

# مشروع التنمية المحلية

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### LD II-P SPARE PARTS MANAGEMENT SYSTEM EVALUATION OF SECOND-PHASE PILOT IMPLEMENTATION

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**LD II-P SPARE PARTS MANAGEMENT SYSTEM  
EVALUATION OF SECOND-PHASE PILOT  
IMPLEMENTATION**

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## SECTION 1

# INTRODUCTION

This report evaluates the results of the pilot of the second phase of the LD II-P spare parts management system (SPMS) installation. It is submitted in partial fulfillment of the requirements of Task 6.2 in the Rolling Stock work plan.

The objective of the system is to support the use of local government rolling stock for service delivery in the roads, water, waste management, and firefighting sectors. The particular objectives of the SPMS within the overall rolling stock program are to reduce service interruptions due to breakdowns and to facilitate proper preventive maintenance by making spare parts available at the appropriate maintenance and repair locations.

The SPMS implementation strategy follows three stages, each of which provides a particular subsystem of the total SPMS:

1. Implementation of the Cardex system of parts classification and storage. Each part is tagged for identification and storage purposes. Part designation, number, price, group/subgroup and quantity in stock is recorded on a card (see Figure 1.1).
2. The parts control system (PCS), which centralizes the Cardex information of all the stores in the governorate at a control center and authorizes the control center's manager to transfer parts from stores where they are in excess of requirements to stores where they are in need.
3. The inventory control system (ICS), which sets out the normative parts stocking requirements for equipment under given operating conditions. The inventory control system permits a nearly exact science of inventory management, procurement planning, and service monitoring.

USAID has funded materials, technical assistance, and training for SPMS implementation for spare parts procured through the Decentralization Support Fund (DSF) and LD II-P Projects for DSF and LD II-P rolling stock in 16 provincial governorates. More than 2000 pieces of equipment, at a value of \$77 million, were delivered under DSF, with \$15 million worth of spare parts. Materials have included cards, cabinets, and metal shelving. Technical assistance has included manuals, field assistance, and training to store personnel in parts identification; classification, labelling, enumeration,

storage and location of parts; and training on the parts control system.

In both of the first two phases, the relevant subsystem has been implemented first in three governorates. In the remaining governorates, the system is somewhere between the first and second stages of implementation. The first stage is the most time-consuming in relation to TA resources. It has proceeded in its own substages, with the Cardex system established first only in the one store in each governorate with the most DSF parts. This substage has been completed in all the governorates. The second sub-stage has involved establishing the Cardex system in all the stores in the governorate with DSF parts. (A governorate typically has stores for each city council and for several directorates.) This substage concludes with the basic TA interventions of the second stage, namely the establishment of the master inventory in the parts manager's office, and training in the parts control system for storekeepers, the governorate maintenance coordinator (GMC), and Village Development Department officials at governorate and markaz levels. The two-day training covers the principles and procedures for parts issuance, accounting, and reporting, and the relation of the system to GOE warehousing laws. A critical element of this stage is the delegation of city council powers of parts control by the governor to the governorate maintenance coordinator. This enables the latter — who is the governorate maintenance coordinator — to authorize the transfer of parts among stores. At the time of writing, seven of the 16 governorates have completed the second stage: the three pilots and Red Sea, Asswan, Beni Suef, and Damietta governorates.

This report examines the consequences of both the generalization of the Cardex system and the implementation of the parts control system in the three pilot governorates of North Sinai, Fayoum, and Minya. Section 2 describes the methodology of evaluation. Sections 3, 4, and 5 evaluate system performance in each governorate. Section 6 compares the three cases and identifies areas which require attention. Section 7 presents recommendations.





## SECTION 2

# METHODOLOGY OF EVALUATION

As noted in Section 1, the evaluation set out to assess the performance of both the Cardex and the parts control subsystems in the pilot governorates. Since the Cardex system is essentially a means of parts placement which can operate autonomously at the level of the single store, while the parts control system (PCS) is essentially a means of redistributing parts between stores, the criteria for measuring system performance are not quite the same for the two systems. On the other hand, proper Cardex operation in all of the governorate's stores and regular reporting by the stores of their parts transactions (issuance/consumption and new acquisition) to the system's control center — the parts control section — is a necessary though not sufficient condition for successful PCS performance. As the roles of the stores and the control system section are different, different questionnaires were developed to guide the evaluation. A copy of the two questionnaires is provided in Annex I. The stores' questionnaire covered mainly the use of the Cardex system. The criteria of success here were:

- Maintenance and updating of the Cardex cards
- Rates of part consumption relative to pre-Cardex times
- The reorganization of the GOE 118 log book of the store to conform to Cardex designation and sequence
- The application of the Cardex system to non DSF parts.

The storekeepers were also encouraged to give their views of the system's benefits and difficulties.

The questions concerning the PCS were addressed to the governorate maintenance coordinator (GMC). Here the questions were concerned with:

- Rates of parts transfer from store to store
- Responsiveness of storekeepers to instructions to transmit parts
- Regularity of reporting on parts transactions by the stores to the control section
- System uses for parts procurement and O&M planning and monitoring

The interviews at both levels were, of course, supplemented by observations of the condition of parts storage and card maintenance in the stores and the state of PCS records.

Some remarks pertinent to the system's evaluation are relevant here. First, the velocity of parts circulation among stores is indicative of PCS performance, but it cannot be treated unqualifiedly as a measure of the system's effectiveness for a number of reasons. First, the PCS was intended to facilitate parts distribution mainly for specific repair and maintenance needs. It is not until the final subsystem of the total SPMS — namely, the inventory control system — is installed that the governorates will attempt an overall redistribution of parts among the stores in accordance with parts stocking norms for the particular items of equipment managed by the directorates, departments, or city councils. In fact, the more rational the distribution of parts among the stores in a governorate system, the lower the velocity of parts circulation we should expect. Hence, the initial distribution of DSF parts, which showed variable degrees of rationality from governorate to governorate, must be taken into consideration in interpreting the rate of parts circulation.

Another observation relevant to the rate of parts circulation is that since the parts control function is centralized in the GMC's office, the storekeepers do not necessarily know what parts are available in stores other than their own. The report will make reference in several places to the implications of this limitation.

Table 2.1 shows that the evaluation took place 10, 5 and 5 months respectively after the PCS training in the three governorates. While the TA contractor believes that sufficient time has elapsed for a preliminary assessment of system operations, it is obvious that evaluation at a later date will be necessary in order to measure the system's performance relative to its ultimate objectives of improving OM&P planning and procurement and increasing the rate of equipment utilization. It is also worth noting that the SPMS, by itself is a necessary but not sufficient condition for these achievements of the objectives.

**TABLE 2.1**  
**CARDEX/PCS IMPLEMENTATION CHRONOLOGY**

	<u>North Sinai</u>	<u>Fayoum</u>	<u>Minya</u>
Cardex Generalization	Dec 87-Feb 88	Mar 88-Feb 89	Mar 88-Jan 89
PCS Training Workshop	18 Dec 89	21 June 90	14 May 90
No. Trained	28	24	20
TA Person-Days			
Field	38	61	59
Office	12	10	10
Date of Evaluation	21-24 Oct 90	4-7, 18-19 Nov 90	8-10 Oct 90
Months of PCS Operation at Time of Evaluation	10 mos.	5 mos.	5 mos.

Table 2.2 provides summary data on some basic features of the system in the three governorates.

**TABLE 2.2**  
**SYSTEM CHARACTERISTICS**

	<u>North Sinai</u>	<u>Fayoum</u>	<u>Minya</u>
No. of DSF Items	44	112	102
No. of DSF Part Types	2936	4492	3587
No. of Stores (a)	9	10	12/8(d)
Largest DSF Store (b)	Arish City Council Store	Road Dept.	Gov'te Maint. Center
GMC Affiliation (c)	Headquarter Garage Engineer	Gov'te Village Develop. Dept	Gov'te Roads Director

**Notes:**

- a. Number of stores with DSF part holdings.
- b. Store with the largest number of DSF parts.
- c. Formal position of GMC in local administration. North Sinai and Fayoum GMCs are mechanical engineers. Minya GMC is a civil engineer.
- d. See Section 5.

## SECTION 3

# NORTH SINAI

### EQUIPMENT AND PARTS DISTRIBUTION

North Sinai received 44 pieces of DSF equipment. Roughly a quarter of the items are road equipment, and another quarter is made up of waste conveyance equipment. Also, there are seven fire engines, some water system components, and seven generators. The annex to Section 3 shows the distribution of the equipment among the governorate headquarters garage, the six city councils, the Roads Directorate, and the fire department.

Only one piece of equipment is held by the Roads Directorate. The fire engines are all held by the fire department. Two truck tractors are held at the HQ garage. The other 34 items are distributed among the city councils, with Arish, the governorate's capital and largest city, holding more than a third of these.

There were 2936 types of parts received. Complete package sets of parts were provided for the motor graders, hydro crane, desalination unit, tire dozers, fire engines, and generators, and these sets were distributed with the equipment. Parts for the other items — most of the city council holdings — were distributed randomly and often in incomplete sets.

### PARTS CONTROL

The governorate maintenance coordinator is the governorate headquarters garage engineer, and the parts control center is at the HQ, even though the HQ Garage has only two pieces of DSF equipment. Cardex was first installed in the Arish City Council Store, the store with the largest number of DSF items (12 out of 44).

