



MCG ENERGY SOLUTIONS, LLC

Software Solutions for Energy

CONTROL AREA SCHEDULING

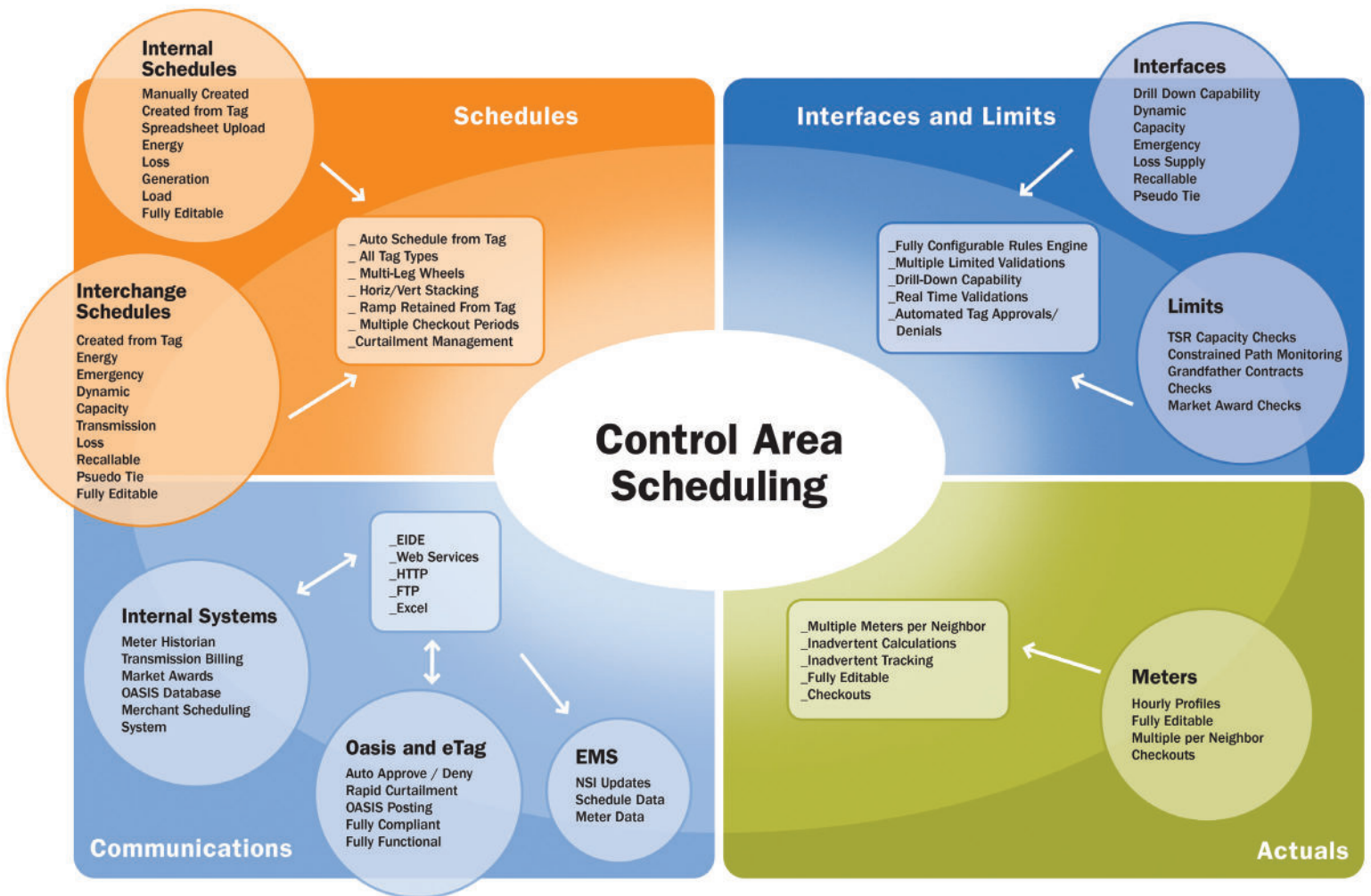


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MCG'S CONTROL AREA SCHEDULING (CAS)

- _ MCG's Control Area Scheduling (CAS) system is a fully featured interchange and transmission scheduling system hosted in MCG Energy's FedRAMP® Authorized, SOC and NIST SP 800-53 compliant Private Cloud.
- _ CAS is fully integrated to MCG's eTagging and OASIS modules to automatically create, categorize, and track interchange and transmission schedules for reliability entities.
- _ The system can be used to manage checkouts (NSI and NAI), calculate and track inadvertent, match schedules against limits for overschedule monitoring, and calculate bulk curtailment strategies based on priorities.
- _ Integration with the EMS can be handled in multiple different ways, allowing for NSI breakpoints to be calculated and communicated as quickly as every minute.
- _ A flexible and configurable rules engine allows the customer to set up interfaces that validate proper physical path construction on the tag.
- _ CAS can support multiple different schedule types, including energy, dynamic, pseudo-tie, capacity, wheel, transmission only, etc. and is able to properly calculate and account for horizontal and vertical stacking of transmission.
- _ MCG's ability to integrate its applications to a customer's internal systems creates an environment where the user can manage all Balancing Area scheduling functionality from a single application with full audit capabilities.

