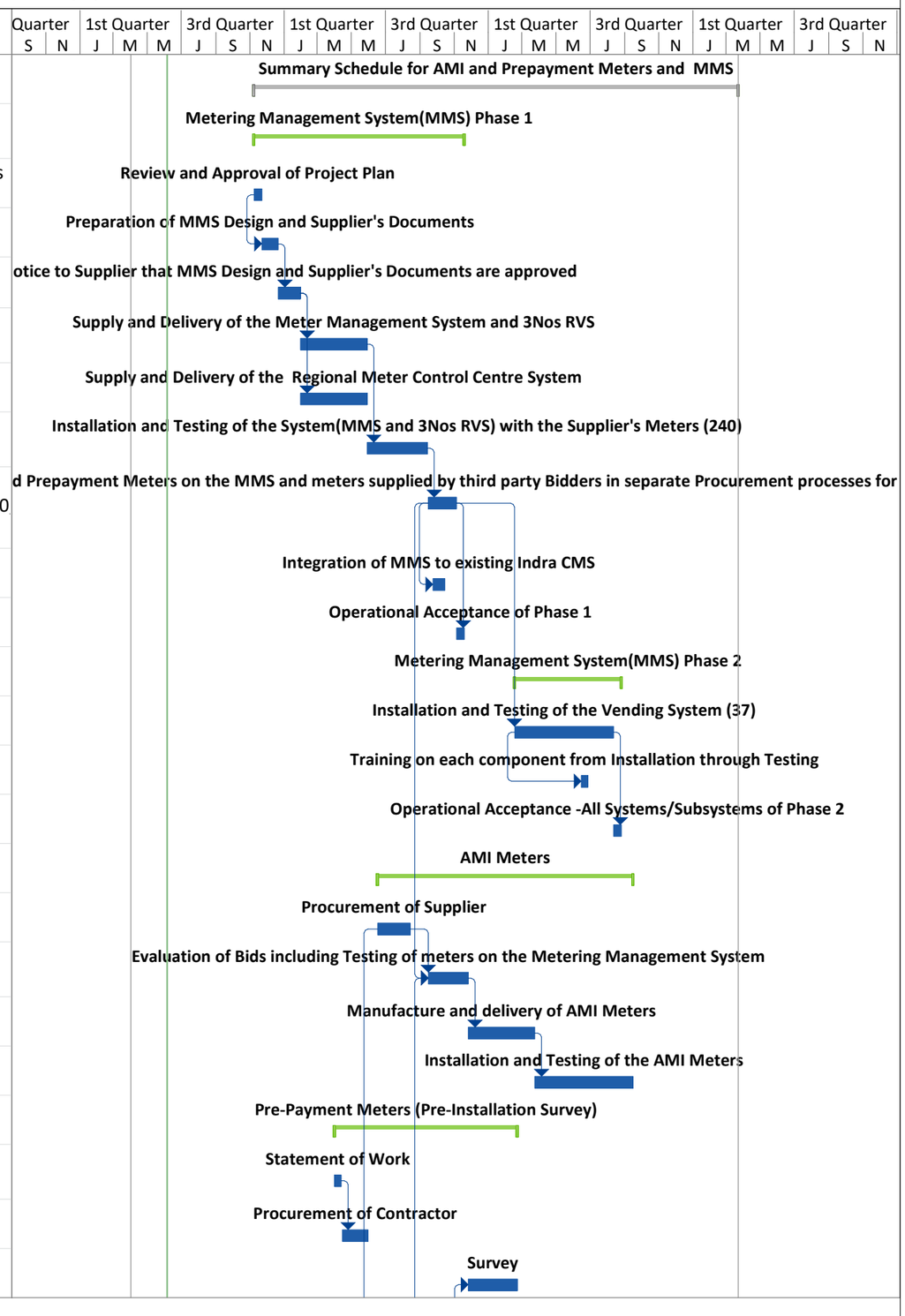
Summary Schedule for AMI and Prepayment Meters and MMS (11)

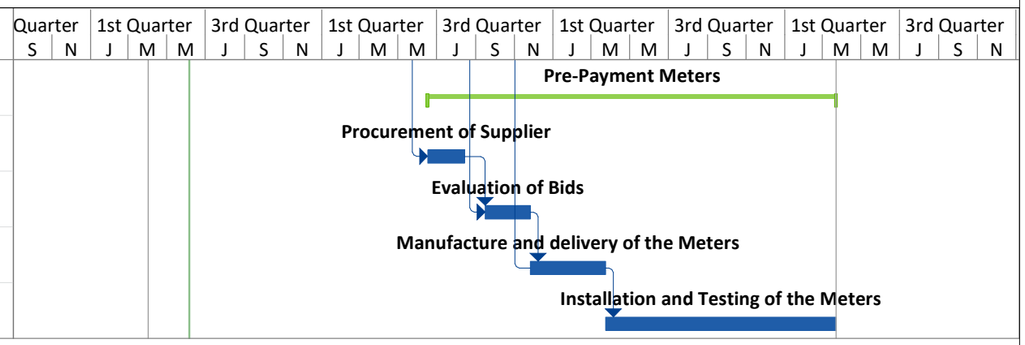
ID	Task Name	Duration	Start	Finish	Predecessors	Successors
0	**Summary Schedule for AMI and Prepayment Meters and MMS**	**588 days**	**08 Nov '18**	**22 Mar '21**		
1	**Metering Management System(MMS) Phase 1**	**255 days**	**08 Nov '18**	**18 Nov '19**		
2	Review and Approval of Project Plan	10 days	08 Nov '18	21 Nov '18		3SS+10 days
3	Preparation of MMS Design and Supplier's Documents	20 days	22 Nov '18	20 Dec '18	2SS+10 days	4
4	Notice to Supplier that MMS Design and Supplier's Documents are approved	25 days	21 Dec '18	29 Jan '19	3	5,6
5	Supply and Delivery of the Meter Management System and 3Nos RVS	80 days	30 Jan '19	28 May '19	4	7
6	Supply and Delivery of the Regional Meter Control Centre System	80 days	30 Jan '19	28 May '19	4	
7	Installation and Testing of the System(MMS and 3Nos RVS) with the Supplier's Meters (240)	75 days	29 May '19	13 Sep '19	5	8
8	Testing of AMI and Prepayment Meters on the MMS and meters supplied by third party Bidders in separate Procurement processes for AMI and PPM	35 days	16 Sep '19	04 Nov '19	7	12FS+70 days,17SS,10 days
9	Integration of MMS to existing Indra CMS	15 days	24 Sep '19	14 Oct '19	8SS+5 days	
10	Operational Acceptance of Phase 1	10 days	05 Nov '19	18 Nov '19	8	
11	**Metering Management System(MMS) Phase 2**	**130 days**	**17 Feb '20**	**25 Aug '20**		
12	Installation and Testing of the Vending System (37)	120 days	17 Feb '20	11 Aug '20	8FS+70 days	14,13SS+80 days
13	Training on each component from Installation through Testing	10 days	15 Jun '20	26 Jun '20	12SS+80 days	
14	Operational Acceptance -All Systems/Subsystems of Phase 2	10 days	12 Aug '20	25 Aug '20	12	
15	**AMI Meters**	**313 days**	**17 Jun '19**	**15 Sep '20**		
16	Procurement of Supplier	40 days	17 Jun '19	13 Aug '19		17FS+1 day,25SS
17	Evaluation of Bids including Testing of meters on the Metering Management System	50 days	16 Sep '19	25 Nov '19	16FS+1 day,8SS	18,26SS
18	Manufacture and delivery of AMI Meters	80 days	26 Nov '19	23 Mar '20	17	19
19	Installation and Testing of the AMI Meters	120 days	24 Mar '20	15 Sep '20	18	
20	**Pre-Payment Meters (Pre-Installation Survey)**	**223 days**	**01 Apr '19**	**21 Feb '20**		
21	Statement of Work	10 days	01 Apr '19	12 Apr '19		22
22	Procurement of Contractor	30 days	15 Apr '19	30 May '19	21	
23	Survey	60 days	26 Nov '19	21 Feb '20	27SS	



Note: (1) AMI Meters: Only Completed AMI Meters within the period provided per this schedule shall be elligible for testing by the MMS Provider
(2) Prepayment Meters: Supply by prospective bidders will be tested on the MMS

Summary Schedule for AMI and Prepayment Meters and MMS (11)

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
24	**Pre-Payment Meters**	**441 days**	**17 Jun '19**	**22 Mar '21**		
25	Procurement of Supplier	40 days	17 Jun '19	13 Aug '19	16SS	26FS+1 day
26	Evaluation of Bids	50 days	16 Sep '19	25 Nov '19	25FS+1 day,17SS	27
27	Manufacture and delivery of the Meters	80 days	26 Nov '19	23 Mar '20	26	28,23SS
28	Installation and Testing of the Meters	248 days	24 Mar '20	22 Mar '21	27	



Note: (1) AMI Meters: Only Completed AMI Meters within the period provided per this schedule shall be elligible for testing by the MMS Provider
(2) Prepayment Meters: Supply by prospective bidders will be tested on the MMS

Amendment 2: Implementation Schedule

Line Item No.	Subsystem / Item	Site / Site Code	Delivery (Bidder to specify in the Preliminary Project Plan)	Installation (weeks from Effective Date)	Acceptance (weeks from Effective Date)
1.0	**Meter Management System (MMS) – Phase 1**			- -	- -
1.1	Project Plan			0	W2
1.2	MMS Design and Supplier's Documents			- -	W4
1.3	Notice to Supplier that MMS Design and Supplier's Documents are Approved			- -	W5
1.4	Supply and Delivery of the MM System and 3Nos RVS			- -	W24
1.5	Supply and Delivery of the Regional Meter Control Centre System			- -	W24
1.6	Installation and Testing of the Systems (MMS and 3Nos RVS) with the Supplier's Meters (240 No.)			W24	W33
1.7	Testing of AMI and Prepayment Meters on the MMS and Meters supplied by third party Bidders in separate Procurement processes for AMI and PPM			W33	W40
1.7a	Integration of MMS to existing Indra CMS			W33	W36
1.8	Operational Acceptance of Phase 1			W40	W42
2.0	**Meter Management System-(MMS) – Phase 2**				
2.1	Installation and Testing of the Vending System (37)			W42	W66

Line Item No.	Subsystem / Item	Site / Site Code	Delivery (Bidder to specify in the Preliminary Project Plan)	Installation (weeks from Effective Date)	Acceptance (weeks from Effective Date)
2.2	Training on each component from Installation through Testing			W64	W66
3.0	**Operational Acceptance – All Systems / Subsystems**			W66	W68

CMS PREPAYMENT INTERFACE
SPECIFICATION DOCUMENT

MODIFICATIONS TO PRIOR DOCUMENT

PREVIOUS VERSIONS:

Ed.	Elaborated	Date	Revised	Date	Approved	Date
3	Farah Mohamed	12th March 2015				
4	Farah Mohamed	17th April 2015				

CURRENT VERSION:

Done by: Farah Mohamed	Revised by:	Approved by:
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1 Introduction

This document describes the prepaid interface specification for the Customer Management System (CMS). This interface allows CMS to interact with prepaid systems when the scenarios defined in Section 2 are triggered. This document describes the prepaid interface, what is required to use it, how to make requests and how to process the response. This document should be the main guideline when implementing the web service.

2 Audience

The intended reader of this document is the prepaid system vendors who will interface with CMS.

3 Terminology

- **Account** - Defines the financial relationship between the company and the customer, that is: which services are grouped to be paid together, who pays the invoices and how (payment method).
- **Authorization** – A right or a permission that is granted to the WSC in order to perform operations through the WSS.
- **Customer** - Individual or corporate entity who, has a relationship with the company as Contract Holder (Service Responsible), as Payer or as Owner of the property.
- **Input** – Data entered and passed to the WSS by the WSC.
- **Message** – Basic unit of communication between the WSS and the WSC.
- **Output** – Response message sent to the WSC by the WSS.
- **Property** – Group of service points located in the same building or site (i.e. building of apartments, house or villa, or compound).
- **Service Point** - It represents the exact location where the service is supplied. This entity is defined by a geographical identification, utility type and type of use.
- **Web service** – A standard protocol for communication over the internet

- **Web Service Consumer (WSC)** – The client program that sends data to the web service server. The consumer will trigger communication with the server by sending a request message and awaiting a response.
- **Web Service Server (WSS)** – The server program that will be in listening mode to receive requests from the client, process the request and send back a response. The web server will be built using SOAP.

4 Abbreviations

- CMS – Customer Management System
- DB – Database
- SOAP – Simple Object Access Protocol
- SPN – Service Point Number
- WSC – Web Service Consumer
- WSDL – Web Service Definition Language
- WSS – Web Service Server

5 Web Methods

The following table lists the web methods that will be available in the WSS:

Web Method	**Description**
Search	This web method will be used to retrieve data from the prepaid system database based on the parameters passed such as Customer ID and meter serial number.
SaveAll	Uploads the contract data to the prepaid system
DataLoad	Retrieves contract data for a specific contract
MeterCheck	Check function that should be called before the MeterImport

	web method used to determine if the meter is available for installation.
MeterImport	Load meter data into the prepaid system meter store
AddDebt	Load the debt for a specific customer and debt type
UpdateDebt	Update the debt data for a specific customer and debt type
GetDebt	Check function to confirm if a specific customer has any debt

6 Base Objects

6.1 Base Request

The base request message (ServiceAuth) describes the parameters that will need to be passed with each request message to the WSS. This will entail the authentication credentials (username and password), unique message ID, and client ID.
The base request will also contain information on the service region code as well as the meter code. Regardless of the number databases in the prepaid system, there will be only one username and password for the web service.

Name	Type	Length	Description
userName	String	30	Username to access the interface
password	String	30	Password to access the interface
messageID	Long	10	Unique message ID to track messages
messageTimestamp	String	14	YYYYMMDDHH24MISS
clientID	String	15	Client ID to identify specific terminals
RegionCode	String	20	Code for the region where data is stored
MeterCode	String	20	Code to identify specific meter make and model

N.B.: The RegionCode and MeterCode values will be CMS codes and must be mapped in the prepayment systems to their internal codes. The RegionCode and MeterCode will be provided as part of parameterization.

6.2 Base Response

The ErrorParam object will be in every response object and contains the following components:

Name	Type	Length	Description
ErrorID	Long	10	Indicate whether an error occurred during processing
ErrorMsg	String	512	Error message only if error occurred

7 Data Objects

The following section describes the data objects to be used in the web service.

7.1 CMSEnt

The CMSEnt object is the main objects to be used in the transfer of data between the two systems. It will be a complex type that will extend the Base Request parameter. It contains the following objects:

Name	Type	Description
Customer	CustEnt	Customer entity object
service_point	ServPoint	Service point entity object

7.1.1 CustEnt

The CustEnt object will hold the customer details. The following are the components of the object that will be sent to the prepaid systems.

Name	Type	Length	Description
CustomerID	String	20	Customer ID
Surname	String	60	Customer's surname

Other_names	String	80	Other names of the customer
Id_no	String	20	Personal ID number of customer
Id_type	String	5	Type of customer identification
Address_1	String	90	Address level 1 – Building unit
Address_2	String	130	Address level 2 – Street/Block
Address_3	String	80	Address level 3 - Area
Telephone_1	String	15	Home Telephone No. of Customer
Telephone_2	String	15	Work Telephone No. of Customer
Telephone_3	String	15	Mobile No. of Customer
Fax	String	22	Fax No. of Customer
email	String	50	Email address of customer
Tax_ref_no	String	14	Tax identification number of customer
Exist	Boolean		For new customer, set to false. For an existing customer, set to true.

7.1.2 ServPoint

The ServPoint object will hold the service point details. The following are the components of the object:

Name	**Type**	**Length**	**Description**
servPointID	String	20	Service Point ID
Address_1	String	90	Address level 1 - Building_unit
Address_2	String	130	Address level 2 – Street/Block
Address_3	String	80	Address level 3 - Area
Geo_code	String	30	Geographical code
meter	MeterEnt		Meter entity object
tariff	TariffEnt		Tariff entity object
blockFlag	Boolean		Flag to indicate whether service is blocked or not

			TRUE – Service is blocked FALSE – Service is not blocked
blockReason	String	1024	The reason the service is blocked
Exist	Boolean		For new service point, set to false. For an existing customer, set to true.

7.1.3 MeterEnt

The MeterEnt object contains the details of the meter as follows:

Name	Type	Length	Description
Meter_serial_no	String	20	Meter serial number
Batch_no	String	15	Meter batch number
Make	String	5	Meter manufacturer
Model	String	5	Meter model

7.1.4 TariffEnt

The TariffEnt object contains the tariff code and the tariff group to be used for billing as follows:

Name	Type	Length	Description
Tariff_code	String	3	Codification of the assigned tariff
Tariff_group	Number	5	Group of the specific tariff

7.2 DebtEnt

The DebtEnt object will be used to load debt to the prepaid system as well as update existing debt.

