



Business Requirements Specification

Gen DB MF Consolidation and Gas Burn Report UI/API

Document Version: 1.1

Date Created: 7/20/2016

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016


Disclaimer

All information contained in this draft Business Requirements Specification (BRS) as provided by the California Independent System Operator Corporation (ISO) is prepared for discussion and information purposes only. The draft BRS is provided “as is” without representation or warranty of any kind, including, without limitation, a representation or warranty as to accuracy, completeness, or appropriateness for any particular purpose. The draft BRS shall be revised as the development and review of the business requirements progresses. The ISO assumes no responsibility for the consequences of any errors or omissions. The ISO may revise or withdraw all or part of this information at any time at its discretion without notice.

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

Revision History

Date	Version	Description	Revision Type	
			Scope?	Clarification?
7/20/2016	1	Created document.		
4/25/2017	1.1	Updated document to incorporate market calculation of gas burn. See red text in the following: Section 2.1.2 (Clarification) Section 4.2.1 (Scope) <ul style="list-style-type: none"> • BRQ205: Changed potential system impacts • BRQ210: Changed potential system impacts • BRQ215: Clarified requirement and changed potential system impacts • BRQ220: Market will calculation gas burn, clarified calculation • BRQ221: Added requirement • BRQ222: Added requirement • BRQ223: Added requirement • BRQ225: Clarified CMRI receives gas burn calculation from the market • BRQ235: Clarified publishing of CMRI reports • BRQ240: Clarified CMRI reports • BRQ245: Removed requirement • BRQ260: Removed requirement 	Yes	Yes


 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

Acronyms	Description
MF	Master File
CMRI	Customer Market Results Interface
AIM	Access and Identity Management
IFM	Integrated Forward Market
RT	Real-Time
RTM	Real-Time Market
RUC	Residual Unit Commitment
FMM	Fifteen Minute Market
DA	Day Ahead
HR	Hourly
STUC	Short-Term Unit Commitment
SC	Scheduling Coordinator
MP	Market Participant
BAA	Balancing Authority Area
NDA	Non-Disclosure Agreement

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

Table of Contents

1. INTRODUCTION.....	6
1.1 PURPOSE	6
2. DETAILS OF BUSINESS NEED/PROBLEM.....	6
2.1 DESCRIPTION.....	6
2.1.1 <i>GenDB MF Consolidation</i>	6
2.1.2 <i>Gas Burn Report UI/API</i>	6
3. BUSINESS REQUIREMENTS.....	8
3.1 BUSINESS PROCESS: < GENDB AND GAS DATA AND MF CONSOLIDATION>	8
3.1.1 <i>Business Requirements</i>	8
3.2 BUSINESS PROCESS: < DAM/RTM FOR GAS BURN REPORTS>	9
3.2.1 <i>Business Requirements</i>	9
3.3 BUSINESS PROCESS: < CMRI FOR GAS BURN REPORTS>.....	15
3.3.1 <i>Business Requirements</i>	15

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

1. Introduction

1.1 Purpose

The purpose of this document is to capture and record a description of what the Users and Business Stakeholders of the **GenDB MF Consolidation and Gas Burn Report UI/API** project wish to obtain by providing high-level business requirements. This document establishes the basis for the agreement between the initiators and implementers of the project. The information in this document serves as input to determining the scope of projects and to all Business Process Modeling and System Requirements Specifications efforts.

Business requirements are what must be delivered to provide value for the Users and Business Stakeholders. Systems, software, and processes are the ways (how) to delivery, satisfy or meet the business requirements (what). The Initial BRS will provide sufficient information to determine the scope of the project and will provide the functional business requirements so that the Architecture Decision can be made. Following the Architecture Decision, the remaining non-functional business requirements, such as data, performance, web services, and security can be added to complete the Final BRS.

2. Details of Business Need/Problem

2.1 Description

2.1.1 GenDB MF Consolidation

This project will make available the attributes requested from Generation database (GenDB) and some separate gas data in Master File. The GenDB Report shall be made available at a publicly viewable site.

