Meter Data Management System

The key use cases to be enabled by AMISP are provided below. Please note that these are illustrative list of use cases only and is not an exhaustive list. Further please note that all IS Standards shall be applicable:

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
1.	**Collection of Daily Meter Profile**			
1.1	At scheduled frequency HES should pull the Daily Meter Data from Smart Meter over communication Channel	HES	Meter	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
1.2	Meter should send the data to HES. Provision for retrial should be there if Meter data is not collected within time. Consumption details including non-critical events will be in 15 min/30 min block data, and data could be incremental to what was sent by meter in preceding instance	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
1.3	HES should send the data to MDM	HES	MDM	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF
1.4	MDM should send the required parameter to Prepaid system for	MDM	Prepaid Engine	Meter Number, reading date & time, kW, kVA, kWh,

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	daily charge calculation at least once on daily basis			kVAh, PF, Non-critical Event Code / Date
2.	**Monthly Billing profile collection**			
2.1	Command from Billing system triggered and send to MDM / HES for collection of Monthly billing Data	Billing System	MDM / HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.2	At scheduled frequency HES should pull the monthly meter data from Smart Meter over the communication channel	HES	Meter	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.3	Meter should send the data to HES. Provision for retrial should be there if Meter data is not collected within time.	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.4	HES should decrypt and validate the data collected and send to MDM	HES	MDM	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
2.5	MDM should send the required parameter to Billing system for Monthly Bill calculation	MDM	Billing Engine	Meter Number, reading date & time, kW, kVA, kWh, kVAh, PF, Non-critical Event Code / Date
3.	**Remote Meter disconnection**			
3.1	Meter disconnect operation command after wallet balance calculation	Prepaid Engine/ Billing system	MDM	Meter Number, group of meters, instruction to close switch
3.2	Disconnection alert sent to consumer	MDM	Billing System	Meter Number, group of meters, instruction to close switch
3.3	Meter disconnection operator command	MDM	HES	Meter number, action (disconnect)
3.4	Consumer meter disconnection	HES	Meter	Meter Number, switch status
3.5	Disconnection Status Update	Meter	HES	Meter Number, switch status
3.6	Disconnection Status Update	HES	MDM	Meter Number, switch status
4.	**Remote Meter Reconnection**			
4.1	Meter reconnect operation command after wallet recharge Billing	Billing system/ Prepaid Engine	MDM	Meter Number, group of meters, instruction to close switch
4.2	Meter reconnect operation command	MDM	HES	Meter Number, group of meters, instruction to close switch
4.3	Consumer meter	HES	Meter	Meter number, action

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
	reconnection			(reconnect)
4.4	Reconnection Status Update	Meter	HES	Meter number, action (reconnect)
4.5	Reconnection Status Update	HES	MDM	Meter number, action (reconnect)
5.	**Utility detects tampering at consumer site**			
5.1	High priority events captured by Meter sent to HES as and when occurred	Meter	HES	Meter Number, event date & time, event Code /description
5.2	High priority events reach MDM for further action.	HES	MDM	Meter Number, event date & time, event Code /description
5.3	Share with WFM to Notify utility personnel for site inspection	MDM	WFM	Consumer number, Meter Number, Tamper code, address
5.4	On analysis and detection of valid tamper event or malfunction, the tamper event must be sent / pushed by the meter to the HES /MDM	Meter	HES/ MDM	Consumer number, meter number, action to be triggered (disconnect), action date & time
5.5	HES sends disconnect command to meter	HES	Meter	Meter Number, action (disconnect)
5.6	Tamper event shared with CIS/CRM. Billing determinants are updated for tamper invoicing	MDM	CIS / CRM	Meter Number, event date & time, event Code /description
5.7	Meter re-connection order once tamper issue is resolved	MDM	HES	Meter number, action (re-connect)
5.8	HES sends re-connect command to meter	HES	Meter	Meter Number, action (re-connect)
6.	**Missed interval readings**			
6.1	On identifying missed interval, HES will re-acquire data for the missing period from meter	HES	Meter	Meter Number, from date & time, to date & time (for which data is missing)
6.2	On receiving data request command, meter will send data to HES	Meter	HES	Meter Number, reading date & time, kW, kVA, kWh, kVAh
6.3	Missed Interval and Reads Data acquired by MDM	HES	MDM	Meter Number, readings with date & time
7.	**Consumer connection outage/restoration event**			
7.1	Outage/restore event recorded by meter is sent to HES as and when event occurs	Meter	HES	Meter Number, Outage / restoration Date / Time, Power On or Off count
7.2	Outage / Restoration Notification	HES	MDM	Meter Number, Outage / restoration Date / Time, Power On or Off count
7.3	Sharing Outage / Restoration Notification	MDM	OMS/CIS-CRM	Meter Number, Outage / restoration Date / Time,