Name	Type	Length	Description
CustomerID	String	20	Customer ID
Debt_type	String	5	Type of debt to be uploaded

Debt_amount	Double	15,3	The debt amount to be loaded
Debt_ref	String	50	The unique debt identification number
Instalment_due_date	String	8	Due date for the instalment (YYYYMMDD)
Debt_status	String	20	Status of the debt

7.3 SearchResult

The SearchResult object will hold the results of the Search web method. It will be an array structure with the following components:

Name	Type	Length	Description
CMSEnt	Complex		Main CMS details parameter

7.4 DebtResult

The DebtResult object will hold the results of the GetDebt web method. It will be an array structure with the following components:

Name	Type	Length	Description
DebtEnt	Complex		Main customer debt parameter

7.5 Web Method Data Objects

7.5.1 SearchReq

The SearchReq object is the input parameter for the Search web method. It contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
SearchType	String	10	Specify how to search
CMSEnt	Complex		Main CMS details parameter

7.5.2 SearchResp

The SearchResp object is the output of the Search web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
SearchResult[]	Complex		Array structure containing customers that match the search parameters

7.5.3 SaveAllReq

The SaveAllReq object is the input parameter of the SaveAll web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
CMSEnt	Complex		Main CMS details parameter
SaveAllType	String		The scenario to be executed

The table below lists the “SaveAllType” options:

SaveAllType	Description
f_add_customer	Scenario to add customer to prepaid system
f_mod_customer	Scenario to modify customer data in the prepaid system
f_add_serv_point	Scenario to add service point to the prepaid system
f_mod_serv_point	Scenario to modify service point in the prepaid system
f_block_serv_point	Scenario to block service
f_unblock_serv_point	Scenario to unblock service
f_install_meter	Scenario to install meter
f_remove_meter	Scenario to remove meter

f_enroll	Scenario to link customer to service point
f_deenroll	Scenario to remove link between customer and service point

7.5.4 SaveAllResp

The SaveAllResp is the output parameter of the SaveAll web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
CMSEnt	Complex		Customer whose data was uploaded or modified

7.5.5 DataLoadReq

The DataLoadReq is the input parameter of the DataLoad web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
CMSEnt	Complex		Main CMS details parameter

7.5.6 DataLoadResp

The DataLoadResp is the output parameter of the DataLoad web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
CMSEnt	Complex		Contract data that matches the specified criteria

7.5.7 MeterCheckReq

The MeterCheckReq is the input parameter of the MeterCheck web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
MeterEnt	Complex		Main Meter details parameter

7.5.8 MeterCheckResp

The MeterCheckResp is the output parameter of the MeterCheck web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
MeterEnt	Complex		Meter that matches the specified criteria

7.5.9 MeterImportReq

The MeterImportReq is the input parameter of the MeterImport web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
MeterEnt	Complex		Main Meter details parameter

7.5.10 MeterImportResp

The MeterImportResp is the output parameter of the MeterImport web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter

7.5.11 GetDebtReq

The GetDebtReq is the input parameter of the GetDebt web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
DebtEnt	Complex		Main customer debt parameter

7.5.12 GetDebtResp

The GetDebtResp is the output parameter of the GetDebt web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
DebtResult[]	Complex		All debts for specified customer

7.5.13 AddDebtReq

The AddDebtReq is the input parameter of the AddDebt web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
DebtEnt	Complex		Main debt parameter

7.5.14 AddDebtResp

The AddDebtResp is the output parameter of the AddDebt web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
DebtEnt	Complex		Debt that has just been added for specified customer

7.5.15 UpdateDebtReq

The UpdateDebtReq is the input parameter of the UpdateDebt web method and contains the following components:

Name	Type	Length	Description
AuthCred	Complex		Main authentication parameter
DebtEnt	Complex		Debt that needs to be updated

7.5.16 UpdateDebtResp

The UpdateDebtResp is the output parameter of the UpdateDebt web method and contains the following components:

Name	Type	Length	Description
ErrorParam	Complex		Error message parameter
DebtEnt	Complex		Debt that has just been modified

8 Scenarios

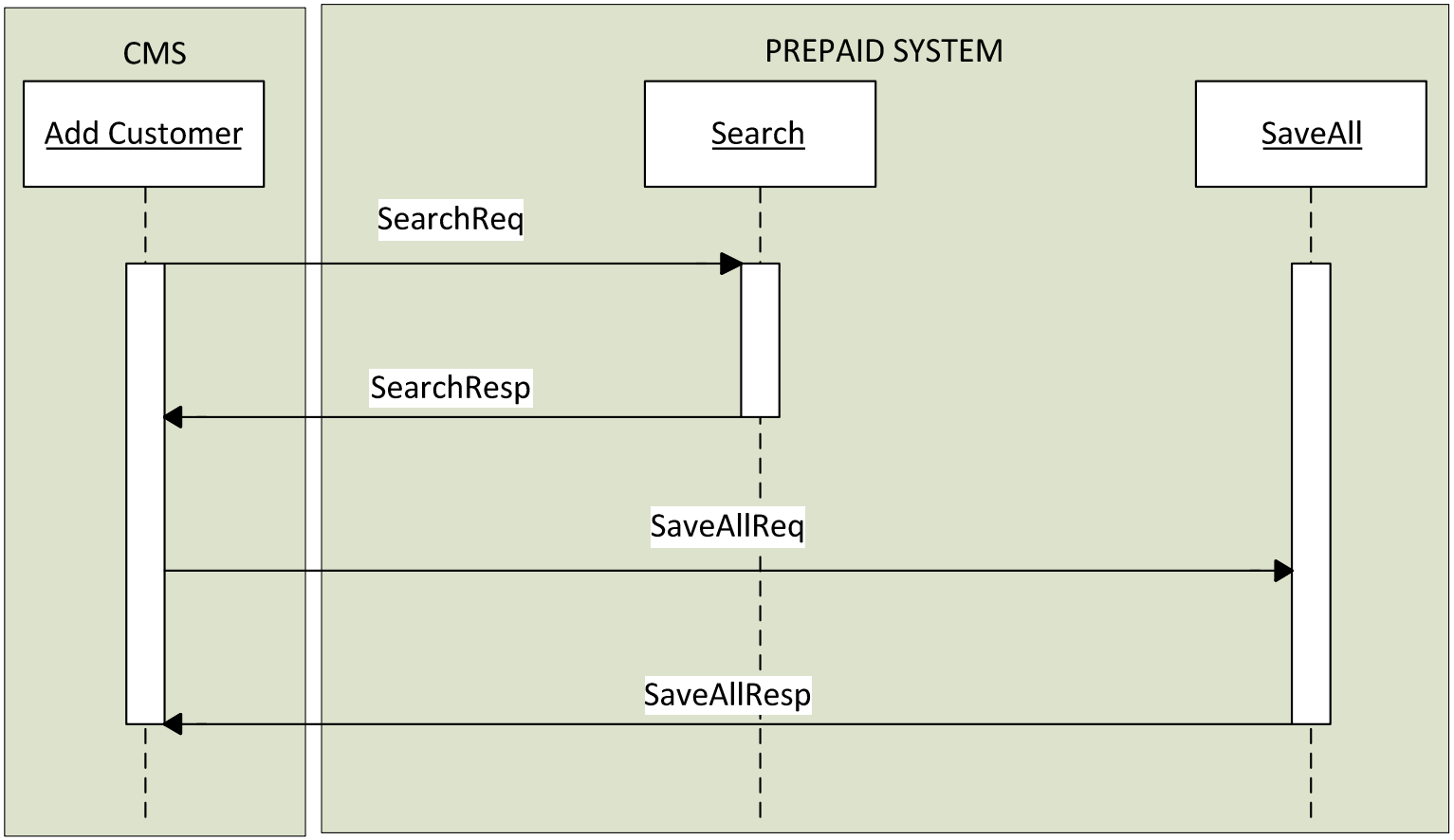
8.1 Add Customer

The following scenario describes the addition of a new customer into the prepaid system:

8.1.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the customer already exists in the prepaid system.
SaveAll	This web method is called to upload the customer details to the prepaid system.

8.1.2 Sequence Diagram



8.1.3 Message Specification

8.1.3.1 Search Method

The table below indicates the components of the SearchReq parameter that will be used to invoke the Search web method:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

The table below indicates the components of the SearchResp parameter that is returned by the Search web method:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.CustEnt.CustomerID	YES	290255139-01

8.1.3.2 SaveAll

The table below indicates the components of the SaveAllReq:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SaveAllReq.CMSEnt.CustEnt.Surname	YES	KIBI
SaveAllReq.CMSEnt.CustEnt.Other_names	YES	CHRISTINE ANNE
SaveAllReq.CMSEnt.CustEnt.Id_no	YES	11123473
SaveAllReq.CMSEnt.CustEnt.Id_type	YES	National ID
SaveAllReq.CMSEnt.CustEnt.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.CustEnt.Address_2	YES	Osu
SaveAllReq.CMSEnt.CustEnt.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.CustEnt.Telephone_1	YES	0505122122
SaveAllReq.CMSEnt.CustEnt.Telephone_2	YES	0
SaveAllReq.CMSEnt.CustEnt.Telephone_3	YES	0505133133
SaveAllReq.CMSEnt.CustEnt.Fax	YES	0
SaveAllReq.CMSEnt.CustEnt.email	YES	kibi@gmail.com
SaveAllReq.CMSEnt.CustEnt.Tax_ref_no	YES	A003551234R
SaveAllReq.CMSEnt.CustEnt.Exist	YES	FALSE – This is a new customer
SaveAllReq.SaveAllType	YES	f_add_customer
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

The table below indicates the components of the SaveAllResp:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt.CustEnt. CustomerID	YES	290255139-01

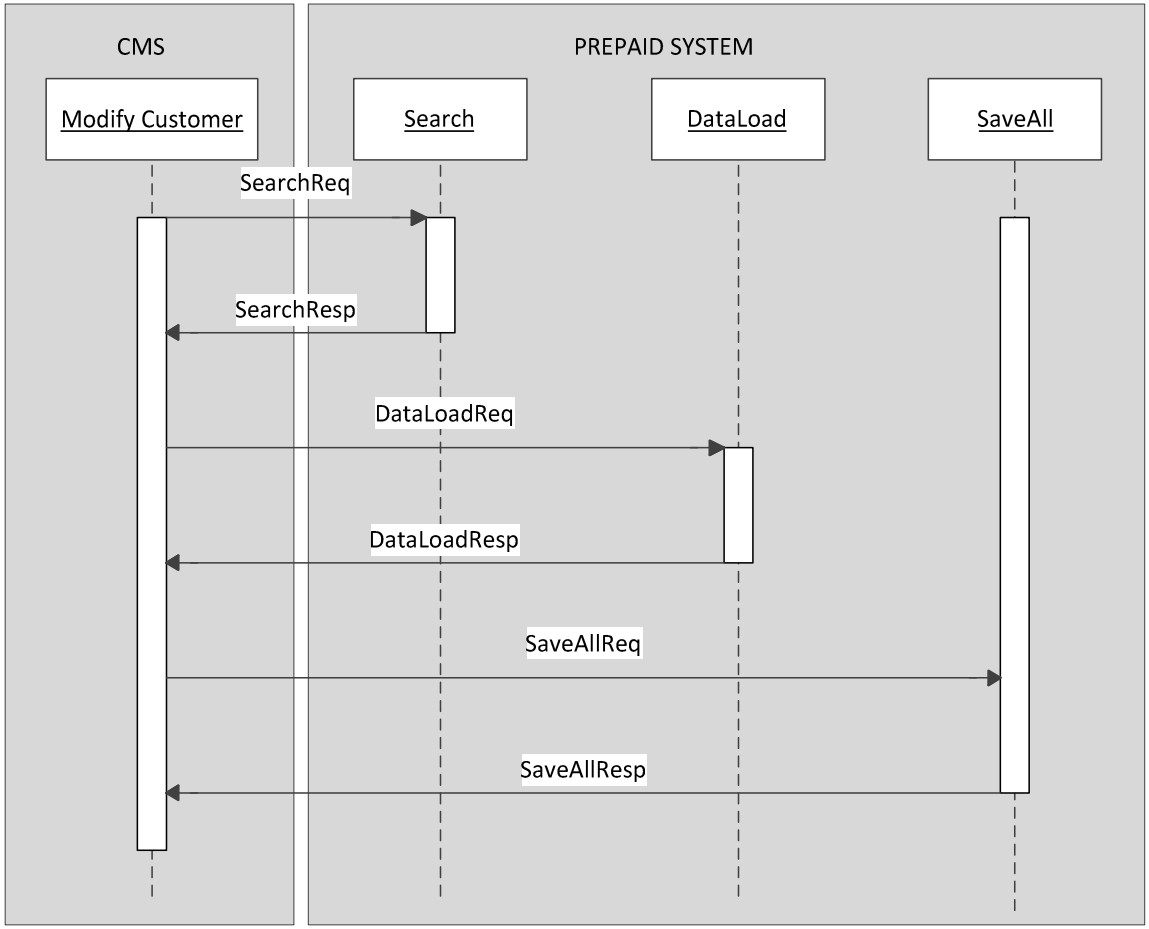
8.2 Modify Customer

The following scenario describes the modification of an existing customer's data.

8.2.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the customer already exists in the prepaid system.
DataLoad	This web method is used to retrieve the contract data of a customer based on the parameters passed.
SaveAll	This web method is called to upload the customer details to the prepaid system.

8.2.2 Sequence Diagram



8.2.3 Message Specification

8.2.3.1 Search Web Method

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.CustEnt.CustomerID	YES	290255139-01

8.2.3.2 DataLoad Web Method

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

N.B.: The CustEnt parameter will contain all the customer data that is in the prepaid database. The ServPoint parameter will contain the service point details that are linked to the customerID.

8.2.3.3 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SaveAllReq.CMSEnt.CustEnt.Surname	YES	KIBI
SaveAllReq.CMSEnt.CustEnt.Other_names	YES	CHRISTINE ANNE
SaveAllReq.CMSEnt.CustEnt.Id_no	YES	11123473
SaveAllReq.CMSEnt.CustEnt.Id_type	YES	National ID
SaveAllReq.CMSEnt.CustEnt.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.CustEnt.Address_2	YES	Osu
SaveAllReq.CMSEnt.CustEnt.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.CustEnt.Telephone_1	YES	0505122189
SaveAllReq.CMSEnt.CustEnt.Telephone_2	YES	0
SaveAllReq.CMSEnt.CustEnt.Telephone_3	YES	0505133133
SaveAllReq.CMSEnt.CustEnt.Fax	YES	0
SaveAllReq.CMSEnt.CustEnt.email	YES	kibi@gmail.com
SaveAllReq.CMSEnt.CustEnt.Tax_ref_no	YES	A003551234R
SaveAllReq.CMSEnt.CustEnt.Exist	YES	TRUE – Since the customer already exists
SaveAllReq.SaveAllType	YES	f_mod_customer
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt.CustEnt. CustomerID	YES	290255139-01

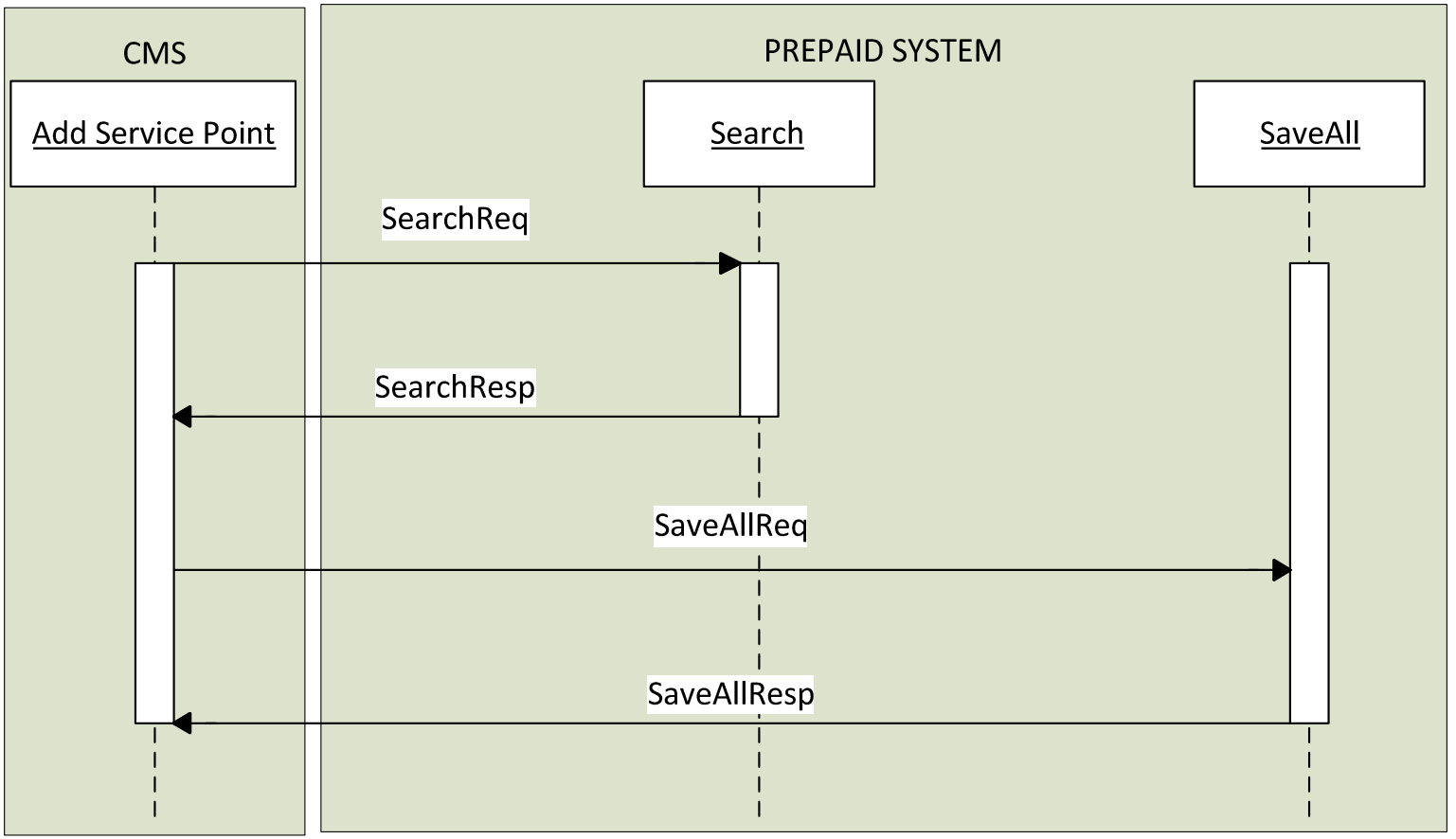
8.3 Add Service Point

The following scenario describes the creation of a new service point in the prepaid system.

