



# EcoStruxure Transformer Expert

## Statement of Work

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Prepared by Schneider Electric Services

Scope: Sensor-as-a-Service

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## 1.0 Executive Summary

### 1.1 Digital transformation of transformers with IoT sensors and expert analysis

EcoStruxure Transformer Expert provides online condition monitoring for liquid immersed transformer, delivering automated insights to identify assets of concern and recommended action.

Through automated data collection and intelligent data analysis, EcoStruxure Transformer Expert provides low-cost, decision-grade information to help maximize asset utilization, and bring meaningful benefits to electrical assets through significant reduction in capital and operating budgets.

EcoStruxure Transformer Expert can be delivered as a standalone service or as an option to an EcoStruxure Service Plan and EcoCare <sup>(1)</sup> if requested.

### 1.2 Condition-based maintenance strategy

EcoStruxure Transformer Expert will analyze the data collected and assess it against standards-based thresholds. The online Dashboard includes actionable insights and suggested actions to manage the asset. The recommendations will be based on historical data and projections provided by EcoStruxure Transformer Expert that will help optimize utilization of the monitored assets. Monitored assets that are reaching “end of life” are identified, to help prioritize future maintenance and asset replacement decisions.

The solution interoperates with existing tools to help extend asset life through improved risk management and optimization of transformer loading, maintenance, and replacement. The EcoStruxure Transformer Expert dashboard provides a fleet-wide view of individual transformer insulation risk, with configurable real time alerts of unexpected status changes, and graphical short-term and long-term trends.

Through different hardware choices, a wide range of transformers can be connected, providing different analytics depending on the connection method.

<sup>(1)</sup> Not available in all countries. Please consult with your local Schneider Electric Services Sales representatives for more details. EcoCare and EcoStruxure Service Plan utilize EcoStruxure Asset Advisor as the key user interface.

## 2.0 Features and Benefits

Features	Benefits
<b>Measure temperature, moisture, vibration and hydrogen, plus detect partial discharge via UHF <sup>(2)</sup></b> (depending on hardware type)	Track operating state and trends
<b>Assess, track and forecast insulation state and life left</b>	Forecast end-of-life based on insulation aging rate with current loading and moisture levels <sup>(3)</sup> . Prioritize maintenance and/or replacement schedule based on life left.
<b>Standards-based risk indices</b>	Engineer data-driven life extension and condition-based maintenance strategies based on short-term and long-term risks
<b>Scenario tools</b>	Determine optimum conditions to help maximize asset life
<b>Warranty and upgrades</b>	Life-long replacement warranty and software upgrades under valid subscription
<b>Fleetwide dashboard and configurable alerts</b>	Receive notifications and alerts when assets change status.
<b>Unlimited users</b>	Fleet and transformer health information available across the organization
<b>Analysis of offline oil test data</b>	Automated assessment of oil test data using IEEE, IEC, Rogers, Doernenburg and Duval methods.
<b>Automated online data collections and analysis</b>	Improve decision making with recommendations based on industry standards

<sup>(2)</sup> UHF: Ultra-High Frequency

<sup>(3)</sup> With EcoStruxure Transformer Expert Probes.

## 3.0 Details of Service

### 3.1 EcoStruxure Transformer Expert – Service Deliverables

The specific features and deliverables of this service are listed below.