Table 3.1 shows the number of part transfers since the PCS was installed in December 1989. Only 15 parts have been transferred. Most of the transfers have been from the Arish store to other city councils (mainly Bir El Abd). As one would expect, these include all types of parts, which were maldistributed initially.

**TABLE 3.1  
PARTS TRANSFER**

FROM	TO	PARTS ISSUANCE DATE	ITEMS			EQUIP. TYPE
			Qty	Part No.	Part Description	
Sheikh Zuwayid CC	Rafah CC	14/1/90	1	469478C1	Dip stick engine oil gauge	IH sewage truck
Arish CC	Rafah CC	27/1/90	1 1	ST518 394292C93	Bearing plate	IH sewage truck
Arish CC	Hasana CC	20/2/90	1	287374	Water Pump	Gen. set 60 KW
Arish CC	Bir El Abd CC	20/5/90	1 1 1	7N0208 7N0944 3L1425	Thermostate Gasket Bearing	Cat Dozer 814B
Arish CC	Bir El Abd CC	10/6/90	1 1 2	7N0718 4M1812 1M4898	Switch Solenoid Sealed Beam	Cat Dozer 814B
Arish CC	Bir El Abd CC	8/7/90	1 1	6055 6054	2" sight Glass 2" Gasket	IH sewage Truck
Arish CC	Bir El Abd CC	24/7/90	1	394292C93	Plate	IH sewage truck
Arish CC	Bir El Abd CC	18/9/90	1 1	5V1246 1W0613	Diaphram Indicator	Cat Dozer 814B

In assessing the low velocity of parts circulation since the PCS was installed, two local factors are relevant. The first is that the governorate contracts out much equipment repair work and the city councils contract out solid waste removal and cleaning. A second is the distances between some cities, especially Hasana and Nikhl, which are 90 to 150 kms respectively from Arish.

## **STORE REPORTING**

The Arish city council storekeeper sends bi-weekly reports to the parts control center. The storekeepers of the Bir El Abd, Sheikh Zuwayyid, and Rafah city councils send monthly reports. The Hasana and Nikhl stores only report when they have issued parts; this is apparently rare.

## **PROCUREMENT PLANNING**

The GMC claimed that the parts control system data proved to be of great use in planning parts procurement and in updating the O&M budget for rolling stock. He also claimed that the PCS helps him to refine his estimates of part consumption requirements.

## **CARDEX IMPLEMENTATION**

Cardex implementation was evaluated from the standpoint of increased parts consumption and from the standpoint of sustainability.

A major positive impact of the Cardex system has simply been to familiarize storekeepers with their holdings and therefore to enable some long-awaited repairs. A comparison of issuance rates for selected parts between the first six months of 1989, before Cardex was installed in all governorate substores, and the first six months of 1990, showed the quadrupled rate of parts issuance detailed in Table 3.2.

The sustainability of the Cardex system can be measured in two ways. The level of storekeeper commitment to in the system is demonstrated in his choice to apply Cardex designations and the Cardex parts listing sequence to his GOE 118 parts log. This has been done in all the stores except the Nikhl city store. (A new store was opened in Nikhl after the Cardex system was installed in the original store; most parts were moved to the new store.)

A higher level of commitment is demonstrated in the application of Cardex to non DSF parts holdings. This has been done in the Arish store, the store with the largest number of DSF and non DSF parts.

**TABLE 3.2  
CONSUMPTION RATES FOR SELECTED PARTS,  
BEFORE AND AFTER CARDEX INSTALLATION**

ITEM	PERIOD 1/1/89 - 30/6/89	PERIOD 1/1/90 - 30/6/90
IH trucks (dump & sewage  Oil filter for oil cooler 970165R1  Gasket for oil filter 887525R1  Oil filter (for sewage pump oil lines) 4022.3000- 01	   1  Zero  Zero	   6  6  3
Cat Dozer 814B Hydraulic oil filter 9J5461  Seal for hydraulic oil filter 6D9157  Fuel water separator 8N9803  Kit (for Air Compressor Repair) 7N7436  Repair Kit (for turbocharger) 6N7245  Bearing for Alternator 5P6920 and 5P9514	   3  2  2  Zero  Zero  Zero	   4  4  4  2  2  2

**DSF EQUIPMENT DISTRIBUTION  
(NORTH SINAI)**

Type of Equipment	Qty	EL Arish CC	Bir EL-Abd CC	EL Sheikh Zwd CC	Rafah CC	Hassana CC	Nekhel CC	Gov. HQs	Fire Dept	Road Dept
Bulldozer on tires caterpillar 814B	2	1	1							
Motor grader John Deere	2	2								
Crane Mobile Grove	1	1								
Generating sets 60 kw	7	1	1	1	1	2	1			
Brackish water desalination unit	1					1				
Vert. deep well pumping unit	3	3								
Bulldozer Caterpillar D7E *	3	1				1	1			
Loader Fiat Allis*	2					1				1
Fire fighting truck medium	1								1	
Fire fighting truck light	6								6	
Dump truck IH rear tipping	4		2	1		1				
Truck tractor IH	6				2	1	1	2		
Sewage dumping Truck IH	5	2	1	1	1					
Articulated Beam Truck Ford F600	1	1								
<b>Total</b>	<b>44</b>	<b>12</b>	<b>5</b>	<b>3</b>	<b>4</b>	<b>7</b>	<b>3</b>	<b>2</b>	<b>7</b>	<b>1</b>

\* US army surplus equipment

## SECTION 4

# FAYOUM

### EQUIPMENT AND PARTS DISTRIBUTION

Fayoum received 112 DSF equipment items; their distribution among the Roads Directorate, fire department, water utility, five city councils, and two public investment projects is shown in the annex to this section. Ninety percent of the road equipment is at the Roads Directorate garage, the remainder at the Fayoum city garage. All fire and water equipment went to their respective governorate-level authorities. Each of two productive projects got a sewage suction truck. The city council holdings are mostly dump trucks, sewage and solid waste removal trucks, and water spray trucks. The Roads Directorate, Fayoum city council, and fire department hold nearly 60 percent of the equipment.

Fayoum also received 4492 parts. All were initially stored at the Roads Directorate's store until December 1988 when a redistribution was decided upon; implementation took place in the latter half of 1989. Parts redistribution mostly followed equipment holdings, with the following major exceptions. All road equipment parts were kept at the roads garage, though the Fayoum city council has about five pieces of road equipment. The roads store also kept all parts for IH trucks and for GM8.2L engines (for Ford F800 trucks); most of these types of equipment are held by city councils.

The initial installation of the Cardex system was at the roads store.

### PARTS CONTROL

The governorate maintenance coordinator is a mechanical engineer in the village development department.

There have been substantial parts transfers since PCS installation. These transfers, summarized in Table 4.1, have been of three types:

- Full sets of Gallion grader parts were distributed to four city stores. Approximately 2,452 parts were redistributed in this manner, effectively decentralizing the capability for M & R of this type of equipment. (Annex III contains the requisitions for Ebshewai city council).
- Another 72 parts were transferred in response to requests from city stores. (Annex IV details these transactions.)

- Forty parts have been transferred from the roads store to city stores by the GMC in anticipation of or response to scheduled visits of equipment dealers for M & R purposes. (Annex V details these transactions.) This practice provides several benefits other than the obvious one of making the parts available at the time of the contractor's visit. It lowers the cost of the contract, since the local government is providing the materials. It also keeps the GMC, who attends these sessions, apprised of the condition and parts needs of the cities' equipment.

**TABLE 4.1  
PARTS TRANSFER**

<u>Basis</u>	<u>No. Types</u>	<u>No. Parts</u>
Redistribution of Gallion grader parts	105	2,542
City store request	33	72
M & R contract work	25	40

## **STORE REPORTING**

Storekeeper reports on parts transactions (consumption and acquisition) have been less frequent than was hoped. One of six stores has reported monthly, three every two months, one only when parts were issued, and one never. Moreover, the city reports do not always include new parts acquisitions. (The cities have signed contracts for parts procurement, with agencies other than the M & R contractors, and for different types of parts.)

## **PROCUREMENT PLANNING**

The irregularity or infrequency of store reports makes parts procurement planning and budgeting particularly difficult for the Fayoum GMC because the city councils have signed parts procurement contracts. Without information on the new acquisitions, the GMC cannot be certain of procurement needs or of rates of consumption by different stores and for different types of equipment.

## CARDEX IMPLEMENTATION

Parts issuance has been the most rapid in the two stores with the most equipment, namely the roads store and the Fayoum city store. Both fast and slow moving parts were issued in these two stores; the other stores issue mainly fast moving parts of the sort needed in preventive maintenance, such as filters.

Storekeepers in four cities have rearranged the 118 log to conform to the Cardex organization. The Fayoum city storekeeper wishes to do so, but claims he does not have the time, and the evaluation team can corroborate this claim. His store has a larger number of non DSF parts than DSF parts.

City storekeepers are now routinely classifying and storing new parts acquisitions according to Cardex (although they are not always reporting the GMC.)