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
				Power On or Off count
7.4	Meter read request from OMS to identify service outage / restoration	OMS	MDM → HES	Meter Number,
7.5	Meter responds to event poll from HES	Meter	HES	Meter number, Status (live/dead)
8.	**Remote firmware upgrades/ meter configuration changes**			
8.1	Remote firmware upgrade	HES	Meter	Firmware
8.2	Configuration Commands: Change tariff parameters, Synchronize clock, Registers reset (status, max, tampering)	HES	Meter	Meter number, tariff parameters, registers status, event type and priority
8.3	Status update of Firmware / Configuration	Meter	HES	
9.	**Load monitoring at demand side**			
9.1	When there is a load violation event recorded in the meter, the information is sent to the CC	Meter	HES → MDM	Meter Number, max demand, date & time of load violation
10.	**Time synchronization**			
10.1	Synchronizing RTCs of meters / DCUs/ACP	HES	DCU/Meter	Time Setting
11.	**Metering network changes**			
11.1	Change / new installation in Meter / DCU Network Hierarchy	Meter / DCU	HES	Network identification info including DCUs
11.2	Change / new installation in Meter / DCU Network Hierarchy	HES	MDM	Network identification info including DCU
12.	**New consumer connection**			
12.1	Receive verified pre & post-paid new consumer requests	CIS-CRM/ Billing	MDM	Consumer name, address. Connection request etc.
12.2	Generate meter installation order	MDM	/WFM	Consumer ID & details
12.3	Receive meter installation report	WFM	MDM	Meter number, DT no, Feeder & reading
12.4	Requesting instant, interval & events data from meters	MDM	HES → Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
12.5	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
12.6	Once new meter remote read verification is over, confirm new connection with other applications	MDM	Billing / CIS-CRM	Consumer ID, Consumer address, Meter Number, initial reading etc.
13.	**Migrate post-paid consumer to prepaid mode**			
13.1	Receive migration request	CIS-CRM/ Billing	MDM	Migration request for post-paid consumer with profile
13.2	Setup prepaid consumer profile	MDM	Prepaid Engine	Prepaid consumer profile

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
	in prepaid engine. If no change in meter is required, skip next two steps			
13.3	Generate prepaid meter installation order if required	MDM	WFM	Consumer ID & details
13.4	Receive meter installation report	WFM	MDM	Meter number, DT no, Feeder & reading
13.5	Enable prepaid mode in meter	Prepaid engine	HES → Meter	Engineering token
13.6	Receive activation confirmation	HES	MDM	Activation status
13.7	Request instant, interval & events data from meter	MDM	HES → Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
13.8	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
13.9	Once meter remote read verification is over, share migration request completion detail with other modules	MDM	Billing / CIS-CRM	Prepaid consumer profile
14.	**Migrate prepaid consumer to post-paid mode**			
14.1	Receive migration request	CIS-CRM	MDM	Migration request for prepaid consumer with profile
14.2	Request meter data	MDM	HES → Meter	Meter Number, Consumer ID
14.3	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.) with balance credit
14.4	Send meter disconnect command	MDM	HES → Meter	
14.5	Receive connection status	HES	MDM	Disconnect status
14.6	Enable post-paid mode in meter	MDM	HES → Meter	Engineering token
14.7	Receive activation of post-paid mode	HES	MDM	Activation Status
14.8	Request instant, interval & events data from meter	MDM	HES → Meter	Meter Number, Consumer ID
14.9	Acquire instant, interval / events data from meter by HES which then reaches MDM system.	HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
14.10	Once meter remote read verification is over, share migration request completion detail with other modules	MDM	Billing / CIS-CRM	Post-paid consumer profile and meter data along with credit balance