8.3.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the service point already exists in the prepaid system.
SaveAll	This web method is called to upload the service point details to the prepaid system

8.3.2 Sequence Diagram



8.3.3 Message Specification

8.3.3.1 Search Web Method

The table below indicates the components of the SearchReq parameter that will be used to invoke the Search web method:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint.ServPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

The table below indicates the components of the SearchResp parameter that is returned by the Search web method:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.ServPointID	YES	290255139-01

8.3.3.2 SaveAll Web Method

The table below indicates the components of the SaveAllReq:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
SaveAllReq.CMSEnt.ServPoint.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.ServPoint.Address_2	YES	Osu
SaveAllReq.CMSEnt.ServPoint.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.ServPoint.Geo_code	YES	02-04-100-030-060-1200
SaveAllReq.CMSEnt.ServPoint.meter	NO	
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_code	YES	E10
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_group	YES	1
SaveAllReq.CMSEnt.ServPoint.blockFlag	YES	FALSE – Service is active
SaveAllReq.CMSEnt.ServPoint.blockReason	NO	
SaveAllReq.CMSEnt.ServPoint.Exist	YES	FALSE – This is a new service point
SaveAllReq.SaveAllType	YES	f_add_serv_point
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

The table below indicates the components of the SaveAllResp:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error

SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt.ServPoint.servPointID	YES	290255139-01

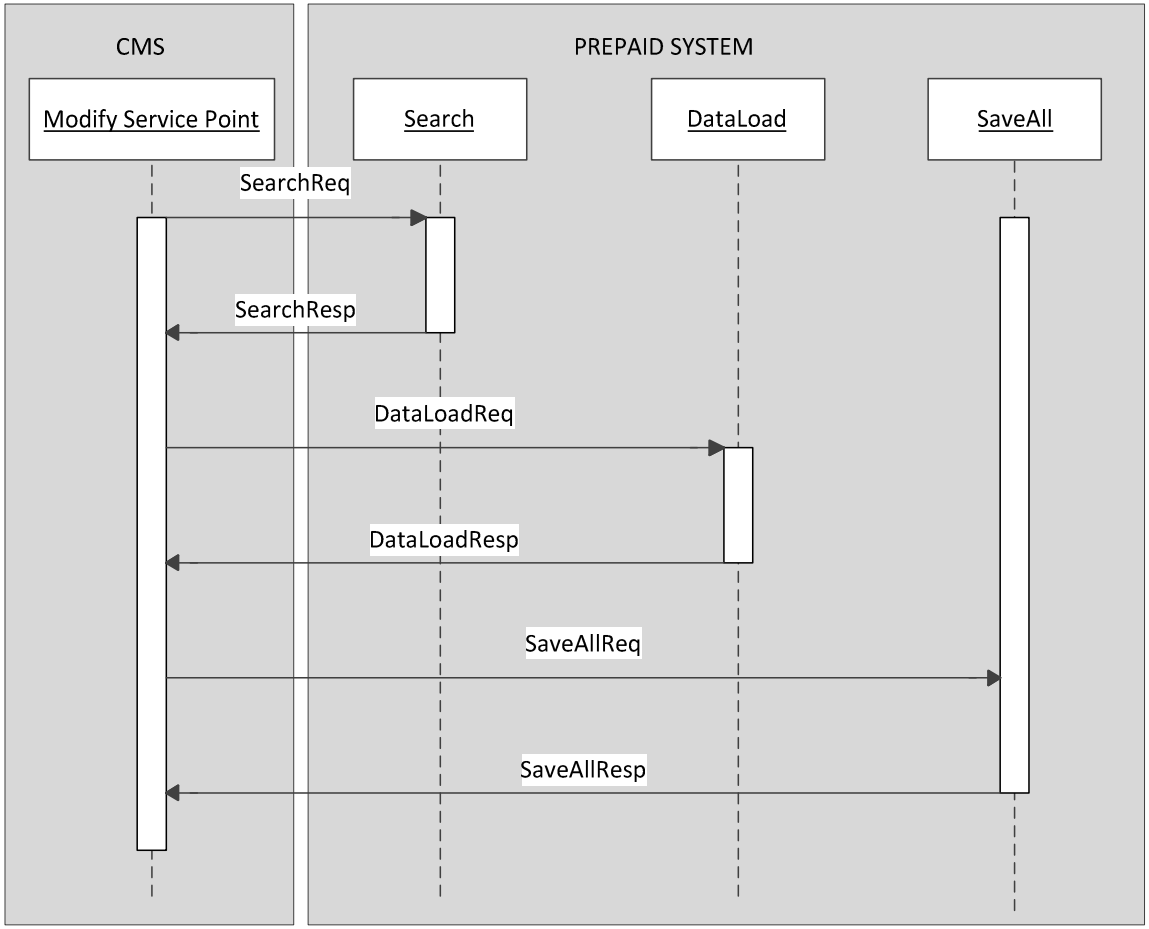
8.4 Modify Service Point

The following scenario describes the modification of an already existing service point.

8.4.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the service point already exists in the prepaid system.
DataLoad	This web method is used to retrieve the service point data based on the parameters passed.
SaveAll	This web method is called to upload the updated service point details to the prepaid system.

8.4.2 Sequence Diagram



8.4.3 Message Specification

8.4.3.1 Search Web Method

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint. servPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.servPointID	YES	290255139-01

8.4.3.2 DataLoad Web Method

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

N.B.: The ServPoint parameter will contain the service point details for the ServPointID that was passed to the method. The CustEnt parameter will contain all the customer details linked to the ServPointID.

8.4.3.3 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
SaveAllReq.CMSEnt.ServPoint.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.ServPoint.Address_2	YES	Osu
SaveAllReq.CMSEnt.ServPoint.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.ServPoint.Geo_code	YES	02-04-100-030-060-1200
SaveAllReq.CMSEnt.ServPoint.meter	NO	
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_code	YES	E10
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_group	YES	1
SaveAllReq.CMSEnt.ServPoint.blockFlag	YES	FALSE/ TRUE
SaveAllReq.CMSEnt.ServPoint.blockReason	NO	
SaveAllReq.CMSEnt.ServPoint.Exist	YES	TRUE – This is an existing service point
SaveAllReq.SaveAllType	YES	f_mod_serv_point
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error

SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt. ServPoint.servPointID	YES	290255139-01

N.B.: The scenario for Service Point modification will be used to block and unblock services. To block a service, the blockFlag will be set to TRUE and a blockReason will be provided. To unblock the service, the blockFlag will be set to FALSE.
If the blockFlag in the prepaid system is already FALSE and a new message is sent with the blockFlag as FALSE, this should not be marked as an error by the prepaid system.

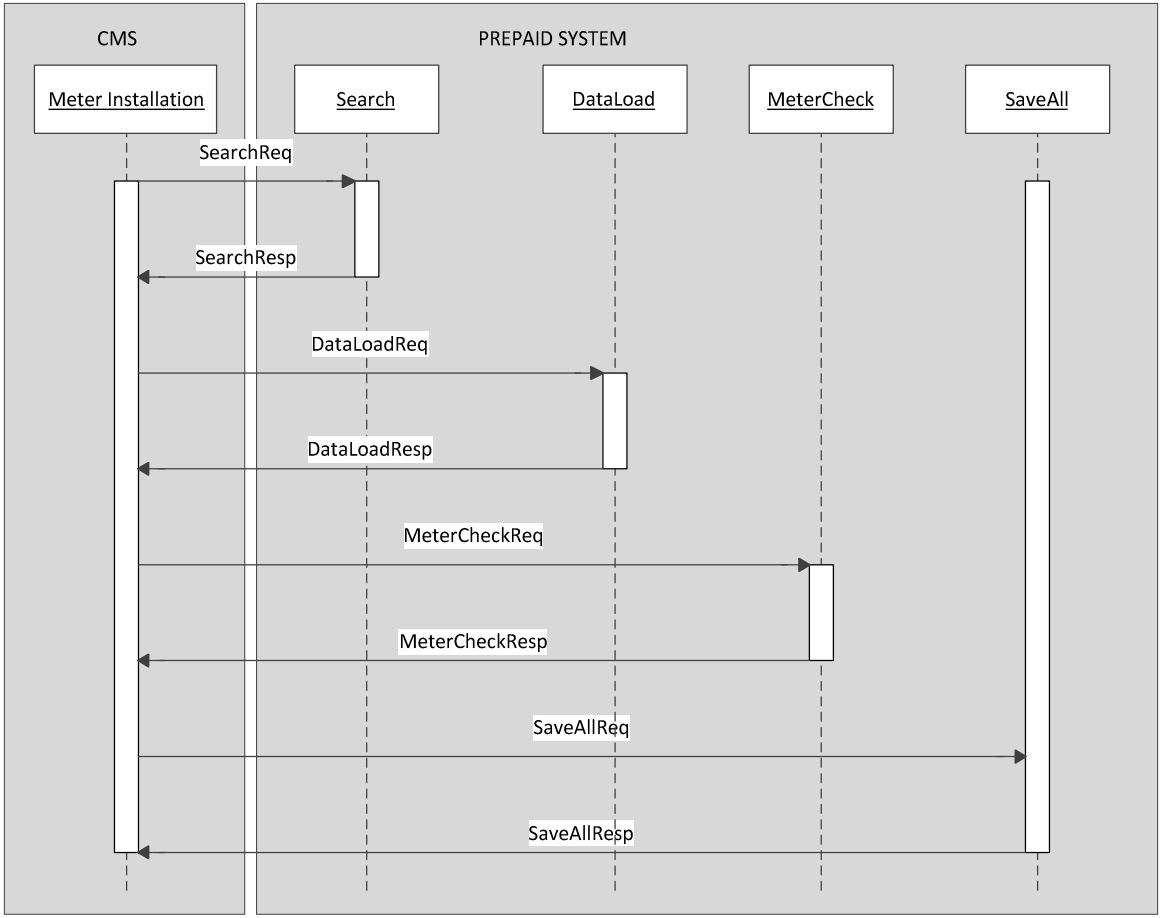
8.5 Meter Installation

The following scenario describes the installation of a meter on a service point.

8.5.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the service point already exists in the prepaid system.
DataLoad	This web method is used to retrieve the service point data based on the parameters passed.
MeterCheck	This web method is used to check if the meter exists and is available for installation. It will return the meter details.
SaveAll	This web method is called to upload the updated service point details to the prepaid system.

8.5.2 Sequence Diagram



8.5.3 Message Specification

8.5.3.1 Search Web Method

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint. servPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.servPointID	YES	290255139-01

8.5.3.2 DataLoad Web Method

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

N.B.: The ServPoint parameter will contain the service point details for the ServPointID that was passed to the method. The CustEnt parameter will contain all the customer details linked to the ServPointID.

8.5.3.3 MeterCheck Web Method

MeterCheckReq parameter variables:

Name	Mandatory	Example
MeterCheckReq.AuthCred.userName	YES	operator
MeterCheckReq.AuthCred.password	YES	Password
MeterCheckReq.AuthCred.messageID	YES	1234567890
MeterCheckReq.AuthCred.messageTimestamp	YES	20130417095823
MeterCheckReq.AuthCred.clientID	YES	172.22.1.176
MeterCheckReq.MeterEnt.Meter_serial_no	YES	0375756744
MeterCheckReq.MeterEnt.Make	YES	MC001
MeterCheckReq.AuthCred.RegionCode	YES	10011060
MeterCheckReq.AuthCred.MeterCode	YES	MC004ML019

MeterCheckResp parameter variables:

Name	Mandatory	Example
MeterCheckResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
MeterCheckResp.ErrorParam.ErrorMsg	NO	
MeterCheckResp.MeterEnt	YES	

8.5.3.4 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890

SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
SaveAllReq.CMSEnt.ServPoint.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.ServPoint.Address_2	YES	Osu
SaveAllReq.CMSEnt.ServPoint.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.ServPoint.Geo_code	YES	02-04-100-030-060-1200
SaveAllReq.CMSEnt.ServPoint.meter	YES	(set to the return of the MeterCheck method)
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_code	YES	E10
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_group	YES	1
SaveAllReq.CMSEnt.ServPoint.blockFlag	YES	FALSE/ TRUE
SaveAllReq.CMSEnt.ServPoint.blockReason	NO	
SaveAllReq.CMSEnt.ServPoint.Exist	YES	TRUE – This is an existing service point
SaveAllReq.SaveAllType	YES	f_install_meter
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	**Mandatory**	**Example**
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt. ServPoint.servPointID	YES	290255139-01

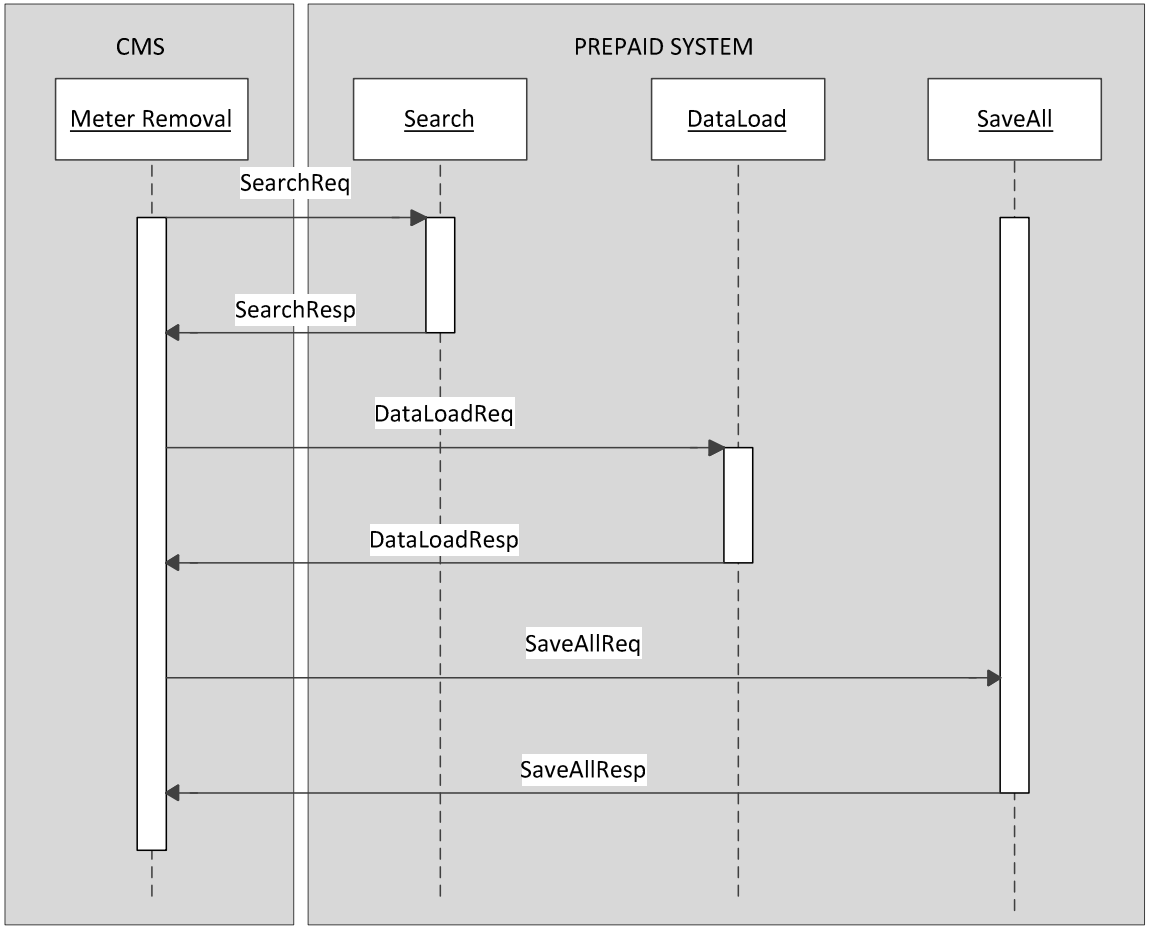
8.6 Meter Removal

This scenario describes the removal of a meter from a service point.

8.6.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the service point already exists in the prepaid system.
DataLoad	This web method is used to retrieve the service point data based on the parameters passed.
SaveAll	This web method is called to upload the updated service point details to the prepaid system.

8.6.2 Sequence Diagram



8.6.3 Message Specification

8.6.3.1 Search Web Method

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint. servPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.servPointID	YES	290255139-01

8.6.3.2 DataLoad Web Method

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

N.B.: The ServPoint parameter will contain the service point details for the ServPointID that was passed to the method. The CustEnt parameter will contain all the customer details linked to the ServPointID.