The most impressive evidence of Cardex sustainability comes from another quarter. The keeper of another Roads Directorate store, which houses non DSF parts — a store which received no TA in Cardex because it holds no DSF parts — has begun to adopt the system for his store. This step could portend a truly comprehensive SPMS in the governorate.

**DSF EQUIPMENT DISTRIBUTION  
(Fayoum)**

Type of Equip.	Qty	Road Dept.	Fayoum CC	Abshewal CC	Etsa CC	Senouris CC	Tamia CC	Water Dept	Fire Dept	Poultry Proj. in El Azab	Brick Factory in Kom Oshlem
Bulldozer on tires Caterpillar 814B	1	1									
Motor grader John Deere	2	2									
Motor grader Gallion	4			1	1	1	1				
Loader 1.5 yr cu. John Deere	1	1									
Loader w/backhoe IH-Dressser	1	1									
Road roller Dynapac	1	1									
Road roller Ingersol-Rand	1	1									
Asphalt finisher Lee Boy	2	1	1								
Asphalt mixer	4	2	2								
Mobile crane Grove	1	1									
Gen. set 200 kw Allis-Charmers•	1		1								
Fork lift •	1						1				
Motor grader Cat 120G •	1		1								
Bulldozer Cat D7E	1	1									
Tire repair Machine •	1				1						

Type of Equip.	Qty	Road Dept.	Fayoum CC	Ebsheawal CC	Etsa CC	Senouris CC	Tamia CC	Water Dept	Fire Dept	Poultry Proj. in El Azab	Brick Factory in Kom Oshlem
IH Dump truck 3-Way Tipping	3	3									
IH dump truck Rear Tipping	2	1	1								
IH dump truck Rear Tipping	15	11		1	1	1	1				
IH sewage dump truck	6		2	1	1	1	1				
IH Water spray Truck rear spray	5	1		1	1	1	1				
Cesspit emptying Ford F800	10		2	2	1	2	1			1	1
Water spray Truck Ford F 800	6		2	1	1	1	1				
Small refuse trucks Ford F350	10		2	2	2	2	2				
Refuse trucks Ford F800	5		1	1	1	1	1				
Refuse incinerators	5		5								
River water purification compact units	3							3			
Fire fighting Truck Medium	2								2		
Fire Fighting truck light	7								7		
Small Fire Truck	10								10		
<b>Total</b>	<b>112</b>	<b>28</b>	<b>20</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>3</b>	<b>19</b>	<b>1</b>	<b>1</b>

\* US army surplus equipment

## SECTION 5

# MINYA

### EQUIPMENT AND PARTS DISTRIBUTION

One hundred and two items of DSF equipment were distributed among the Roads Directorate, Fire Department, and nine city councils (see section annex). More than two-thirds of the items are in three garages: those of the Roads Directorate, fire department, and Minya city council. As in other governorates, city council holdings are mainly waste conveyance trucks of various sorts.

Distribution of the 3587 types of parts was highly centralized. All roads and fire equipment parts were stored at the respective governorate - level department's store. Parts for seven water treatment units are stored on site. All other parts, including parts for all city council equipment, were given to the store at the governorate main maintenance center (GMMC), though the initial Cardex installation was at the roads store. Two reasons were given for the pattern of parts distribution: limited storage capacity at the city stores and the large investment of funds and skilled personnel in the GMMC.

### PARTS CONTROL

The GMC is the Roads Director; his assistant engineer is also heavily involved in the PCS.

The parts control system is the most unusual of the three pilot cases, because of the centralization of parts at the GMMC. Actually, there are two control centers. The larger is at the GMMC. It covers the parts holdings of the Roads Directorate, city councils, and fire department, and storing the parts for all equipment except the fire engines, whose parts are in the fire department store.

The second control center, at the governorate Housing Directorate, (GHD) covers the parts for the seven water treatment units. These parts, as noted above, are stored on site to enable operators to respond quickly to service interruptions. But parts transactions are reported to the GHD by the relevant city council engineering departments.

There is little need for parts transfer under this pattern of parts distribution. The compact units' parts requirements are nearly identical, and the units were given equal numbers of

parts. All other parts are stored by the governorate, mostly in a single store at the GMMC. While the GMMC can send parts to a city store for repair work, the concentration of skilled labor at the GMMC constrains most M & R work to the GMMC, including work on the fire engines.

## **STORE REPORTING**

The centralization of parts and of repair work makes reporting largely redundant. Compact unit parts transactions are reported to the GHD every three months.

## **PROCUREMENT PLANNING**

The centralization of parts and repair work greatly facilitates procurement planning, since the GMC is well-appraised of parts consumption rates. However, two provisos are in order. First, comprehensive procurement planning awaits the development and installation of the inventory control system, since local technical and data processing capabilities are not yet sufficiently developed to enable OM & R officials to set out accurate normative, minimal, and maximal stock requirements for all sorts of parts.

More importantly, the centralization of parts and repair activities in the GMMC must raise the question of whether such a system can be fully responsive to the repair needs of the city councils. As noted in Section 2, the city councils do not necessarily know what parts are available at the central stores. Moreover, even if city OM & R officials are quick to request repair from the GMMC, there is considerable delay involved in the transportation of the equipment needing repair to the center. The centralization of the system is strengthened by the concentration of skilled OM & R manpower. If the system is not fully responsive, then the parts consumption data at the control center underreflect actual parts needs.

## **CARDEX IMPLEMENTATION**

Few parts were issued for the water treatment units; most of them were fuses. At the GMMC however, a significant increase in parts consumption was documented for selected parts. Table 5.1 compares issuance of parts for the city councils' nine Ford F350 garbage trucks for the five months since the Cardex system was implemented with that of the previous five years.

Note that these are not especially slow-moving parts, though the GMMC has issued slow-moving parts as well. The data

strongly support the conclusion that the very existence of these parts was not recognized prior to Cardex installation because of the arbitrariness of the designations used under the 118 log system and the wretched storage conditions.

The 118 log book in the GMMC was rearranged in accordance with the Cardex System. There are no non-DSF parts in the GMMC.

As the on-site water plant stores are not official stores, there was no 118 log to begin with, and Cardex provided these stores with a parts labelling and storage system, which the plant operators are applying to new acquisitions as well as existing parts. Parts transactions are reported to the city council storekeeper, who reports them to the GHD control center every three months, but the city stores were never installed with Cardex, and the storekeepers continue to use the 118 log system.

**TABLE 5.1  
CONSUMPTION RATES FOR SELECTED PARTS,  
BEFORE AND AFTER CARDEXIZATION**

<b>Part No.</b>	<b>Part Description</b>	<b>No. Rec'd in 1985</b>	<b>No. In stock 1-5/90</b>	<b>No. In stock Oct. 90</b>	<b>Parts consumption Jun-Oct 90</b>
E5TZ-9J288CB	Fuel water separator	2	2	Zero	2
D20Z-10A304A	Bearing alternator	2	2	Zero	2
E3TZ-12B536A	Indicator for heating coil	2	2	Zero	2
E0TZ-3B203B	Insulator for front tie rod	8	8	4	4
E5TZ-5493C	Insulator for rear tie rod	16	16	8	8
E1TZ-7234A	Spring for shaft of gear fork shift	5	5	2	3
E0TZ-1190F	Retainer, grease front wheel	4	4	2	2
E4TZ-2004A	Repair kit master brake	8	8	4	4
E0TZ-3A525A	Flange for steering column	2	2	1	1
D6ZZ-7052A	Seal for output shaft	2	2	2	2

**DSF EQUIPMENT DISTRIBUTION  
(MINYA)**

Type of Equipment	Qty	Road Dept	Minya CC	Abo Korkas CC	Beni Mazar CC	Dair Mowas CC	El Edwa CC	Maghagha CC	Malawy CC	Matal CC	Samalout CC	Fire Dept
Bulldozer on tires Caterpillar 814B	1	1										
Loader 1.5 cu. yr. John Deere	1	1										
Asphalt mixer	1								1			
Motor grader Gallion	4	4										
Road roller Dynapac	1	1										
Motor grader Wapco 440AH*	2	2										
Bulldozer Cat D7E*	3	3										
Road roller Hupper*	1	1										
Loader Fiat Allis*	1	1										
Artesian water treatment units for Mn & Fe	5		2	1		2						
River water pur. compact units	2						1		1			
IH dump truck rear tipping	5	5										
IH dump truck rear tipping	4		1			1	1			1		
IH sewage dumping truck	10		2	1	1	1	1	1	1	1	1	
IH water spray truck rear spray	7	7										

\* US Army Surplus Equipment.

Type of Equipment	Qty	Road Dept	Minya CC	Abo Korkas CC	Beni Mazar CC	Dair Mowas CC	El Edwa CC	Maghagha CC	Malawy CC	Matal CC	Samalout CC	Fire Dept
IH water spray truck front (st. Flasher)	1		1									
IH refuse collecting truck with compactor	1		1									
Sewage pipe cleaning truck jet type ford F800	1		1									
Refuse Truck Ford F800	4		1		1		1			1		
Cesspit emptying truck Ford F800	9		1	1	1	1	1	1	1	1	1	
Water spray trucks front & rear Ford F800	1		1									
Rear spray truck sprinklers Ford F800	3	3										
Small refuse trucks Ford F350	9		3	1	1		1		2	1		
Fire fighting trucks medium	4											4
Small fire trucks Ford F250	20											20
Truck tractor and trailer	1		1									
<b>Total</b>	<b>102</b>	<b>29</b>	<b>15</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>2</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>24</b>

## SECTION 6

# CONCLUSION

### SUMMARY OF GOVERNORATES' PERFORMANCE

#### North Sinai

The evaluation found that there was a relatively low rate of parts transfer after 10 months of system operations. The use of private contractors for many equipment-based services, such as solid waste collection is certainly relevant to this low rate of transfer. Also of the six city councils, one alone accounts for much of the limited transfer activity, suggesting that the commitment of city council officials to equipment utilization is an important variable in parts control system performance.

