

TOOL GUIDE

SWAPs Creation Tool Guide

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Introduction

Please follow these instructions if you need support in filling out the required data for the SWAPS calendar creation.

You will be required to insert three classes of conditions:

- Environmental
- Operational
- Others

Once you get the maintenance calendar, you have the option to click on the UPS maintenance widget to add its maintenance plan to the SWAPS calendar.

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Medium Voltage equipment

ENVIRONMENTAL CONDITIONS

1. Temperature (°C) – Indicate the minimum and maximum ambient air temperature in °C
2. Humidity (%) – Indicate the Relative humidity min and max value measured over a period of 24 hours (Relative humidity - RH - is the ratio of the partial pressure of water vapor to the equilibrium vapor pressure of water at a given temperature)
3. Rate of change of temperature (°C) – Indicate the change of temperature in °C/minute averaged over a period of 5 min (if condensation is not present, set to 0)
4. Altitude (m) – Indicate the altitude in meters where the equipment is located
5. Heat radiation – Indicate if there is solar radiation
6. Flora / Fauna – Indicate if flora and fauna are present (e.g. musk...)
7. Salt Mist – Indicate if salt is present:
 - Yes, in offshore and coastal areas
 - Yes, in other areas - no offshore and coastal ones
 - No
8. Other chemicals – indicate if chemicals are present, and, if so, if below or over the limits.
Limit values: Sulphure dioxide :0.1 mg/m3; hydrogen sulphide 0.01 mg/m3; Chlorine: 0.01 mg/m3; Hydrogen Chlorine: 0.01 mg/m3; Hydrogen Fluoride: 0.003mg/m3; Ammonia 0.3 mg/m3; Ozone 0.01 mg/m3 ; Nitrogen Oxides 0.1 mg/m3
9. Dust ingress preventions – Indicate if equipment preventing dust ingress, such as filters and air conditioning, is present on site
10. Visibility of dust – Indicate the dust level:
 - Not visible: its detection is possible only with clean clothes
 - Visible: there is a non-significant visible dust layer
 - Dusty: there is a significant dust layer
11. Sand – Indicate if sand is present

12. External vibrations – Indicate if external vibrations are present (e.g. close to running machines, motors, generators, etc.)

OPERATIONAL CONDITIONS

For the following fields, related to operational conditions, please fill in with the highest data among the different panels of the line-up (e.g. most loaded panel, oldest breaker, etc.). Only for frequency of operations, indicate the one with lowest frequency.

1. Present mechanical lifetime – Indicate the number of operations performed in % of the declared total expected lifetime declared in the product manual.
Example: breaker with 10000 total mechanical operations / 1000 operations already performed operations = 10%
2. Age of components (number of years) – Indicate the age of circuit breaker, relay and switchgear.
Example: I have a breaker constructed in 2010, and now it's 2020: 10 years
3. Current Loading (%) - current load in % of nominal value
4. Voltage loading (%) - voltage load in % of nominal value
5. Number of max Isc interruption (%) – Indicate the number of interruptions of short circuit current in % of the number declared in the product manual.
Example: 10 total short circuit current operations / 1 already performed short circuit current operations = 10%
6. Interrupted Isc/Is_{c_nom} (%) – Indicate the Interrupted Isc in % of the Isc declared for the specific product.
Example: 50kA declared short circuit interruption capability / 25kA interrupted one = 50%
7. Frequency of operations – Indicate the frequency of operations of your circuit breakers/contactors (consider the one with lowest frequency):
 - At least one operation every 2 months
 - At least one operation every 6 months
 - More than 6 months on inactivity

OTHERS

1. Presence of any obsolete device – Indicate the presence of obsolete devices according to the latest ABB Lifecycle management (LCM) release. If you miss this data, check with ABB first; if you need to fill out immediately, check the end of life in normal conditions in the SWAPs Brochure as a triggering point
2. Monitoring and Diagnostic equipment installed on the switchgear – Indicate if M&D equipment is installed, such as SWICOM, MysiteCare, etc
3. Installed relay family – Indicate if the relay installed are the old generation (electromechanical relays) or modern numerical ones (microprocessor based)
4. Preventive maintenance on the switchgear – Indicate if and how the previous maintenance has been carried out:
 - Optimal: Done by ABB
 - Normal: maintenance done
 - No: no maintenance carried out