8.6.3.3 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
SaveAllReq.CMSEnt.ServPoint.Address_1	YES	37 Liberation Road
SaveAllReq.CMSEnt.ServPoint.Address_2	YES	Osu
SaveAllReq.CMSEnt.ServPoint.Address_3	YES	Accra East, Accra
SaveAllReq.CMSEnt.ServPoint.Geo_code	YES	02-04-100-030-060-1200
SaveAllReq.CMSEnt.ServPoint.meter	YES	This will be set to NULL
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_code	YES	E10
SaveAllReq.CMSEnt.ServPoint.tariff.Tariff_group	YES	1
SaveAllReq.CMSEnt.ServPoint.blockFlag	YES	FALSE/ TRUE
SaveAllReq.CMSEnt.ServPoint.blockReason	NO	
SaveAllReq.CMSEnt.ServPoint.Exist	YES	TRUE – This is an existing service point
SaveAllReq.SaveAllType	YES	f_remove_meter
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error

SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt. ServPoint.servPointID	YES	290255139-01

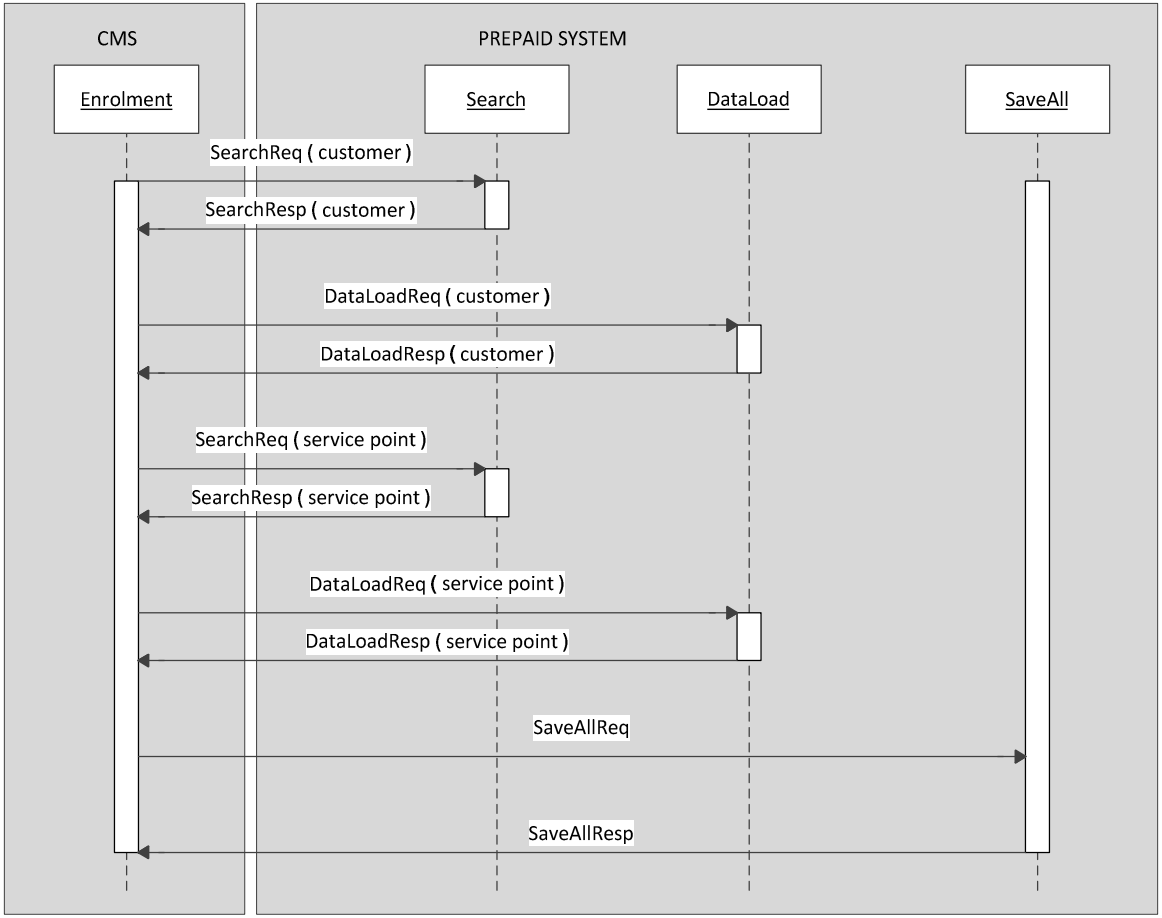
8.7 Enrolment

This scenario describes the contracting of a customer which will imply the linking of the customer to a service point.

8.7.1 Sequence of Events

Web Method	**Description**
Search	This web method is called to check if the service point and customer already exists in the prepaid system.
DataLoad	This web method is used to retrieve the customer data and the service point data based on the parameters passed.
SaveAll	This web method is called to upload the updated service point details to the prepaid system.

8.7.2 Sequence Diagram



8.7.3 Message Specification

8.7.3.1 Search Web Method

8.7.3.1.1 Customer Search

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.CustEnt.CustomerID	YES	290255139-01

8.7.3.1.2 Service Point Search

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint. servPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.servPointID	YES	290255139-01

8.7.3.2 DataLoad Web Method

8.7.3.2.1 Customer DataLoad

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password

DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.CustEnt.CustomerID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	**Mandatory**	**Example**
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

8.7.3.2.2 Service Point DataLoad

DataLoadReq parameter variables:

Name	**Mandatory**	**Example**
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060

DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

8.7.3.3 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example
SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.CustEnt	YES	(Assigned to CustEnt parameter returned in DataLoad)
SaveAllReq.CMSEnt.ServPoint	YES	(Assigned to ServPoint parameter returned in DataLoad)
SaveAllReq.SaveAllType	YES	f_enroll

SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	Mandatory	Example
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt.CustEnt.CustomerID	YES	290255139-01
SaveAllResp.CMSEnt.ServPoint.servPointID	YES	290255139-01

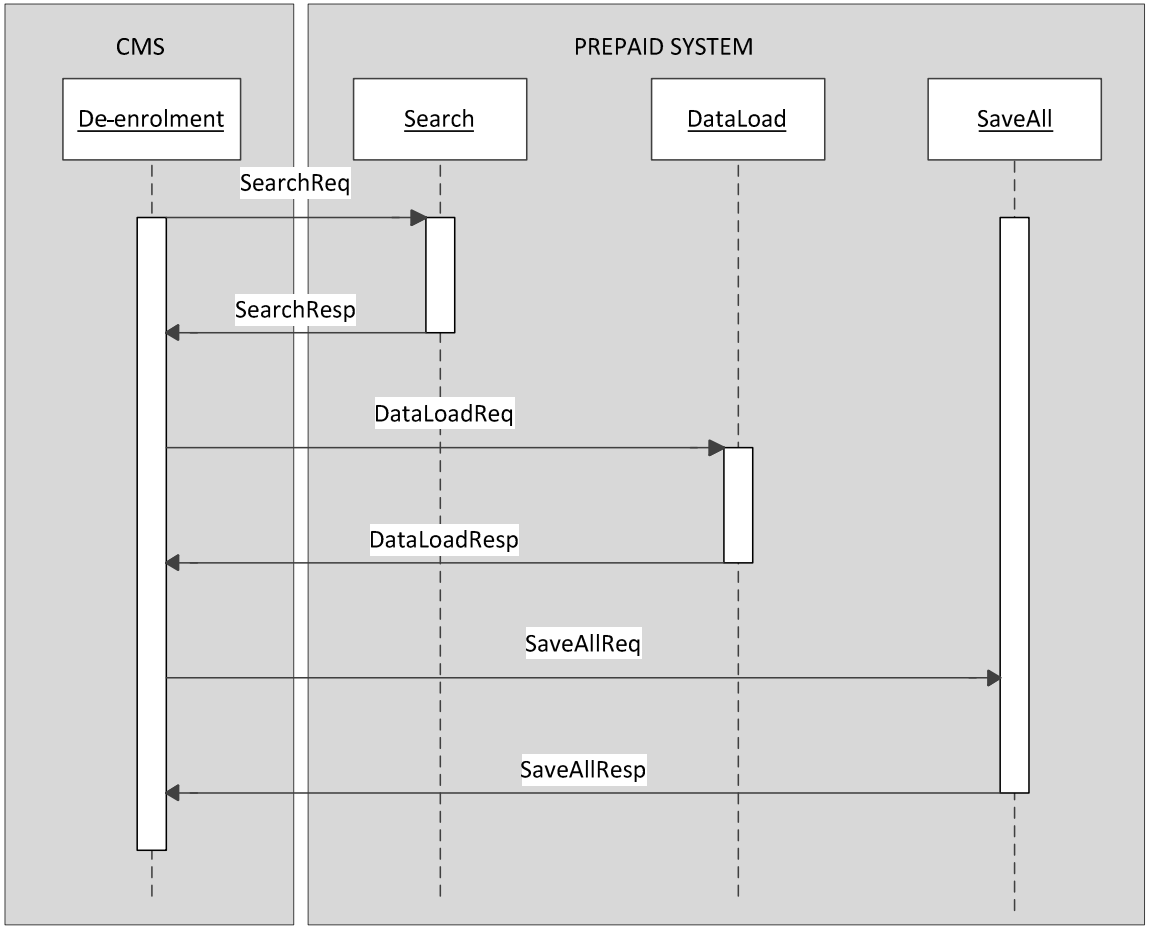
8.8 De-enrolment

The following scenario describes the cancellation of a contract. This will imply the removal of the link between the customer and the service point.

8.8.1 Sequence of Events

Web Method	Description
Search	This web method is called to check if the customer already exists in the prepaid system.
DataLoad	This web method is used to retrieve the contract data from the prepaid system
SaveAll	This web method is called to upload the modified contract details to the prepaid system

8.8.2 Sequence Diagram



8.8.3 Message Specification

8.8.3.1 Search Web Method

SearchReq parameter variables:

Name	Mandatory	Example
SearchReq.AuthCred.userName	YES	operator
SearchReq.AuthCred.password	YES	Password
SearchReq.AuthCred.messageID	YES	1234567890
SearchReq.AuthCred.messageTimestamp	YES	20130417095823
SearchReq.AuthCred.clientID	YES	172.22.1.176
SearchReq.SearchType	YES	EXACT
SearchReq.CMSEnt.ServPoint. servPointID	YES	290255139-01
SearchReq.AuthCred.RegionCode	YES	10011060
SearchReq.AuthCred.MeterCode	YES	MC004ML019

SearchResp parameter variables:

Name	Mandatory	Example
SearchResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SearchResp.ErrorParam.ErrorMsg	NO	
SearchResp.SearchResult[].CMSEnt.ServPoint.servPointID	YES	290255139-01

8.8.3.2 DataLoad Web Method

DataLoadReq parameter variables:

Name	Mandatory	Example
DataLoadReq.AuthCred.userName	YES	operator
DataLoadReq.AuthCred.password	YES	Password
DataLoadReq.AuthCred.messageID	YES	1234567890
DataLoadReq.AuthCred.messageTimestamp	YES	20130417095823
DataLoadReq.AuthCred.clientID	YES	172.22.1.176
DataLoadReq.CMSEnt.ServPoint.servPointID	YES	290255139-01
DataLoadReq.AuthCred.RegionCode	YES	10011060
DataLoadReq.AuthCred.MeterCode	YES	MC004ML019

DataLoadResp parameter variables:

Name	Mandatory	Example
DataLoadResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
DataLoadResp.ErrorParam.ErrorMsg	NO	
DataLoadResp.CMSEnt.CustEnt	NO	
DataLoadResp.CMSEnt.ServPoint	NO	

N.B.: The ServPoint parameter will contain the service point details for the ServPointID that was passed to the method. The CustEnt parameter will contain all the customer details linked to the ServPointID.

8.8.3.3 SaveAll Web Method

SaveAllReq parameter variables:

Name	Mandatory	Example

SaveAllReq.AuthCred.userName	YES	operator
SaveAllReq.AuthCred.password	YES	Password
SaveAllReq.AuthCred.messageID	YES	1234567890
SaveAllReq.AuthCred.messageTimestamp	YES	20130417095823
SaveAllReq.AuthCred.clientID	YES	172.22.1.176
SaveAllReq.CMSEnt.ServPoint	YES	(Assigned to ServPoint parameter returned in DataLoad)
SaveAllReq.CMSEnt.CustEnt	YES	(This will be set to null)
SaveAllReq.SaveAllType	YES	f_deenroll
SaveAllReq.AuthCred.RegionCode	YES	10011060
SaveAllReq.AuthCred.MeterCode	YES	MC004ML019

SaveAllResp parameter variables:

Name	**Mandatory**	**Example**
SaveAllResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
SaveAllResp.ErrorParam.ErrorMsg	NO	
SaveAllResp.CMSEnt. ServPoint.servPointID	YES	290255139-01

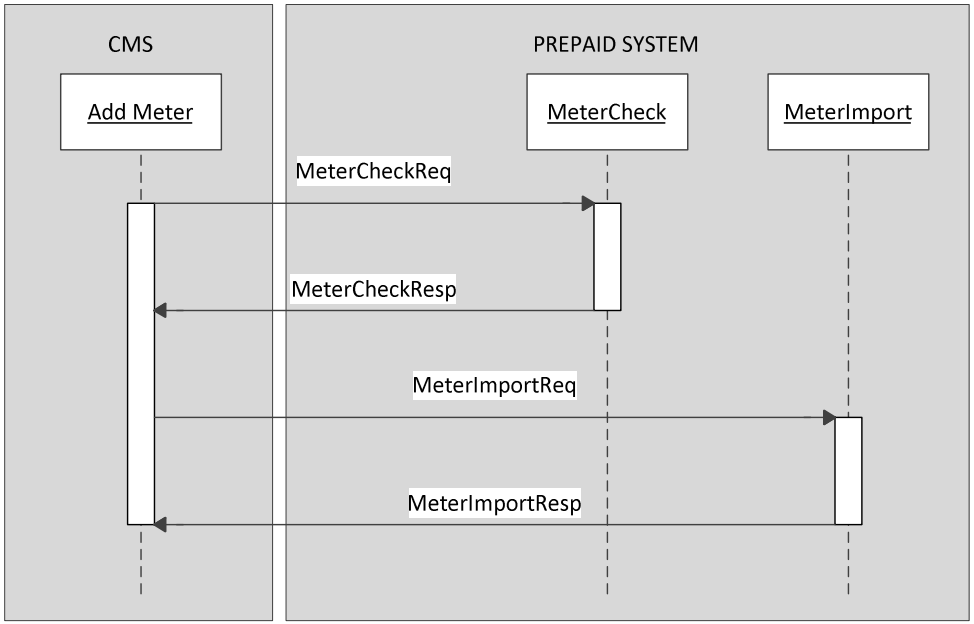
8.9 Add meter to Store

This scenario describes the process of adding a new meter to the prepaid system store

8.9.1 Sequence of Events

Web Method	**Description**
MeterCheck	This web method is called to check if the meter already exists in the prepaid system.
MeterImport	This web method is called to upload the meter details to the prepaid system.

8.9.2 Sequence Diagram



8.9.3 Message Specification

8.9.3.1 MeterCheck Web Method

MeterCheckReq parameter variables:

Name	Mandatory	Example
MeterCheckReq.AuthCred.userName	YES	operator
MeterCheckReq.AuthCred.password	YES	Password

MeterCheckReq.AuthCred.messageID	YES	1234567890
MeterCheckReq.AuthCred.messageTimestamp	YES	20130417095823
MeterCheckReq.AuthCred.clientID	YES	172.22.1.176
MeterCheckReq.MeterEnt.Meter_serial_no	YES	0375756744
MeterCheckReq.MeterEnt.Make	YES	MC001
MeterCheckReq.AuthCred.RegionCode	YES	10011060
MeterCheckReq.AuthCred.MeterCode	YES	MC004ML019

MeterCheckResp parameter variables:

Name	**Mandatory**	**Example**
MeterCheckResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
MeterCheckResp.ErrorParam.ErrorMsg	NO	
MeterCheckResp.MeterEnt	YES	Null if no meter

8.9.3.2 MeterImport Web Method

MeterImportReq parameter variables:

Name	**Mandatory**	**Example**
MeterImportReq.AuthCred.userName	YES	operator
MeterImportReq.AuthCred.password	YES	Password
MeterImportReq.AuthCred.messageID	YES	1234567890
MeterImportReq.AuthCred.messageTimestamp	YES	20130417095823
MeterImportReq.AuthCred.clientID	YES	172.22.1.176
MeterImportReq.MeterEnt.Meter_serial_no	YES	0375756744

MeterImportReq.MeterEnt.Make	YES	MC001
MeterImportReq.MeterEnt.Model	YES	MO452
MeterImportReq.MeterEnt.Batch_no	YES	301300000000001
MeterImportReq.AuthCred.RegionCode	YES	10011060
MeterImportReq.AuthCred.MeterCode	YES	MC004ML019

MeterImportResp parameter variables:

Name	**Mandatory**	**Example**
MeterImportResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
MeterImportResp.ErrorParam.ErrorMsg	NO	

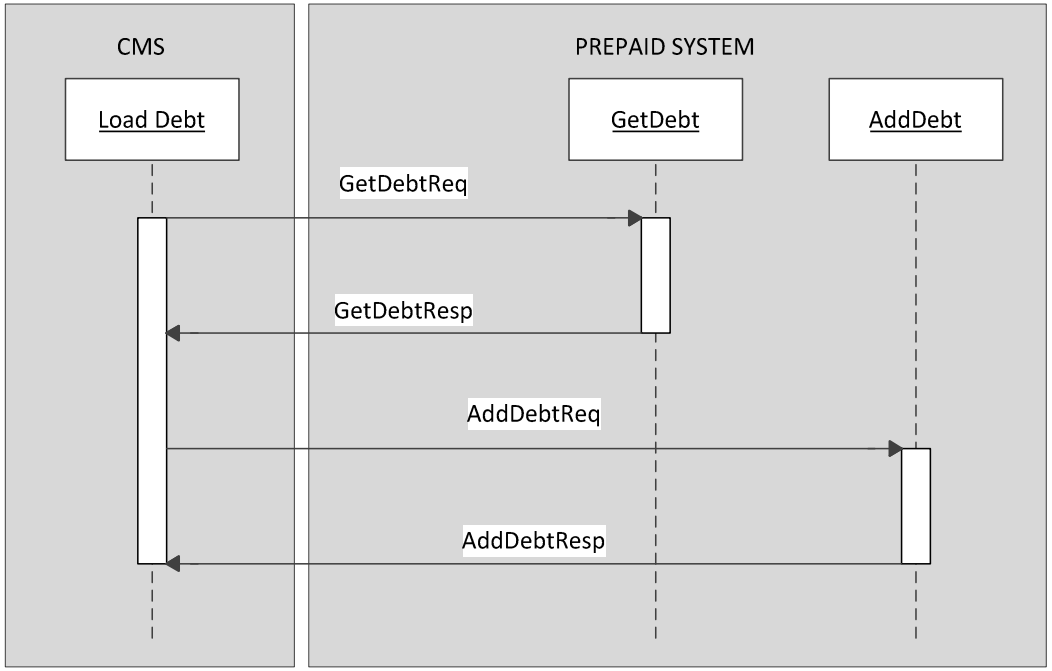
8.10 Load Debt

This scenario describes the creation of a new debt amount in the prepaid system.