The reporting of parts transactions to the control center occurred less than the weekly frequency requested in the parts control system training. Actual frequencies varied between bi-weekly, monthly, and occasional, and were directly related to the physical distance between the store and the control center.

Cardex installation has had dramatically positive effects on the rate of parts consumption. Only one of the six city stores has not rearranged the 118 log to conform to the Cardex system, and the Arish City Store is now installing Cardex for non-DSF parts as well.

#### Fayoum

In quantitative terms, Fayoum has the highest rate of parts transfer of the three governorates. In addition to responses to city store requests, the governorate has effected a mass redistribution of Gallion grader parts to city councils. Moreover, the governorate maintenance coordinator has taken the initiative of using the PCS to work closely with equipment M & R dealers to assure the timely provision of spare parts to work locations.

Reporting is the problem area in this governorate. Report frequencies vary from monthly, to bi-monthly, to occasional, to never (in a setting in which distances from the cities to the control center are not great). Another problem is that the reports do not always contain information about the acquisition of DSF-type parts by the stores. The resulting uncertainty makes it difficult for the GMC to confidently assess parts consumption rates and to plan new parts procurements.

Most city storekeepers are revising the 118 log to conform to the Cardex system. The Fayoum City Council storekeeper wishes to do so, but has not yet had enough time. The storekeepers are also applying Cardex to new parts acquisitions but, again, the shortage of shelves acts as a constraint. The keeper of the main non-DSF parts store is also beginning to apply the Cardex system.

## **Minya**

The centralization of parts and repair activities, with the exception of on-site storage of parts for compact units, to the main governorate maintenance center, has meant that the parts control system is somewhat redundant. On the other hand, the cardexization of the GMMC store has resulted in a dramatic increase in parts consumption and repair work.

## **CONCLUSIONS**

### **Achievements**

Parts consumption has increased substantially in all cases, suggesting that the Cardex system implementation has achieved its main objective of facilitating repairs and preventive maintenance.

The vast majority of storekeepers have demonstrated their conviction in the value of the Cardex system by rearranging their 118 log books to conform to Cardex designations and sequences. In many cases, efforts are being made to extend the system to the classification and storage of non-DSF parts.

The important step of obtaining governorate-level approval for the centralized management of DSF parts has been achieved in all three governorates.

Rates of parts transfer have been high in Fayoum, where the PCS has been used to decentralize road equipment maintenance and repair functions and to develop new symbiotic relationships between the governorate maintenance organization and its private-sector M & R contractors. The deliberate centralization of parts in the Minya case makes the question of the rate of transfer irrelevant there. North Sinai's low transfer rate may be partly related to the fact that, since equipment is provided by service contractors, much of its city equipment is not used, but it also seems to reflect genuinely low levels of OM & R interest on the part of some of the city councils.

All three GMCs have affirmed that the system increases their capability to estimate parts consumption rates, measure inventory, monitor OM & R activity rates, and plan for new spare parts procurements.

## Problems

The evaluation was not able to measure the relationship between present and optimal rates of parts consumption. Since a general equipment condition assessment was beyond the scope of the evaluation and since the inventory control system has not yet been developed, we cannot say whether a given rate of parts consumption is adequate for local repair needs.

In this regard, let us first recall the obvious, namely that spare parts management is only one element in the total OM & R system. Storekeepers have little authority to initiate OM & R actions; if a city's engineering personnel lack motivation or do not attribute significance to an equipment problem, a needed part may not be requested.

On the other hand, the question may be related to what was clearly identified as a performance gap in the SPMS: the infrequency and/or inadequacy of parts transactions reporting by subsidiary stores. We have noted in several places in this report that the subsidiary stores do not necessarily know what parts exist in other stores in the governorate. This may reduce requests for parts. The Recommendations section below proposes a limited computerization effort of data entry and quarterly inventory report circulation to the stores, with the aim to publicize parts availability and encourage storekeepers to view regular reporting as beneficial to all system users.

Another area in which the evaluation has been necessarily limited is in its ability to assess the impact of the system on OM & R planning. As noted in 6.2.1 above, all GMCs report that the system has increased capability in this area. We have no doubt about this, but we must also note that inadequate reporting of parts transaction by stores can lead to either overprocurement or underprocurement of new parts, and that, as already noted, SPMS performance is only one part of overall OM & R system performance. Parts consumption rates can be influenced by under-, over-, or mis-utilization of equipment, as well as other factors. In any case, the parts replacement norms to be developed under the inventory control system will facilitate local governments', and our, capability to relate actual rates of parts consumption to OM & R planning, budgeting, and monitoring. Finally, the limited local government experience with the current system prior to the evaluation — only five months in two cases — is insufficient for a definitive assessment of this aspect of system performance.

## SECTION 7

# RECOMMENDATIONS

### PART TRANSACTION REPORTING

The evaluation found that infrequent and inadequate reporting of local parts transactions to the parts control center is the most widespread (system operations) deficiency in the pilot governorates. It was argued that this has several negative implications for system performance. Some storekeepers may find the English part numbers difficult to transcribe. Also, in some governorates, the distances between the subsidiary stores and the parts control center are too great, and means of transportation too limited, for weekly reporting. We suspect however that a third factor is also at work. The PCS, as currently constituted, centralizes the information on the governorate-wide inventory at the parts control center. Subsidiary stores therefore do not necessarily know what parts are available in the governorate system. This almost certainly affects their capability to request parts.

We suggest that the governorates be encouraged to initiate a process of cross-reporting between the center and the stores. It is proposed that the center send complete inventory lists of all governorate holdings to each store every three or six months, in return for subsidiary store parts transaction reports to be sent to the center not less than once a month.

We believe that the implementation of this recommendation would have three salutary consequences:

- It will instill a mutualistic attitude to information exchange, motivating storekeepers to report more frequently and accurately.
- It will increase the number of requests for parts.
- It will facilitate the GMC's inventory, planning, and monitoring tasks.

The third benefit points to the main requirement for the recommendation's implementation, namely, that computer operators of the governorate village development department set up a data base for the inventory data (the file structure is already given in the Cardex card) and enter the data from the control center files. While the initial data entry operation may be time-consuming, the subsequent data entry tasks would involve only quarterly updates. (An information systems advisor should visit one or two governorates with SPMS advisors to estimate the time

required and available for the data entry.) The quarterly inventory would then be photocopied and sent to each store.

This recommendation implies only a limited computerization effort and no computer or network procurement, and thus should not be confused with the full-scale computerized data base and local area network contemplated for the implementation of the inventory control system phase.

## **SPMS EXTENSION**

More thought needs to be given to ways of extending SPMS benefits to the entire local government equipment sector. One way in which this may be done is for USAID to consider allowing these governorates which have shown interest in extending the system to non-DSF parts to use LD II-P or LA Bab II funds to purchase additional Cardex cabinets and metal shelves, especially where the parts are for equipment that delivers basic services. It is obvious that interventions of this type will lead to more comprehensive and therefore better inventory control, leading in turn to higher levels of basic service delivery. Moreover, as the Village Infrastructure Maintenance Survey (Chemonics/Cairo, September 1986) noted, USAID-financed equipment is in relatively less need of repair than older GOE investments.

## **PILOT GOVERNORATES**

The three governorates discussed in this report have been the pilot governorates for the first two phases of SPMS implementation. However, we recommend that North Sinai not be included as a pilot in the implementation of the third phase (the inventory control system) for two reasons. First, its performance in the second stage has suggested relatively low levels of commitment, and second, it makes extensive use of private contractors for equipment repair, solid waste removal, and cleaning services. Since the inventory control system pilot phase should include at least one desert governorate, and in view of the importance of environmental variables for the definition equipment utilization norms, another desert governorate should be selected as a pilot. We suggest the New Valley. Apart from its generally high standard of LD II-P performance, New Valley has a skilled and energetic computer section in its Development Department.

## **ANNEX I**

### **Evaluation Questionnaires, with North Sinai and Fayoum Responses**

# Section I

## Local Unit Stores

### 1 - Basic Data:

City: \_\_\_\_\_ Governorate: \_\_\_\_\_  
Completion date of Cardex system: \_\_\_\_\_  
Store affiliated with: \_\_\_\_\_  
Name of storekeeper: \_\_\_\_\_  
No. of pieces of equipment with spare parts: \_\_\_\_\_  
Type of equipment with spare parts: \_\_\_\_\_

**First: Storekeeper's use of the Cardex System:**

1 - Have you issued spare parts since the completion of the Cardex System?

