



BILLING MASTER FILE ANALYSIS



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BE

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1. INTRODUCTION

A Metering Survey is to be carried out on the entire metering population in Iraq to ascertain the condition of the existing metering systems. An initial pilot survey will be completed utilizing handheld collection devices (PDA) and a purpose built database. This database will be populated with information from the existing billing files to simplify the collection process and enable subsequent checking of the billing file accuracy.

The pilot will be carried out in Resafa which is the Eastern half of Baghdad and Karkh which is the Western half of Baghdad. On successful completion of the pilot, the survey will be sequentially rolled out to the remainder of Iraq.

Purpose & Scope

The purpose of this deliverable is to detail the acquisition of data from the existing Billing Master Files and document the format and content of the billing file extracts together with the actions necessary to render the data suitable for loading into the metering population survey database application and the subsequent loading into the PDAs to be used to collect the data.

Audience

The audience is the Ministry of Electricity Capacity Building Steering Committee and BearingPoint management.

2. EXISTING BILLING INFORMATION

Billing File Contents

The existing billing system is divided into four separate files:

- Inside Baghdad – Industrial

The file currently contains 29474 customers covering both Resafa (16261) and Karkh (13213). The numbers are continually changing with new customers being added and old customers being removed. A large proportion is purported to be not actively using electricity. These potentially inactive Customers have, however, been included in the survey database to assist with confirming the accuracy of the billing information and the existence or otherwise of metering at the premises. The file contains the fields as shown in Appendix A and includes more than are required for the survey. Only those fields necessary to carry out the required data acquisition will be loaded into the database application and the PDA. The data supplied by the MoE was for the whole of Baghdad (Karkh and Resafa) and, since each area will be surveyed separately, it is necessary to split the data into two separate tables. The Resafa Industrial Customers are those with M_SIDEREG = 1, 2, 3 or 7. The Karkh Industrial Customers are those with M_SIDEREG = 4, 5, 6, 9. There is a number of Customers with a blank value in the M_SIDEREG field and these are currently included in the Karkh database pending investigation by the Ministry billing section.

- Inside Baghdad – Residential

The file currently contains 899979 customers covering Resafa (498602) and Karkh (401377). The condition of supply usage at these premises is not accurately known. Similar to the Industrial data, this file, as shown in Appendix A, also contains many unnecessary fields which will be excluded from the

survey database and the PDA. As with Industrial, this data requires dividing into two separate tables for Resafa and Karkh. The Resafa Residential Customers are those with M_REGION = 2 or 3. The Karkh Residential Customers are those with M_REGION = 0 or 1.

- Outside Baghdad – Industrial

This file has not yet been received but the format and field names are known and are detailed in Appendix A. The contents will be minimized to those of the inside Baghdad requirements.

- Outside Baghdad – Residential

This file has not yet been received but the format and field names are known and are detailed in Appendix A. The contents will be minimized to those of the inside Baghdad requirements.

Fields required for Survey

A form representation of the Database and PDA Data requirement is shown in Appendix B and consists of the following:

- For Residential Customers

The fields required for the Residential part of the survey are simple and can be divided into two categories - Customer details and Meter details

- Customer Details

Service Account Number, District, Ledger, Meter Reading Sequence Number, Customer Name, Customer House Number, Customer Street Address and Customer Class.

The Service Account Number is 11 digits which consist of:-

1&2 are the District number which is the Governate where the customer premise is located i.e. Baghdad.

3, 4 &5 are the Ledger number which groups the customers within a specific geographic location within the Directorate.

6-10 are the sequence/location route number

11 is a check digit.

District and Ledger do not exist in the billing files as separate entities. They will be extracted from the account number to populate the fields in the survey database to facilitate the reporting requirements described later in this document.

Meter Reading sequence number is supposed to reflect the order in which a meter reader would normally collect meter readings within a Ledger. It has become somewhat redundant with the inclusion of many numbers that are not in the correct sequence although space had been left between adjacent properties to enable this not to happen. This number therefore does not assist in driving the survey but the survey process will enable the billing system to be brought up to date by correcting any incorrect sequence numbers identified.

Customer Name, Customer House Number, Customer Street Address are self explanatory

Customer Class designates the type of premise – domestic, shop, small business etc.

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– Meter details

Meter Manufacturer, Meter Manufactured Date, Meter Type, Meter Installation Date, Number of phases (1 or 3), Meter Serial Number, Multiplying Factor, Meter Reading, and Meter Reading Date.

