District Shops, at the time of the shop visits, indicated that approximate rates were:

Jimma	33% deadlined
Shashemane	24% "
Alem Gena	20% "
Dire Dawa	32% "

The equipment lists were not up-to-date, therefore, the percentages are unreliable.

2. External TA not required

This evaluation concluded that the District Shop management and organization has the level of competency required to operate highly satisfactory equipment maintenance and repair functions. However, the following constraints exist at the District Shops and CRS levels:

a. Inadequate staffing in the area of equipment repair and maintenance support, from lowest to highest positions.

b. Inadequate spare parts support resulting in inadequate maintenance of assigned equipment.

c. Lack of manuals and specialized tools to maintain specific types of equipment, i.e., (1) automatic transmissions on dump trucks, and (2) automotive electronic testing equipment.

The evaluation concludes that the assignment of external TA to each of the nine District Shops or the CRS is no longer necessary in order for the ERA to maintain satisfactory levels of equipment repair, rebuild and maintenance functions. However, specialized external TA will continue to be required by the ERA in areas of (a) warehouse/spare parts control, (b) training for new equipment operation and repair, and (c) specialized equipment maintenance programs.

3. ERA Maintains Equipment at Reduced Unit Costs

No evidence was noted during the evaluation to support the achievement of this objective. The IBM data bank printouts used by ERA to compile daily equipment utilization and maintenance reports, if compiled accurately, could represent the needed tool for evaluation purposes.

The shortage of spare parts at District Shops and at the Component Rebuild Shop has resulted in the fabrication of required parts by ERA machine tool operations. While this method allows a unit of equipment to be placed back into operation, it is noted that this method of operation can be extremely costly and time consuming.

4. Project Reporting Performance

From the onset of the project, and in compliance with AID reporting requirements, the ERA Project Manager prepared monthly reports during the first three years of the project. ERA and USAID jointly agreed that monthly reports could be discontinued during the last year of the project. Quarterly Progress Reports, although sometimes late in submission by the ERA, were prepared by the ERA Supplies and Equipment

Division and submitted to USAID. From the period September 1974 to November 1975, Quarterly Reports were delayed due to the phase-out of the expatriate personnel who had been assigned the responsibility of preparing these reports.

The contents of the Quarterly Reports were generally satisfactory except during the last three quarters of the project when reporting on financial data and on the status of ordered equipment was less than satisfactory.

USAID/REDSO, during the monitoring of this project, prepared 20 inspection reports (trip reports) of District Shops, the CRS and related project activities.

C. Technical Assistance (TA) Team

In an agreement with the ERA in 1969, it was determined that the AID loan would finance expatriate technicians in the following areas:

(1)	One Equipment Specialist (mechanic) located at each of the nine (9) ERA District Shops	9 persons
(2)	One Component Rebuild Specialist at the CRS	1 person
(3)	One welder specialist at the CRS	1 person
(4)	One Project Manager in charge of the TA team at ERA Headquarters	1 person
(5)	One Spare Parts Specialist located at the Central Warehouse for one contract period of two years, 1971-73	1 person
	TOTAL	13 persons

The total TA input was approximately 50 person years. The decision to add a TA component to the project was made on the basis of the past poor performance record of ERA District Shops in maintenance of AID funded equipment (previous loans). As an example, the ERA equipment deadline rate in 1968 was above 60 percent and had grown to this level over the six-year period from 1962 to 1968. Also it was believed that appropriately trained technicians could be of tremendous assistance in installing the new shop equipment to be purchased under the loan and training ERA employees at the District Shops and the Component Rebuild Shop in equipment operation. Additionally, it was believed that the TA personnel could assist in the training of ERA DS and CRS personnel on equipment repair, preventative maintenance and shop operation.

The total person year costs of this project resulted in one of the lowest person-month costs for an AID-funded TA project. The total cost was approximately US$ 780,000 divided by 580 person months which averages US$ 1,350 per person month.

In retrospectively examining the effectiveness of the technical assistance team during this evaluation, the following factors are noted:

(1) During the first two evaluations of this project (Sept. 1972 and November 1974) both the ERA and USAID rated the performance of the Project Manager and the twelve team members as excellent. However, this final evaluation, reflecting a greater degree of ERA input, indicates that the TA input did not truly reflect the quality of the ratings given the TA team during past evaluations. It was noted that the Project Manager and his team tended to constitute a closed group which operated independent of ERA management and control.