No   
Yes

1.1. If "Yes": How many requisition forms have you issued till now?  
\_\_\_\_\_

1.2. Type of parts issued: Fast moving: \_\_\_\_\_  
Slow moving: \_\_\_\_\_  
Other: \_\_\_\_\_

2 - Have you used the Cardex System cards and log book No. 118 to keep track of parts issued?

Yes   
No

If "No": Why not? \_\_\_\_\_  
\_\_\_\_\_

3 - Do you have any difficulty in locating spare parts in the store now that you are using the Cardex System?

No   
Yes

If "Yes": Why not? \_\_\_\_\_  
\_\_\_\_\_

4 - Have you rearranged the log book No. 118 to be compatible with the Cardex System parts card sequence?

No   
Yes

4.1. If "No": Why not? \_\_\_\_\_  
\_\_\_\_\_

5 - Are there any advantages to using the Cardex System?

5.1. Yes  No   
Explain: \_\_\_\_\_ Explain: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Second: How Useful is the part control System?**

1 - Were there any parts (needed) that turned out to be unavailable in the store?

No   
Yes

1.1. *If "Yes"*: What action was taken? -----  
-----

2 - Did you contact the governorate maintenance coordinator to check availability of the required parts in other stores?

Yes   
No

2.1. *If "No"*: Why -----  
-----

3 - Are there any administrative procedures that should be followed before visiting the governorate maintenance coordinator?

No   
Yes

3.1. *If "Yes"*: Indicate procedures: -----  
-----

4 - How was the GMC contacted to check availability of the required parts?

By a visit   
By telephone   
By other means

5 - Did you obtain the parts which were been not available in your store from another local unit store?

No   
Yes

5.1. *If "Yes"*: Name the parts and the local council -----  
-----

6 - Have any parts been issued from your store for the repair of other local council equipment?

No   
Yes

6.1. If "Yes": Name the parts -----  
and the local council -----

**Third: How well do local councils coordinate with the GM coordinator in making use of the parts control system?**

- 1 - Do you regularly report the stock status to the GM coordinator?  
If "Yes" [ ] If "No" [ ]

1.1. Name reporting intervals ----- Indicate reasons -----  
and attach copy of last report -----

- 2 - Did you have any difficulty in obtaining parts from other stores once you have the GM coordinator's approval?  
No [ ]  
Yes [ ]

2.1. If "Yes": Indicate those difficulties: -----  
-----

- 3 - Did any local council order parts from this store, and have the order rejected although the parts were available?  
No [ ]  
Yes [ ]

3.1. If "Yes": name the reasons: -----  
-----

- 4 - Is there any problem with obtaining the GM coordinator's approval to get parts from another local council's store?  
No [ ]  
Yes [ ]

4.1. If "Yes": name the reasons: -----  
-----

## Section II

### Parts Control Section

#### 1 - Basic Data:

Governorate:-----  
Parts control system completion date:-----  
No. of DSF Parts stores in the whole governorate:-----  
Date of visit:-----  
Name of GM coordinator:-----

**First: DSF parts status, prior to parts control system application:**

- 1 - Were there any criteria set for DSF parts distribution?  
No   
Yes

*If "Yes":* Name the criteria: -----  
-----

- 2 - Were parts exchanged among various local council stores before the parts control system was introduced?  
Yes   
No

*If "Yes":* Name:  
- Local councils that exchanged parts: -----  
- Type of parts exchanged: -----  
- System used: -----

- 3 - Was there any system in use for DSF equipment parts control in local council stores?  
No   
Yes

*If "Yes":* Explain that system -----  
-----  
-----

**Second: DSF parts status, after parts control system application:**

1 - Are local councils regularly reporting the status of parts stock to the governorate parts control section?

No   
Yes

*If "No":*

- No. of local councils that did not report: -----
- Action taken: -----

2 - Were any parts issued to another local council to repair broken down equipment?

Yes   
No

*If "Yes":*

- No. of local councils: -----
- Type of parts issued: -----

3 - Were parts exchanged between stores in different local councils if there was a surplus in one store and shortage in another?

No   
Yes

*If "Yes":*

- Type of parts exchanged: -----
- Local councils that exchanged parts: -----

4 - Was any requisition order, countersigned by the governorate maintenance coordinator, made to another local council store turned down by its officials?

No   
Yes

*If "Yes":*

- Why?: -----
- Action taken: -----

**Third: How the parts control system is operating in the governorate:**

1 - When requesting parts available in more than one local council store how do you choose which particular store to submit your request to?

- Availability of larger quantities
- Nearby store
- Other reasons: -----  
-----

2 - Did you experience any problems in using the parts control section's cards to keep track of the balance of parts, according to reports received from local council stores?

- No
- Yes

2.1. If "Yes": Indicate those problems: -----  
-----  
-----

3 - Did local council storekeepers or maintenance officials experience any problems as a result of insufficient information on requested parts (e.g., part no., main and subgroup)?

- No
- Yes

3.1. If "Yes": indicate those problems: -----  
-----

4 - Have you noted any local council that issues or requests parts at unusually short intervals, indicating improper use of equipment or poor fixing of parts?

- No
- Yes

4.1 If "Yes":

- Local council: -----
- Type of equipment: -----
- Type of parts: -----
- Action taken: -----

**Results of Parts Control System Evaluation  
Questionnaire for North Sinai Governorate**

**Results of Parts Control System Evaluation  
Questionnaire for North Sinai Governorate**

**Section 1  
Sub-Stores**

**I. Storekeeper's use of the Cardex system**

Question No.	Question	El Arish	Bir El-Abd	Shelkh Zowayed	Rafah	El-Hasana	Nekhel	Gov. H.Q.
1	Have you issued spare parts since the completion of the Cardex system? No      Yes	Yes	Yes	Yes	Yes	Yes	Yes but not DSF parts	Yes
1-1	How many parts have you issued to date?	47	26	18	17	6	1	4
1-2	Type of parts: Fast moving	Fast	Fast	Fast	Fast	Fast		Fast
	Slow moving	Slow	Slow	Slow	Slow			
	Other	Other				Other	Other	
2	Have you used the Cardex system cards and log book No. 118 to keep track of parts issued?	Yes	Yes	Yes	Yes	Yes	Parts issued have no part card	Yes
3	Do you have any difficulty in locating spare parts in the store now that you are using the Cardex system? No      Yes	No	No	No	No	No	Not examined	No
4	Have you rearranged the log book No. 118 to be compatible with the Cardex system part cards sequence? No      Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
4.1							Delay	

Question No.	Question	El Arish	Bir El-Abd	Sheikh Zowayed	Rafah	El-Hasana	Nekhel	Gov. H.Q.
5	Are there any advantages to using the Cardex system? No                      Yes	Yes	Yes	Yes	Yes	Yes		
5-1	If yes, explain.	- Facilitates annual inventory  Knowledge of available parts  Applicability to all parts	Ease of annual inventory	Ease of annual inventory	Ease of annual inventory	Familiarization with unknown parts	Not examined	Few items in the store so system advantages were not shown

II. How useful is the part control system

Question No.	Question	El Arish	Bir El-Abd	Sheikh Zawayed	Rafah	El-Hasana	Nekhel	Gov. H.Q.
1	Were any parts needed unavailable in the store? No Yes	No	Yes	Yes	Yes	Yes	Yes	No
1-1	What action was taken?		Contact GMC	Contact GMC	Contact GMC	Contact GMC	Procure from the local market	
2	Did you contact the governorate maintenance coordinator to check availability of the required parts in other stores? Yes No	No	Yes	Yes	Yes	Yes	No	No
2.1	If "No" Why?	No parts requested						No parts requested
3	Are there any administrative procedures that should be followed before visiting the governorate maintenance coordinator? No Yes	No Same City	Yes	Yes	Yes	Yes	Yes	No Same location
3.1	If "Yes", indicate procedures		Approval from C.C Chairman for transportation	Approval from C.C Chairman for transportation	Approval from C.C Chairman for transportation	Approval from CC Chairman for transportation	Approval from C.C Chairman for transportation	
4	How was the GMC contacted to check availability of the required parts? By a visit By telephone By other means	phone	visit	visit	visit	visit	visit	phone

Question No.	Question	El Arish	Bir El-Abd	Sheikh Zowayed	Rafah	El-Hasana	Nekhel	Gov. H.Q.
5	Did you obtain the parts which were been not available in your store from another local unit store? No Yes	N/A. No requests	Yes	Yes	Yes	Yes	Not examined	No requests
5.1	If "Yes", name the parts and the local council.		Check	Schedule	3.1 of	the text		
6	Have any parts been issued from your store for the repair of other local council equipment? No Yes	Yes	No	Yes	No	No	No	No
6.1	If "Yes", name the parts and the beneficiary local council.	Bir El-Abd-Sheikh-Zowayed Rafah-Hasana		Rafah				

III. How well do local councils coordinate with the governorate maintenance coordinator in making use of the parts control system.

