Recommended ADMS Application Implementation Schedule

UDC™

ID	Functionality	Dependent	Description	Business Release	Operational Focus
1	**Facility Information**		Operating characteristics about the facility.	1	Enhanced Visibility and Manual Operating Devices
2	**Load Models and Load Estimation**		Takes advantage of Advance Metering Infrastructure (AMI)/Meter Data Management System (MDMS) meter readings.		
3	**Manually Operating, Tagging Devices**		Uses ADMS as a mimic board of what the field is performing; adds tagging information.		
4	**Navigation**		Searching based on device nomenclature, substation names, circuit names, grid names, street names, street addresses, and pole ids.		
5	**Online PowerFlow**	2, 8	Whenever a device is operated (open/closed, on/off, or setpoint changed), then Online PowerFlow should run on the impacted section of the model. Used to aid in determining detrimental electric conditions (voltage, current, etc.) in real-time, thus improving grid visibility.		
6	**SCADA Functionality/Historian**		SCADA/SCADA HISTORIAN SCADA Historian stores and logs the compiled data from the SCADA system.		
7	**Study Mode**		Takes current state of network and allows the operator to run switching orders to verify their validity on the current state of the network. Enables operators to better analyze outage data for more accurate reporting by comparing outages against the network model and topology data.		
8	**Supports Online Incremental GIS Updates**		Supports incremental updates to the as-operating model from the System of Record (SOR) business systems. Typically need to support either accepting incremental changes from the SORs or need the ability to detect and generate their own set of deltas and apply them to the ADMS operational system.		
9	**System Administration Tools**		System monitoring tools to help in monitoring the health of the system and performance tuning tools and managing user access.		
10	**Dispatcher Training Simulator**	1, 2, 3, 4, 5, 6, 7	Enables utilities to generate trouble calls and allows dispatchers to train for managing outages. Enables the trainer to place a fault anywhere on the power system and for the dispatchers to isolate and troubleshoot the fault based on simulating how the power system would react to the fault. Captures and allows for actual storm set of trouble calls and Advance Metering Infrastructure (AMI) last gasp message replays.		
ID	Functionality	Dependent	Description	Business Release	Operational Focus
11	**ADMS Management of Protection and Controls (P&C) Settings**	19	Should support bulk loading of P&C settings from engineering systems used to generate and manage the protection and coordination relay settings. These are required to support Training Simulator applications, allowing the trainer to place a fault anywhere on the power system and the system simulating how the power system would react. This information is required to ensure that the correct relay setting is set before extending its reach for more complex Switch Order Management (SOM) that needs to issue P&C set point selection commands prior to actual switching steps.	2	Daily Operations and Trouble Response
12	**Distributed Generation (DG) Connection Impact Assessment & Planning**	5	Operating in Study Mode, takes the DG connection requests and creates the impact assessment the connection would have with the system at peak load. Can collect or be integrated with a solar intensity rating system to determine how much energy will be available at the desired connection location. Provides utilities with the finest granularity and allows utilities to encourage DG connections in areas that would benefit them the most.		
13	**Emergency Planning**	5, 16, 20	Allows utilities to simulate mock emergencies and practice emergency planning procedures. Utilities can enhance procedures by considering what-if scenarios to accommodate in-accessible roads and builds; utilities can also plan for evacuation routes and possible air and water rescues. Supports the planning and generation of switching orders to shut down the distribution network as quickly and safely as possible, based on specific areas of the distribution network impacted by the emergency event.		
14	**Fault Investigation**	16, 19	Uses the Predicted Fault Location (PFL) application to generate the list of possible fault locations. Provides tracing tools that the field could use or collaborate with the outage operator to troubleshoot and locate the next set of protective devices, if the predicted outage location is not the device that operated.		
15	**Intelligent Alarming**	5, 6	Utilizes the connected network to filter and prioritize alarms. High-value when deploying more peer-to-peer Distribution Automation (DA) schemes. Provides operators additional time to diagnose alarms and effectively respond by inhibiting nuisance alarms, using one synthetic alarm, and creating diagnoses for faulty devices.		
16	**Outage Management System (OMS) Trouble Call/Outage Prediction Functionality**	5	Ingests trouble calls and Advance Metering Infrastructure (AMI) last gasp messages to generate a Probable Outage (PO) device based on the current as-operating state of the network. The number of customers is generated by phase in addition to the number of 'critical' customers impacted. Needs to filter out all trouble calls and AMI messages arising from utility self-induced outages (planned outages, Distributed Network Protocol (DNP) shutoffs, and temporary switching orders).		