2.1.2 Gas Burn Report UI/API

This project is primarily to create a UI/API for gas companies accessing timely gas burn estimate data, and provide additional necessary gas data. The purpose is to implement ISO Market software functionality to calculate and present gas burn estimates to gas companies serving electric generation located within the CAISO BAA. This functionality is needed to provide timely information to the gas companies to manage their respective gas operations. The data is critically important during times of gas supply and/or gas system constraints.

- The forecast gas usage data is currently sent to the gas companies daily via an Excel spreadsheet attachment in an email, for Day Ahead (12:30pm) and Two Days Ahead (3:45pm). Current process and tool(s) are not suited for providing external access to the report data.
- Based on requests of the gas companies receiving daily gas burn estimate reports, a user interface or system to system interface is needed to streamline the processing of the gas burn data.
- Gas Companies, Market Participants with interest in gas fueled electric generation, external agencies would be affected.

I. Automation of Providing Gas Burn Estimate Data through UI/API

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016


- Gas burn estimate data is available for consumption into gas operations management systems, and the respective systems in all gas companies.
- Provide automated mechanism for gas companies and operations management systems processing of gas burn estimate data.
- A UI/API shall be created to provide the gas burn estimate data for gas companies.

II. Providing All Necessary Gas burn estimate data

- In addition to the existing data, detail generation unit data and plant meter grouping to enable curtailment calculation at plant meter level. So the data for Transmission zone and pipelines (serving the plant) will be provided. See the updated mapping of gas information below.
- Only providing the information to the gas companies that serve the generators and only to the gas companies who have executed the NDA.
- All gas companies would be able to consume daily (on an hourly basis) gas burn estimate data at gas service area level, gas forecast zone level, unit (equivalent to resource) and plant level for Day Ahead and Two Days Ahead. Proposing to provide the real time (hourly and probably also 15min) gas burn estimate data.
- All the gas information will be available in MF through the *GenDB MF Consolidation* project, to support the automation process mentioned above.

The mapping of resources/units to gas forecast zone to service area to gas company, with added transmission zone and pipelines, is shown below.

- A Gas Company (equivalent to Gas Operator/ Pipeline Operator) could have multiple Gas Service Areas, while a Gas Service Area only belongs to one Gas Company.
- A Gas Service Area (equivalent to the physical pipeline system a gas company manages) could have multiple Gas Forecast Zones, while a Gas Forecast Zone only belongs to one Gas Service Area. ~~There might be overlapping Gas Forecast Zones.~~
- A Gas Service Area could have multiple Gas Transmission Zones, while a Gas Transmission Zone only belongs to one Gas Service Area. ~~There might be overlapping Gas Transmission Zones.~~ Gas Forecast Zone and Gas Transmission Zone are parallel definitions for the similar granularity.
- A Gas Forecast/Transmission Zone will be associated to multiple Gas Customer Meters. A Gas Customer Meter may belong to a Gas Forecast Zone and a Gas Transmission Zone.
- A Gas Customer Meter could have multiple Gas Resources, while a Gas Resource only belongs to one Gas Customer Meter A pipeline could be within one Gas Company, across multiple Gas Service Areas, across multiple Gas Forecast Zones, across multiple Gas Transmission Zones, and vice versa. A pipeline could include multiple Gas Customer Meters, but a Gas Customer Meter will be associated to only 1 pipeline.

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

3. Business Requirements


The sections below describe the Business Processes and the associated Business Requirements involved in the project. These may represent high level functional, non-functional, reporting, and/or infrastructure requirements. These business requirements directly relate to the high level scope items determined for the project.

3.1 Business Process: < GenDB and Gas Data and MF Consolidation>

This section 4.1 is the requirement for GenDB MF Consolidation.