Question No.	Question	El Arish	Bir El-Abd	Sheikh Zowayed	Rafah	El-Hasana	Nekhel	Gov. H.Q.
1	Do you regularly report the stock status to the GM coordinator? Yes No	Yes	Yes	Yes	Yes	Yes	Yes	No
1-1	Name reporting intervals, indicate reasons and attach copy of last report	Each 2 weeks	Monthly	Monthly	Each 2 month	When parts issued	When parts issued	Store and parts control section in the same location
2	Did you have any difficulty in obtaining parts from other stores once you have the GM coordinator's approval? No Yes If "Yes", indicate those difficulties	N/A	No	No	No	No	Not examined	Not examined
3	Did any council have a request rejected although the parts were available? If "Yes" name the reasons	No	No parts requested	No	No parts requested	No parts requested	No parts requested	No parts requested
4	Is there any problem in obtaining the GM coordinator's approval to get parts from another council's store? If "Yes" name the reasons	Not examined	No	No	No	No	Not examined	Not examined

## Section II Parts Control Section

### **First: DSF Status Prior to Parts Control Application**

1. Were any criteria set for the original DSF parts distribution?

Yes

1.1. If Yes, name the criteria

a. For equipment:

- 2 Motor Graders John Deere are located in El Arish CC with all delivered parts for the 2 units.
- 1 Hydro Crane Grove is located in El Arish CC with all delivered parts.
- 2 Tire Dozer Cat 814B. One is in El Arish C C. and the other is in Ber El Abd CC. Each CC has received an equal amount of parts.
- 3 Track Dozer Cat D7E are located in 3 different CCs. Parts delivered with these Dozers were randomly distributed among the 3 CC.
- Deep well pump parts were mostly used. The remaining parts are located in El Arish CC.
- All parts for the desalination water plant are located in Hasana CC.
- 7 Gen sets 60 KW. Each city received one unit. Hasana CC received 2. Equal amounts of parts were delivered with each unit for each CC.
- 2 Loaders Fiat - Allis were delivered, one in the road dept. and the other in Hasana CC; parts were randomly distributed.

b. For trucks

- Spare parts for all types of IH trucks (dump, sewage and truck tractor) were randomly distributed among the 6 city councils.
- Spare parts for the articulated beam truck Ford F600 were originally stored in the governorate electrical dept. but the truck and the remaining parts were subsequently transferred to El Arish CC.
- All spare parts for the fire trucks were placed in the fire department.

**2. Were parts exchanged among various local council stores before the parts control system was introduced?**

No.

**3. Was there any system in use for DSF equipment parts control in local council stores previously?**

No.

**Second: DSF Parts Status After Parts Control System Application**

1. Are local councils regularly reporting the status of parts stock to the governorate parts control section?

Yes.

2. Were any parts issued to another local council to repair broken down equipment?

Yes.

- 2.1. If Yes: No. of local councils, Type of parts issued.

(see text: Table 3.1).

3. Were parts exchanged between stores in different local councils simply because there was a surplus in one store and shortage in another?

No.

4. Was any requisition order countersigned by the governorate maintenance coordinator and made to another local council store turned down by its officials?

No.

**Third: How the parts control system is operating in the governorate**

- 1. When requesting parts available in more than one local council store, how do you choose which particular store to submit your request ?**

On the bases of quantity in stock at the store and proximity of store to beneficiary store.

- 2. Did you experience any problems in using the parts control section's cards to keep track of the balance of parts, according to reports received from local council stores?**

Yes.

- 2.1 If Yes: Indicate those problems**

Sometimes storekeepers do not mention name of main group and subgroup of the item.

- 3. Did local council storekeepers or maintenance officials experience any problems as a result of insufficient information on requested parts (e.g., part no., main and subgroup)?**

Yes.

- 3.1. If Yes: Indicate those problems**

Storekeepers or maintenance officials will not know the part number, main and subgroup, if the parts catalog is not available.

- 4. Have you noted that any local council issues or requests parts at unusually short intervals, indicating improper use of equipment or poor fixing of parts?**

No.

**Results of Parts Control System Evaluation  
Questionnaire for Fayoum Governorate**

**Section I - Local Unit Stores**

**I. Storekeeper's use of the Cardex system**

<b>Quest. No.</b>	<b>Question</b>	<b>Road Dept</b>	<b>Fayoum</b>	<b>Ebshwal</b>	<b>Etsa</b>	<b>Senouris</b>	<b>Tamia</b>
1	Have you issued spare parts since the completion of the Cardex system? No Yes	Yes	Yes	Yes	Yes	Yes	Yes
1.1	How many parts have you issued to date?	115	87	10	6	8	4
1.2	Type of parts: Fast moving	Fast	Fast	Fast	Fast	Fast	Fast
	Slow moving	Slow	Slow	Other		Other	
	Other	Other					
2	Have you used the Cardex system cards and log book No 118 to keep track of parts issued?	Yes	Yes	Yes	Yes	Yes	Yes
3	Do you have any difficulty in locating spare parts in the store now that you are using the Cardex system? No Yes	No	No	No	No	No	No
4	Have you rearranged the log book No. 118 to be compatible with the Cardex system parts cards sequence? No Yes	Yes	Just started	Yes	Yes	Yes	Yes

Quest. No.	Question	Road Dept	Fayoum	Ebshwal	Etsa	Senouris	Tamia
5	Are there any advantages to using the Cardex system? No                      Yes	Yes	Yes	Yes	Yes	Yes	Not examined
5-1	If yes, explain	Ease of annual inventory  Ideal system for store management	Getting familiar with unknown parts	Getting familiar with unknown parts  Modern system for handling parts	Easy to find the required part	Easy to find required part	Not examined

II. How useful is the Parts Control system?

Quest. No.	Question	Road Dept	Fayoum	Ebshwal	Etsa	Senouris	Tamia
1	Were there any parts (needed) that turned out to be unavailable in the store? No Yes	Yes	Yes	Yes	No	Yes	No
1.1	What action was taken?	Report to Dep. Director	Report to O&M engineer	Check availability of needed parts in Road Dept.store via GMC		Check availability of needed parts in Road Dept store via GMC	4
2	Did you contact the GMC to check availability of the required parts in other stores? Yes No	No	No	No	No	No	No
2.1	If "No" Why?	This store is the main store	O&M Eng'r in frequent contact with GMC	O&M Eng'r in frequent contact with GMC	N/A	O&M Eng'r in frequent contact with GMC	N/A
3	Are there any administrative procedures that should be followed before visiting the governorate maintenance coordinator? No Yes	Yes	Yes	Yes	Yes	Yes	Yes
3.1	If "Yes", indicate Procedures	Approval to leave the Dept.	Approval by chief of center	Approval by garage chief	Approval by garage chief	Approval by garage chief	Approval by garage chief
4	How was the GMC contacted to check availability of the required parts? By a visit By telephone By other means	No contact to check parts availability	By visit	By visit	By visit	By visit	By telephone
5	Did you obtain the parts which were been not available in your store from another local unit store? No Yes	No	Yes	Yes	Yes	Yes	No

Quest. No.	Question	Road Dept	Fayoum	Ebshwal	Etsa	Senouris	Tamia
5.1	If "Yes", name the parts and the local council		See Annex IV				
6	Have any parts been issued from your store for the repair of other local council equipment? No Yes	Yes	No	No	No	No	No
6.1	If "Yes", name the parts and the local council?	See Annex IV	N/A	N/A	N/A	N/A	N/A

III. How well do local councils coordinate with the GMC in making use of the parts control system?

Quest. No.	Question	Road Dept	Fayoum	Ebshwai	Etsa	Senour...	Tamia
1	Do you regularly report the stock status to the GM coordinator? Yes No	Yes	Yes	Yes	Yes	Yes	No
1.1	Name reporting intervals, indicate reasons and attach copy of last report	Monthly	2 mos.	2 mos.	When parts issued	2 mos.	
2	Did you have any difficulty in obtaining parts from other stores once you have the GMC's approval? No Yes	N/A	No	No	No	No	N/A
3	Did any council have a request rejected although the parts were available?		No	No	No	No	N/A
4	Is there any problem with obtaining the GM's approval to get parts from another local council's store?		Not examined	No	No	No	N/A

## Section II Parts Control

### **First: DSF Status Prior to Parts Control Application**

#### 1. Were there any criteria for DSF parts distribution?

Yes

##### 1.1 If Yes, name the criteria

All spare parts delivered with DSF equipment to Fayoum Governorate were originally stored in one main store located in the road department.

This store was serving all DSF equipment needs for parts. The equipment itself was distributed among the road department, the city councils, and the fire department. In December 1988 officials of the road department decided to hand over specific spare parts to city councils and departments in order to alleviate the pressure on the road department warehouse. These parts were for types of equipment that only served city councils and departments, such as:

- Spare parts of Ford trucks type F800 (sewage, sprinkler and refuse) to all city councils of Fayoum Governorate.
- Spare parts of Ford refuse pick up type F350 to all city councils of Fayoum governorate.
- Spare parts of refuse incinerators transferred to Fayoum city council.
- Spare parts of water plants transferred to water department.
- Spare parts of fire trucks transferred to fire department.

Spare parts allocations for Ford trucks F800 and F350 were based on equal shares for each truck.

Road department kept spare parts that can be used for road equipment of city councils such as:

- All spare parts delivered with the different types of IH Trucks.
- All spare parts delivered for the GM 8.2L engine. This type of engine is used in Gallion grader, Grove hydro crane and all types of Ford trucks type F800.
- Fayoum Governorate received 31 units of IH trucks. The road department holds 18 units and the others are distributed among the city councils.
- Fayoum governorate also received 4 Gallion graders, 1 Grove hydro crane and 21 units of Ford trucks type F800; this equipment is using the GM 8.2L engine.