EcoStruxure Transformer Expert	
Activities	Descriptions
<b>EcoStruxure Transformer Probe Basic / Probe Dual H2</b>	<p>Delivery of EcoStruxure Transformer Expert probes as per the attached data sheet and including the following for each sensor:</p> <ul style="list-style-type: none"> <li>○ ETE adapter (machined connector) One O-ring seal with integrated oil sample valve, ¼ inch male BSPP</li> <li>○ ¼ inch BSPP / NPT adaptor</li> <li>○ DIN rail mount power supply: <ul style="list-style-type: none"> <li>● Input: 85 – 264 VAC Output: 24 VDC</li> </ul> </li> <li>○ Low voltage power cable 10 meter with M12 connector</li> <li>○ External temperature sensor with 10-meter cable and M12 connector</li> <li>○ In-line cable ties for affixing external temperature sensor</li> <li>○ Optional Hydrogen Sensor and cabling to EcoStruxure Transformer Sensor</li> </ul>
<b>EcoStruxure Transformer H2 Sensor</b>	<p>Delivery of EcoStruxure Transformer Expert H2 Sensors as per the attached data sheet and including the following for each sensor:</p> <ul style="list-style-type: none"> <li>○ ETE adapter (machined connector) with integrated oil sample valve 1-inch male BSPP</li> <li>○ 1-inch BSPP/NPT adaptor</li> <li>○ DIN rail mount power supply: <ul style="list-style-type: none"> <li>● Input: 85 – 264 VAC Output: 24 VDC</li> </ul> </li> <li>○ Low voltage power cable 10-meter with M12 connector</li> <li>○ External temperature sensor with 10-meter cable and M12 connector</li> <li>○ In-line cable ties for affixing external temperature sensor</li> <li>○ Hydrogen Sensor and cabling to EcoStruxure Transformer Logger</li> <li>○ Optional digital protection relay adapter for hermetically sealed transformers</li> </ul>
<b>Connection to EcoStruxure Transformer Expert Web Platform</b>	<ul style="list-style-type: none"> <li>○ Subscription to the EcoStruxure Transformer Expert analytics portal with unlimited end user accounts</li> <li>○ Once a sensor is installed, the self-provisioning communications system achieves connection to the EcoStruxure Transformer Expert web dashboard.</li> <li>○ 3G/4G Sensor communication including provisioned SIM card and ongoing communications costs.</li> </ul>
<b>Onboarding</b>	One on-boarding session (within 3 months of the initial EcoStruxure Transformer Expert subscription commencement)
<b>Support</b>	Access our Technical Support team if you have any enquiries related to solution via <a href="mailto:support.dts@se.com">support.dts@se.com</a>

## 4.0 Assumptions and Exclusions

### 4.1 Assumptions

The successful performance of the tasks defined in this Statement of Work is based on the following key assumptions, which are agreed to by Schneider Electric Services.

#### 4.1.1. Time, People and Location <sup>(4)</sup>

- Services performed on-site by Schneider Electric Services will be executed during the Schneider Electric business hours unless otherwise requested by the customer. Those hours are Monday through Friday from 8am to 5pm weekly, local time, unless otherwise specified.
- All services are performed on-site by qualified Schneider Electric representatives.
- Hours of Operation for Technical Support are country specific and include either 24x7 or business hours coverage.
- Next-Business-Day is defined as the next day during the business week and normal business hours.
- Schneider Electric will provide Services with respect to equipment and assets that are inside the Service Area. "Schneider Electric Services Area" means a location that is within (i) one hundred (100) miles or one hundred and sixty (160) kilometers radius of a Schneider Electric services' 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.
- Geographical restrictions may apply. Some aspects of the service definition presented in this document may vary by location. In the case of a conflict between the service definitions contained on this Statement of Work and the local service definitions the local service definitions will prevail. For more information, please refer to your Certified Schneider Electric Services sales representative.
- This service applies to a customer location with standard site and product access. Our Services assume continuous uninterrupted and unobstructed access to the equipment, standby time may be chargeable.
- The 3-month onboarding call will be scheduled during Schneider Electric business hours. Those hours are Monday through Friday from 8am to 5pm weekly, local time, unless otherwise specified.
- EcoStruxure Transformer Expert is not available in all locations. Please consult with your local Schneider Electric Services sales representative for availability in your area;
- EcoStruxure Transformer Expert refers to a remote monitoring Sensor-as-a-Service.

### 4.2 Exclusions

Any items not expressly included in this Services offering will be subject to specific quotation and charged separately after mutual agreement with the customer. For instance, but not limited to:

#### 4.2.1. Additional Scope of Work not expressly included in the order/contract

- Safety officer or security escort charges;
- Costs and charges associated with switching and isolation operations;

<sup>(4)</sup> All assumptions that refer to reaching a location within a certain time are subject to local variation. Please contact your local Schneider Electric Services Sales representatives for further information.

- Additional type test, test or FAT with reports or other reports outside the Schneider Electric standards; or any specialized testing and commissioning;
- Repair of damage caused by abuse, misuse, improper storage conditions, lack of maintenance, maintenance not in accordance with Schneider Electric's/the manufacturer's instructions, non-compliance with Schneider Electric instructions for installation or energizing, mechanical, electrical or electronic overload or other events outside Schneider Electric's control;
- Replacement or repair work resulting from normal wear-and-tear of equipment, damage or accidents due, or use that is non-compliant with the purpose of the equipment and/or Schneider Electric's/the manufacturer's instruction;
- Cabling or wiring external to equipment;
- Process design, civil and other mechanical works;
- Consumables, additional spare parts, cables or other materials and related labor and travel costs (such as: batteries, wearing parts, including, but not limited to, capacitors and fans);
- Support for third-party equipment;
- Adaptations required due to insufficient nature of, or error in, the information sent by the Customer, a change to the location of the equipment or its environment.

