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## 1.0 Executive Summary

The Schneider Electric Power and Cooling Assessment for Data Center provides an assessment and analysis of your data center facility and critical physical infrastructure components – including the power systems, cooling systems, and rack configurations. Schneider Electric service will supply you with the information necessary to manage your facilities for optimum performance, extend the life of your hardware and strive for the highest level of network availability.

The Schneider Electric Power and Cooling Assessment for Data Center offer a detailed review of your data center. Schneider Electric professional services consultants will visit the site and collect data pertaining to:

- Environmental conditions
- Critical infrastructure capacity and utilization
- Cooling distribution and effectiveness
- Condition of power and cooling equipment

With this data, Schneider Electric will develop a comprehensive report that will include recommendations to:

- Address your specific concerns
- Correct deficiencies
- Optimize existing conditions
- Increase infrastructure capabilities
- Extend data center service life

## 2.0 Features & Benefits

Features	Benefits
Comprehensive Data Center Power and Cooling Assessment Report.	Data center power and cooling utilization analysis identifies key infrastructure constraints that inhibit full space utilization.
Measurement of existing environmental conditions.	Indicates areas where temperature and humidity levels are not within tolerances established by industry standards and equipment manufacturers.
Measurement of the data center electrical infrastructure loads.	Provides an accurate assessment of the actual data center power and heat loads; identifies excessive load conditions that can compromise existing reliability.
Measurement of present temperature conditions using thermal imaging.	Provides visual representation of excessive rack inlet temperatures and other potential hot spots within the data center.
Recommendations to optimize infrastructure utilization.	Identifies methods to maximize availability and the efficient use of power, cooling and space.

## 3.0 Details of Service

The specific activities of this service are listed below. For each activity, Schneider Electric service will perform the work described.

Data Center Power	
Activities	Description
Data Center Electrical Infrastructure Review	Document nameplate data, manufacturer and configuration of the data center bulk power distribution equipment to include: main switchgear, switchboards, generator(s), automatic transfer switch (ATS) and other equipment as applicable. Identify redundancy of power distribution system.
	Perform a visual inspection of data center electrical equipment including: switchboard, generator(s), ATS, uninterruptible power supply (UPS) and UPS power distribution infrastructure, checking for improper installation practices, damaged equipment, and labeling of circuits.
	Review available maintenance records for the data center electrical equipment including: switchboard, generator(s) and ATS, and provide recommendations, where applicable, to improve practices.
	Document the generator fuel supply system and storage capacity.
Document Existing UPS and Configuration	Document configuration, existing condition and nameplate data of the UPS and UPS power distribution infrastructure.
	Document configuration, existing condition and nameplate data of the battery system.
Document UPS Capacity and Utilization	Record input and output load measurements taken at the UPS.
Document Static Transfer Switch Configuration	Identify and record preferred and alternate sources, document load readings, identify load balance and load transfer capabilities.
Data Center Load Analysis	Record, interpret and analyze displayed load values from metered power distribution units (PDU).
	Interpret and analyze measured load data collected from the data center, load panel boards taken during the assessment.

Data Center Cooling	
Activities	Description
<b>Computer Room Air Conditioning (CRAC) System Characterization and Analysis</b>	Visually assess the Computer Room Air Conditioning (CRAC) units. Check for general conditions, improper installation practices, damaged equipment and improper use.
	Identify the system type (i.e. direct expansion, water based or dry cooler, upflow or downflow) and document equipment manufacturer and model number.
	Document the rated capacity (based upon nameplate data and manufacturer nominal ratings) of the CRAC unit(s).
	Record and analyze supply and return temperatures, humidity, set points and operational modes to determine environmental conditions and where demand fighting may occur.
<b>Record Data Center Temperature and Humidity Levels</b>	Record and document room temperature levels to ensure that they are within ranges established by equipment manufacturers and recognized industry standards.
	Record average hot aisle and cold aisle temperatures. Identify conditions outside of recognized industry standards.
<b>Rack Analysis</b>	Identify where air mixing is likely to occur and where blanking panels should be installed.
	Examine rack enclosures for airflow suitability.
	Identify airflow obstructions within, above, and below the rack environment.
<b>Infrared Thermography</b>	Detect and document areas where rack inlet temperatures exceed industry standards and guidelines using infrared thermography.
<b>Air Distribution Effectiveness</b>	Analyze rack arrangements for air distribution effectiveness.
	Identify the air distribution topology within the computer room.
	Evaluate the air distribution topology effectiveness relative to the computer room heat load.
	Measure airflow and temperature of the raised-floor air distribution system and overhead supply grills (if accessible). Identify possible obstructions and restrictions. Compare to nominal equipment nameplate data.