(2) In discussing the performance of the TA team during this evaluation, indications are that the team quality varied from sub-standard, for at least six of the total of the 17 individuals assigned to the project during various periods, to excellent. This sub-standard performance was characterized by the: (a) lack of education deemed necessary for the specific job requirements; (b) inexperience on equipment and the lack of knowledge of new tools; (c) inability to train and/or teach ERA staff; and (d) disregard for supervision by Ethiopian Nationals, especially at the District Shop level.

(3) The ERA did not fully exercise its authority in the selection, screening and approval of each individual team member. The recruitment problems associated with the early history of the project were characterized by two false starts that were encountered prior to obtaining a Project Manager (the first two candidates actually arrived on site only to leave shortly thereafter). The problems in 1970 of obtaining 12 additional team members presented a major recruitment constraint which was solved, good or bad, by the most recent Project Manager who had contacts with numerous individuals presumably having the skills and expertise required for the project. Thus, the twelve positions were quickly filled.

(4) The evaluation of the TA team started about year two of the project. The overall assessment of the TA input indicates that the TA team members were effectively utilized. The ERA perception of performance, which was an early problem of the project, did not surface until the departure of the final team member in October, 1975.

D. <u>Present Capability of District Shops to Accommodate Additional Work load</u>

An assessment of present capabilities of District Shops and the CRS to assume additional work load revealed the following problems:

1. Staffing of Shops

The evaluation revealed that major problems exist at the District Shops and CRS relative to adequate staffing for all positions. This was especially true with regard to mechanics, electricians and machinists.

Overall position vacancies noted were:

	Approved	Filled	Vacant
Jimma	84	42	42
Shahsamane	92	39	53
Alem Gana	125	66	59
Dire Dawa	90	44	46
CRS	250	208	42

The rapid expansion of ERA force account construction programs under the 5th and 6th Highway Programs along with the ongoing Rural Access Road Construction Programs over the past two years has resulted in a drain of existing skilled personnel at the DS and the CRS levels without a corresponding inflow of new personnel. This, along with reorganizations and mandatory retirements within the ERA has caused a serious problem, with regard to (a) the availability of trained and experienced personnel to man ongoing projects, (b) the availability of trained experienced personnel, newly recruited, to staff new programs.

This problem is further exacerbated by the existing situation that new school graduates are not available for employment from either secondary, technical or university educational institutions to fill the existing personnel vacancies.

2. District Shops' Capabilities

The program of shop renovation by the ERA, as an input to this project, has been outstanding. The physical facilities now existing at the District Shops (only four District Shops were visited) have more than exceeded project output expectations.

Also the physical facilities now existing at the District Shops and the CRS coupled with the installed shop tools show a capacity for equipment repair, maintenance and rebuild in excess of that now being performed. However, the Shashemane shop will require further expansion and renovation of facilities to maintain pace with the ongoing and proposed progress within that district.

3. Spare Parts

When the project was initiated in 1970, it was decided to purchase a tranche of spare parts, on an emergency basis, to be used to repair deadlined equipment and to be stocked at the DS for use in the future to reduce the deadline rate.

Following this first tranche of spare parts procurement a scheduled second, third and fourth tranche also produced unsatisfactory results. The spare parts supply in stock still remains a major obstacle to reducing down time for repair works which now varies from five days up to and exceeding one year.

A major and first priority problem continues to exist within the ERA regarding the timely procurement, receipt and distribution of spare parts for deadlined equipment and rebuild components at the DS and CRS level. This problem was not adequately treated in the design and implementation stages of this Loan. A mid-point attempt to partially address this problem by the addition, to the TA team, of a spare parts/warehouse specialist also produced unsatisfactory results. Although the problem was identified, with recommended actions, in the two previous evaluations of this project, no improvement has been made nor alternatives developed (see recommendations, Section X).

4. Shop Tools

The evaluation showed that the installation of all shop tools purchased under the initial loan (017) has been successfully completed. Except for a few items tools were operational and shop personnel were trained in tool operation.

At of this report, all of the shop tools purchased under the loan amendment (017A) through GSA in the US had not been received and installed by the ERA. In addition, the list of shop tools purchased under 017A by the GSA was not readily identifiable by the ERA. The status as to specifically what tools had been shipped or where located was not clearly discernible.

VIII. Procurement Performance

The overall procurement performance during the life of the project was considered less than satisfactory.