Consequently, the road department store was still functioning as the store for IH trucks parts and GM engines.

2. Were parts exchanged among various local council stores before the parts control system was introduced?

No

Spare parts were not exchanged between city councils but used to be issued from the road department store to city councils according to equipment needs.

3. Was there any system in use for DSF equipment parts control in local council stores?

No

**Second: DSF parts status after parts control system application**

1. Are local councils regularly reporting the status of parts stock to the governorate parts control section?

Yes

2. Were any parts issued to another local council to repair broken down equipment?

Yes

- 2.1 If Yes: No. of local councils, type of parts issued

(See Annexes)

3. Were parts exchanged between stores in different local councils if there was a surplus in one store and shortage in another?

Yes (See Annexes)

4. Was any requisition order, countersigned by the governorate maintenance coordinator, and made to another local council store, turned down by its officials?

No

**Third: How the parts control system is operating in the governorate**

1. When requesting parts available in more than one local council store, how do you choose which particular store to submit your request to?

Availability of larger quantities and proximity of store to beneficiary store.

2. Did you experience any problems in using the parts control section's cards to keep track of the balance of parts, according to reports received from local council stores?

Yes

Sometimes reports received from local councils do not include parts main group and subgroup.

3. Did local council storekeepers or maintenance officials experience any problems as a result of insufficient information on requested parts (e.g., part no., main and subgroup)?

Yes

- 3.1 If Yes: Indicate those problems:

For parts not available in local councils stores before, storekeepers or maintenance officials do not know the part number, group and subgroup, unless they check the parts catalogues.

4. Have you noted any local council that issues or requests parts at unusually short intervals, indicating improper use of equipment or poor fixing of parts?

No.

**ANNEX II**

**SECRETARIES - GENERAL DIRECTIVES ON  
DSF PARTS CONTROL SYSTEM  
(NORTH SINAI AND FAYOUM)**

2 September 1990

Fayoum Governorate  
Village Development Department

Effective M & R of equipment is a prerequisite for optimal equipment utilization, and efficient spare parts management is a prerequisite for effective M & R of equipment.

The Cardex system, installed now in all the governorates' spare parts stores, facilitates spare parts management and enables transfer of parts on a governorate-wide basis under the aegis of the Equipment O&M Committee and the Parts Control Section, located in the Village Development Department.

You are asked to follow these instructions:

1. Parts transfer is for actual repair purposes, not for inventory expansion.
2. Parts will be issued from the main store (the Road Directorate's DSF store), unless the part is not available there, in which case it will be issued from a store at which it is available; these decisions will be made by the Parts Control Section.
3. City councils should request parts on requisition Form No. 111. The form should indicate the part required. It should be signed by City Council representatives and sent to the Parts Control Section, which responds to these requests.
4. Every Monday, warehouse managers and storekeepers are required to send to the Parts Control Section, a copy of all parts issuance forms issued by the store. This is necessary in order to keep the PCS's inventory information up-to-date and accurate.
5. Warehouse managers and storekeepers of units in which Cardex has been implemented are required to re-arrange the 118 and 115 log books to conform to the Cardex sequence of parts listing from June 1990, the start of the current inventoring year, onwards.

Gamal El-Hefnawi  
Secretary General

28 Dec. 1989

North Sinai Governorate  
Office of the Governor

File No. 10/2/1

ADMINISTRATIVE DIRECTIVE NO. 146/1989

The following instructions should be followed with respect to city councils management of spare parts in conformity with the Cardex system provided by USAID:

1. Spare parts transfers should be for repair work, not for inventory expansion. A city council that wants parts should submit Requisition Form No. 111, indicating the parts needed. The form, signed by city council officials, is sent to the Governorate Maintenance Coordinator, who will check his records to determine which city council has the parts requested. He then notifies the council with the part(s) to transfer the part to the needy council. The Governorate Maintenance Coordinator is authorized to follow-up the transfer to completion.
2. The Governorate Maintenance Coordinator is authorized to receive and approve DSF spare parts requisition forms (parts in/parts out) from the city councils.
3. Warehouse managers and storekeepers are required to send to the GMC, each Saturday, copies of the official forms used for parts transactions (issuing/acquiring) between the city councils.
4. DSF parts store managers are required to rearrange the GOE 118 and 115 log books to conform to the Cardex parts listing sequence by 1 Jan. 1990.
5. The GMC's assistant will manager the parts control system, under the supervision of the GMC.
6. The Maintenance Section room of the Village Development Department on the ground floor will be furnished with 2 sets of 4 desks, 4 chairs, a file cabinet, and light fittings, to be ready for use by 1 January 1990.
7. These instructions are binding on all relevant officials as of 1 Jan 1990.

Secretary General

**ANNEX III**  
**GALLION GRADER PARTS REDISTRIBUTION**  
**(IBSHWAI CITY COUNCIL, FAYOUM)**



رقم الحساب	التاريخ	الوصف	مدين	دين	مدين	دين	مدين	دين
3/4/R/c	12/14	مدين	1	1	1	1	1	1
2/3/R/c	11/10	دين	1	1	1	1	1	1
8/3/R/c	12/17	دين	1	1	1	1	1	1
	12/17	دين	1	1	1	1	1	1
	12/17	دين	1	1	1	1	1	1
1/11/L/c	12/17	دين	1	1	1	1	1	1
~	12/17	دين	1	1	1	1	1	1
~	12/17	دين	1	1	1	1	1	1
3/11/L/c	12/17	دين	1	1	1	1	1	1
~	12/17	دين	1	1	1	1	1	1
~	12/17	دين	1	1	1	1	1	1
8/6/R/c	12/17	دين	1	1	1	1	1	1

49506  
 49903  
 49904  
 86613  
 86614  
 86625  
 74152  
 86626  
 49210  
 49211  
 49214  
 82436

توقيع الموظف المسؤول عنه  
 مدير  
 مدير  
 مدير  
 مدير

توقيع المالك  
 توقيع كاتب الحساب  
 توقيع كاتب دفتر الحساب

هذا الحساب يفتح في تاريخ 12/17/14  
 هذا الحساب يفتح في تاريخ 12/17/14  
 هذا الحساب يفتح في تاريخ 12/17/14





(استاذة رقم 111 111-111)

وزارة  
مصلحة

طلب و صرف أصناف **تعليمية** **تعليمية** **تعليمية**

بيانات نماذجها المخازن إدارة المخازن بيانات نماذجها الجهة الطالبة

تاريخ تحرير الطلب رقم الطلب مطلوب من مخزن  
 بدل كهيئة أوجعت في بيوليصة رقم إلى **مجلس التعليم العالي** تاريخ الصرف **11/1/111** رقم اذن الصرف  
 بدل فاقد أو نالف تحمور عنه **186** بتاريخ سنة **198** لتصدير لحظة روجع  
 المرتب المقرر للدة من إلى **ترسل للبوليصة برسم**  
 ثلاثة مرتب زيادة عن المرتب **3**

رقم تصنف	اسم تصنف	الوحدة	المرتب المقرر أو متوسط الاستهلاك		المرتب المقرر أو متوسط الاستهلاك	الباقي بالمهدة وقت تحرير الطلب	المقادير المطلوبة	المقادير المرخص صرفها	المصرف		سعر الوحدة	نوع الأصناف		رقم القيد	رقم القيد	ملاحظات	ملاحظات
			مستعمل	جديد					علم	علم							
55490A	تاديوغنة كبريت	م					1	1	1			علم	علم	12/78	110	111-111	موم المخازن
28715	كلين سلفيد راتنج	م					8	8	8			علم	علم	14/78	110	111-111	الجهة الطالبة
30899	عقده رشه لوزالنج	م					8	8	8			علم	علم	14/77	110	111-111	
31032	موتور بولي بروبيلين	م					8	8	8			علم	علم	14/78	110	111-111	
40375	عقده رشه لوزالنج	م					14	14	14			علم	علم	14/80	110	111-111	
58614	أدوية	م					7	7	7			علم	علم	14/80	110	111-111	
60130	ناج حراتب	م					5	5	5			علم	علم	14/84	110	111-111	
61148	مخز كبريت	م					10	10	10			علم	علم	14/87	110	111-111	
61149	مخز كبريت	م					10	10	10			علم	علم	14/88	110	111-111	
62564	مخز كبريت	م					2	2	2			علم	علم	14/90	110	111-111	

٧٥ ٧٥ ٧٥



مجلس التعليم العالي  
 وزارة التعليم  
 بغداد

BEST AVAILABLE COPY









رقم الوثيقة	الوصف	الرقم	الرقم	الرقم	الرقم	الرقم	الرقم
5195078	مذكرة	17	17	17	17	17	17
8920789	مذكرة	17	17	17	17	17	17
8926733	مذكرة	17	17	17	17	17	17
8926833	مذكرة	17	17	17	17	17	17
8920104	مذكرة	17	17	17	17	17	17
8920144	مذكرة	17	17	17	17	17	17
8921426	مذكرة	17	17	17	17	17	17
		17	17	17	17	17	17
		17	17	17	17	17	17

