Webinar with SMUD: Achieve the Potential of DERMS, Connect Utility Operations and Customer Programs

Frequently Asked Questions

Q: What are the top three risks of High DERs adoption for municipal electric utilities?

A: As DER penetration grows, it may exceed the real-time hosting capacity of the network. At this point there are risks of equipment overloads, power flows not supported by protection settings, localized high or low voltages exceeding standards and others.

Q: What happens if an electric utility does not have a DERMS?

A: If a utility does not have a DERMS, the alternative is costly equipment upgrades coupled with outages and power quality issues from equipment failure caused by excessive, unmanaged DER.

Q: How difficult is it to integrate different ADMS and DERMS vendors or would you recommend one platform like AspenTech that offers both? Does DERMS depend on the data ADMS collects through SCADA?

A: AspenTech's DERMS was designed to be a system of systems. It's capable of integrating with other third-party DERMS providers that may not provide the full functionality required to be utilized within the control center. Utilizing standard protocols greatly reduces the effort needed in this process, but using API integrations for custom setups is capable. While AspenTech's DERMS natively integrates with AspenTech OSI Spectra ADMS, it has

been designed in such a way to integrate with third-party ADMS software as well.

In addition, AspenTech's DERMS is capable of consuming data via SCADA as well as other common DER protocols such as OpenADR and IEEE2030.5. DERMS has detailed models for solar, wind, batteries, etc. that improve forecasting. ADMS is typically modeling and forecasting loads whereas DERMS is also looking at DER generation. These forecasts can be consumed by scheduling to optimize network performance and create schedules for peak shaving, battery charging or other objectives.

Typically, these integrations rely on ICCP and other common communication methods, but a design session is ideal to create the most effective integration methods needed.

Q: How do you register and manage DERS that you manage? Is this brought in through a built model import or some other process?

A: AspenTech's DERMS has a model import process. When pairing with AspenTech's ADMS, this can be part of the GIS integration process that updates the ADMS model. The model can also be supported by an Excel spreadsheet import.

Q: Could you say more about how operators interact with the Volt-Var functionality of the DER inverters?

A: AspenTech's DERMS is able to model all of the smart inverter functions as specified in IEEE 1547-2018 and the MESA standard. The operator is able navigate to the DERs Volt-Var mode and other mode settings in the DERMS displays. From those displays, the operator can also enable/disable modes, edit curves and other meta data, and change curve reference indices as needed.

As part of our DERMS Phase 1 implementation, operators do not have the ability to interact with Smart Inverter Functions. As part of DERMS Phase 2 & 3, operators will have the ability to manually set/schedule operating modes for DERs using DNP3 profile through DERMS.

Q: Could you clarify the how DERMS manages utility-owned resources vs customer owned? What are key differences?

A: AspenTech's DERMS is capable of accounting for contractual rules around control and setting preferences to devices. Typically, customer-owned devices would be part of an aggregation and have the ability to opt out of demand response events or other dispatches.

Utilities may put these devices at lower priority to avoid frequent interaction with customer devices.

Q: Currently in Colombia, large-scale, medium-scale and small-scale solar generation is being encouraged, and these last points are controlled with bidirectional meters. How can this system (DERMS) integrate small-scale generations?

A: DERMS is able to model all of the solar generation. In cases where there isn't direct telemetry, DERMS is able to estimate the output in real time based on weather or other measurable quantities. This allows the utility to have a complete picture of all DER production at all times. DERMS is also able to issue curtail controls as needed to any solar sites that can accept these controls.

Q: How does AspenTech'svDERMS aggregate a large percentage of DERs of small and large sizes?

A: AspenTech's software is very configurable. When pairing with an ADMS integration, aggregation can be tied to network hierarchy. Aggregation can also be done by custom groupings that can easily be set up via tabular filters.

Q: How many AspenTech DERMS have been installed or being installed in North America?

A: AspenTech currently has 30+ projects installed or in the process of being installed in North America.

Q: We are a small G&T cooperative with a current monarch system. We are considering a DERMS to manage a dozen or so small solar sites. What product should we consider or what steps should we take first?