Procurement agents were:

1. ERA procurement branch
2. Afro-American Purchasing Center (AAPC)
3. General Services Administration (GSA)

The initial procurement of emergency spare parts for the project followed by Groups I and II spares, undertaken by AAPC, was unsatisfactory. Procurement and delivery was delayed to the extent that when the spare parts actually arrived, the majority of the deadlined equipment had been written-off, therefore, resulting in the accumulation of many unusable spare parts. The purchase of shop tools by GSA proved to be satisfactory but very time consuming.

The purchase of additional shop tools by GSA has resulted in excessive delays in delivery time. (Even now, six months after the end of the project a major portion of GSA tools are still not on site.)

The financial accountability of all procurement was also less than satisfactory as AAPC and GSA did not provide timely and periodic status of disbursement reports.

Distribution of spares after arrival in country from the Central Warehouse also resulted in a sub-standard performance.

IX. Financial Analysis

A financial summary/analysis of the loan is presented below:

Loan 663-H-017

Date authorized: 11/18/69
TDD: 3/31/75

Original loan amount	$ 3,500,000.00
Deobligation (May 1975)	(104,233.75)
Net loan amount	$ 3,395,766.25

Disbursements by DA

L/Comm 01	FAS	$ 12,000.00	Recruitment contract
L/Comm 02	AAPC	111,108.10	Procurement fees
L/Comm 03	USAID	538,028.12	Technician salary
L/Comm 04	AAPC	1,142,790.99	Spare parts
L/Comm 05	FNCB	49,194.11	Cat spare parts
	TOTAL	$ 3,395,766.25	

Loan 663-H-017A (Amendment)

Date authorized: 6/23/72
TDD: 12/31/75

Original Loan amount	$ 1,200,000.00
Deobligation (Dec. 1975)	(313,615.96)
Net Loan amount	$ 886,384.04

DA No.	DA Amount	Disbursements	
1 GSA	529,722.00	403,893.98 (125,828.02 deob.)	Shop tools/equipment
2 FNCB	100,000.00	82,490.06 (17,509.94 deob)	Cat spare parts
3 USAID	400,000.00*	247,320.62	Technician salary
TOTAL	$ 1,029,722.00	733,704.66	

* Letter of Commitment decreased by $152,679.38 but not yet deobligated. The loan expired 12/31/75, however, GSA billings are still forthcoming.

X. Conclusions and Recommendations

1. The evaluation of the 4 (four) District Shops visited revealed that, in addition to the present shop equipment purchased under this Loan, certain minor shop tools are needed in the District Shops as well as at the CRS to compliment the existing shop equipment. Some of these tools are minor units but essential to the shop repair work, e.g., an injector pump testing machine, a generator testing machine, an equipment washing unit, a gas welder for field work, specialized heavy duty tools, minor tool sets, larger size chucks for the 50-ton drill press, more adaptors for lathe machines, etc.

It is recommended that the ERA institutionalize a system whereby the exact needs of the shops are frequently assessed and prompt procurement action is taken.

2. To overcome the parts procurement and destribution problem, it is recommended that a committee be selected to specifically evaluate the warehouse operation, procurement and follow up procedure and recommend necessary action to remedy this problem. The committee could be composed of TA type individuals or ERA staff capable of performing this task. In this regard ERA should follow through with the work of the in-house task force that is being formed to consider this problem.

3. It is recommended that special training seminars be arranged in Addis Ababa, to invite highly specialized Mechanical Engineers representing manufacturers to conduct short-term classes lecturing on maintenance and repair of problem type equipment, e.g., Suntester, Dinamometer, Automatic Transmission, etc.

4. In order to keep up with the present demand for technically capable personnel, it is recommended that the Alem Gana Training center be rehabilitated to improve the course material and to upgrade the training program to train equipment support personnel to fill the ERA staff vacancies.

PHASE I - FIELD INSPECTIONS

Jimma District Shop: The inspection was made on March 24, 1976, with Ato Yohannes Woide Selassie, ERA, District Equipment Superintendent Ato Abraham Teggen and Ato Kelede Mihiretu, Maintenance Superintendent. The physical facilities were excellent with adequate work space and electricity. Water availability posed only a minor problem. The AID financed equipment was being effectively utilized. The warehouse was well-organized with proper card indexes and accurately inventoried shelves. An equipment status board existed with appropriate categories to identify the location and condition of the equipment units assigned to the district.

Major Problems Observed

1. The review of the equipment assigned to the district showed 33 units out of a total of 95 deadlined or 35 percent. Most of these units were waiting for the arrival of spare parts from the Central Warehouse in Addis. The lack of spare parts and an effective delivery system through the ERA Central Warehouse to this DS are major problems.