8.10.1 Sequence of Events

Web Method	**Description**
GetDebt	This web method is called to check if the customer has any debt.
AddDebt	This web method is called to upload the customer debt to the prepaid system.

8.10.2 Sequence Diagram



8.10.3 Message Specification

8.10.3.1 GetDebt Web Method

GetDebtReq parameters variables:

Name	Mandatory	Example
GetDebtReq.AuthCred.userName	YES	operator
GetDebtReq.AuthCred.password	YES	Password

GetDebtReq.AuthCred.messageID	YES	1234567890
GetDebtReq.AuthCred.messageTimestamp	YES	20130417095823
GetDebtReq.AuthCred.clientID	YES	172.22.1.176
GetDebtReq.DebtEnt.CustomerID	YES	290255139-01
GetDebtReq.AuthCred.RegionCode	YES	10011060
GetDebtReq.AuthCred.MeterCode	YES	MC004ML019

GetDebtResp parameter variables:

Name	**Mandatory**	**Example**
GetDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
GetDebtResp.ErrorParam.ErrorMsg	NO	
GetDebtResp.DebtResult[].DebtEnt	YES	Null if no debt

8.10.3.2 AddDebt Web Method

AddDebtReq parameter variables:

Name	**Mandatory**	**Example**
AddDebtReq.AuthCred.userName	YES	operator
AddDebtReq.AuthCred.password	YES	Password
AddDebtReq.AuthCred.messageID	YES	1234567890
AddDebtReq.AuthCred.messageTimestamp	YES	20130417095823
AddDebtReq.AuthCred.clientID	YES	172.22.1.176
AddDebtReq.DebtEnt.CustomerID	YES	290255139-01
AddDebtReq.DebtEnt.Debt_type	YES	VA120
AddDebtReq.DebtEnt.Debt_amount	YES	456.34

AddDebtReq.DebtEnt.Debt_ref	YES	12902551390120140801
AddDebtReq.DebtEnt.Instalment_due_date	YES	20141028
AddDebtReq.DebtEnt.Debt_status	YES	ACTIVE
AddDebtReq.AuthCred.RegionCode	YES	10011060
AddDebtReq.AuthCred.MeterCode	YES	MC004ML019

For instalment plans, the due date will be the date by which the instalment must be settled. For other debts, the date will be set to 29991231.

AddDebtResp parameter variables:

Name	Mandatory	Example
AddDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
AddDebtResp.ErrorParam.ErrorMsg	NO	
AddDebtResp.DebtEnt	YES	

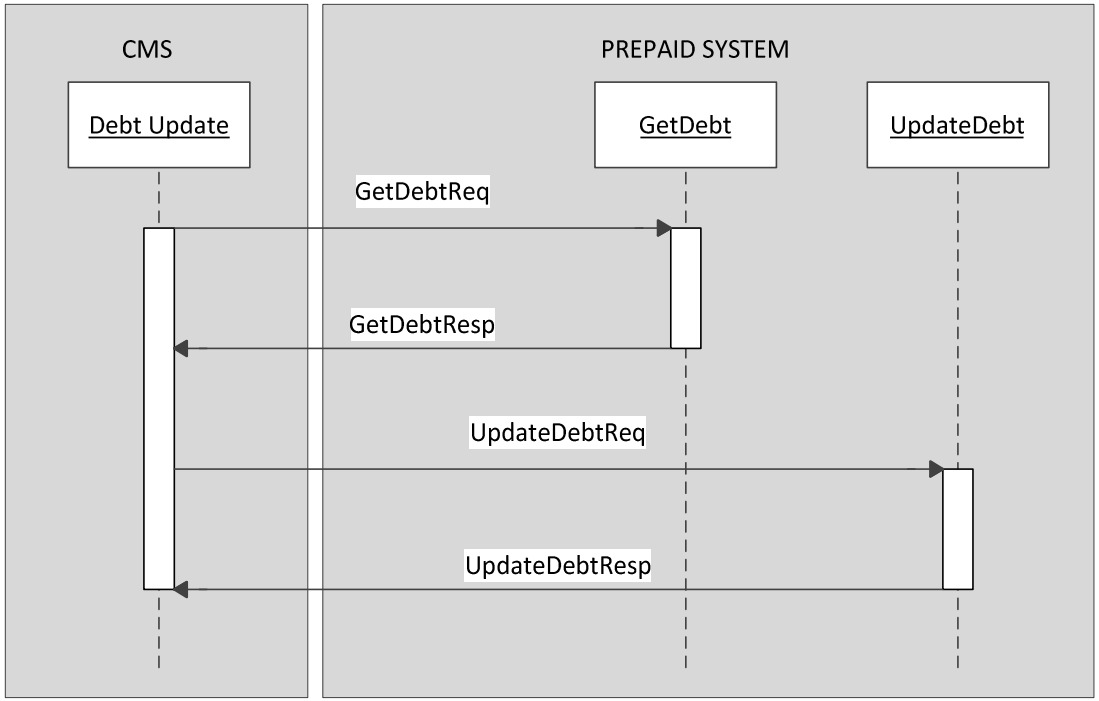
8.11 Update Debt

This scenario describes the process of updating an existing debt value.

8.11.1 Sequence of Events

Web Method	Description
GetDebt	This web method is called to check if the customer has any debt.
UpdateDebt	This web method is called to update customer debt to the prepaid system.

8.11.2 Sequence Diagram



8.11.3 Message Specification

8.11.3.1 GetDebt Web Method

GetDebtReq parameters variables:

Name	Mandatory	Example
GetDebtReq.AuthCred.userName	YES	operator

GetDebtReq.AuthCred.password	YES	Password
GetDebtReq.AuthCred.messageID	YES	1234567890
GetDebtReq.AuthCred.messageTimestamp	YES	20130417095823
GetDebtReq.AuthCred.clientID	YES	172.22.1.176
GetDebtReq.DebtEnt.CustomerID	YES	290255139-01
GetDebtReq.AuthCred.RegionCode	YES	10011060
GetDebtReq.AuthCred.MeterCode	YES	MC004ML019

GetDebtResp parameters variables:

Name	**Mandatory**	**Example**
GetDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
GetDebtResp.ErrorParam.ErrorMsg	NO	
GetDebtResp.DebtResult[].DebtEnt	YES	Null if no debt

8.11.3.2 UpdateDebt Web Method

UpdateDebtReq parameter variables:

Name	**Mandatory**	**Example**
UpdateDebtReq.AuthCred.userName	YES	operator
UpdateDebtReq.AuthCred.password	YES	Password
UpdateDebtReq.AuthCred.messageID	YES	1234567890
UpdateDebtReq.AuthCred.messageTimestamp	YES	20130417095823
UpdateDebtReq.AuthCred.clientID	YES	172.22.1.176
UpdateDebtReq.DebtEnt.CustomerID	YES	290255139-01
UpdateDebtReq.DebtEnt.Debt_type	YES	VA120

UpdateDebtReq.DebtEnt.Debt_amount	YES	756.34
UpdateDebtReq.DebtEnt.Debt_ref	YES	12902551390120140801
UpdateDebtReq.DebtEnt.Instalment_due_date	YES	20141028
UpdateDebtReq.DebtEnt.Debt_status	YES	ACTIVE
UpdateDebtReq.AuthCred.RegionCode	YES	10011060
UpdateDebtReq.AuthCred.MeterCode	YES	MC004ML019

UpdateDebtResp parameter variables:

Name	Mandatory	Example
UpdateDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
UpdateDebtResp.ErrorParam.ErrorMsg	NO	
UpdateDebtResp.DebtEnt	YES	

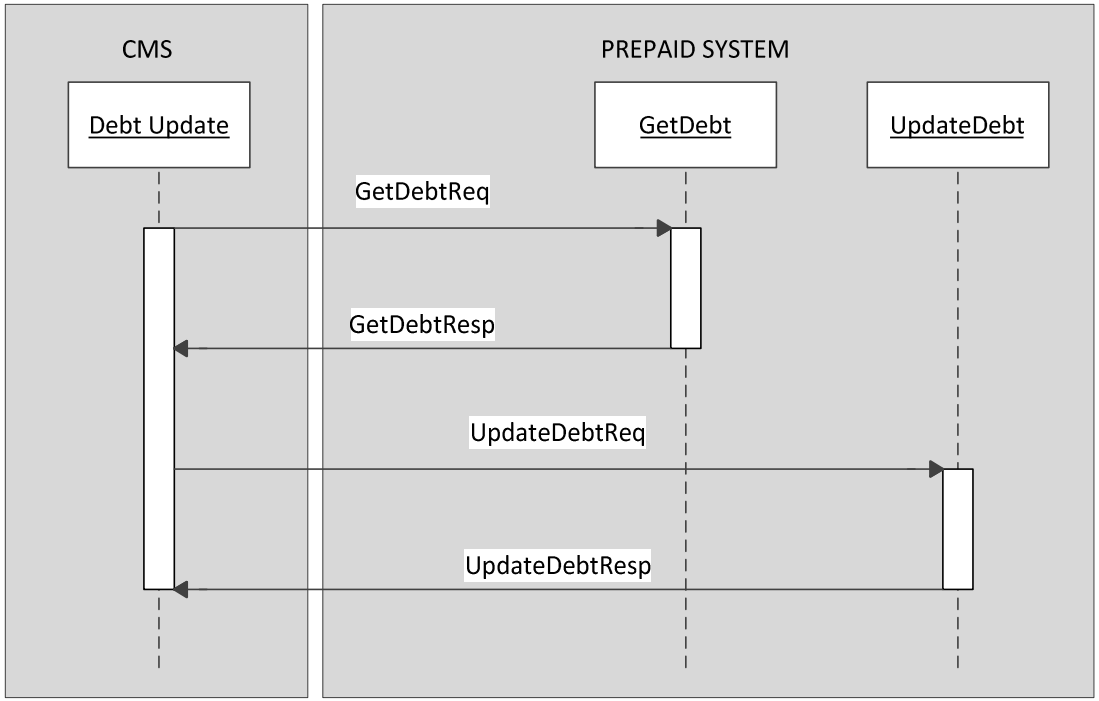
8.12 Cancel Debt

This scenario describes the process of cancelling an existing debt value.

8.12.1 Sequence of Events

Web Method	Description
GetDebt	This web method is called to check if the customer has any debt.
UpdateDebt	This web method is called to update customer debt to the prepaid system.

8.12.2 Sequence Diagram



8.12.3 Message Specification

8.12.3.1 GetDebt Web Method

GetDebtReq parameters variables:

Name	Mandatory	Example
GetDebtReq.AuthCred.userName	YES	operator

GetDebtReq.AuthCred.password	YES	Password
GetDebtReq.AuthCred.messageID	YES	1234567890
GetDebtReq.AuthCred.messageTimestamp	YES	20130417095823
GetDebtReq.AuthCred.clientID	YES	172.22.1.176
GetDebtReq.DebtEnt.CustomerID	YES	290255139-01
GetDebtReq.AuthCred.RegionCode	YES	10011060
GetDebtReq.AuthCred.MeterCode	YES	MC004ML019

GetDebtResp parameters variables:

Name	**Mandatory**	**Example**
GetDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
GetDebtResp.ErrorParam.ErrorMsg	NO	
GetDebtResp.DebtResult[].DebtEnt	YES	Null if no debt

8.12.3.2 UpdateDebt Web Method

UpdateDebtReq parameter variables:

Name	**Mandatory**	**Example**
UpdateDebtReq.AuthCred.userName	YES	operator
UpdateDebtReq.AuthCred.password	YES	Password
UpdateDebtReq.AuthCred.messageID	YES	1234567890
UpdateDebtReq.AuthCred.messageTimestamp	YES	20130417095823
UpdateDebtReq.AuthCred.clientID	YES	172.22.1.176
UpdateDebtReq.DebtEnt.CustomerID	YES	290255139-01
UpdateDebtReq.DebtEnt.Debt_type	YES	VA120

UpdateDebtReq.DebtEnt.Debt_ref	YES	12902551390120140801
UpdateDebtReq.DebtEnt.Debt_status	YES	CANCEL
UpdateDebtReq.AuthCred.RegionCode	YES	10011060
UpdateDebtReq.AuthCred.MeterCode	YES	MC004ML019

UpdateDebtResp parameter variables:

Name	Mandatory	Example
UpdateDebtResp.ErrorParam.ErrorID	YES	0 – No Error -1 - Error
UpdateDebtResp.ErrorParam.ErrorMsg	NO	
UpdateDebtResp.DebtEnt	YES	

8.13 Transactions Processing

All transactions carried out in the prepaid system, such as vending, will be sent back to CMS. In CMS, the data will be processed and reported to the finance system. This process is further detailed in the collection module.

Data will be loaded in the CMS table PREP_TRANS_EXT by the prepaid systems. A batch in CMS will run daily to collect all the data in this table process it in CMS.

The table PREP_TRANS_EXT will be accessed through a database link by the prepaid systems.

Below is the structure of the PREP_TRANS_EXT table:

FIELD NAME	DESCRIPTION	TYPE	SIZE	UNIT	NULL ?	DEFAULT	KEYS

TS	Timestamp of the transaction group	DATE			N		
TRANSACTION_ID	**The ID of the transaction.**	**NUMBER**	**20**		**N**		**PK**
NUM_APA	Meter serial number	VARCHAR2	20	BYTE	N		
CO_MARCA	Meter manufacturer code	VARCHAR2	5	BYTE	N		
CUST_NAME	Name of the customer (Surname, Names)	VARCHAR2	100	BYTE	N		
CUSTOMER_NUMBER	Consumer number	VARCHAR2	80	BYTE	N		
SERVICE_POINT_NO	Service Point number	VARCHAR2	80	BYTE	N		
VENDOR_ID	Vendor id the transaction(s) took place at	VARCHAR2	50	BYTE	Y		
RECPT_NO	Receipt number used in the group transaction. If no valid RECPT_NO, combine CO_CONCEPTO and TRANSACTION_ID	VARCHAR2	50	BYTE	N		
TOKEN_NO	Token number	VARCHAR2	20	BYTE	Y		
PMETHOD	Payment method	VARCHAR2	5	BYTE	Y		
CO_CONCEPTO	Concept Code (DEBT/ CREDIT/ CONSUMPTION/ INSTALLMENT)	VARCHAR2	15	BYTE	N		PK
CSMO_FACT	Amount of units issued on the Resource transaction (KWH). Negative values will be rejected.	NUMBER	12,3		Y		
CYCLE	Cycle number for the consumption	NUMBER	2		Y		
CYCLE_DATE	End date of the cycle	DATE			Y		
IMP_CONCEPTO	Amount of the Concept.	NUMBER	15,3		Y		

DEBT_REF_NO	Unique reference number for debt	VARCHAR2	50	BYTE	Y		
COD_UNICOM	Vendor commercial Office	NUMBER			N		
OPERATOR_NAME	Vendor who sold the token	VARCHAR2	50	BYTE	Y		
CO_SISTEMA	Code for the originating prepaid system	VARCHAR2	5	BYTE	N		PK
NUM_CHEQUE	Cheque number	VARCHAR2	25	BYTE	Y		
COD_CENCOBRO_BANK	Bank commercial office code	NUMBER			Y	0	
EXPORTED	Processed status. [0 – Not processed], [1 – Processed]	NUMBER			N	0	
EXPORTED_TS	Date record was processed	DATE			Y	(SYSDATE)	

Each prepaid system will be assigned a system code. This code must be entered each time a record is inserted into the table PREP_TRANS_EXT. The **final** system codes will be provided as part of the parameterization file.

Below is an example of the codes to be assigned to each system:

VALUE	DESCRIPTION
SE001	Electrocash 2
SE002	Electrocash 1 and 3
SE003	Aimir
SE004	Pay N Smile (PNS)
SE005	Holley
SE006	BOT
SE007	BXC

SECTION IV. BIDDING FORMS – REVISED FORM

The Purchaser has revised this section of the Bidding Document to address specific clarification questions raised by prospective Bidders. In its Bid, the Bidder must use these forms in addition to others Technical Bid Forms of the original Bidding Document.