SOFTWARE OVERVIEW



- _ Provides automatic schedule creation with a fully configurable rules engine for determining interface and path assignment
- _ Allows checkouts at multiple time periods (Pre-schedule, Pre-hour, Post-hour, ATF, etc) and at multiple rollop levels
- _ Produces alarms for a variety of events related to tags, schedules, limits, and transfers which can be subscribed to by any user and displayed both visually or audibly
- _ Includes a full suite of communication methodologies such as EIDE, Web Services, HTTP, and SFTP

ENERGY IMBALANCE MARKET (EIM) SOLUTION FOR GRID OPERATIONS

The MCG Value Proposition

Energy Imbalance Market (EIM) participants need tools to manage both new and legacy business requirements. MCG's suite of applications provide an elegant and robust solution designed to meet the demanding needs of EIM participants.

Alternative solutions only address a segment of requirements. Only MCG's EIM Market Solution addresses all aspects of the EIM in a comprehensive, integrated manner. MCG's products, experience and system implementation record makes MCG's Solution for the EIM a wise management decision.

MCG Solutions—The right system for the specific requirement

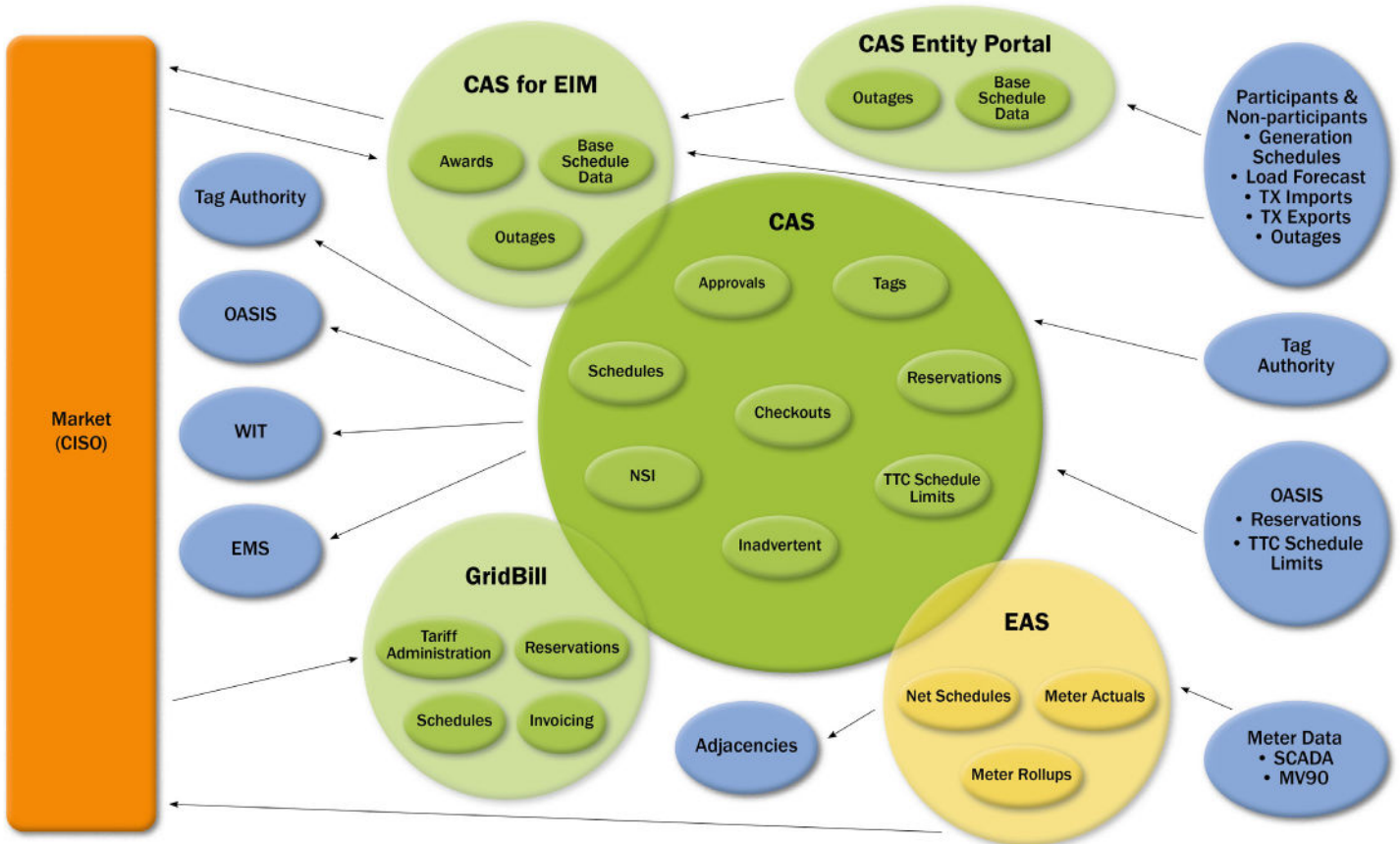
MCG's Control Area Scheduling (CAS). CAS for EIM performs a number of critical functions in the EIM. Customer schedules, forecasts, imports and exports are captured for the aggregation and development of EIM Base Schedule Data. Participants and Non-Participants, for whom you are acting as the EIM Entity Scheduling Coordinator, can use CAS's EIM Entity Web Portal to enter data into the system. CAS then performs any aggregation or calculations needed for submittal to the market. CAS boasts an integrated E-Tag function and is standard with interfaces to Tag Authorities, OASIS, WIT and numerous internal systems.