2. There was a total of 84 positions authorized for equipment support personnel to be working in the shop area, of which 42 positions were vacant or a vacancy rate of 50 percent. There seemed to be no immediate remedy to improve this situation.

Minor Problems

The lack of a sufficient supply of small tools; the lack of some minor attachments for the equipment in the machine shop area and the lack of additional equipment to compliment the existing units were the minor problems observed.

Conclusion

The shop has sufficient capacity to handle additional workload if the problems of manpower, spare parts and tools are ameliorated.

PHASE I - FIELD INSPECTIONS

Alem Gana District Shop: The inspection was made on March 26, 1976, with Ato Yohannes, ERA and District Equipment Superintendent Ato Wolde Amlak Dike. The District Manager was absent. Physical facilities were excellent with adequate work space and electricity. Water availability posed a minor problem. The AID financed equipment was being effectively utilized. The warehouse was well organized with proper card indexes and accurately inventoried shelves. An equipment status board existed with appropriate categories to identify the location and condition of the equipment units assigned to the district.

Major Problems Observed

1. A survey of the equipment showed 85 units out of a total of 450 deadlined or 20 percent. Most of these units were waiting for the arrival of spare parts from the Central Warehouse in Addis. It was difficult to estimate a more accurate deadline rate as the equipment status board was not up-to-date. Lack of spare parts and lack of an effective delivery system through the ERA Central Warehouse to this DS are major problems.

2. There was a total of 125 positions authorized for equipment support personnel to be working in the shop area, of which 66 positions were vacant or a vacancy factor of 53 percent. There seemed to be no immediate remedy to improve this situation.

Minor Problems

1. The lack of a sufficient amount of small tools; the lack of some minor attachments for the equipment in the machine shop area and the lack of additional shop equipment to compliment the existing units were the minor problems observed.

2. A large quantity of unsalvagable equipment is stored at this location awaiting the Survey Board's decision to be written off.

3. A dinamometer located at this shop is excessive to their needs and should be transferred to CRS.

Conclusion

The shop has sufficient capacity to handle additional work load if the problems of manpower, spare parts and tools are corrected.

PHASE I - FIELD INSPECTIONS

Component Rebuild Shop: The inspection made on March 26, 1976, with Ato Yohannes, ERA and Ato Getachew Wolde Mariam, CRS Supervisor. The physical facilities were excellent with adequate work space, water and electricity. AID financed equipment was being effectively utilized. All components received for rebuilding were properly logged and indexed.

The component replacement theory does not work. Components received from the field are kept until parts become available (which could be more than one year), the unit is then repaired and returned to the DS. The ERA plans to decentralize engine overhaul operations. The current plan is to develop engine overhaul capabilities at the larger District Shops. The Component Rebuild Shop will remain however to provide repair support for the smaller district shops and to handle other repairs such as crankshaft and automatic transmissions.

Major Problems Observed

1. There are a total of 250 positions authorized for the Component Rebuild Shop, of which 42 positions were vacant or a vacancy rate of 17 percent. A total of 30 of these vacancies was in the area of major rebuilding of components.

2. The lack of certain catalogs and manuals seemed to be a problem here, similar to other district shops.

3. The lack of spare parts was another major problem.

Conclusion

The overall operation seemed satisfactory with appropriately trained personnel to handle additional work load, once the spare parts problem is overcome.

PHASE V - FIELD INSPECTIONS

Shashemane District Shop: The inspection was made on March 29, 1976, with Ato Yohannes, ERA, Ato Asmelash Girma Taiyoum, District Manager, and Ato Gejahegn Mamo, District Equipment Superintendent. Physical facilities were excellent with adequate work space and water. Electricity posed a problem. We were informed that the shop was incapable of operation about 50 percent of the time due to lack of sufficient power. AID financed equipment was being effectively utilized. The warehouse was well organized with proper card indexes and accurately inventoried shelves. An equipment status board existed with appropriate categories to identify the location and condition of the unit. The machine shop area was being reorganized and improved.

Major Problems Observed

1. A survey of the equipment showed 36 units out of a total of 152 deadlined or 24 percent. Most of these units were awaiting arrival of spare parts from the Central Warehouse in Addis. The lack of spare parts (including fast-moving spares), and the lack of an effective delivery system through ERA Central Warehouse to this DS are major problems.