Sr No	DESCRIPTION	EMPLOYER REQUIREMENT	BIDDER'S OFFER
1.0	3G Communication Module	This module shall be used with three-phase smart meters for remote communication based on GSM, GPRS and 3G. The module shall work in three modes: permanent online; interval online; passive activation, separately. The module shall be plugged in the Smart energy meter and work without external power supply.	
1.1	**Network**		
a	UMTS	900/2100MHz (Option: 1900/850)	
b	GSM	Tri-Band GSM 850/900/1800MHz	
c	GPRS	GPRS multi-slot class 12 AND EDGE multi-slot Class 12	
d	WCDMA	Max.384Kbps(DL), Max.384Kbps(UL)Plug-and-play installation with clear information about the connection status	
1.2	**SIM Card**		
a	SIM Card type	External SIM connectivity, Mini-SIM Card (25mmx15mm) or SIM chip, 2 chips	
1.3	**Power Supply**		
a	Source	From meter	
b	Power consumption Idle	≤0.3W	
c	Power consumption transmission	≤2 W	
1.4	**Environmental condition**		
a	Working temperature range	Up to 70℃	
b	Humidity requirement	95%	
1.5	**Other information**		

Sr No	DESCRIPTION	EMPLOYER REQUIREMENT	BIDDER'S OFFER
a	Antenna	SMA connector	
b	Mounting	In the module area of the electricity meter	
c	Protection degree	IP54 (according to IEC 60529)	
1.6	**Communication**		
a	Communication protocol	DLMS/COSEM, IEC62056-21, TCP/IP stack access via AT commands	

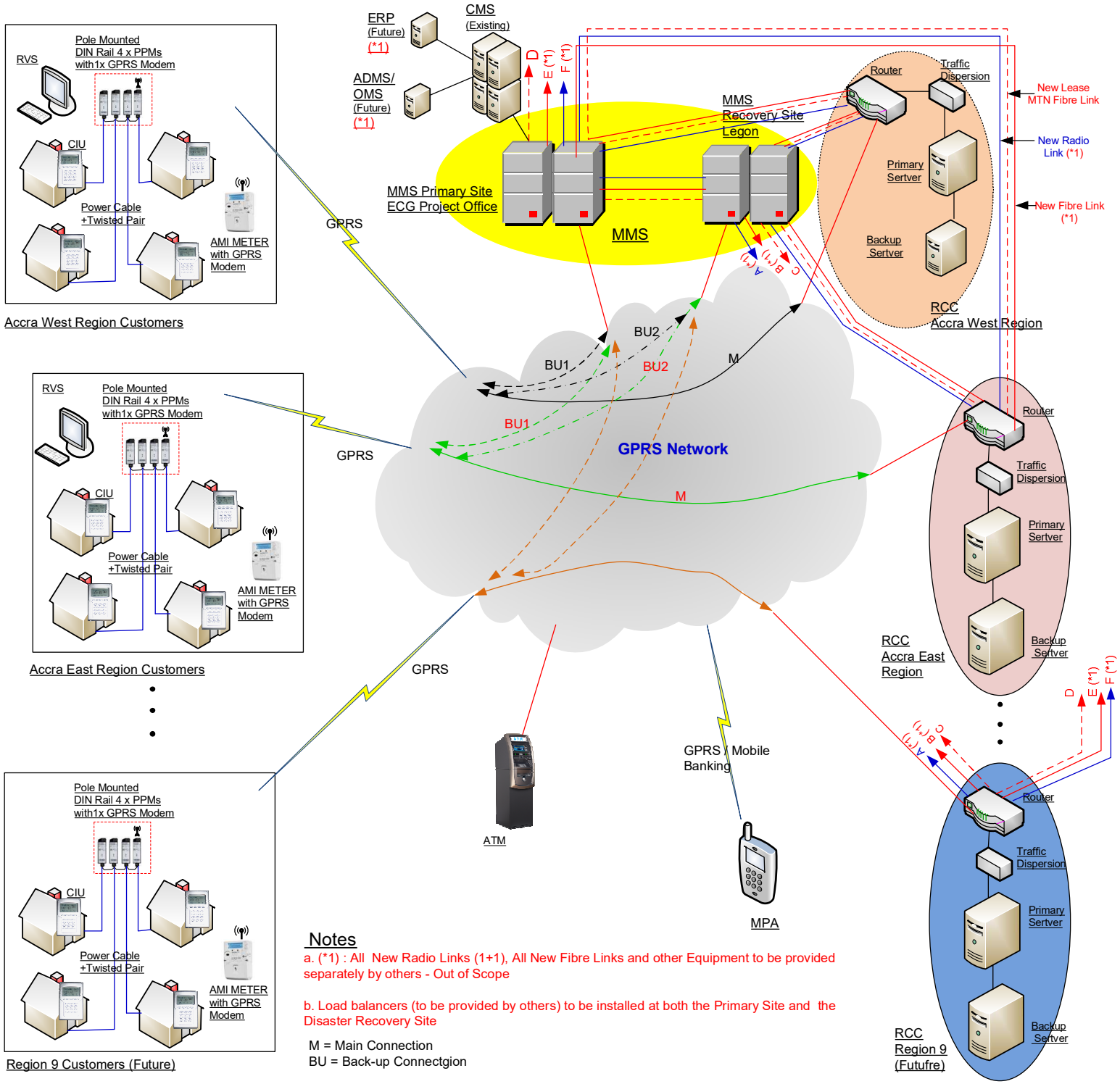
SECTION VII. PURCHASER'S REQUIREMENTS

Section VII. Purchaser's Requirement of the Bidding Document is accordingly revised as follows under 2.8 Technical Data Sheets (TDS)

Sr No	DESCRIPTION	EMPLOYER REQUIREMENT	
1.0	3G Communication Module	This module shall be used with three-phase smart meters for remote communication based on GSM, GPRS and 3G. The module shall work in three modes: permanent online; interval online; passive activation, separately. The module shall be plugged in the Smart energy meter and work without external power supply.	
1.1	**Network**		
a	UMTS	900/2100MHz (Option: 1900/850)	
b	GSM	Tri-Band GSM 850/900/1800MHz	
c	GPRS	GPRS multi-slot class 12 AND EDGE multi-slot Class 12	
d	WCDMA	Max.384Kbps(DL), Max.384Kbps(UL)Plug-and-play installation with clear information about the connection status	
1.2	**SIM Card**		
a	SIM Card type	External SIM connectivity, Mini-SIM Card (25mmx15mm) or SIM chip, 2 chips	
1.3	**Power Supply**		
a	Source	From meter	
b	Power consumption Idle	≤0.3W	

Sr No	DESCRIPTION	EMPLOYER REQUIREMENT	
c	Power consumption transmission	≤2 W	
1.4	**Environmental condition**		
a	Working temperature range	Up to 70℃	
b	Humidity requirement	95%	
1.5	**Other information**		
a	Antenna	SMA connector	
b	Mounting	In the module area of the electricity meter	
c	Protection degree	IP54 (according to IEC 60529)	
1.6	**Communication**		
a	Communication protocol	DLMS/COSEM, IEC62056-21, TCP/IP stack access via AT commands	

Figure 1: Overall Architecture Of Metering Management System (MMS)



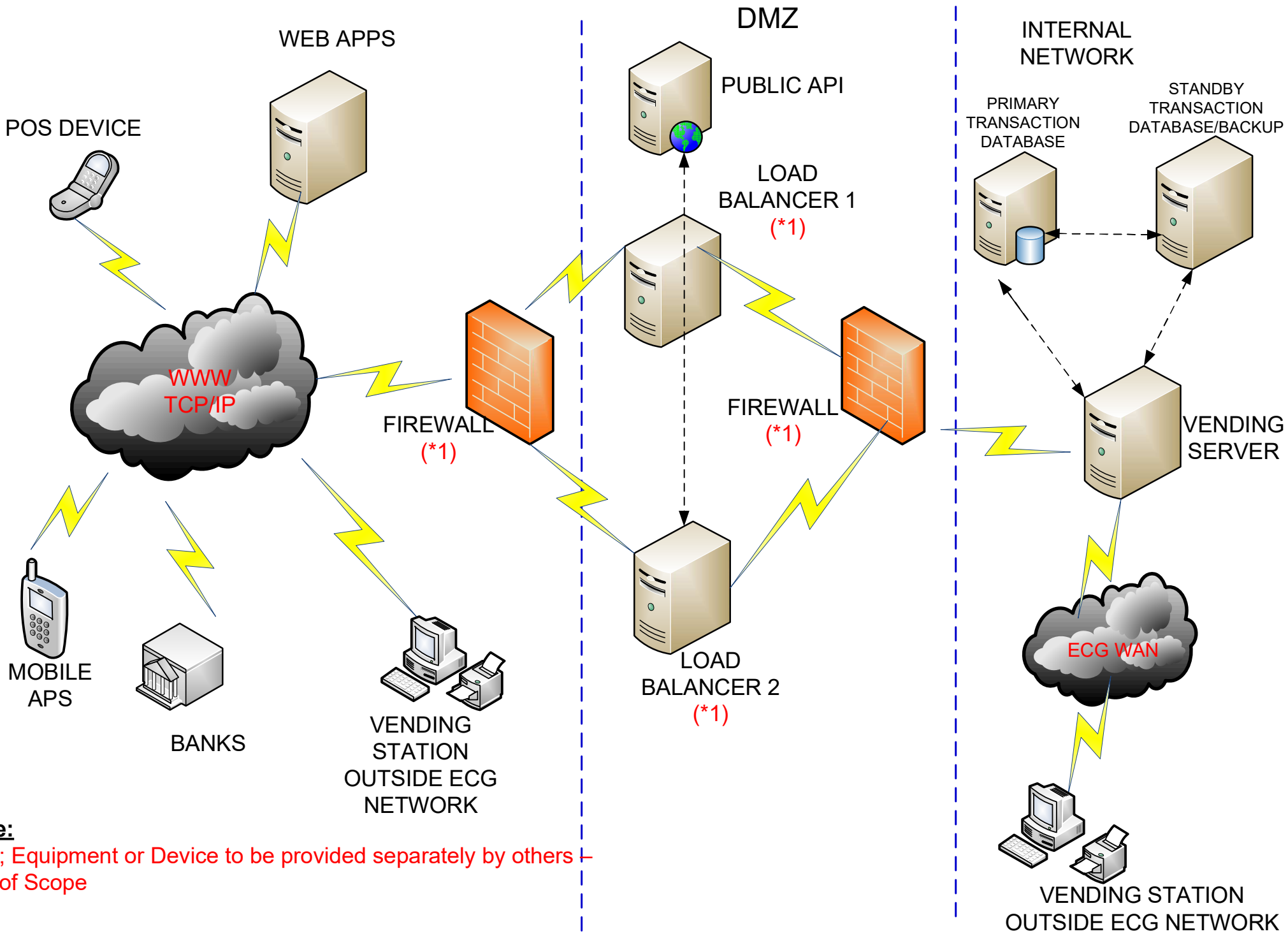
Notes

a. (*1) : All New Radio Links (1+1), All New Fibre Links and other Equipment to be provided separately by others - Out of Scope

b. Load balancers (to be provided by others) to be installed at both the Primary Site and the Disaster Recovery Site

M = Main Connection
BU = Back-up Connectgion

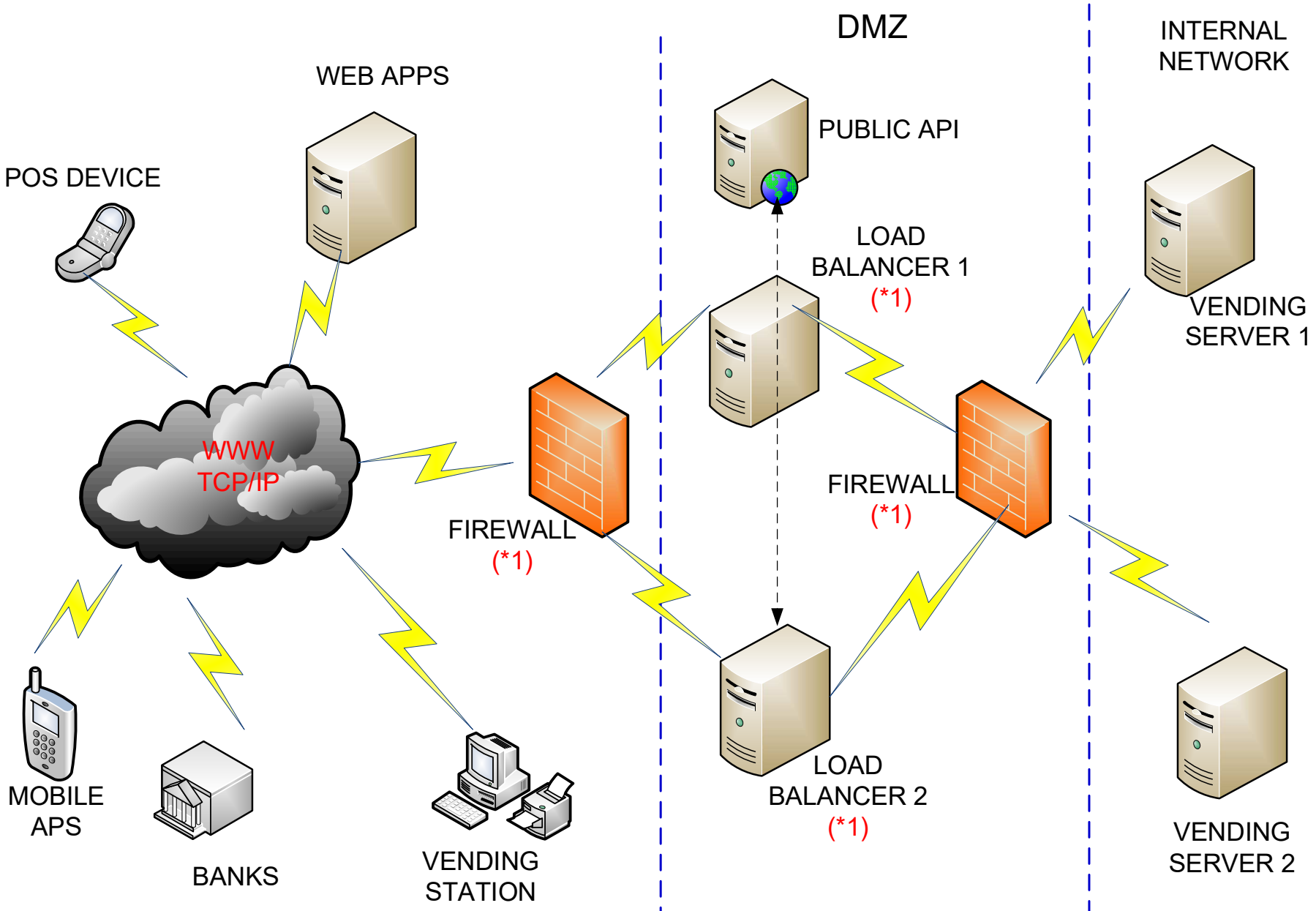
Figure 2: Proposed Model For The Deployment Of Vending Systems



Note:

(*1) ; Equipment or Device to be provided separately by others – Out of Scope

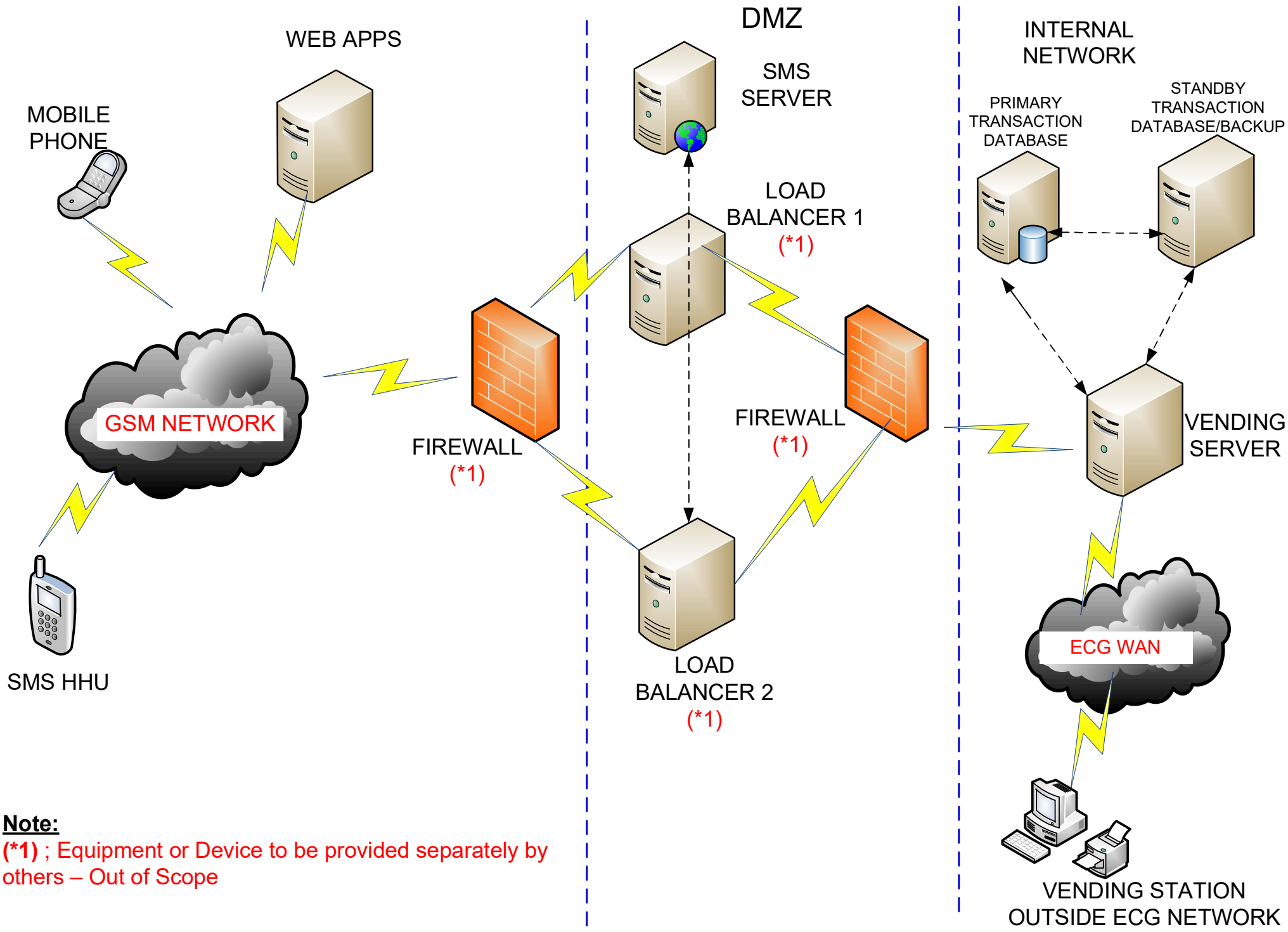
Figure 3: Proposed Model For The Deployment Of Vending Servers With Load Balancer