These specific metering details, other than number of phases and meter reading and reading date do not exist in the current billing files. They are, however, necessary to create a meaningful database of meter system details for future asset management purposes and enable reporting of meter type and age issues.

• For Industrial Customers

The fields required for the Industrial part of the survey can also be divided into two categories - Customer details and Meter details

– Customer Details

Service Account Number, District, Ledger, Meter Reading Sequence Number, Customer Name, Customer House Number, Customer Street Address, Customer Class.

The Service Account Number is 11 digits which consist of:-

1&2 are the District number which is the Governate where the customer premise is located i.e. Baghdad.

3&4 are the Ledger number which groups the customers within a specific geographic location within the Directorate.

5&6 are the Group table code.

7-10 are the sequence/location route number

11 is a check digit.

As with the Residential data, District and Ledger do not exist in the billing files and will be extracted from the Account Number.

Comments regarding Meter Reading sequence number, Customer Name, Customer House Number and Customer Street Address are as Residential.

Customer Class designates the type of Industry.

– Meter details

Meter Manufacturer, Meter Manufactured Date, Meter Type, Meter Installation Date, number of phases (usually 3), Meter Serial Number, Multiplying Factor, CT Ratio, VT Ratio, Meter Reading, and Meter Reading Date. Each site can have multiple meters up to a maximum of 5 although the incidence of 4 or 5 meters is very low.

Comments above regarding Meter Manufacturer, Meter Manufactured Date, Meter Type, Meter Installation Date, number of phases, Meter Serial Number, Multiplying Factor, Meter Reading, and Meter Reading Date are as Residential.

Report

In addition, it is intended to collect details of the Current Transformer/s (CT) and Voltage Transformer/s (VT) at each industrial site. These details do not exist in the billing files but are necessary to confirm that the billing constants (meter multiplier) used in bill calculation are correct.

It may not be appropriate to collect this specific CT and VT information at the time of the initial survey due to the necessity for advanced training in safety, access and associated technology as well as the increase in time required at each location. However, these details are a prerequisite for good metering asset management and will be added to the survey database when possible to complete the asset management information and enable future bill accuracy checking.

In addition to the Metering technical data above for both Residential and Industrial Customers, the condition of the Meter/s at site will also be collected. This will be by a drop down selection box and the options are shown in Appendix C along with the options offered for Meter Manufacturer and Meter Type. The data collected in this category will be utilized to drive the reports to the Ministry Metering Department for site investigation and Meter replacement.

3. ACTIONS REQUIRED

To prepare the imported Billing Master File data for loading into the survey database and PDAs, numerous actions are required on the Customer data:

- Remove unwanted fields from Residential and Industrial databases

The database as received contains many fields that are not required for the survey. The unwanted fields are to be removed from the databases prior to other actions below.

- Spilt Baghdad Industrial database into Resafa and Karkh

The “Inside Baghdad” Industrial databases contain all Customers in Baghdad which are all District 00. The survey for Baghdad will be split into two distinct halves – Resafa and Karkh and this will necessitate splitting the databases into these two areas so that each area can be loaded into a different set of PDAs. This split is initiated by creating two tables based on M_SIDEREG.

M_SIDEREG = 1, 2, 3 or 7 for Resafa and M_SIDEREG = 4, 5, 6 or 9 for Karkh

- Spilt Baghdad Residential database into Resafa and Karkh

The “Inside Baghdad” Residential database contains all Customers in Baghdad which are all District 00. As with the Industrial Customers, this database will be split into Resafa and Karkh databases for use in different PDAs. This split is initiated by creating two tables based on M_REGION.

M_REGION = 2 or 3 for Resafa and M_REGION= 0 or 1 for Karkh

- Check for duplicate account numbers in each database and between databases

Duplicate use of account number was found for both Residential and Industrial Customers. Since the account number is the primary key for searching the database, this difficulty has been overcome by creating a secondary key based on the type of Customer i.e. Residential or Industrial. This ensures uniqueness of records. There were no incidences of duplicates within the individual databases. Because of the continually changing contents of the Billing files, it is necessary to upload the latest information available immediately prior to commencement of the survey. The existence of duplicates within each database received must therefore be checked on each receipt of data prior to loading into the Host database.

