

CHAPTER 6 CONCLUSION AND RECOMMENDATIONS

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Electric power is one of the most important energy sources for economic and social activities in any country. Power generation and supply capacities in Sudan are at a low level compared to those in other countries, and the Government gives high priority to increasing these capacities. Power demand forecast made by the Sudanese side was adjusted on the basis of past records and relevant report by a UK consultant. However, it is conceivable that additional demand may be generated after the power supply network is improved, as inferred from extremely low level at present. To meet increasing demand, stable (without outage) power supply of high quality (stable voltage and frequency) must be provided.

As to fuel oil transport, rail transport has much higher advantage over road transport. Also, this will contribute greatly to the improvement of SRC's management. Therefore, it is essential for both NEC and SRC to be fully committed to the accomplishment of the project.

The Study Team concluded that required equipment to be furnished under the project is six diesel locomotives (for fuel trains) with on-board radio equipment, although the request from the Government of Sudan is ten locomotives and telecommunication equipment. To make best use of these pieces of equipment, the following recommendations are made:

To the Government of Sudan:

- (a) To clearly define responsibilities of related organizations for major components of the fuel transport project, including fuel procurement, loading and discharge, reliable train operation, additional installation, operation and maintenance of facilities, and to monitor their performance all the time and give necessary advice and guidance to them.

To NEC:

- (a) To upgrade discharge facilities (improvement of station tracks, installation of heating facilities, addition of storage tanks) as planned.
- (b) To provide exclusive shunting locomotives.
- (c) To carry out efficient loading in consideration of capacities of the oil companies, and thereby to minimize loading time.

To SRC:

- (a) To establish an adequate utilization plans for diesel locomotives and carry out their maintenance in planned manners.
- (b) To secure the budget for spare parts and other costs required for efficient rolling stock maintenance, to upgrade the workers' technique and carry out reliable inspection and maintenance.
- (c) To provide shunting locomotives for efficient fuel loading and discharge through discussions with NEC.
- (d) To review the present train operation diagram and improve schedule speed. In particular, to reconsider the necessity of inspection of tank wagons and stopping time at way stations.

This study concludes that six diesel locomotives should newly be provided. The rest of the locomotives required for the project shall be provided by using existing locomotives or procured by other means. However, locomotive requirements can be reduced through efficient train operation which minimizes turn round time by implementing the above recommendations. Thus, further efforts are expected to be made by the Sudanese side.

APPENDIX

Appendix 1. List of the Study Team Members

Name	Assignment	Present Position
Tetsuya YAMAGATA	Leader	Deputy Director International Department, Japanese National Railways
Yoshitaro WATANABE	Project Coordinator	Second Project Management Division, Grant Aid Project Management Department, JICA
Kazutaka ARIMA	Railway Trans- portation Plan	Japan Railway Technical Service
Muneaki FUJIWARA	Rolling Stock Plan	- Ditto -
Yoshio SUGIMOTO	Telecommunication Plan	- Ditto -

Appendix 2. Study Schedule in Sudan

9/28 (Sat)	Arrival at Khartoum	
29 (Sun)	Visit for the Japanese embassy and SRC Discussion about Study schedule Explanation of Inception Report and Questionnaire	
30 (Mon)	Visit for NEC Explanation of Inception Report and Questionnaire	
10/1 (Tue)	Survey of power stations and terminal facilities at Khartoum	
	(A group)	(B group)
2 (Wed)	Go to Port Sudan (by air) Survey of fuel loading terminal (AGIP)	Go to Atbara (by train)
3 (Thu)	Survey of railway station	Visit for SRC head office Survey of SRC workshop
4 (Fri)	Go to Khartoum (by air) and to Atbara (by night train)	
5 (Sat)	Visit for SRC head office Explanation of Inception Report and Questionnaire Survey of SRC workshop, depot and telecommunication facilities	
6 (Sun)	Data collection and discussion with SRC	
7 (Mon)	Data collection and discussion with SRC Go to Khartoum (by night train)	
8 (Tue)	Arrangement of collected data	
9 (Wed)	Data collection and discussion with NEC and Ministry of Finance & Economic Planning	
10 (Thu)	Discussion about locomotive and telecommunication system with SRC chairman Discussion about collected data with NEC	
11 (Fri)	Internal meeting	
12 (Sat)	Discussion about the minutes	
13 (Sun)	Visit for the World Bank to get informations	
14 (Mon)	Signing on the minutes Reporting to the Japanese embassy	
15 (Tue)	Leave Khartoum	