Note:

(*1) ; Equipment or Device to be provided separately by others – Out of Scope

Figure 4: Proposed Model For The Deployment Of SMS Vending Systems



Note:

(*1) ; Equipment or Device to be provided separately by others – Out of Scope

Figure 5: Proposed Model For Implementing Disaster Recovery System

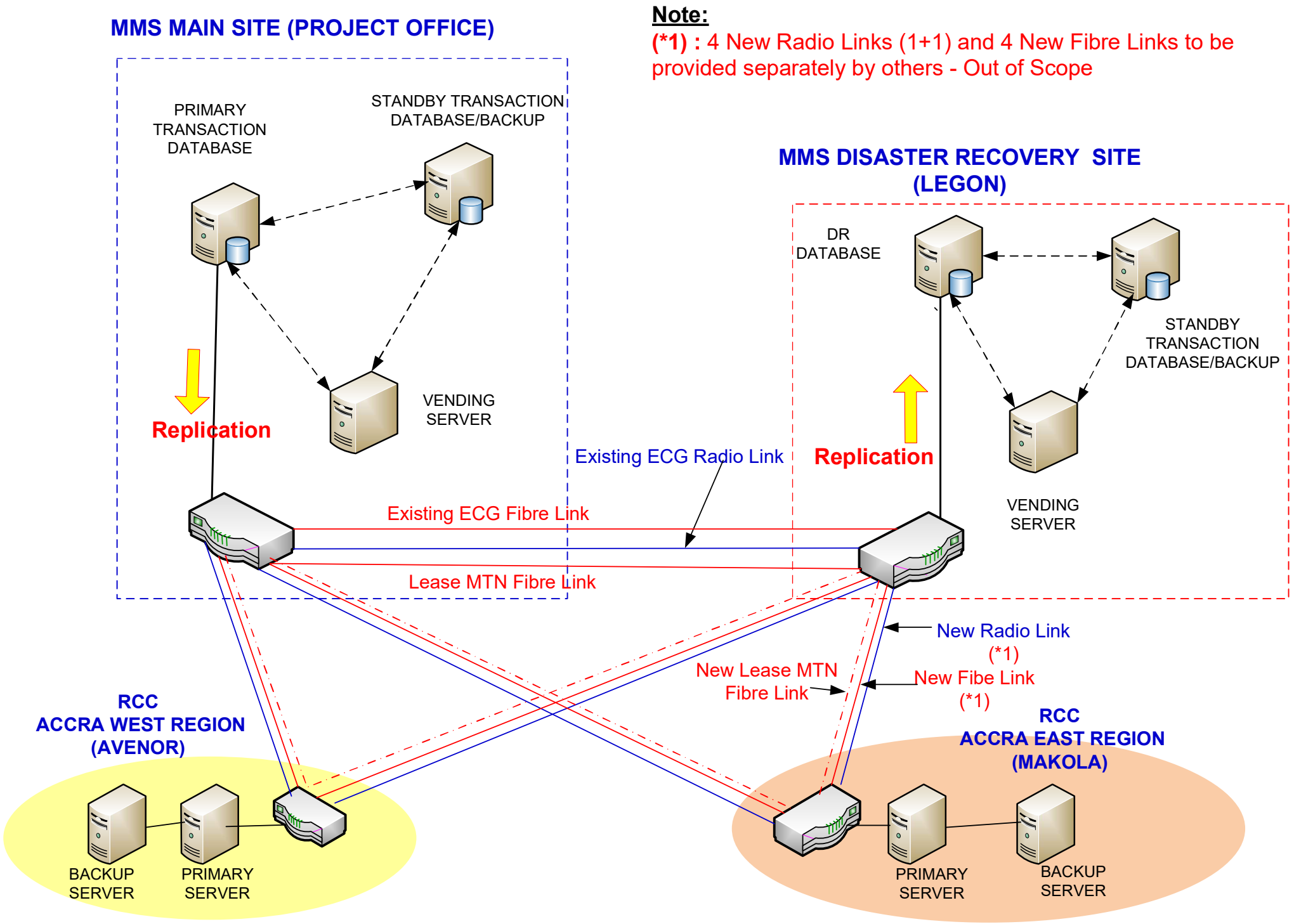

MMS MAIN SITE (PROJECT OFFICE)
Note:
(*1) : 4 New Radio Links (1+1) and 4 New Fibre Links to be provided separately by others - Out of Scope
PRIMARY TRANSACTION DATABASE
STANDBY TRANSACTION DATABASE/BACKUP
VENDING SERVER
Replication
MMS DISASTER RECOVERY SITE (LEGON)
DR DATABASE
STANDBY TRANSACTION DATABASE/BACKUP
VENDING SERVER
Replication
Existing ECG Radio Link
Existing ECG Fibre Link
Lease MTN Fibre Link
New Radio Link (*1)
New Fibe Link (*1)
New Lease MTN Fibre Link
RCC ACCRA WEST REGION (AVENOR)
BACKUP SERVER
PRIMARY SERVER
RCC ACCRA EAST REGION (MAKOLA)
PRIMARY SERVER
BACKUP SERVER

Figure 6: Proposed Model For The Deployment Of The MMS For The PPM System

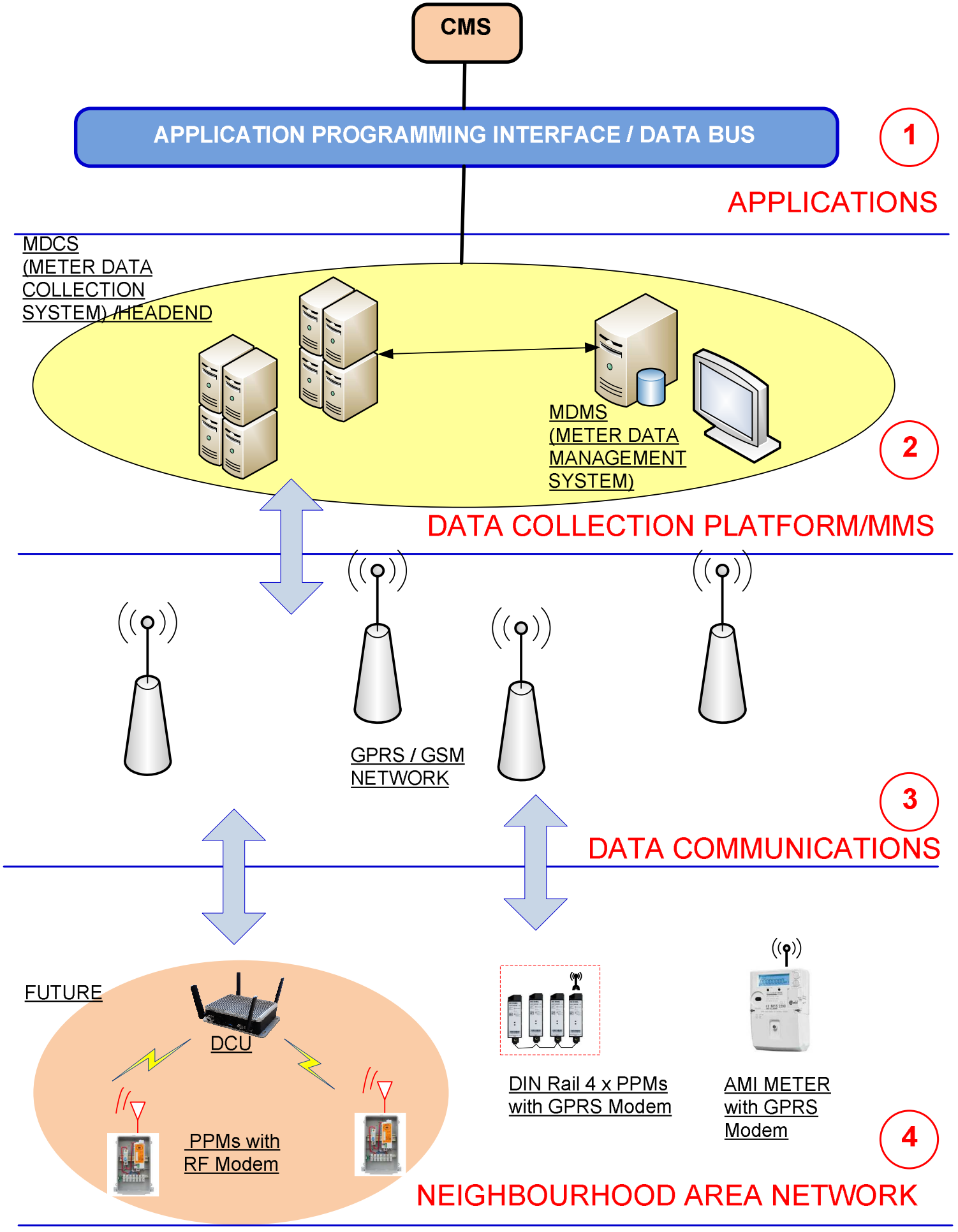
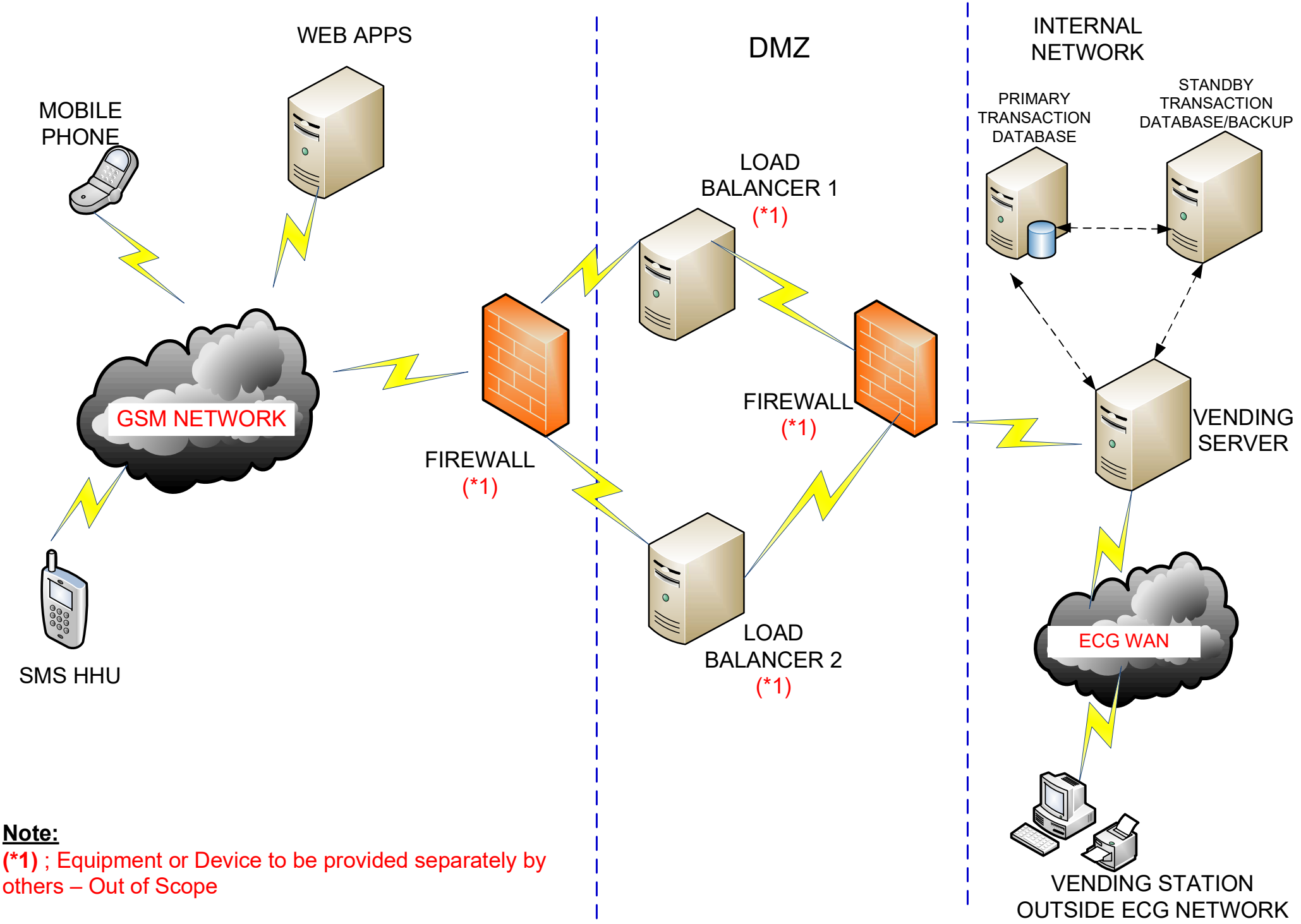

CMS
APPLICATION PROGRAMMING INTERFACE / DATA BUS
1
APPLICATIONS
MDCS
(METER DATA
COLLECTION
SYSTEM) /HEADEND
MDMS
(METER DATA
MANAGEMENT
SYSTEM)
2
DATA COLLECTION PLATFORM/MMS
GPRS / GSM
NETWORK
3
DATA COMMUNICATIONS
FUTURE
DCU
PPMs with
RF Modem
DIN Rail 4 x PPMs
with GPRS Modem
AMI METER
with GPRS
Modem
4
NEIGHBOURHOOD AREA NETWORK

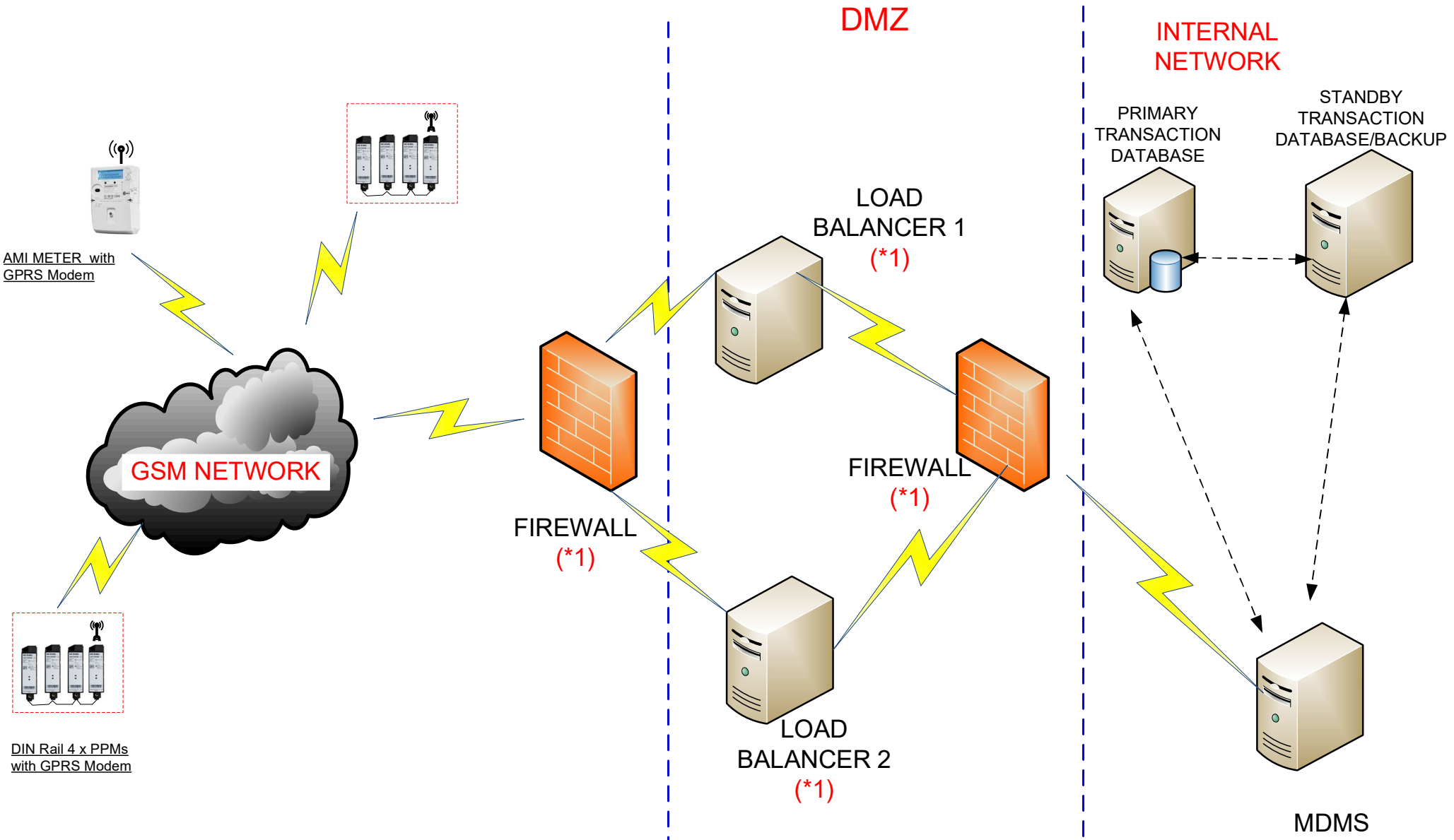
Figure 7: Proposed Model For The Deployment of Meter Management System (MMS)