- Add new District field to both Residential and Industrial databases

The District field does not exist as a separate field in the Metering Billing Master file for Baghdad but is (or would be) the first two digits of the Customer Account Number. Since the District number for Baghdad is 00 (double zero), and the Account Number field is Numeric, these zeros do not show. The District field will be an important part of the reporting exercise for the whole of Baghdad; therefore the field will be created and populated with the required digits. For the Customers inside Baghdad this will be 00 and for those outside Baghdad it will be possible to extract the first two digits from the account number. The existence of the District field in the Survey database will simplify the reporting criteria.

- Add new Ledger field to both Residential and Industrial databases

The Ledger field does not exist as a separate field in the Metering Billing Master file for Baghdad but is (or would be) the next two or three digits after the District number i.e. digits 3&4 (Industrial

file) and digits 3, 4&5 (Residential file). As with the District number, the Ledger number will be an important part of the reporting exercise and the Ledger field will therefore be created.

The Ledger numbers in the Industrial file range from 11 to 99 and population of the Ledger field is a simple extract from the Account Number.

The Ledger numbers in the Residential file range from 001 to 876. The leading zeros (following the two zeros from the District number) for all number less than 100 are obviously not present in the Account Number and must be accounted for when extracting the requisite digits to populate the Ledger number.

- Add CT and VT fields to Industrial databases

The Current Transformer (CT) and Voltage Transformer (VT) are a necessity to any future Meter Asset Management System and to enable checking of the meter constants used in Industrial Billing and have therefore been included in the survey database and PDA collection application. The field will be empty initially and populated during a site check either during the survey or subsequently.

- Remove numeric/character anomalies from the meter multiplier field

The Meter Multiplier field in the Residential files is always 1 (one). However, the Industrial file contains a host of values depending on the Meter, CT and VT ratios. This is a numeric value but the Billing Master file is set to text. There are many instances of decimal values but the separator is not always a decimal point and a dash (-) is used in some cases. This is understood to have been custom and practice to ensure that the numbers are clearly decimals since it may be possible to miss the decimal point. However, decimal points do exist indicating that there is no fixed policy on this field. To simplify the survey database and assist in checking billing calculations, the Meter Multiplier field has been set to numeric and it is necessary to identify those customers with a dash in this field and replace it with a decimal point. The format of the field will then be modified to numeric.

- Add M_PHASE field to Industrial table.

Currently, there is no indication of number of phases at Industrial sites and it is purported to always be 3. Inclusion of this field is for completeness and possible future use.

4. BILLING MASTER FILE CONTENTS

The attached Excel Spreadsheet shows all the Billing Master File fields and indicates those to be utilized in the survey as detailed below by file.



Master File Fields

Inside Baghdad – Residential

| Customer Details | | | | |
|---------------------------|-------------------------|------|------------|---|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 1 | M_ACOUNTNO | N | 11 | Service Account Number |
| 5 | M_SERIAL | N | 6 | Meter Reading Sequence Number |
| 6 | M_NAME | C | 20 | Customer Name |
| 7 | M_HOUSENO | C | 14 | Customer House Number |
| 8 | M_ADDRESS | C | 24 | Customer Street Address |
| 15 | M_PHASE | N | 1 | 1 or 3 Phases |
| 18 | M_HOUSECODE | N | 2 | Customer Class |
| - | M_DISTRICT | C | 2 | District Number – Created from Account Number |
| - | M_LEDGER | C | 3 | Ledger Number – Created from Account Number |

| Meter Details | | | | |
|---------------------------|-------------------------|-------|------------|------------------------------|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 4 | M_INSTDATE | D | 8 | Installation/Connection Date |
| 9 | M_METERNO | N | 6 | Meter Serial Number |
| - | M_METER- | N | 6 | Multiplying Factor |
| 11 | M_LASTREAD | N | 6 | Last Meter Reading |
| 12 | M_LASTDATE | D | 8 | Last Reading Date |
| - | | A | 1 | Meter Manufacturer |
| - | | N | 4 | Meter Manufactured (Year) |
| - | | (A/N) | 3 | Meter Type |
| - | | N | 7 | Meter Reading |
| - | | N | 8 | Meter Reading Date |
| - | | A | 1 | Meter Condition |
| - | | A | 40 | Freeform Comment |

The meter factor/multiplier (M_METER-FACT) is missing from the billing file extract. Information provided indicates that this factor is always 1 for Inside Baghdad Residential Customers. The database and PDA will include this field – set to 1 – for validation at site.