Appendix 3. Minutes of Discussions

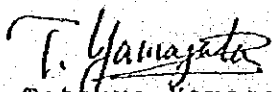
MINUTES OF DISCUSSIONS ON BASIC
DESIGN STUDY ON THE PREPARATION
PROJECT OF FUEL TRANSPORTATION
IN THE DEMOCRATIC REPUBLIC OF THE
S U D A N

In response to the request made by the Government of the Democratic Republic of the Sudan, the Government of Japan has dispatched through the Japan International Cooperation Agency a team headed by Mr. Tetsuya Yamagata (Deputy Director, International Department, Japanese National Railways) to conduct the basic design study on the Preparation Project of Fuel Transportation (hereinafter referred to as "the Project") from September 28 to October 15, 1985.

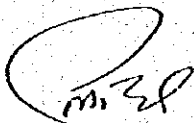
The team has carried out a field survey and had a series of discussions with the authorities concerned of the Democratic Republic of the Sudan.

As a result of the survey and discussions, the team and the concerned authorities have agreed to recommend to their respective Governments that the result of the survey and discussions attached herewith should be examined toward the realization of the Project.

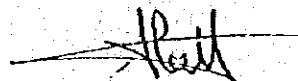
Khartoum, October 14, 1985



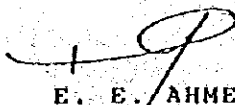
Tetsuya Yamagata
Team Leader,
Japanese study team



O. A. RAZIK
Representative
Sudan Railways Corp.



A/LATIF IBRAHIM
Representative
National Elect. Corp.



E. E. AHMED
Representative
Ministry of Finance &
Economic Planning

ATTACHMENT

1. The objective of the Project is to provide railway transportation equipment to improve fuel oil transport for electric power generation.
2. The implementation body of the Project on the Sudanese side shall be decided among the authorities concerned through coordination of the Ministry of Finance and Economic Planning.
3. The Government of the Democratic Republic of the Sudan expressed the desire that the Government of Japan takes necessary measures to cooperate by providing equipment listed in Annex 1 within the scope of the Japanese economic cooperation programme in grant form.

The team stated that, although the team would convey the abovementioned desire to the Government of Japan, the list of equipment in the Annex I should be subject to the further study in Japan.

4. The authorities concerned of the Democratic Republic of the Sudan have understood Japan's Grant Aid System.
5. The authorities concerned of the Democratic Republic of the Sudan have confirmed that the Government of the Democratic Republic of the Sudan will take necessary measures as listed in Annex 1 on condition that the grant aid by the Government of Japan is extended to the Project.

T.Y.

J.P.

04/30

Annex I

List of equipment requested by the Government of the Democratic Republic of the Sudan :

1. Diesel Electric Locomotive

Ten (10) diesel electric locomotives with 1600-1700 h.p. (nominal) of about 16. t axle loads.

" Explanation"

This is sufficient, with spare capacity for maintenance requirement, for four (4) block trains each with 28 rail tank wagons and two (2) locomotives and would be sufficient to carry 260,000 t of fuel oil annually to meet the planning standard requirement for electric power generation for 1987/88.

2. Telecommunication equipment.

- a) Radio equipment to link Khartoum, Atbara and Port Sudan independently from the existing telecommunication network for solely dedicating to fuel oil transportation
- b) Cabin Radio is to be installed in each locomotive.

T.Y.

H.P.