Data Center Analysis and Report	
Deliverable	Description
Customer Identified Site Specific Issues	Provide analysis and recommendations to address and correct customer specific issues within the data center using industry best practices.
Infrastructure Summary and Recommendations	Provide a data center summary and recommendations to optimize the existing data center according to industry best practices.
Data Center Electrical Infrastructure Analysis	Provide a simplified one-line diagram from the main data center switchboard or separately derived source to critical load distribution panels, including transfer switches, UPSs, and generators.
	Tabulate and analyze the bulk power system within the data center. Provide recommendations where applicable.
	Determine bulk power utilization and identify limiting factors for increased power density within the data center.
	Project future growth load potential and analysis based on actual load measurements.
	Provide recommendations, where applicable, to optimize the operation and utilization of the generator infrastructure.
Data Center Electrical Distribution Analysis	Tabulate and analyze power distribution within the data center. Provide recommendations where applicable.
	Determine power distribution utilization and identify limiting factors for increased power density within the data center.
Data Center Cooling Infrastructure Analysis	Tabulate and analyze the bulk cooling distribution within the data center.
	Determine the bulk cooling utilization and identify limiting factors for increased power density within the data center.
	Report conditions that compromise bulk cooling effectiveness, where applicable, and provide recommendations to correct problems.
Data Center Cooling Distribution Analysis	Document and analyze the cooling distribution within the data center.
	Provide a cooling distribution floor plan of the data center identifying rack inlet air temperatures and tile airflow and temperature data, if applicable.
	Report conditions that compromise cooling distribution effectiveness, where applicable and provide recommendations to correct problems.
	Provide a floor plan of the existing data center depicting average hot and cold aisle temperatures, and raised floor supply tile airflow rates and temperature readings.

Data Center Analysis and Report (cont.)	
Deliverable	Description
<b>Data Center Load Constraint Analysis</b>	Provide analysis of the infrastructure constraints and how the constraints limit increased data center loads.
<b>Facilities Analysis</b>	Document general facilities information.
	Provide a floor plan of the existing data center. If a floor plan is provided by the customer, it will be validated and updated as necessary to reflect the current operations.
<b>Recommendations For Data Center</b>	Provide analysis, scenarios and recommendations to optimize infrastructure utilization and availability.
	Provide power, cooling and infrastructure recommendations for each scenario.
	Provide conceptual floor plan depicting equipment layout for each recommended scenario.
<b>General Recommendations</b>	Provide general observations and recommendations for the data center infrastructure not covered in other sections of the report.

### 4.0 Deliverables

Schneider Electric service will deliver a comprehensive data center assessment report to the customer that includes:

- Recommendations for specific actions addressing customer concerns.
- General recommendations to improve power, cooling and facility utilization.
- Identifying problem areas based on analysis performed using digital photography, thermal imaging, and actual field measurements.
- Tabular data collected from all the activities defined in Section 3.0, Details of Service.
- Three (3) hard copies and a PDF of the final report.
- An optional follow-up conference call to review the report and answer questions.

### 5.0 Exclusions

The following items are outside the scope of this standard service offering. They can be integrated into a customized Statement of Work (SOW) at request of the customer. Contact Schneider Electric service sales representative for more details.

- Specialized testing or commissioning
- Fire detection and fire suppression
- Physical security
- Structural analysis
- Circuit Tracing

## 6.0 Scope of Responsibility

The items stated here are responsibilities of both Schneider Electric service and the customer.

### 6.1 SCHNEIDER ELECTRIC SERVICE RESPONSIBILITIES

- Assign a Professional Services Fulfillment Manager to the case.
- Initiate a meeting to:
  - Review the assessment process and deliverables.
  - Establish project stakeholders and key contacts.
  - Review the Assessment Preparation Questionnaire to identify customer specific existing conditions and issues in the data center.
- Schedule an assessment and manage the complete assessment process through the Schneider Electric Professional Services office.
- Perform an assessment of the customer site.
- Provide a written report to the customer of the completed field survey.