Low Voltage equipment

ENVIRONMENTAL CONDITIONS

1. Temperature, min and max values (°C) – Indicate the minimum and maximum ambient air temperature in °C
2. Temperature, average value over a period of 24 h (°C) – Indicate the average value of ambient air temperature in °C, measured over a period of 24h
3. Humidity (%) – Indicate the Relative humidity min and max value measured over a period of 24 hours (Relative humidity - RH - is the ratio of the partial pressure of water vapor to the equilibrium vapor pressure of water at a given temperature)
4. Rate of change of temperature (°C) – Indicate the change of temperature in °C/minute averaged over a period of 5 min (if condensation is not present, set to 0)
5. Altitude (m) – Indicate the altitude in meters where the equipment is located
6. Condensation – Indicate the occurrence of condensation:
 - Condensation never occurs
 - Moderate condensation occasionally occurs, due to variations in temperature
 - Condensation often/always occurs
7. Formation of ice – Indicate if ice is present
8. Flora / Fauna – Indicate if flora and fauna are present (e.g. musk, fungus...)
9. Dust - Indicate if dust is present
10. Sand - Indicate if sand is present
11. External vibration / shocks / seismic occurrences - Indicate if external vibrations are present (e.g. close to running machines, motors, generators, seismic zone, etc.)
12. Pollution degree – The pollution degree refers to the environmental conditions for which the switchboard is intended. Please specify it among the following:
 - No pollution or non-conductive pollution occurs
 - Conductive pollution occurs, or dry, non-conductive pollution occurs which is expected to become conductive due to condensation
 - Continuous conductivity occurs

OPERATIONAL CONDITIONS

For the following fields, related to operational conditions, please fill in with the highest data among the different panels of the line-up (e.g. most loaded panel, oldest breaker, etc.). Only for frequency of operations, indicate the one with lowest frequency.

1. Present mechanical lifetime – Indicate the number of operations performed in % of the declared total expected lifetime declared in the product manual.
Example: breaker with 10000 total mechanical operations / 1000 operations already performed operations = 10%
2. Age of components (number of years) – Indicate the age of circuit breaker, relay and switchgear.
Example: I have a breaker constructed in 2010, and now it's 2020: 10 years
3. Current Loading (%) - current load in % of nominal value

4. Voltage loading (%) - voltage load in % of nominal value
5. Number of max Isc interruption (%) – Indicate the number of interruptions of short circuit current in % of the number declared in the product manual.
Example: 10 total short circuit current operations / 1 already performed short circuit current operations = 10%
6. Interrupted Isc/Isc_nom (%) – Indicate the Interrupted Isc in % of the Isc declared for the specific product.
Example: 50kA declared short circuit interruption capability / 25kA interrupted one = 50%
7. Frequency of operations – Indicate the frequency of operations of your circuit breakers/contactors (consider the one with lowest frequency):
 - At least one operation every 2 months
 - At least one operation every 6 months
 - More than 6 months on inactivity

OTHERS

1. Presence of any obsolete device – Indicate the presence of obsolete devices according to the latest ABB Lifecycle management (LCM) release. If you miss this data, check with ABB first; if you need to fill out immediately, check the end of life in normal conditions in the SWAPs Brochure as a triggering point
2. Monitoring and Diagnostic equipment installed on the switchgear – Indicate if M&D equipment is installed, such as CMES
3. Type of relay installed – Indicate if there is a relay integrated in the Air Circuit Breaker, or/and an external relay in the switchgear
4. (If applicable) Installed relay family – Indicate if the relay installed are the old generation (electromechanical relays) or modern numerical ones (microprocessor based)
5. Preventive maintenance on the switchgear – Indicate if and how the previous maintenance has been carried out:
 - Optimal: Done by ABB
 - Normal: maintenance done
 - No: no maintenance carried out

UPS

Once you have filled out the three sections of conditions (environmental, operational, others) for either MV or LV switchgear, you can use the UPS widget to add the related maintenance to the SWAPs calendar.

You will be therefore asked to fill out some more information related to the UPS system.

Please note you might not get all the questions below, depending on the specific case (for instance, if the UPS is located in the same room of the MV or LV switchgear the tool will not ask for temperature or other data which have been already provided in the previous form).

1. UPS manufacturer – Indicate if the UPS is an ABB one or from other brands
2. Is the UPS system located in the same room of the switchgear? – Indicate if the UPS is in the same room of the MV or LV switchgear
3. Are batteries located in a separate room? – Indicate if batteries are in a separated room than the UPS one
4. Dust – Indicate if dust is present
5. Minimum clearance on top of cabinet (mm) – Indicate the clearance on top of the cabinet in millimeters, as this is related to the minimum distance required for ventilation
6. Dust ingress prevention – Indicate if equipment preventing dust ingress - such as filters and air conditioning - is present on site
7. Presence of water (liquid) pipeline above the UPS/Battery – Indicate if above the UPS system there is water pipeline which could lead to leakage
8. Anti-animals' grids – Indicate if grids are present to avoid animals entrance in the room
9. UPS room temperature (°C) – Indicate the minimum and maximum ambient air temperature in °C for the UPS room
10. Batteries room temperature (°C) - Indicate the minimum and maximum ambient air temperature in °C for the batteries room
11. Relative humidity (%) - Indicate the Relative humidity min and max value measured over a period of 24 hours (Relative humidity - RH - is the ratio of the partial pressure of water vapor to the equilibrium vapor pressure of water at a given temperature).
12. Condensation – Indicate if condensation is present
13. Altitude (m) - Indicate the altitude in meters where the equipment is located
14. Vibration and shocks - Indicate if external vibrations are present (e.g. close to running machines, motors, generators, etc.)
15. Moisture / steam / fungus / gases or fumes /radiated or conducted heat from other sources – indicate if these elements are present in the equipment area