2. There were a total of 92 positions authorized for equipment support personnel to be working in the shop area, of which 53 positions were vacant or a vacancy rate of 57 percent. There seemed to be no immediate remedy to improve this situation.

3. The shop needs a 200 Kw. generator to meet electricity requirements.

Minor Problems

The lack of sufficient amount of small tools, the lack of some small attachments for the equipment in the machine shop area, and additional shop equipment to compliment the existing units were the minor problems observed.

Conclusion

The shop has sufficient capacity to handle additional work load if the problems of manpower, spare parts, tools, and most importantly, electricity are resolved.

PHASE I - FIELD INSPECTIONS

Dire Dawa District: The inspection was made on March 31, 1976, with Ato Yohannes, ERA, Major Abate Bezuneh, District Manager, and District Equipment Superintendent Ato Alemsaged Alemayehu. Physical facilities were adequate with adequate work space, water and electricity. The physical facilities were being expanded. AID financed equipment was being effectively utilized. The warehouse was well organized with proper card indexes and accurately inventories shelves. However, storage space was a problem. An equipment status board existed with appropriate categories to identify the location and condition of the equipment units. The accuracy of the equipment status was not known.

Major Problems Observed

1. A survey of the equipment showed 54 units of a total of 172 deadlined or 32 percent. Most of these units were awaiting arrival of spare parts from the Central Warehouse in Addis. The lack of spare parts and an effective delivery system through the ERA Central Warehouse to this DS are major problems.

2. There was a total of 90 positions authorized for equipment support personnel to be working in the shop area, of which 46 positions were vacant or a vacancy rate of 51 percent. Of this number, about 18 vacancies were in the category of mechanics and mechanic helpers.

Minor Problems

The lack of a sufficient amount of small tools, the lack of some minor attachments for the equipment in the machine shop area and the lack of additional shop equipment to compliment the existing units were minor problems observed.

Conclusion

The shop has sufficient capacity to handle additional work load if the problems of manpower, spare parts, tools, and physical facility are resolved.

PHASE I - FIELD INSPECTIONS

Central Warehouse Addis: The inspection was made on May 4, 1976, with Ato Yohannes, ERA and Ato Keletta Tesfa Michael, Chief, Parts and Supply. Physical facilities were inadequate, however, it must be noted that considerable warehouse space is being utilized to store parts that are now obsolete. A new warehouse has been completed to allow segregating storage of spare parts for heavy equipment, i.e., Caterpillar. Additionally, further plans are underway to construct additional buildings to provide ample space. There is ample supply of both water and electricity. A card index system is being used for keeping an inventory of spare parts in addition to film machines, with plans to further improve the system. Apparently an adequate spare parts warehousing and follow-up system does exist. However, the operational personnel do not seem to be well acquainted with the system. Training is required.

The CWH has been going through a major change, trying to improve the services, i.e., they have developed a four phase spare parts identification and ordering system. The Phase I - order is already placed (about Eth$3 million); Phased II - documents are already in the hands of procurement; and Phase III is in the midst of preparation with Phase IV to follow. Plans are underway to computerize the spare parts operation. The spare parts list is prepared by the warehouse but the actual procurement is done by the Procurement Section. This procedure seems to cause unnecessary delays.

Major Problems Observed

1. There was a total of 201 positions authorized for the warehouse, of which 46 positions were vacant or a vacancy factor of 23 percent. However, out of this number apparently only three position vacancies are affecting operation. The major problem is that the present clerks assigned to the warehouse section do not have proper training to identify parts.

2. Frequently, construction equipment will have several components manufactured by companies other than the supplier.

3. Manuals (spare parts, operations and service) are normally stored in the warehouse where they can be obtained by the District Shops only by written requests.

4. The total value of spare parts stored in the warehouse is about Eth$12,000,000 of which about $3 million constitute obsolete items. Apparently, spare parts procurement, done under contract by AATC and supervised by an expatriate technician, did not consider ordering higher quantities of fast-moving spares and a less amount of the slow-moving spares. The results have contributed to the accumulation of a vast amount of obsolete spare parts.

Recommendations

1. The Central Warehouse carried about 81,000 line items. With this number of spares it is almost mandatory to have computerized spare parts tracking system.

2. The personnel working directly with spare parts should receive appropriate training to enable them to identify requested parts and substitutions.

The overall picture of the Central Warehouse operation seems promising. Apparently during the past year concrete steps have been and are being taken to address the supply and distribution problem.

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