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15.	**Consumer Registration in Consumer Portal/ App**			
15.1	Consumer clicks on new user on consumer portal/ App, provides RMN or email ID and submits data	Portal/ App	CIS/CRM	Request for registration with RMN/email ID
15.2	Utility receives request for registration and sends OTP after verification	CIS/CRM	Email/Message Gateway	OTP
15.3	Consumer submits OTP	Portal/ App	CIS/CRM	
15.4	Consumer receives registration detail	CIS/CRM	Email Gateway	Login ID and default password
15.5	Consumer submits first login request	Portal/ App	CIS/CRM	
15.6	System seeks password change	CIS/CRM	Portal/ App	
15.7	Consumer changes default password	Portal/ App	CIS/CRM	
16.	**Consumer Access to Consumption, Billing & Profile Data**			
16.1	Consumer logs in to Portal/ App	Portal/ App	MDM	
16.2	Consumer Profile for Portal/ App	CIS-CRM	MDM →Portal/ App	Name, Account, Address, Service Points, K Number
16.3	Consumption Data	MDM	Portal/ App →UI	Consumption profile
16.4	Billing (post-paid) / Credit Balance (prepaid)	Billing → MDM	Portal/ App	Post-paid Billing history/ Current Bill, Prepaid Recharge history
17.	**Prepaid Consumer Recharge**			
17.1	Consumer logs into Portal / Mobile App	Mob App / Portal	UI	Login
17.2	Consumer fills-in required detail in UI and requests recharge	UI→ Prepaid App	Payment Gateway	Consumer ID, Recharge amount
17.3	Consumer selects payment method	Payment Gateway	Net banking /Credit Card / Wallet etc.	
17.4	Consumer receives payment acknowledgement	Payment Gateway	Prepaid App→Portal→UI	
17.5	Calculate credit balance for prepaid consumer & update prepaid meter	Prepaid App	HES→Meter	Consumer credit balance (virtual token)
17.6	Notify credit balance to consumer	Prepaid App	Email/SMS Gateway	Credit Balance
18.	**Post-Paid Consumer Bill Payment**			
18.1	Consumer logs into Portal / Mobile App	Mob App / Portal	UI	Login
18.2	Consumer is presented with Billing history and current outstanding Bill	Billing → MDM	Portal/ App→UI	Outstanding Bill
18.3	Consumer requests bill payment. Option to download bill	UI→Billing	Payment Gateway	

Sr.	Use Case Activity Description	Source	Destination	Info Exchanged
18.4	Consumer selects payment method	Payment Gateway	Net banking /Credit Card / Wallet etc.	
18.5	Consumer receives payment acknowledgement	Payment Gateway	Billing→ Portal/ App→UI	
18.6	Payment acknowledgement through email/SMS	Billing	Email/SMS Gateway	Payment acknowledgement
19.	**Consumer Service Request**			
19.1	Consumer logs in to Portal/ App	Portal/ App	CIS/CRM	
19.2	Consumer requests for service	UI	CIS/CRM	Service request
19.3	System assigns SRN & sends acknowledgement	CIS/CRM	Portal/ App→UI, Email/SMS Gateway	
19.4	System resolves request & updates consumer records	CIS/CRM	Portal/ App→UI, CIS/CRM	
19.5	System closes SRN	CIS/CRM	Email/SMS Gateway	
20.	**Consumer Complaints**			
20.1	Consumer logs into Portal/ App	Portal/ App	CIS/CRM	
20.2	Consumer registers complaint	UI	CIS/CRM	Specific complaint
20.3	System assigns CRN & sends acknowledgement	CIS/CRM	Portal/ App→UI, Email/SMS Gateway	
20.4	System assigns resolution based on nature of complaint	CIS/CRM	CIS / OMS / WFM	
20.5	Target system reports completion of complaint	OMS / WFM	CIS/CRM	
20.6	System updates records and closes CRN	CIS/CRM	CIS, Email/SMS Gateway	
21.	**Demand read of meters from consumer premises**			
21.1	Requesting instantaneous, interval, load profile & events data from meters	MDM	HES→Meter	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
21.2	Acquire instant, interval, load profile & events data from meters by HES which then reaches MDM system.	Meter→ HES	MDM	Meter Number, Reading date & time, reading params (kWh, kVAh, kW etc.)
22.	**Staff User Access to Utility Portal**			
22.1	User logs in to Portal	Portal	MDM	Login with appropriate credentials
22.2	User selects available functions	MDM	Portal → UI	
22.3	User logs out	Portal → UI	MDM	