3.1.1 Business Requirements

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
GMCGBR-BRQ015	<ul style="list-style-type: none"> GEN DB reports will be made available on a publicly viewable site. <p>Note: The caiso.com webpage where the GenDB report, "Master Control Area Generating Capability List", is (a screenshot is attached) http://www.caiso.com/planning/Pages/GeneratorInterconnection/Default.aspx</p>  <p>A sample MasterControlAreaGeneratingCapabilityList</p>	Core	MF, GEN DB, OASIS

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

3.2 Business Process: < **DAM/RTM** for Gas Burn Reports >

Section 4.2 is the requirement for Gas Burn Report UI/API.

3.2.1 Business Requirements


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
GMCGBR-BRQ205	<ul style="list-style-type: none"> • Currently, the necessary information for gas burn data calculation and gas burn reports is still provided in the same way as it is today, including some manual work. • As part of this project, MF shall be able to automatically provide the information for gas burn data calculation and gas burn reports, as well as any new data upon request. MF shall make these data available to other downstream users. 	Core	MF, IFM, RUC, RTPD, FI , CMRI , AIM
GMCGBR-BRQ210	<ul style="list-style-type: none"> • The System shall implement the gas burn functionality, to calculate the estimate gas burn data, store the output data, and publish the estimate gas burn data. 	Core	IFM, RUC, RTPD

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

GMCGBR-BRQ215	<ul style="list-style-type: none"> • For calculating estimate gas burn data, the system shall pull the input from MF and Market Database. <ul style="list-style-type: none"> ○ MF: <ul style="list-style-type: none"> ➢ Resource Heat Rate Table ➢ Gas Company Information defined as below: <ul style="list-style-type: none"> ▪ Gas Customer Meter <p>This is the meter gas companies use to identify the gas service to one or more generation resources/plants, from business perspective.</p> <ul style="list-style-type: none"> ▪ Gas Company Legal Name <p>This is the long official name for Gas Company.</p> <ul style="list-style-type: none"> ▪ Gas Company Short Name <p>This is the name of Gas Company providing Gas Service to the generation resource.</p> <ul style="list-style-type: none"> ▪ Gas Service Area <p>This is the Gas Service territory in which the gen resource is located.</p> <ul style="list-style-type: none"> ▪ Gas Conversion Factor Rate <p>Gas Conversion Factor Rate is the Gas Conversion value (a number) to define heat content of gas for each Gas Service Area (likely static); MOU = MMbtu/MMcf. It is at the service area granularity. Gas companies will provide the number.</p> <ul style="list-style-type: none"> ▪ Gas Forecast Zone <p>This is the zone defined by Gas Companies to provide meaningful gas burn forecast ISO sends to gas company for 2 Day Out, Day Ahead and advisory (FMM/STUC) to provide estimate of gas usage one and two days ahead of gas trading day as well as updates during the gas trading day.</p> <ul style="list-style-type: none"> ▪ Gas Transmission Zone <p>This is the zone defined by Gas Companies to identify an alternative grouping for the gas burn reporting such as to implement gas curtailments as needed.</p> <ul style="list-style-type: none"> ▪ Gas Company Resource Name 	Core	IFM, RUC, RTPD, GMRI, MF
----------------------	--	------	--

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
	<p style="color: red;">There is a similar field for how the Gas Company names the resource. This also applies to Unit Name.</p> <ul style="list-style-type: none"> ▪ Natural Gas Pipeline Name This is the name of the natural gas pipeline(s) that is connected to the facility. ○ Market System: <ul style="list-style-type: none"> ➤ IFM and RUC MWh values at hourly basis for Day Ahead and Two Days Ahead ➤ Hourly and FMM MW values for Real Time 		