17	**Outage Restoration**	14, 16, 20	Generates the switching plans to isolate the faulted section and restore to the fullest extent while repairs are done. For complete outage restoration support, this application should manage tree trimming activities required as part of the storm damage assessments. If Advance Metering Infrastructure (AMI) is available, this application should use its integration with AMI to validate that outage restoration is complete as well as to detect nested service level outages and place them in the outage event queue.		
18	**Protection and Controls (P&C) Configuration Management**		Supports the bulk loading of values from the engineering application used to create the group relay settings.		
19	**Short Circuit Analysis (Predicted Fault Location)**	8	Varies greatly on whether it starts with just the substation's intelligent electrical devices (IED) fault distance/magnitude vector or if it has access to a wealth of Faulted Circuit Indicators (FCIs) installed along a feeder. Returns either a set of possible fault locations when starting with a substation IED fault vector or one location if many FCIs are on the feeder.		
20	**Switch Order Management (SOM)**	5, 11	Provides a switching request module. Attempts to optimize multiple switching requests to minimize the number of operations. Uses the results of Online PowerFlow to optimize switching operations based on the following parameters: number of device operations, number of manual device operations, number of automated device operations, and number of customers impacted. Can also optimize based on current conditions, next few hours, and next few days.		
ID	Functionality	Dependent	Description	Business Release	Operational Focus
21	**Distributed Generation (DG)/ Distributed Energy Resources (DER) Monitoring and Control**	5, 6	Provides visibility to operators to 'dispatch' DG capacity and monitors power quality impacts of DER on the network.	3	Automating IED Data Collection and Populating DGDR
22	**Distribution State Estimator (DSE)**	5, 6	Provides technical and non-technical power losses in real-time by using load allocation methods, running continuously in the system background.		
23	**Data Collection Environment to Populate the Digital Grid Data Repository (DGDR)**	DGDR	DGDR		
24	**Intelligent Electrical Devices (IED) Management**	DGDR	Management of IEDs including identification and authentication in compliance with NERC Critical Infrastructure Protection (NERC CIP), with mandatory changing of passwords.		
ID	Functionality	Dependent	Description	Business Release	Operational Focus
25	**Load Forecasting**	37	Contains both short-term and long-term load forecasting capabilities to aid utilities in planning for load management strategies. Requires information from the utility's Meter Data Management System (MDMS) or Customer Information System (CIS) meter reading systems, Distributed Energy Resource Management Systems (DERMS), and weather forecasts for the period the load forecast is being requested.	4	Optimization and Automating Device Operations
26	**Load Management**	5, 20	Generates load shedding rotating scheme with automated load restoration.		
27	**Optimal Network Reconfiguration (ONR)**	5, 11, 20	Uses the Switch Order Management (SOM) application with intent to optimally reconfigure the power system. Generates a list of switching orders that can be operated automatically by the system or invoked manually in Study Mode to validate that the end state is the desired state of the power system.		
28	**Storm Planning**	7, 16, 17, 20	Operates in Study Mode and allows the operator to simulate a wide area outage event. Can be used with the Dispatch Training application to support mock drills.		
29	**Storm Restoration**	5, 6, 16, 17, 20	May start with a storm prediction input from a weather forecast to generate the impacted area and start generating 'like-for-like' material requisitions. Should manage the dispatching of damage assessors. The field damage assessment information automatically generates material requisitions for 'like-for-like' repairs. The field information can first be returned to engineering for review to optimally place material requisitions and filter out the repairs that need to be engineered due to using outdated materials or construction standards. Must support communication and coordination with mobile command centers and the operating center.		
30	**System Optimization**	5, 6, 20	Has the capability to optimize the distribution network with existing Distributed Generations (DGs), uses the Optimal Network Reconfiguration (ONR) application to optimally reconfigure the distribution network for short or long-term, and uses Volt/Var Optimization (VVO) to provide power quality while optimizing voltage conservation reductions. Typically integrated with weather forecasts to calculate the amount of energy the connected DGs will be contributing to the distribution network over the period of optimization.		
31	**Volt/Var Optimization (VVO)**	5, 6	Manages system-wide voltage levels and reactive power flow which can be used to minimize system losses and demand and lower injected energy while remaining within operating voltage levels. Closed loop optimization based on operator configurable parameters. Requires either Online PowerFlow or Distribution State Estimator (DSE) for optimizations.		
32	**Weather Forecasting**		Access to national weather forecasting services for both short-term and long-term weather forecasts.		
