Siemens Demand Response Management System (DRMS) is a proven software application that allows utilities to manage all aspects of their demand response (DR) programs through a single, integrated system. Demand response is a key tool that addresses growing trends such as modernization, responsible energy consumption and greening the grid.

Demand response challenges
Utilities seek to add DR capacity to reduce peak load, avoid building new generation, and enable more responsible consumption. However, realizing value from DR has presented challenges:

- DR capacity has been difficult to scale in a cost-effective way, because DR programs typically involve manual processes that are resource intensive and susceptible to human error.

- Demand response has not been fully integrated with other utility systems. This type of isolation fails to maximize the value and potential derived from each demand response kilowatt.

- Legacy DR programs use a system-wide, “shotgun” approach to ensure committed reduction levels are achieved.

A proven and reliable application
Siemens DRMS has been successfully deployed at several utilities, each with their own unique requirements, using open protocols and standards like MultiSpeak and OpenADR 1.0 and 2.A profiles.

DRMS is both reliable and scalable, supporting several hundred thousand endpoints per customer class. The secure, web-based interface allows access from multiple locations with role-based access and full auditing of system activities. The interactive customer portal increases performance by showing customers their historical results and real-time feedback during DR events.
Evolution and innovation for the future

As the field of demand response continues to mature, enabling technologies allow DR providing assets to further extend value. DRMS Version 2.5 makes it easier to maximize the value of each DR resource and minimize DR operational costs through more efficient processes and process automation. Siemens DRMS Version 2.5:

‒ Ensures committed reduction levels are met by providing a forecast of both connected and sheddable load, thereby increasing reliability and reducing uncertainty.

‒ Includes added support for DR program definitions, third-party device integration and event notification allows many types of programs and consumer classes to be managed through a single application in a more cost-effective manner.

‒ Extends the number and type of business processes that can be mapped into the DRMS via configuration, not through expensive customization. This capability allows for increased operational efficiency by dispatching DR programs and assets in a consistent and logical manner while also providing more accurate results over time.

Out-of-the-box functionality with flexibility

DRMS has been designed with flexible interfaces using industry standards and nearly 300 different published application programming interfaces (APIs), to allow integration with many business and operational systems promoting automation and efficiency. With pre-built productized adapters (Figure 1), DRMS can interface not only with utility systems, but also with all types of consumer segments. This allows Siemens to deploy, configure and integrate DRMS quickly and cost effectively without the need for expensive customized software development that also creates long-term support challenges.

Expanded program support

DRMS allows for the ability to create and manage different kinds of constraints for different types of programs. Constraints can include the number of events and/or hours for a defined period, opt-in/opt-out capability and complex time-level constraints. For example, a program could be created with the following constraints, although many more exist: no more than five events per month, no more than four hours per week, and Monday through Thursday, 1 p.m. to 7 p.m. These constraints are tracked and monitored at an individual site level to maintain fair play and meet contracted agreements.

Surgical demand response

Utilities can provide targeted demand reductions through the use of a flexible load aggregation engine that allows loads to be grouped by defined fields including substation, feeder line, zip code, map interface or other user-defined associations. This “surgical” approach uses DR program resources more efficiently, allowing utilities to condition load to help maintain grid reliability in near real-time. Surgical DR gives utilities the ability to limit or avoid outages and restoration costs, and contributes to longer, better performing assets.

Performance

Before an event – DRMS forecasts the demand and predicted load shed for a single load or a user-defined aggregation (Figure 2) to allow for better event planning and more informed decision making. After scheduling an event, but prior to the event starting, DRMS provides near real-time feedback with time-stamps of which participants have been notified and which assets will participate in the event. The information derived from these forecasting and feedback mechanisms allows utilities to better understand how participants will perform prior to an actual event, reducing uncertainty and increasing confidence in DR resources.

During an event – DRMS can monitor the event performance by interfacing to real-time metering devices or through on-demand meter reads. With this information, operators are able to diagnose if targeted load reductions are being met and can decide if additional resources need to be scheduled and called, helping to meet desired commitments.
After an event – DRMS can provide automated reporting that can include event performance, measurement, verification and settlement by retrieving validated meter data. DRMS will then calculate baselines and load reduction delta values to create a determinate for individual sites and aggregations. DRMS can also provide additional reporting based on user-defined attributes with respect to any system data DRMS is capturing. This automation helps reduce manual processes and errors, increasing operational efficiency and performance.

The value of Siemens DRMS Version 2.5

– Ensures business objectives are achieved by executing events in a consistent manner with configurable workflow processes.

– Utilizes DR resources more efficiently and reliably with real-time event monitoring, load forecasting and the use of surgical DR.

– The system architecture promotes low-cost configuration as opposed to complex, proprietary customization.

– Reduces DR execution costs by automating notification, measurement and verification, and settlement calculations.