#### *4.2.2. Additional time or fee not planned to access or exit from Customer site*

- Delay in gaining access to or obtaining work permits for the utility substation or other aspects of the site;
- Delays incurred due to compliance with exceptional background check requirements or due to required medical or drug tests;
- Additional health and safety, environmental or security requirements at the Customer's site which were not previously agreed to Schneider Electric;
- Induction, Safety or Cybersecurity training longer than planned; and
- Access to final on-site destination longer than 30 minutes from gate to the equipment.

#### *4.2.3. Standby time/Waiting Time more than 30 minutes unless caused by Schneider Electric.*

- Unavailability of Customer or its third-parties required for the performance of the services;
- Unavailability of equipment, tools, hardware, software, internet connectivity, or office space required for the performance of the services;
- Cancellation or postponement of the services by the Customer (unless in accordance with the contract with Schneider Electric); and
- Delay or unavailability of transport either when not organized by Schneider Electric or outside of Schneider Electric's control.

#### *4.2.4. Extra working hours not included in order/contract*

- Schedule modification or acceleration plan requested by the Customer;
- Additional expenses (accommodation, catering and transportation);
- Delay in decisions and approvals by the Customer;
- Delay or unavailability of accurate and complete information as requested by Schneider Electric.

#### 4.2.5. *Other circumstances that increase the time or costs of performing*

- Other events or circumstances outside of Schneider Electric's reasonable control which increase the time or costs of performing the services.

Please contact your local Service Representatives for clarification.

**Pandemic Protocol:** The company reserves the right to amend, withdraw or otherwise alter this submission without penalty or charge as a result of any event beyond its control arising from or due to a pandemic or similar events, including changes in laws, regulations, bylaws, or direction from a competent authority.

## 5.0 Scope of Responsibility

The items stated here are responsibilities of both Schneider Electric Services and the Customer.

### 5.1 Schneider Electric Services Responsibilities

- Schedule qualified and approved service personnel to perform services;
- Meet the pre-determined scheduled service date;
- Perform EcoStruxure Transformer Expert activities in accordance to this Statement of Work;
- Perform services to manufacturer's specifications and conform to local health and safety regulations;
- Meet manufacturer and Customer safety requirements;
- Submit site forms, documentation/report to the Customer; and
- Inform and provide recommendations to the Customer about any action items not included in this Statement of Work.

### 5.2 Customer Responsibilities

- Prior to order, inform Schneider Electric Services Sales of any special site conditions that could prohibit the successful execution of this standardized service, that is, security clearance, site access requirements, unions, no truck access, no loading dock, no elevator access, no inside moving equipment available, etc.; Once agreed upon with Schneider Electric Services Sales, acceptable special site conditions must be clearly identified on the Customer Purchase Order;
- Provide dates and times when the scheduled work can be performed;
- Provide Schneider Electric with 5 business days' notice of any required reschedule;
- Facilitate site access for Schneider Electric Services personnel;
- Provide a suitable location for the staging of the old components nearby the system location;
- If possible, allow the use of Customer on site moving equipment, such as, moving dolly, two wheeled truck, pallet jack, etc.;
- Provide a named resource for scheduling of the services;
- Notify Schneider Electric Services personnel of any security clearance and/or safety training and equipment requirements in advance of arrival;
- Ensure safety plan is in place prior to intervention;
- Provide a point of contact during time of service;
- Provide a point of contact at the completion of service to sign off on completed work; and
- Provide the name of the project manager (if applicable).

## 6.0 Project Work Details

The project work details listed below are provided by Schneider Electric Services for the Customer with regard to services date, place and completion criteria.

### 6.1 Schedule

Actual set dates will be discussed and approved between Schneider Electric Services and the Customer.

### 6.2 Location

The location of this service will be on-site and will be agreed to by Schneider Electric Services and the Customer prior to the service delivery.

### 6.3 Completion Criteria

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

1. Schneider Electric Services completes all the tasks described in Section 3.0 of this Statement of Work document; and
2. This service and Statement of Work are terminated for other reasons within the Service Customer Agreement.

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