ID	Functionality	Dependent	Description	Business Release	Operational Focus
33	**Distributed Generation (DG) Dispatch**	5, 6	Allows the operator to fairly dispatch the Distributed Generation (DG) units on the feeder according to their connection agreements if more DG is allowed to connect to a given feeder than it can handle. Weather forecasts are typically integrated with this application to provide the operator a realistic view of the available operating window based on if the DG units are solar or wind units.	5	Adding Asset Management Applications to Use the DGDR
34	**FLISR (Fault Location, Isolation, and Service Restoration) – Self Healing**	5, 6, 17, 19, 20	Automates power restoration and mitigates the impact and duration of power interruptions. Relies on Online PowerFlow or Distribution State Estimator (DSE) and Switch Order Management (SOM). If the power network does not have sufficient Faulted Circuit Indicators (FCIs) or other intelligent electrical devices (IEDs) installed, then utilities will probably not want to turn on FLISR on top of the Predicted Fault Location (PFL) module as human input is required to choose from the possible set of fault locations.		
35	**Condition Based Inspections**	23	DGDR – Uses the condition information collected from humans and intelligent electrical devices (IEDs) in the DGDR as well as operational historic information, such as duration running above thermal limits, to drive inspection programs.		
36	**Condition Based Maintenance**	23	DGDR – Uses the condition information collected from humans and intelligent electrical devices (IEDs) in the DGDR as well as operational historic information, such as duration running above thermal limits, to drive maintenance programs.		
37	**Distributed Generation (DG), Power Quality (PQ), & Performance Analysis**	23	DGDR – Allows the utility to be proactive by using the historical information in the DGDR to monitor DG connection compliance, power quality issues in the distribution network and the performance of the distribution network power quality assets, and the performance of ADMS applications, such as Volt/Var Optimization (VVO), on the power quality of the distribution network.		
38	**Dynamic Line & Equipment Loading**	23	DGDR – Uses information in the DGDR and current as-operating distribution network to re-rate the circuit and equipment on the circuit.		
39	**Historical Reliability Analysis**	23	DGDR – Uses the information in the DGDR to address the worst performing circuits from a reliability point of view and makes recommendations to improve these circuits.		
40	**Long Range System Planning**	23	DGDR – Uses the information in the DGDR, long-term load forecasts, Distributed Generation (DG) connection applications, and planned system improvement jobs to provide the view in Study Mode of what the system will look like.		
41	**Predictive Analysis**	23	DGDR – Uses the historical information from the DGDR to predict the performance of assets, subsections of connected circuits, and circuits based on time-of-day load profiles.		
42	**Predictive Outage Analysis**	23	DGDR – Uses the digital footprints from the DGDR to predict when a specific device will fail.		
43	**Reliability Centered Maintenance**	23	DGDR – Uses the forecasted reliability statistics to focus where system improvements need to be made and where new preventative maintenance or more frequent preventative maintenance needs to be applied.		
44	**Short Range System Planning**	20, 23	DGDR – Uses the information in the DGDR, short-term load forecasts, and planned switching orders to provide the view in Study Mode of what the system will look like.		
ID	Functionality	Dependent	Description	Business Release	Operational Focus
45	**Asset Investment Decision Tool (AIDT)**	23	This is not an ADMS application; it is a CAPEX portfolio optimization tool that utilizes the DGDR suite of asset management applications enabled by an ADMS. Included to take full advantage of what an ADMS enables.	6	Micro Grid Management
46	**Energy Losses/Revenue Protection**	5, 6, 22	Operates in the background and looks for discrepancies between what transformer bellwether meters or results from Online PowerFlow or results from Distribution State Estimator (DSE) and what power the utility's Advance Metering Infrastructure (AMI)/Meter Data Management System (MDMS) show is being used .		
47	**Load Management with Customer Demand Management/Demand Response (CDM/DR)**	5, 6, 20	Looks for where load management is needed in the distribution network and uses its integration with CDM/DR programs to pinpoint which programs will bring load relief in areas that required it. Coordinates between invoking DR programs and switching orders to reconfigure the system to move load.		
48	**Measurement and Verification of Demand Response (DR)**	5, 6	Monitors and measures how well each invoked DR program provided the load relief benefits enlisted by the utility's customers.		
49	**Micro Grid Management**	5, 6, 20, 21	Manages the interconnection point(s) of a community's micro grid connection to the utility's distribution network. Includes managing its connection status in support of grid reliability and coordinating the reconnection of island micro grids.		
50	**Transformer Load Management (TLM)**	5, 8, 19	Displays which transformers are overloaded or underloaded by the threshold percentage and indicates how long each transformer has been overloaded.		