A: The AspenTech OSI Integra DERMS product is ideal for adding on to an existing monarch system to manage small solar sites. It can usually be added on the existing servers and monarch instance. The first steps would be to list out the different use cases desired for the solar management and then begin collecting the necessary data to

support that. If the sites will have SCADA, getting the analogs, statuses and setpoints into monarch are first steps, as well as any met station SCADA points as well.

Q: What is a ballpark cost of an AspenTech DERMS system?

A: That depends on many different parameters, including size of the system (number of DERs), whether you're an existing AspenTech customer (already have some products), desired DERMS use cases and others.

Q: For small utilities without a 24/7 dispatch is this solution practical?

A: DERMS is very useful for small utilities without 24/7 dispatch. DERMS is able to monitor and issue controls automatically if desired, allowing the system to schedule and solve issues after hours without needing operator intervention, while triggering alarms that can alert the operators after hours if needed. We have several small DERMS customers operating like that today.

Q: Is DER management software, like PowerClerk, useful and compatible with AspenTech ADMS and DERMS?

A: DERMS can interface with systems like PowerClerk to receive the DER model data.

Q: As a G&T only, would a company lose capabilities by only having DERMS integrated to an OpenNET transmission model and not an ADMS distribution model?

A: There are some additional functionalities that come with interactions into the full DERMS/ADMS integration that relate to the advanced apps (VVO, FLISR, etc.), but the core DERMS benefits would still be available in a G&T environment. There are several AspenTech customers using DERMS integrated into OpenNET and AGC for things like frequency support and renewables + storage management.

Q: Is SMUD working with medium and heavy-duty fleet operators to transition to EVs and then to aggregate their vehicle batteries into storage systems when idle in depots? How is DERMS supporting this undertaking?

SMUD: SMUD does not have any modeling of medium and heavy-duty fleets, dispatch capability or a managed charging of fleets scoped as part of implementation for DERMS Phase 2 & 3. Please let us know if there is any interest to learn more about SMUD initiatives in this area.

Q: How are you protecting SMUD systems from any cyber threat vectors that might come through the DERMS connections?

SMUD: The cyber security protocols and practices for SMUD's systems are handled internally by SMUD's Cyber Security team, in collaboration with the ADMS support and OSI support teams.

Q: Given the importance of having accurate models for a lot of applications mentioned here, what approach did SMUD take to ensure model quality?

SMUD: There are data validation checks that SMUD runs, via custom apps/sql, on the data/model before it is migrated to ADMS. These data validation checks ensure that the device types are modelled and configured in ADMS or will run reports on the deltas between the current model and what is to be accepted as part of migration.

Q: Could you say more about how operators interact with the Volt-Var functionality of the DER inverters?

SMUD: As part of our DERMS Phase 1 implementation, operators do not have the ability to interact with Smart Inverter Functions. As part of DERMS Phase 2 & 3, operators will have the ability to manually set/schedule operating modes for DERs using DNP3 profile through DERMS.

Q: What is the time frame SMUD is envisioning for Phase 2 and 3?

SMUD: SMUD is currently looking to go-live with Phase 2 & 3 in Q3 of 2024.

Q: Any changes to the roadmap to accommodate FERC Order 2222? Is SMUD working with any third-party DER aggregators?

SMUD: SMUD is taking incremental steps towards understanding DER and VPP participation in markets as part of our Phase 3 DERMS Implementation.

Q: Does SMUD have non-AspenTech aggregators on its system, and is AspenTech DERMS able to integrate those into its DERMS solution?

SMUD: As part of SMUD's Phase 3 DERMS implementation, there will be two third-party aggregator platforms that will be integrated via OpenADR into the DERMS solution.

Q: Hashim mentioned that scalability was one of the requirements for SMUD; how did SMUD test and validate the scalability of the AspenTech DERMS solution?

SMUD: SMUD had scalability as a requirement and worked with AspenTech early in the project during design workshops to understand how best to size the system to accommodate the projected sizes for the datasets over a five-year growth period. There was also testing of the performance during an all-testing event.

