

ANNEX 9: GUARANTEED TECHNICAL PARTICULARS FOR MRS

Clause-KPLC REQUIREMENT	MANUFACTURER'S COMPLIANCE/ REMARKS	REFERENCE PAGE IN THE SUBMITTED DOCUMENTS
3.4.1 General Features of the MRS		
The system shall support the following data collection and functionality: Extraction of all data in the meter including:		
o Full read packets for scheduled and 'on demand' reads. A full packet includes register and interval data, and all meter events.		
o Bidirectional Real and Reactive energy		
o 15-minute interval data – 4 channels for single-phase meters, 8 for polyphase meters		
o Net metering data		
o Voltage (register and interval data)		
o Per phase current, voltage, energy and demand on polyphase meters		
o Meter events for all meter diagnostics, such as an under-voltage alert or an outage or restoration message		
o Ability to send a 'last gasp' outage event when the meter losses power		
o Demand metering;		
o Remote demand resets;		
o On-request reads;		
<input type="checkbox"/> Shall permit the customer data entry and update;		
<input type="checkbox"/> Entry, update and monitoring of data on installation and replacement of meters;		
<input type="checkbox"/> Allow for GIS coordinates acquisition for the meter;		
<input type="checkbox"/> Real time clock synchronization;		
<input type="checkbox"/> Set up and change of approved mean power limit;		
<input type="checkbox"/> Change of voltage thresholds related to electricity quality;		
<input type="checkbox"/> Setup, change, review and synchronization of reading programs/sequence;		
<input type="checkbox"/> Setup, change, review and synchronization of programs/sequence execution priorities;		
<input type="checkbox"/> Setup, change, review and automatic update of communication route;		
<input type="checkbox"/> Setup and management of grouping of meter reading;		
<input type="checkbox"/> Activation of function keys on the meter (e.g.		

conditional reconnection);		
<input type="checkbox"/> Any programmable or not programmable command can be sent individually or to any group of any level; Shall automatically provide the available data from each consumer unit starting from its selection;		
<input type="checkbox"/> Shall allow the exportation of all meter data from the system to ASCII, TXT, XML, CSV or Excel files;		
<input type="checkbox"/> Shall allow the allocation of consumer units for analysis groups and relocate them, when necessary;		
<input type="checkbox"/> Shall generate summaries of the events with information about power, current and voltage, alarms, etc.;		
<input type="checkbox"/> Shall have features that will allow performing the activities related to the management of the measurement and actions related to the protection of the revenue;		
<input type="checkbox"/> Shall have features that will allow performing the activities related to the disconnection and reconnection;		
<input type="checkbox"/> Shall generate graphical reports and statistics related to active energy, reactive energy, demands and quality parameters;		
<input type="checkbox"/> Shall generate statistics of periodic events (frequency and duration) per measurement points, per occurrences;		
<input type="checkbox"/> The system shall generate histories of all the parameters per measuring point;		
<input type="checkbox"/> The System shall have functionalities that will allow the setting for a scheduled electric energy meter readings, in addition to allow on-demand access, at any time, to these same points of measurement;		
<input type="checkbox"/> The MRS system shall be able to monitor/read meter data during data processing. Shall report the status of the reading process, percentage of advance, etc.;		
<input type="checkbox"/> Shall permit to define a Calendar with holidays;		
<input type="checkbox"/> Shall permit to define and schedule automatically reading according to the reading routine;		
<input type="checkbox"/> Shall show the Consumption charts (Hourly, daily, weekly, monthly) of active energy of the measurement point, with at least the following features and characteristics:		
o The period, under the initial conditions of		