Note:

(*1) ; Equipment or Device to be provided separately by others – Out of Scope

Figure 8: Proposed Model For The Deployment Of MMS With Load Balancer



Note:

(*1) ; Equipment or Device to be provided separately by others – Out of Scope

Figure 9 : Overall System Of Smart Prepayment Network

AMI METER with GPRS Modem

Printer

Card Reader

Switch

DIN Rail 4 x PPMs with 1 x GPRS Modem

3 x Mobile Operator Servers

SMS

Utility Consumer

Mobile Op Accounting Server

Accra West Region Customers

AMI METER with GPRS Modem

Printer

Card Reader

Switch

DIN Rail 4 x PPMs with 1 x GPRS Modem

3 x Mobile Operator Servers

SMS

Utility Consumer

Mobile Op Accounting Server

Accra East Region Customers

Printer

Card Reader

Switch

POS / Vending Station

RCC Accra East Region

Primary Transaction Database

Standby Transaction Database

Vending Sertver

3x Data Service Network Operators

2 x 3 x Fibre Links Provided by Mobile Operators

New Fibre Link (*1)

New Lease MTN Fibre Link

New Radio Link (*1)

VPN

Primary Transaction Database

Standby Transaction Database

Vending Sertver

Link A

Link C (*1)

Link B (*1)

Router

Bank Transaction Server

RCC Accra West Region

Disaster Recovery Site (ECG Legon)

Application Servers (Financial Transaction)

SMS Server

Accounting & Management Server

Switch

FIREWALL (*1)

Router

Database Servers

Application servers (Mobile OP)

Switch

Link A

Link B (*1)

Link C (1*)

Existing ECG Fibre Link

MTN Leased Fibre Link

Existing ECG Radio Link

Switch

Router

FIREWALL (*1)

Application Servers (Financial Transaction)

Accounting & Management Server

Application servers (Mobile OP)

Switch

Database Servers

SAN Switch

SAN

Primary Site (ECG Project Office)

SMS Server

ADMS/OMS (Future) (*1)

Switch

ECG Project Office

CMS (Existing)

ERP (Future) (*1)

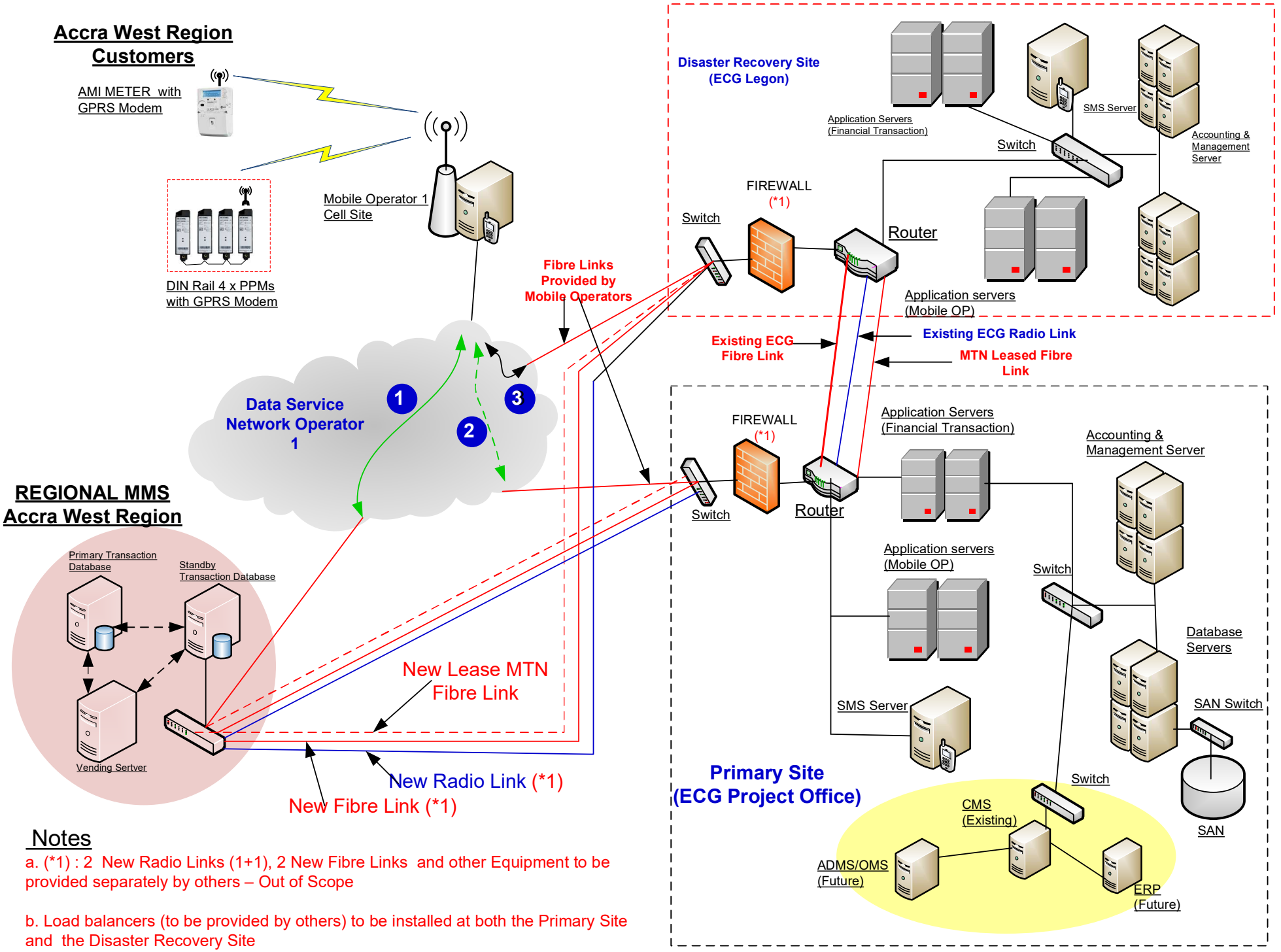
CENTRAL MMS Project Office & Legon

Notes

a. (*1) : 4 New Radio Links (1+1), 4 New Fibre Optic Links and other Equipment to be provided separately by others – Out of Scope

b. Load balancers (to be provided by others) to be installed at both the Primary Site and the Disaster Recovery Site

Figure 10: Connectivity Among Meters And Metering Management System (MMS)



Notes

a. (*1) : 2 New Radio Links (1+1), 2 New Fibre Links and other Equipment to be provided separately by others – Out of Scope

b. Load balancers (to be provided by others) to be installed at both the Primary Site and the Disaster Recovery Site

SECTION IV. BIDDING FORMS – ADDITIONAL FORM

The Purchaser has prepared this additional form for this section of the Bidding Document to address specific clarification questions raised by prospective Bidders. In its Bid, the Bidder must use these forms in addition to others Technical Bid Forms of the original Bidding Document.

4.36 FORM MMS 25: F5 Load Balancer

SI	Description	Purchaser's Minimum Requirement	Supplier Offer
1	Intelligent Traffic Processing:	L7 requests per second: 10M L4 connections per second: 4.2M L4 HTTP requests per second: 35M Maximum L4 concurrent connections: 300M Throughput: 320 Gbps/160 Gbps L4/L7	
2	Hardware Offload SSL/TLS:	ECC†: 100K TPS (ECDSA P-256) RSA: 160K TPS (2K Keys) 50 Gbps bulk encryption	
3	FIPS SSL:	NA	
4	Hardware Compression	60 Gbps	
5	Hardware DDoS Protection	210M SYN cookies per second	
6	TurboFlex Performance Profiles:	Tier 3 (4x BW)	
7	Software Compression:	NA	
8	Software Architecture	64-bit TMO	
9	Virtualization (Maximum Number of vCMP Guests	56	
10	Processor	Two 14-Core Intel Xeon processors (total 56 hyper threaded logical processor cores)	
11	Memory	512 GB DDR4	
12	Hard Drive	1x 1.6 TB Enterprise Class SSD	
13	40 Gigabit Fiber Ports (QSFP+):	8 SR4/LR4 (sold separately) (QSFP+ optical breakout cable assemblies available to convert to 10G ports)	
14	Power Supply	2x 1500W Platinum AC 230V, 50Hz	
15	Temperature	32° to 104° F (0° to 40° C)	
16	Operational Relative Humidity	5% to 85% at 40º C	

Bid Table of Contents and Checklist

The Bid Table of Contents and Checklist is revised to include the additional Form as follows:

Item	present: y/n	page no.
Form MMS 25 – LOAD BALANCER F5		

SECTION VII. PURCHASER'S REQUIREMENTS

Section VII. Purchaser's Requirement of the Biding Document is accordingly revised to include the following 2.8.25 – Load Balancer F5 under 2.8 Technical Data Sheets (TDS)

2.8.25 MMS – LOAD BALANCER F5

SI	Description	Purchaser's Minimum Requirement
1	Intelligent Traffic Processing:	L7 requests per second: 10M L4 connections per second: 4.2M L4 HTTP requests per second: 35M Maximum L4 concurrent connections: 300M Throughput: 320 Gbps/160 Gbps L4/L7
2	Hardware Offload SSL/TLS:	ECC†: 100K TPS (ECDSA P-256) RSA: 160K TPS (2K Keys) 50 Gbps bulk encryption
3	FIPS SSL:	NA
4	Hardware Compression	60 Gbps
5	Hardware DDoS Protection	210M SYN cookies per second
6	TurboFlex Performance Profiles:	Tier 3 (4x BW)
7	Software Compression:	NA
8	Software Architecture	64-bit TMO
9	Virtualization (Maximum Number of vCMP Guests	56
10	Processor	Two 14-Core Intel Xeon processors (total 56 hyper threaded logical processor cores)
11	Memory	512 GB DDR4
12	Hard Drive	1x 1.6 TB Enterprise Class SSD
13	40 Gigabit Fiber Ports (QSFP+):	8 SR4/LR4 (sold separately) (QSFP+ optical breakout cable assemblies available to convert to 10G ports)
14	Power Supply	2x 1500W Platinum AC 230V, 50Hz
15	Temperature	32° to 104° F (0° to 40° C)
16	Operational Relative Humidity	5% to 85% at 40º C

..mm

Sl	Reference			Original	Modified	Addendum
	Page (Bidding doc)	Section	Item			
13	553 - 555	Section VII. E. Implementation Schedule	Schedule and Schedule Table		Though this is not indicated in bidding document, the Integration of MMS to the existing Indra CMS is planned to run concurrently with the Testing of AMI and Prepayment Meters on the MMS. Meters supplied by third party Bidders in separate Procurement processes for AMI and PPM on page 550. A revised schedule will be issued as an addendum.	Amendment 1- Timetine Amendment 2 - Implementation schedule
14	466	VII. Purchasers Requirements	Hardware The Supplier shall familiarize himself with the existing Vending Systems hardware utilized by ECG and take this infrastructure and systems into account in the proposed vending solution offered.	The Supplier shall familiarize himself with the existing Vending Systems hardware utilized by ECG and take this infrastructure and systems into account in the proposed vending solution offered.	The requirement that *The Supplier shall familiarize himself with the existing Vending Systems hardware utilized by ECG* is no longer required as there will no interface between the MMS and ECG's existing Remote Vending Stations (RVS). This will be issued as an addendum	The Supplier shall not be required to familiarize himself with the existing Vending Systems hardware utilized by ECG and take this infrastructure and systems into account in the proposed vending solution offered.
					Specification document for Indra CMS will be attached as an addendum.	Amendment 3- CMS prepayment interface – specification document
17	417	VII. Purchasers Requirements	2.1.2.3 GSM/GPRS Modem		This will be included in the FORM MMS as an addendum	Amendment 4- GSM / GPRS Modem
18	98	Communications - Hardware	C2	SIM cards for PPMs (single phase and 3-phase) and AMI Meters. The SIM cards shall be from 3 Mobile Operators, each providing leased fibre links from their sites to the Primary Site (ECG Project Office) and the Data Recovery Site (ECG Legon District Office). The capacities of the Leased Fibre Links shall be determined by the number of SIM cards supplied by the Mobile operator, but the minimum shall be 5 Mbps	The number of SIM cards shall be 240. This will be added as an addendum	Original Quantity is 35,000 (Schedule 2 , 3 and 4) New quantity is 240 (Schedule 2, 3 and 4)
19	/	/	□ 99% success rate for all 'full' meter reading packets (interval and register data, and meter events)	99% success rate for all 'full' meter reading packets (interval and register data, and meter events)	98% success rate within 22 hours. This will be added as an addendum	· 98% success rate for one daily reading of meter registers, meter statuses, electricity quality log and event log within 22 hours from the moment of recording of such daily value. · 98% success rate for complete daily meter reading, load profile, electricity quality log and event log within 22 hours from reading initiation. · 98% success rate for complete reading of monthly accounting data from all meters within the demand area within 22 hours from initiation of such reading.
	/	/	□ The system availability must be at least 99.95%	Availability of the system shall be 99.995% (page 402) 99.5% within 30 minutes.(page 404)	The system availability shall be 99.95%. This will be added as an addendum	The system availability must be 99.95% (page 402)
	/	/	□ 4 hours maximum recover time if a catastrophic failure is corrected	The MTTR of the system shall be 1	4 hours maximum recover time if a catastrophic failure is corrected. An addendum will be added	4 hours maximum recover time if a catastrophic failure is corrected (page 404)
25	474	Passwords	1. User Passwords must be changed every forty [30] days.	User Passwords must be changed e	30 days is confirmed. This will be added as addendum	User Passwords must be changed every thirty [30] days (page 470)
28	403	Section VII. B 1.1.1. e) f)	One hundred and twenty (120) STS prepayment Meters based on open protocol system, (Twenty (20) meters each from six (6) different manufacturers). One hundred and twenty (120) AMI meters based on open protocol system (Twenty (20) meters each from six (6) different manufacturers)		1.) 20 meters from six different manufacturers 2.) The twenty (20) prepayment meters to be supplied from six different manufacturers shall consist of: a. Ten (10) Single phase prepaid meters for residential applications, with basic current and maximum continuous current rating of 5 and 60A/phase respectively b. Eight (8) Three phase prepaid meters for medium commercial applications, with a basic current and maximum continuous current rating of 10 and 100A/phase respectively c. Two (2) Three phase CT-connected meters for large commercial applications, with a rated current and maximum continuous current rating of 5 and 10A/phase respectively. This shall be issued as an addendum 3.) Bidders are required to comply fully with the meter requirements including 2.8.22 , 2.8.23.& 2.8.24. 4.) One universal HES is expected to be provided	The twenty (20) prepayment meters to be supplied from six different manufacturers shall consist of: a. Ten (10) Single phase prepaid meters for residential applications, with basic current and maximum continuous current rating of 5 and 60A/phase respectively b. Eight (8) Three phase prepaid meters for medium commercial applications, with a basic current and maximum continuous current rating of 10 and 100A/phase respectively c. Two (2) Three phase CT-connected meters for large commercial applications, with a rated current and maximum continuous current rating of 5 and 10A/phase respectively.
30	540	VII 3.0	Operating /storage Temperature		Up to 70 deg C for "storage" up to 60 deg C for "operating" An addendum will be added	Up to 70 deg C for "storage" up to 60 deg C for "operating"
55	93 | 101 | 107	SCHEDULE-2 – SUPPLY SCHEDULE-3 – DELIVERY TO SITE SCHEDULE-4: SERVICES – SYSTEM DESIGN, INSTALLATION AND COMMISSIONING	Table Quantities - Price Schedules			Amendment 6 - F5 Load balancer

79	25	16.2(d)	With reference to 16.2 (d) " a written confirmation that the Bidder accepts responsibility for the successful integration and inter-operability of all components of the Information System as required by this Bidding Document"		The specification document for the Indra CMS Prepayment Interface will be provided as an addendum	Amendment 3- CMS prepayment interface – specification document
81					The specification document for the Indra CMS Prepayment Interface will be provided as an addendum	Amendment 3- CMS prepayment interface – specification document
	190	Section IV Bidding Forms and Section VII 4.22	4.22 FORM MMS 11	MS Window server 2012 R2, Microsoft Windows Server 2003, Windows 2000/Advanced Server, Red Hat Linux 6.x, SUSE Linux 11.x, Novell Netware, VM Ware ESX Server		This specification is amended as follows: **Delete** - Microsoft Windows Server 2003 & Windows 2000 MS and **Replace with** Window server 2008 or higher versions.
104					The samples required are 120 Prepayment Meters and 120 AMI meters. The breakdown of the prepayment meters is issued as an addendum	The twenty (20) prepayment meters to be supplied from six different manufacturers shall consist of: a. Ten (10) Single phase prepaid meters for residential applications, with basic current and maximum continuous current rating of 5 and 60A/phase respectively b. Eight (8) Three phase prepaid meters for medium commercial applications, with a basic current and maximum continuous current rating of 10 and 100A/phase respectively c. Two (2) Three phase CT-connected meters for large commercial applications, with a rated current and maximum continuous current rating of 5 and 10A/phase respectively