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
GMCGBR-BRQ220	<ul style="list-style-type: none"> • The system shall calculate gas burn for all resources associated with a gas company with a heat rate. Process will ensure that resources without heat rates are not allowed to be associated with a gas company. • The system shall perform the calculation for the daily estimate gas burn data on hourly basis, for Day Ahead and Two Days Ahead. <ul style="list-style-type: none"> ○ Two Days Ahead is the D+2 Market Run. • The system shall be able to calculate Real Time estimate gas burn data, for STUC's 4.5 hour time horizon, and FMM's 15min horizon. • The system shall calculate Real Time estimate gas burn data for FMM's 15 min binding/advisory intervals. This data will be published in the RTPD display and used to calculate the FMM Advisory MMcf as defined in BRQ-223. • The system shall calculate Real Time estimate gas burn data for all STUC time horizons. This data will be published in the STUC display and used to calculate the FMM Advisory MMcf as defined in BRQ223. • For each resource, hourly/FMM gas burn values shall be calculated by: <p style="margin-left: 20px;"> $\text{GasBurnData (MMcf)} = \text{MWh} * \text{HeatRate} / (\text{Gas Conversion Factor} * 1000)$ </p> <p style="margin-left: 20px;">where a corresponding Gas Conversion Rate Factor applies to convert MMBtu to MMcf.</p> <p style="margin-left: 20px;"><i>Note: Heat Rate Curve is a function of MW. For MSG, Heat rate is by configuration. The Gas Burn calculation is a function of MWh.</i></p> 	Core	IFM, RUC, MF, RTPD, CMR

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
<i>GMCGBR-BRQ221</i>	<ul style="list-style-type: none"> • The system shall display and publish gas burn report by resource to operators. For MSG resources display at MSG plant level. • The system shall summarize gas reports by the following categories: <ul style="list-style-type: none"> ○ Gas Company, ○ Service Area, ○ Forecast Zone, ○ Transmission Zone, ○ Gas Customer Meter. • System shall publish by resource and summaries to downstream systems, including RTPD/STUC results for FMM Advisory reports. 	Core	IFM, RUC, RTPD
<i>GMCGBR-BRQ222</i>	<ul style="list-style-type: none"> • For each market, system shall allow internal users to filter the resource gas burn data with a “Refresh” button for: <ul style="list-style-type: none"> ○ Time Interval ○ Gas Company (Name) ○ Service Area (Name) ○ Forecast Zone (Name) ○ Transmission Zone (Name) ○ Gas Customer Meter (Name) • System shall display gas burn data for all resources associated with a gas company with the ability to hide resources without schedules. • System shall display the following attributes in detail view columns preceding the Total Gas Burn column: Scheduling Coordinator, Gas Company, Service Area, Transmission Zone, Forecast Zone, Gas Pipeline and Gas Customer Meter. • Filters should default to “ALL”. With the exception of market type, filters should allow user to select multiple items. Filters shall provide the option for in-line filtering, where the user can search for a value by typing into the field. 	Core	IFM, RUC, RTPD

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016


ID#	Business Feature	Requirement Type	Potential Application(s) Impacted
<i>GMCGBR-BRQ223</i>	<ul style="list-style-type: none"> • System shall transfer Day Ahead results to Real Time in order to display IFM and RUC values for the day. • System shall display total IFM and RUC gas burn values normalized to a 15 minute interval as columns in the Real Time displays so the user can compare Day Ahead and Real Time gas burn for the applicable interval. 	<i>Core</i>	<i>IFM, RUC, RTPD, STUC</i>