implementation, shall automatically present the available reading period;		
o Line type chart or bar type chart, with different colors for each type of quantities;		
o Meter parameters entry and update		
o Daylight saving time changes		
o 15 minutes or less of interval data per channel		
o Tariff programmed change		
o Change of display value period on meter display		
o Change of sequence and selection of registers for display on meter display		
o Change of electric power integration period		
o Controllable output management		
o Change of registers within profile framework.		
o Change of profile periods		
o Change of voltage thresholds related to electricity quality		
o Meter software change and Meter Firmware Update		
o Software shall be able to read any meters that provide a standard communication interface		
It shall allow the visualization of the register and interval data of the parameters of each metered and calculated value, with, at least the following information:		
Note: The visualization of data is the ability to view register and interval data.		
o Meter's identification number		
o Meter's firmware version		
o Meter's program		
o Inductive (Lagging) PF (power factor) and capacitive (Leading) PF		
o Multiple channels of data at the same time.		
o Battery status		
o Composition of the measurement channels used to calculate billing determinants such as the PF		
o The interval range of mass memory storage – the start and stop time and dates		
o Integration interval – interval used for calculating demand (KW or KVAR or KVA) from energy values		
Shall allow the visualization of the data from all available channels on the meter in daily, weekly or monthly segmentation, for initial / final specified periods (day / month / year) in intervals of lowest resolution recorded, such as 5, 15 (default), 30 or 60 minutes, with exportation for, at least, the		

Excel format or CSV;		
<input type="checkbox"/> It shall allow the visualization of the meter values derived from interval data, from every meter with the following information where some values must be calculated from the total interval data values:		
o Presentation Mode (pulses and magnitudes and energy values)		
o Grand total usage, such as KWH, KVARH Lag, KVARH Lead, etc.		
o Total at the direct peak		
o Total at the reverse peak,		
o Total off-direct peak		
o Total off-reverse peak		
o Total direct reserved		
o Total reverse reserved		
o Previous peak demand prior to most recent demand reset.		
o Maximum peak demand		
o Maximum off-peak demand		
o Maximum reserved demand		
o Accumulated reserved demand		
o Reactive Energy Billing Value		
o Reactive Power at Maximum Peak Demand		
o Reactive Power at Accumulated demand at the peak		
o Total exceeding reactive energy		
<input type="checkbox"/> According to the capacity of the meter, it shall be possible to extract archives from all meters channels.		
MRS shall have a screen for visualization of at least the last ten power outages (greater than predefined duration - e.g. 5 minutes), with date and time of the start of the outage, date and time of the end of power restoration and detailed duration in days, hours, minutes and seconds;		
<input type="checkbox"/> It shall allow KPLC to make the following changes in parameters:		
o Date;		
o Range of demand;		
o National holidays;		
o Multiplication constants;		
o Time segments;		
o Condition of reserved time;		
o Method of demand calculation;		
o Automatic replacement of demand;		
o Summer time;		

o Method of calculation of the quantity of energy corresponding to the reactive energy surplus;		
o Visualization of the display codes;		
o Condition of the serial output of the user;		
o Presentation format of the display quantities;		
o Micro-adjustment of the clock;		
o Reading;		
<input type="checkbox"/> The MRS system shall show the endpoint registers voltage variations in accordance with the meter parameterization or MRS configuration.		
MRS system must interface with the KPLC Outage Management System (OMS) uploading outage and restoration events from the AMI System.		
3.4.2 Generation of Reports / Charts		
It shall allow the generation of graphs of the measuring point, with at least the following characteristics:		
Zoom functionality (increasing and decreasing), making possible amplifications for detailing specific areas of the graph and subsequent return to the initial conditions sizing;		
The system shall allow for graphing of register, interval, and calculated values over a period of time, such as:		
<input type="checkbox"/> Power factor graph: it shall have as a central reference on the horizontal axis the value of power factor equal to one or other adjusted value based on the available data. Values in the lower part of the chart shall correspond to inductive power factors and in the upper part to capacitive power factors.		
<input type="checkbox"/> Graph of the load curve (daily, weekly, monthly) from the point of measurement and from the available channels, with at least the following features and characteristics:		
o Option to view the data recorded in any of the channels (as available in the meters);		
o Possibility of choice of the date and of the time of the start and of the end of the analysis;		
o Line chart or bar chart types, with different colors for each type of quantity;		
o Ability to export data;		
o Ability to draw phasor (vector) diagrams from per phase voltage, current, and power factor values.		