Inside Baghdad – Industrial

| Customer Details | | | | |
|---------------------------|-------------------------|------|------------|---|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 1 | M_ACCOUNTNO | N | 11 | Service Account Number |
| 7 | M_CUSTCODE | N | 3 | Customer Class |
| 11 | M_SERIALNO | N | 6 | Meter Reading Sequence Number |
| 14 | M_NAME | C | 40 | Customer Name |
| 15 | M_ADDRES | C | 40 | Customer Street Address |
| 16 | M_HOUSENO | C | 14 | Customer House Number |
| - | M_DISTRICT | C | 2 | District Number – Created from Account Number |
| - | M_LEDGER | C | 3 | Ledger Number – Created from Account Number |
| - | M_PHASE | N | 1 | Number of Phases (1 or 3) |

The Number of Phases (M_PHASE) is missing from the billing file extract. Information provided indicates that this is always 3 for Industrial sites but the field has been included in the survey for completeness and for checking the site conditions.

| Meter Details | | | | |
|---------------------------|-------------------------|-------|------------|-------------------------------------|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 32 | M_MTRNO1 | N | 6 | Meter Serial Number – Meter 1 |
| 10 | M_INSTALDT1 | D | 8 | Installation/Connection Date |
| 37 | M_FACTOR1 | C | 6 | Multiplying Factor – Meter 1 |
| 34 | M_LASTRED1 | N | 7 | Meter Reading – Meter 1 |
| 24 | M_LASTDTE | N | 8 | Meter Reading Date – Meter 1 |
| - | | A | 1 | Meter Manufacturer – Meter 1 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 1 |
| - | | (A/N) | 3 | Meter Type – Meter 1 |
| - | | A | 1 | Meter Condition – Meter 1 |
| 38 | M_MTRNO2 | N | 6 | Meter Serial Number – Meter 2 |
| 10 | M_INSTALDT2 | D | 8 | Installation/Connection Date |
| 43 | M_FACTOR2 | C | 6 | Multiplying Factor - Meter 2 |
| 40 | M_LASTRED2 | N | 7 | Meter Reading – Meter 2 |
| 24 | M_LASTDTE | N | 8 | Meter Reading Date – Meter 2 |
| - | | A | 1 | Meter Manufacturer – Meter 2 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 2 |
| - | | (A/N) | 3 | Meter Type – Meter 2 |

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| | | | | |
|----|-------------|-------|----|-------------------------------------|
| - | | A | 1 | Meter Condition – Meter 2 |
| 44 | M_MTRNO3 | N | 6 | Meter Serial Number - Meter 3 |
| 10 | M_INSTALDT3 | D | 8 | Installation/Connection Date |
| 49 | M_FACTOR3 | C | 6 | Multiplying Factor - Meter 3 |
| 46 | M_LASTRED3 | N | 7 | Meter Reading – Meter 3 |
| 24 | M_LASTDTE | N | 8 | Meter Reading Date – Meter 3 |
| - | | A | 1 | Meter Manufacturer - Meter 3 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 3 |
| - | | (A/N) | 3 | Meter Type – Meter 3 |
| - | | A | 1 | Meter Condition – Meter 3 |
| 50 | M_MTRNO4 | N | 6 | Meter Serial Number - Meter 4 |
| 10 | M_INSTALDT4 | D | 8 | Installation/Connection Date |
| 55 | M_FACTOR4 | C | 6 | Multiplying Factor - Meter 4 |
| 52 | M_LASTRED4 | N | 7 | Meter Reading – Meter 4 |
| 24 | M_LASTDTE | N | 8 | Meter Reading Date – Meter 4 |
| - | | A | 1 | Meter Manufacturer - Meter 4 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 4 |
| - | | (A/N) | 3 | Meter Type – Meter 4 |
| - | | A | 1 | Meter Condition – Meter 4 |
| 56 | M_MTRNO5 | N | 6 | Meter Serial Number - Meter 5 |
| 10 | M_INSTALDT5 | D | 8 | Installation/Connection Date |
| 61 | M_FACTOR5 | C | 6 | Multiplying Factor - Meter 5 |
| 58 | M_LASTRED5 | N | 7 | Meter Reading – Meter 5 |
| 24 | M_LASTDTE | N | 8 | Meter Reading Date – Meter 5 |
| - | | A | 1 | Meter Manufacturer - Meter 5 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 5 |
| - | | (A/N) | 3 | Meter Type – Meter 5 |
| - | | A | 1 | Meter Condition – Meter 5 |
| - | | A | 40 | Freeform Comment |

The only instance of an installation date for metering in the Industrial Billing File is **M_INSTALDT** which will be used to populate the separate Installation dates for each meter in the database in order that future Meter changes can be tracked individually.