MCG's Energy Accounting System (EAS). Meter data management, as well as the related calculations such as Net Scheduled Interchange and Net Actual Interchange, are performed in MCG's EAS. Meter data submission to the market is a standard functionality of EAS. EAS is natively integrated with other MCG applications which directly lead to lower risk implementations as well as cost avoidance for interface work.

MCG's GridBill. GridBill's configurable billing engine allows an organization to manage even the most complex of transmission agreements. The system manages both Grandfather Agreements as well as pro forma OATT billing for your transmission customers.

MCG's Hosted Data Services (HDS). HDS provides both a user interface as well as programmatic access to the data created and received by all MCG applications. The user interface is an efficient tool to run reports for large date ranges across multiple systems. The programmatic interface allows organizations to pull data as needed directly into internal systems with no direct involvement from MCG. Being hosted at MCG data centers, HDS requires no table or hardware maintenance by the customer.

MCG SOLUTIONS FOR THE EIM



EIM Entity Customer Web Portal – Allows participants and non-participants to submit base schedule data, bid range data, and outage data for non-participating resources to the EIM Entity Scheduling Coordinator for aggregation and forwarding to the market. Electronic data submissions are supported via an EIDE based web service, or a spreadsheet upload. MCG's EIM Entity Customer Web portal also displays relevant award and confirmation information.

Data Management and Market Submission

- **AGGREGATION** – The solution will create base schedule rollups at the Load Aggregation Point (LAP) level for validation and submission to the market.
 - _ Load Forecasts – Aggregated by LAP
 - _ Generation Schedules – Grouped by LAP, but not rolled up
 - _ Interchange Schedules – Aggregated by LAP and adjacent balancing authority (BA)
- **VALIDATION, SUBMISSION AND REPORTING** – Prior to market submission, validation reports allow the entity to review the schedule and bid range data provided by its participants to help ensure reliability. Examples include the *Resource Adequacy Validation* and the *Reserves Validation* reports. Once validated, the data is submitted to the EIM directly from the system. The solution also includes the *Market Awards Recap* report which displays all market confirmed schedules and compares them against base schedule data to denote any awards altered by the market.

- **RETENTION** – All base schedule data, outage data, settlement data, and submission information (confirmation numbers, submission dates, status messages, etc.) will be held according to the Entity's compliance and accounting policies.

Outage System – Provides integration to internal outage management systems in order to submit outages to the market operator.

- Planned transmission outages
- Planned non-participating generation outages
- Unplanned outages

Settlements and Billing – The solution pulls and displays settlements data from the market, as well as providing shadow calculations based on submitted data, tags, and market prices. Multiple settlement statements can be aggregated for invoice reconciliation. The solution also supports creating transmission invoices for transmission customers.

- Invoice Reconciliation
- Shadow Settlements
- Settlement determinant reports
- Transmission Billing

Meters and Calculations – The solution includes the ability to manage schedule and meter data from multiple data sources. Rollups and calculations allow for the visualization of your system including the calculation of Net Scheduled Interchange (NSI) and Net Actual Interchange (NAI).



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