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Annex II

Following arrangement is required to be taken by the Government of the Democratic of the Sudan :

1. To secure necessary number of rail tank wagons mentioned in the paragraph 1. of Annex 1.
2. To bear necessary commissions based on the Banking Agreement.
3. To ensure unloading and customs clearance of the products supplied under the grant at ports of disembarkation in the Democratic Republic of the Sudan.
4. To exempt Japanese nationals from customs duties, international taxes and other fiscal levies which may be imposed in the Democratic Republic of the Sudan with respect of the supply of the products and services under the grant.
5. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the grant such facilities as may be necessary for their entry into the Democratic Republic of the Sudan and stay therein for the performance of their work.
6. To maintain and use properly and effectively equipment purchased under the grant.
7. To bear all the expenses other than those to be borne by the grant for the project.

T. Y.

HP

W. S. P.

Appendix 4. List of Collected Data

No.	Name of materials	Collected from
1	Map of existing lines and proposed expansion	SRC
2	Khartoum - Sudan light & power Burri Water Works & Power Station	SRC
3	Khartoum - Port Sudan Line diagram	SRC
4	Table of contents	SRC
5	Sudan Railways Corporation tender document for purchase of ten main line Diesel Electric loco.	SRC
6	Specification for the supply of 35 ton tank wagon	SRC
7	Standard structure and loading gauge	SRC
8	Loading gauge adopted for rolling stock after 1957	SRC
9	Analysis of working result by service 1982/1983	SRC
10	Time table (Khartoum - Atbara & Atbara - Haiya)	SRC
11	Working time table	SRC
12	Check list for inspection	SRC
13	Port Sudan - Khartoum operation diagram	SRC
14	Khartoum North Power Station layout	SRC
15	Burri Power Station extention realignment of track	SRC
16	Buffing and drawgear general arrangement	SRC
17	Transportation of oil products bogie tank wagons	SRC
18	Inspection and lubrication schedule	SRC
19	Answer to the questionnaire	NEC
20	Prospects Programmes and Policies for Economic Development III	Ministry of E. & F. Planning
21	Sudan Year Book (by Sudanow, 1983)	Bought

Appendix 5. Officials Consulted

Organ.	Name	Present Position
M. of P.	Mr. ELSEILCH ELICHIDER AHMED	Ministry of Finance and Economic Planning
SRC	Mr. ADAM ABUDEL MOMIEM Mr. HASHIM MOHAMED AHMED Mr. OMER ABDEL RAZIK Mr. MODAWI EL TIRAIFI Mr. FAHIM AZIN Mr. BALA ABUDEL RAHMAN Mr. ABBAS SIRALKHTIM Mr. MAOYIA FREGON Mr. FRANCIS MORGOS MAHROUS Mr. ABDALLA MOHMED ABUALKHAIRAT Mr. MOHMED ELBAHTALI Mr. ABDALNAHMAN MOHMED Mr. ARAB ELARABI Mr. AL MAGEED Mr. BABIKIR ABDALLA SAAD Mr. ABDALLA MOHAMED KHAMIS	Chairman Board of Director General Manager Deputy General Manager Director of Planning Technical Manager Traffic Manager Chief Mech. and Elect. Engineer Manager Telecom. and Signalling Deputy Chief Civil Engineer Deputy Chief Mechanical Engineer Deputy Technical Engineer Deputy Technical Engineer Deputy Regional Engineer (North) Deputy Regional Engineer (Central) Assistant Regional Engineer (East) Workshop Manager
NEC	Mr. ABUDEL LATIF IBRAHIM Mr. MUSTAFA CISMALLA Mr. ABBAS ELHASSAN ELHASSIN Mr. JOHN GINDI Mr. E.M. YASSIN Mr. SHARIF MOHAMED ALI Mr. MOHAMED GLAMIN SULIMAN Mr. AMIN SABRI AHMED Mr. MAHMOUD ABDU HUSEIN Mr. ABDEL EL RAHIM	General Manager Senior Director Finance and Admin. Senior Director Eng. and Operation Director of Planning Director of Operation Energy Resources Manager Manager Project Preparation Unit Manager Manag. Inform. Plan. & Proj. Port Sudan Port Sudan
AGIP	Mr. ABUDEL LATIF MOHD SAEED	Manager of AGIP Port Sudan
World Bank	Mr. JASDIP SINGN	Resident Representative

JICA