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

3.3 Business Process: < CMRI for Gas Burn Reports >

3.3.1 Business Requirements

GMCGBR-BRQ225	<ul style="list-style-type: none"> The system shall receive gas burn for resource from the market. For MSGs, this will be at MSG plant level. The system shall receive gas burn summary for Gas Company, gas service area, gas forecast zone, gas transmission zone, gas pipeline, and gas customer meter level from the market. The system shall store the output gas burn data in the database. These data shall be available to other internal users and external users with the required authorization. The system shall provide optional alert to indicate the delivery of reports at the user's discretion. 	Core	CMRI
GMCGBR-BRQ235	<ul style="list-style-type: none"> The system shall display the estimate gas burn data for gas companies, including daily (on an hourly basis for Day Ahead and Two Days Ahead) gas burn estimate data. Every 15 minutes, the system shall summarize and publish Real Time estimate gas burn data for FMM' 15min binding intervals for the completed hours and the latest STUC advisory interval time horizon after the complete binding hour. System shall display summary estimate gas burn data at gas company, gas service area level, gas forecast zone, gas transmission zone, gas pipeline, and gas customer meter level. Data is displayed at gas service area level, gas forecast zone/gas transmission zone level. System shall display estimate gas burn at Unit (equivalent to resource) and customer meter data will also be provided. NDA with gas company enables provision of unit and plant level data. Any functionality provided to gas companies shall be available to internal users (i.e. operations). The system shall provide optional alert to indicate the delivery of reports at the user's discretion. 	Core	CMRI

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

GMCGBR-BRQ240	<ul style="list-style-type: none"> • System shall allow user to access the user specified resource and summary data. • The system shall display, by default, the zone level estimate gas burn data. • The system shall allow users (particularly gas companies) to see and download summary data and detailed resource level data. NDA with gas company enables provision of unit and plant level data. • The system shall provide optional alert to indicate the delivery of reports at the user's discretion. 	Core	CMRI
---------------	--	------	------



<p>GMCGBR-BRQ245</p>	<ul style="list-style-type: none"> • The system shall allow authorized users to filter the gas burn data with a “Refresh” button for: <ul style="list-style-type: none"> ○ Run Time (calculation time) Fill out Calculation date, Calculation Hour, Calculation FMM ○ Report Time (DA, 2DA, HR, FMM)* Select one of the four exclusive options, which leads to further selection below <ul style="list-style-type: none"> ➤ Operating Date (available to DA & 2DA) Further selection for Report Type (IFM or IFMRUC) ➤ Operating Hour (available to HR) ➤ Operating FMM (available to FMM) ○ Gas Company (Name) ○ Service Area (Name) ○ Forecast Zone (Name) ○ Transmission Zone (Name) ○ Pipeline (Name) ○ Hide Resources w/o Schedules (a check mark) • CMRI shall allow users to download any filtered data in excel format. • This filter and download functionality may also be provided to gas companies. <p>*Report Time distinguishes for Day Ahead gas burn estimate data, 2-Day Ahead gas burn estimate data, Real Time Hourly gas burn estimate data, and Real Time Fifteen Minute Market gas burn estimate data.</p>	<p>Core</p>	<p>CMRI</p>
<p>GMCGBR-BRQ250</p>	<ul style="list-style-type: none"> • The timeline for publishing estimate gas burn data shall be consistent with the publishing timeline of other RT and DA data in the impacted system, particularly for the RT and DA estimate gas burn data. 	<p>Core</p>	<p>CMRI</p>
<p>GMCGBR-BRQ251</p>	<ul style="list-style-type: none"> • Users (internal and external) of the gas burn data should be able to automatically identify if there are some unusual events. Automatic triggering events could be, e.g. a significant difference between Real Time (RT) data and Day Ahead (DA) data that is above some threshold. 	<p>Core-Optional</p>	<p>CMRI</p>

 California ISO	Technology	Template Version:	4.1
		Document Version:	1.1
Gen DB MF Consolidation and Gas Burn Report UI/API Business Requirements Specification - Planning		Date Created:	7/20/2016

GMCGBR-BRQ255	<ul style="list-style-type: none"> The estimate gas burn data provided to external Market Participants through the system is only for gas companies, not for Scheduling Coordinators (SC). <p>Note: the system by default is providing information at SC level. For purposes of this functionality, SC refers to the Gas company, and the Gas customers they serve. This information shall not be provided to SCs associated with MPs.</p>	Core	CMRI
GMCGBR-BRQ260	 <ul style="list-style-type: none"> The Gas burn estimate data shall be in synchronism with the Market schedule to enable updates to any change for DA, and RT. 	Core	CMRI