### 6.2 CUSTOMER RESPONSIBILITIES

- Complete and return the Assessment Preparation Questionnaire. This will identify issues or problems in the data center needing specific, detailed analysis and recommendations.
- Provide qualified personnel to take electrical panel readings on the day the Schneider Electric Professional Services consultant performs the assessment.
- Provide qualified personnel for physical access to the data center, all infrastructure support areas and electric panels to be surveyed. These areas include, but are not limited to, the power systems within the data center and those feeding the data center from outside.
- Access to data center power systems will include:
  - Generator.
  - Service entrance.
  - Uninterruptible power supplies.
  - Breaker panels.
  - Access to the internal and external cooling system components within the data center.
  - Floor panel removal and sub-floor access.
- Provide building infrastructure one-line diagrams for the cooling and electrical systems, if available.
- Provide generator, switchgear, UPS and HVAC maintenance records, if available.
- Notify Schneider Electric service of any non-disclosure agreement, security clearance, safety or other certification requirements prior to arrival on site.
- Provide a single point of contact to assist during assessment.

## 7.0 Project Work Details

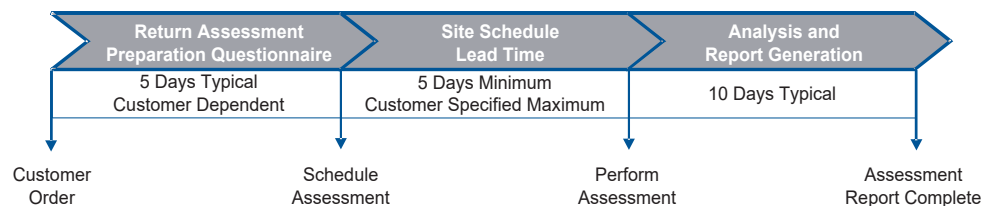
The following details of the project specify the schedule, location and successful completion criteria.

### 7.1 SCHEDULE

1. All onsite services performed by Schneider Electric service are executed during the normal business hours of Monday through Friday from 8:00AM to 5:00PM, local time. Exceptions are national or provincial holidays. Services performed outside of normal working hours may incur additional charges.
2. The service will be scheduled as quickly as possible at the convenience of the customer. Delays in fulfilling the service caused by labor disputes of third parties, customer contracted services, or other unforeseen conditions may affect the schedule. Schneider Electric service will not be responsible for delays related to circumstances outside of its control.

### 7.2 ASSESSMENT PROCESS TIMELINE AND FLOW

1. Customer Purchase Order received by Schneider Electric service.
2. Assessment Preparation Questionnaire complete and returned to Schneider Electric service.
3. Site assessment scheduled with customer through Schneider Electric Service Professional Services office.
4. Meet with IT, facility management and Schneider Electric service representative to coordinate site visit.
5. Site assessment performed at the customer location.
6. Customer Site Assessment Report completed.



The actual and specific dates are not contracted due to the variability in each unique site assessment and analysis.

### 7.3 LOCATION

The location of this project will be onsite. It will be discussed and approved by Schneider Electric service and the customer.

### 7.4 COMPLETION CRITERIA

Schneider Electric service is expected to have finished its written duties when any of the following occurs:

1. Schneider Electric service completes all the items described in Section 4.0, Deliverables of this SOW.
2. This project and SOW are terminated for other reasons, within the Schneider Electric service customer agreement.



## 8.0 Pricing

Part Number: QWPADCPC-MISC

Pricing for the Power and Cooling Assessment for Data Center varies depending on data center size, equipment, power capacity, cooling capacity, available existing documentation and location of the data center. To receive a price quote for your application, please visit [www.apc.com](http://www.apc.com) or contact your Schneider Electric service sales representative.

## 9.0 Terms and Conditions

Schneider Electric Standard Terms and Conditions apply.

The information provided in this Scope of Work cannot be used or duplicated, in full or in part. Other uses for this document are prohibited without written consent by Schneider Electric.

All documentation, photographs, imaging or other information provided by the customer, or gathered at the customer site, will be for internal use only and used solely for the purpose of report generation, analysis and recommendations.

All services' conditions included in this document apply (i) only between Schneider Electric and that organization that bought the Services Solutions; and (ii) only to those products and services ordered by the Customer at the time that the Schneider Electric Services information is current. Schneider Electric may change the Schneider Electric Services Information at any time. The Customer will be notified of any change in the Schneider Electric Services Information in the manner stated in the then current product ordering and/or services solutions related agreement between Schneider Electric and the Customer, but any such change shall not apply to products or service ordered by the Customer prior to the date of such change. Schneider Electric will have no obligations to provide Services Solutions with respect to equipment and assets that are outside the Service Area. "Schneider Electric Service Area" means a location that is within (i) one hundred (100) miles or one hundred and sixty (160) kilometers radius of a Schneider Electric service location; and (ii) the country in which the Installation site is located, unless otherwise defined in the governing agreement with Schneider Electric, in which case the definition in the governing agreement prevails.

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