هذا مقامه من المذكرة رقم 17

استلمت الأصناف المبررة الآتية

المستلم

توقيع المكلف باستلام

الأصناف من أمين المخزن

توقيع كاتب الشطب 110 ع.ح

توقيع كاتب دفاتر الموهدة 118 ع.ح

توقيع الموظف الصادر منه الطلب

يصرف ما

مدير المخازن

صرف ما

أمين المخازن

(\*) يذكر التاريخين وجوب الطلب

هذه تصرف بانتم بذكر رقم الوثيقة إضافة للخدمة أو المهمة التي تم قبولها من قبل. وتسلم الأصناف بالمخازن بوضع اسم المستلم على الاستمارة. مع طلب أمراء المخازن. مع ذكر التاريخين من قبل

الكهنة وردل الثالث ونفكة الرب والربود

لبيد

**ANNEX IV**  
**PARTS TRANSFERRED IN RESPONSE TO CITY COUNCIL**  
**REQUESTS (FAYOUM)**

### Parts Transferred by City Council Request

Store that issued parts	Store that received parts	Requisition		Items Transferred			Type of Equip.
		No	Date of Issuance	Qty	Part Number	Part Description	
Road Dept.	Senouris CC	402	June 30, 90	1 1	590300C91 394292C93	Disc. Plate	IH sewage truck
Road Dept.	Senouris CC	403	June 30, 90	1 1	ST518 398383C11	Bearing Sleeve	IH sewage truck
Road Dept.	Senouris CC	5	July 8, 90	1	8924126	Gasket Set	GM 8.2L Engine
Road Dept.	Fayoum CC	15	July 14, 90	16 2 2	111024R1 871931R1 373457C91	Seal for valve retainer Diaphragm Kit "V"belt	IH
Road Dept.	Senouris CC	29	August 4, 90	4 4	494229C92 571963C1	Hose Lower Radiator Hose	IH Truck
Road Dept.	Ibshwai CC	32	August 6, 90	1	2646	Propeller shaft for sewage pump	IH sewage truck
Road Dept.	Fayoum CC	38	August 12, 90	1 1	1700549C91 1700548C96	Gasket Set Gasket Set	IH truck

Store that issued parts	Store that received parts	Requisition Form		Items Transferred			Type of Equip.
		No	Date of Issuance	Qty	Part Number	Part Description	
Road Dept.	Tamia CC	55	August 18, 90	1	46805C91	Steering pump belt	IH Truck
				1	358997C91	Steering pump belt	
				1	270094C2	Belt Alternator belt	
				1	488539C91	Belt	
				1	673950C1	Belt	
Road Dept.	Tamia CC	59	August 19, 90	1	572107C91	Sleeve	IH truck
Road Dept.	Senouris CC	61	August 22, 90	1	148514	Hydraulic Hose	Gallion Grader
Road Dept.	Tamia CC	66	August 26, 90	1	594453C91	Plate	IH truck
Road Dept.	Senouris CC	73	August 30, 90	1	2488076510	Propeller Shaft	Gallion Grader
Road Dept.	Fayoum CC	77	Sept. 3, 90	1	317749C92	Oil seal Crank shaft rear	IH truck
Road Dept.	Senouris CC	90	Sept. 17, 90	40*	NPN	Air Hose 5/16 Diam.	IH Truck
				1	283067C92	Propeller shaft center bearing	
Road Dept.	Senouris CC	91	Sept. 17, 90	1	T255823144	Propeller shaft	IH Truck
				1	1700594C91	Water pump	
Road Dept.	Ebshwai CC	93	Sept. 23, 90	1	596344C91	Fork	IH Truck
				1	596435C91	Gasket Set	

Store that issued parts	Store that received parts	Requisition Form		Items Transferred			Type of Equip.
		No	Date of Issuance	Qty	Part Number	Part Description	
Road Dept.	Fayoum CC	103	Oct. 10, 90	1	1987989	Rotor starting motor	IH Truck
				5	1906988	Brush starting motor	
Road Dept.	Fayoum CC	104	Oct. 10, 90	1	1700548C96	Gasket set	IH Truck
				5	997139R1	Brake fluid	
Road Dept.	Ebshwai CC	108	Oct. 22, 90	8	5229727	Nozzle	GM 8.2L engine

**ANNEX V**

**PARTS TRANSFERRED IN RESPONSE TO SUPPORT M & R  
CONTRACTOR ACTIVITY**

### Parts Transferred to Support M&R

Requisition form		Store that issued parts	Equipment			Spare Parts Issued		
No	Date		Jurisdiction	Type	Gov. Plate No.	Qty	Part Number	Description
392	June 25, 90	Road Dept.	Road Dept.	John Deere Loader	104	1	AT63548	Hydi Oil Filter
						2	AR75603	Trans Oil Filter
						1	AR50041	Fuel Filter
						1	T19044	Engine Oil Filter
393	June 25, 90	Road Dept.	Road Dept.	Hydro Crane Grove		2	9414100734	Engine Oil Filter
						1	9414100619	Fuel Filter
						1	9437100235	Fuel Water Separator
						1	9304100069	Air Filter
						1	9437100156	Hyd. Oil Filter
						1	9880100004	Steering Oil Filter
394	June 26, 90	Road Dept.	Road Dept.	John Deere Grader	40707	1	AR50041	Fuel Filter
						2	T19044	Engine Oil Filter
						1	AT35155	Prim. Air Filter
						1	AT31227	Sec. Air Filter
1	July 7, 90	Road Dept.	Road Dept.	Dyna-pac Road Roller		1	747289	Engine Oil Filter
						1	499345	Prim. Air Filter
						1	499346	Sec. Air Filter
						1	335657	Hyd. Oil Filter
11	July 9, 90	Road Dept.	Road Dept.	IH Dresser Loader	146	2	3132428R2	Fuel Filter
						1	528250R1	Engine Oil Filter
						1	1105717C1	Prim. Air Filter
						1	529852R5	Sec. Air Filter
						1	1103462C2	Hyd. Oil Filter

Requisition form		Store that issued parts	Equipment			Spare Parts Issued		
No	Date		Jurisdiction	Type	Gov. Plate No.	Qty	Part Number	Description
14	July 12,90	Road Dept	Road Dept.	John Deere Grader	40708	2	T19044	Engine oil filter
						1	AR50041	Fuel filter
						1	AT35155	Prim. air filter
						1	AT31227	Sec. air filter
19	July 16,90	Road Dept.	Tamia CC	Gallion Grader	40196	1	25010959	Fuel Filter
						2	6438384	Engine Oil Filter
						1	79360	Hydr. Oil Filter
						1	149661	Trans.Oil Filter
71	Aug. 29,90	Road Dept.	Itsa CC	Gallion Grader	40194	2	6438384	Engine Oil Filter
						1	25010959	Fuel Filter

**ANNEX VI**  
**SAMPLE CITY COUNCIL PART REQUEST AND ISSUANCE FORM**

بسم الله الرحمن الرحيم

محاذينه اغبسوم  
اداره بناه وتممه القريه  
الصبايه

الصبيد / الصبيد سرمد بهرام الطرق والنقن بالقبوم

تحبه طيبه وبعد :-

بناه على التاللب المقدم من الورض المركزيه التابعه لمركز ومد يده القيوم بالبعدد واحد. بوبينه  
ماره انتراشر ه عدد واحد طقم مخدات مارش ه عدد واحد طقم شربون مارش وبالكشف علسي  
الصبيد وجد ان قنلع الفهار المذكوره موجوده لديكم بالخزن الخاص بكم وبناه على الكتاب الدوري  
رقم ١ سنه ١٠ المنظم لتبادن قطع الفهار بفرض الاصلاح ولهم التخزين - براجا التكرم بالصرف  
والسلام عليكم ورحمه الله وبركاته

تحريرا في ١٠/١/٣٠

المكترتير العمام

صبيد سر/ جمال الدين الحفناوي

المكترتير العمام  
بناه على التاللب المقدم  
من الورض المركزيه التابعه  
لمركز ومد يده القيوم  
بالبعدد واحد

١٠/١/٣٠





**ANNEX VII  
SAMPLE REPORT OF PART RECEIVED  
(HASAN CITY COUNCIL, NORTH SINAI)**

مما نظرت في شمال سيناء  
الوصف المحلبي لركز ودينير طين  
ادارة المخازن / الصيانه

١٤٤  
٩٠٢

السيد المهندس / منعم عام الصيانه بالديوان العام للمحافظة

مخيم طيبة وبعد

نشرف بأحاطة سيادتكم عملاً بأنه نظراً لحاجه مجلس  
صينيه الحنة (١) ولقطنه رقم طلبه ماه 287374 فقد تم استلام  
سه مجلس صينيه العريشه (ركز الصيانه) بتاريخ ١٤١٢٠١٩٩ م  
ومتى تم اضافته بسفد اهنافه رقم ١١٦٥٧٠ بتاريخ ١٤١٢٠١٩٩ م  
مرسل للعلم والإحاطة

وتفضلوا بقبول واز الاحترام

R C. 11

م المخازن

الصيانه

المخازن

٢٢١٠  
لا اله الا الله

يسعد

رئيس

مركز ودينير طين

عاب

ت

خاتمة

١٩٩٠ / ٢ / ١٠  
٢٢٤٦

« مذوره محمد صبيح »