Q: What is meant by DER dispatch? Don't your customers want to generate as much power as they can all the time?

SMUD: SMUD has modeled telemetered and non-telemetered DERs in DERMS to provide real-time information and visibility into the ADMS model. Telemetered DERs are providing real-time measurements from the field and non-telemetered DERs use real-time estimation methods to provide the model with real-time information. The idea of DER dispatch by DERMS is limited to DERs that have dispatch capabilities, whereas non-dispatchable DERs are providing real-time visibility and forecasted capabilities. The purpose of DERMS dispatching a customer-owned resource is to address an operational need or grid constraint in real time (localized voltage issue, overloads, backfeeds, etc.). The DERMS scheduling application will also be able to provide an optimal schedule for DER dispatch for optimization at different network topologies. SMUD has deployed pilots and programs that offer customers incentives to allow for SMUD to dispatch or schedule their DER.

Q: Could you talk about integration of DERMS with the wholesale power market? Do you offer your owned DERs to the RTO? What is wholesale integration for non-SMUD-owned DERS?

SMUD: SMUD's current market operations, Power Systems Operations, and customer/ contractual agreements allow for participation of SCADA-connected DERs on the distribution system in the wholesale power markets today. As part of the Phase 3 DERMS implementation, we are moving elements from Power System Operations and their control systems to our DERMS, which is operated by our Distribution System Operators. Please let us know if there is any interest in learning more about our process flows and how our DER Operations map to our Distribution Operations and Energy Trading Operations.

Q: Did SMUD quantify the value for each of the benefits before progressing to implement the associated DERMS functions?

SMUD: SMUD did not quantify the value for each of the benefits before progressing to implementation of the associated DERMS function, but rather quantified the value of both ADMS and DERMS system deployments since they were concurrent deployments.

Q: Is SMUD’s implementation of DERMS able to utilize built-in inverter functionality (required in California) such as volt-var to manage local voltage issues? If not, are there plans to do so?

SMUD: As part of our DERMS Phase 1 implementation, operators do not have the ability to utilize Smart Inverter Functions. As part of DERMS Phase 2 and 3, operators will have the ability to manually set/schedule operating modes for DERs using DNP3 profile through DERMS.

Q: Is there any EV Demand Response implemented in SMUD? If not, is it in the plans? How does OSI support this?

SMUD: Currently, there are no EV Demand Response, managed charging or fleet management functionality to be deployed as part of SMUD's Phase 1, 2, or 3 DERMS implementations.

Q: What contractual arrangement do you have with individual small generators that allows you to disconnect their generator when generation on a line segment or substation is too high?

SMUD: This is a larger conversation that involves multiple methodologies for constructing contractual arrangements by our Interconnection Process group. Please let us know if there is any interest in setting up some time to review this process.

Q: What is available in AspenTech live vs. Phase 2, Phase 3 SMUD?

SMUD: SMUD's Phase 1 implementation of DERMS includes functionality that provides visibility, monitoring, control and forecasting capabilities. Phase 2 will provide the ability to create, store and execute optimal schedules; incorporate DERs in advanced application solutions; and Automatic DER Controller. Phase 3 implementation will include scheduling DERs for economic performance and electricity markets, VPP functionality, third-party aggregator integrations and price-based communication.

Q: For SMUD is GIS the 'gatekeeper' for your DERMS data or is there a third-party application that stores the data and that data is brought into GIS as part of your model extract?

SMUD: For PV and ESS, we utilize PowerClerk for our interconnection application processing and SAP for mapping to customer information. The data is migrated from these systems into GIS. A majority of the DERMS data currently comes from our GIS, but SMUD has built a process/program to pull some data from other sources, perform analyses, populate data fields based on results and merge the data.

Q: Aside from the technical capability for VVO from advanced inverter functionality, have you developed a customer program model that allows VVO optimization and, if necessary, compensates them for it?

SMUD: SMUD is still in development of piloting advanced inverter functionality with customers and does not have a customer program model fully developed that provides compensations.

About AspenTech

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

aspentech.com