3.4.3 MRS Administration Function		
The MRS shall support the following functionalities:		
<input type="checkbox"/> Defining of roles and users/user groups		
<input type="checkbox"/> Access control to System components		
<input type="checkbox"/> Administration of reporting functions		
<input type="checkbox"/> Execute a regular backup of all data at the desired time.		
<input type="checkbox"/> Defining of user/user group rights		
<input type="checkbox"/> Manage dynamically the server infrastructure (Application, Communication and Data Base servers status)		
MRS system shall provide such data access and target functionality that should ensure that only authorized users could use the system, within the scope of their authorizations according to the security level. Records must be kept about the users having system access, with specification of privileges for each user, as well as system access records (identification of successful and unsuccessful attempts).		
When user privileges are changed, MRS system must register the security level change, time of the change and who executed the change.		
MRS system should implement a security procedure on all access levels through the usage of users, groups of user, as well as their roles. Security procedure shall support the possibility of allocating users within specific or standard groups, whereby; roles are defined in the way enabling the application to individuals or groups of users.		
3.4.4 MRS Reporting Capabilities		
3.4.4.1 Analysis of statuses and alarms		
The MRS must be able to report the number of meters (and AMI communication network device) with any type of a meter event. It must also report meter counts by AMI status. KPLC will be able to use the MRS to view all related meter identification and location data for each meter.		
Result of such reports should be the daily, i.e. periodical report on the state clearly showing all alarms, statuses and events and on which meters, representing the basis for further action on these meters.		
3.4.4.2 Reports on electricity quality		
The MRS will report and tabulate all meter events		

associated with a under or over voltage threshold event. KPLC will be able to use the MRS to view all related meter identification and location data for each meter. In this way, the function would indicate poor voltage circumstances with one or a group of customers and it would represent the reason for the crews to go out into the field.		
3.4.4.3 Communication reports		
Statistics of communication between system elements represents a special whole within the reporting functions.		
3.4.5.4 General		
All reports must be capable to be downloaded to Excel, CSV, ASCII and TXT file.		
Print/Print Preview option is mandatory with every report automatically generated in the form of PDF file.		
3.5 USER AND OPERATOR INTERFACE		
It is desirable that administrator and client GUI (Graphical User Interface) is realized on the latest computer platform not requiring special software installation.		
3.6 DATA MANAGEMENT		
3.6.1 Data Grouping		
Key information of MRS systems is grouping of gathered meter data for the following purposes: billing, reporting and analysis.		
3.6.2 Data and Information Exchange Functions with MDM System and Other Information System of Electric Utility		
This section identifies elements that need to be transferred to and from the MDM system. Data transfer request should be executed consistently to and from MDM system, information subsystems within electric utility and other interested parties.		
3.6.3 Data Entry Into MRS System		
Data entered into MRS system include:		
<input type="checkbox"/> Data from Customer Information System		
<input type="checkbox"/> Information related to reading Cycle and routes		
<input type="checkbox"/> Data on network resources on which End Point have been implemented		
3.6.4 DATA SUBMITTED TO BILLING SYSTEM		
The type of information transferred between MRS and Billing System:		
<input type="checkbox"/> Automated data on electricity accounting		

collected by MRS		
<input type="checkbox"/> Data on metered consumption and reports from AMI system		
In the defining of the requirements in terms of automated data transfer between systems, it is necessary to anticipate submission of grouped accounting according to an accounting period, in accordance with the operation technology of electric utility.		
All data on electricity accounting to be submitted to the Billing System will be archived by the System.		
3.6.5 Data submitted to MDM System		
An example of information transferred between MRS and MDM System:		
o Data on metered consumption for Industrial Customers, at a daily level; data on consumption must be transferred at the end of every day.		
o Data on metered consumption for industrial customers; data on consumption must be transferred on the lowest measured resolution such as 5, 15, 30 or 60-minute data at the end of the every day.		
The type of information transferred between OMS (Outage Management System) and MDM System must be managed in the MDM for VEE and fraud detection processes.		
3.6.6 Voltage Variations		
The MRS system must display meter events for over voltage or under voltage meter events detected by the meter.		
=====END=====		