Outside Baghdad – Residential

| Customer Details | | | | |
|---------------------------|-------------------------|------|------------|---|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 1 | ACCT-NO | N | 11 | Service Account Number |
| 3 | SERIAL | N | 6 | Meter Reading Sequence Number |
| 4 | CONSNAME | C | 20 | Customer Name |
| 5 | HOUSE-NO | C | 14 | Customer House Number |
| 6 | ADRESS | C | 24 | Customer Street Address |
| - | M_PHASE | N | 1 | Number of Phases (1 or 3) |
| 21 | HOUSE-CODE | N | 2 | Customer Class |
| - | DISTRICT | C | 2 | District Number – Created from Account Number |
| - | LEDGER | C | 3 | Ledger Number – Created from Account Number |

| Meter Details | | | | |
|---------------------------|-------------------------|-------|------------|------------------------------|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 7 | METER-NO | N | 6 | Meter Serial Number |
| 9 | METER-FACT | N | 6 | Multiplying Factor |
| - | INSTAL-DATE | D | 8 | Installation/Connection Date |
| 11 | LAST-READ | N | 6 | Last Meter Reading |
| 12 | LAST-DATE | D | 8 | Last Reading Date |
| - | | A | 1 | Meter Manufacturer |
| - | | N | 4 | Meter Manufactured (Year) |
| - | | (A/N) | 3 | Meter Type |
| - | | N | 7 | Meter Reading |
| - | | N | 8 | Meter Reading Date |
| - | | A | 1 | Meter Condition |
| - | | A | 40 | Freeform Comment |

Report

Outside Baghdad – Industrial

| Customer Details | | | | |
|---------------------------|-------------------------|------|------------|---|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 1 | ACCT-NO | N | 11 | Service Account Number |
| 4 | CONSNAM | C | 40 | Customer Name |
| 5 | ADRESS | C | 40 | Customer Street Address |
| 6 | HOUSE-NO | C | 14 | Customer House Number |
| 12 | HOUSE CODE | N | 2 | Customer Class |
| 37 | FASE-NO-ONE | N | 1 | 1 or 3 Phases |
| - | M_DISTRICT | C | 2 | District Number – Created from Account Number |
| - | M_LEDGER | C | 3 | Ledger Number – Created from Account Number |
| - | SERIAL | N | 6 | |

| Meter Details | | | | |
|---------------------------|-------------------------|-------|------------|-------------------------------------|
| Billing File Field Number | Billing File Field Name | Type | Field Size | Database and PDA Field Name |
| 34 | METER-ONE | N | 6 | Meter Serial Number – Meter 1 |
| 39 | METER-FACT-ONE | N | 6 | Multiplying Factor – Meter 1 |
| 3 | INSTAL-DATE | D | 8 | Installation/Connection Date |
| 41 | LAST-READ-ONE | N | 6 | Last Meter Reading – Meter 1 |
| 25 | LAST-DATE | D | 8 | Last Reading Date – Meter 1 |
| - | | A | 1 | Meter Manufacturer – Meter 1 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 1 |
| - | | (A/N) | 3 | Meter Type – Meter 1 |
| - | | A | 1 | Meter Condition – Meter 1 |
| 42 | METER-TWO | N | 5 | Meter Serial Number – Meter 2 |
| 46 | METER-FACT-TWO | N | 6 | Multiplying Factor – Meter 2 |
| 3 | INSTAL-DATE | D | 8 | Installation/Connection Date |
| 48 | LAST-READ-TWO | N | 6 | Last Meter Reading – Meter 2 |
| 25 | LAST-DATE | D | 8 | Last Reading Date – Meter 2 |
| - | | A | 1 | Meter Manufacturer – Meter 2 |
| - | | N | 4 | Meter Manufactured (Year) – Meter 2 |
| - | | (A/N) | 3 | Meter Type – Meter 2 |
| - | | A | 1 | Meter Condition – Meter 2 |
| - | | A | 40 | Freeform Comment |