

DASHPOT ASSESSMENT AND REPLACEMENT SERVICES

For S-type Circuit Breakers with Spring Mechanism

The dashpot is a key component used in the switch-off process of the circuit breaker with spring mechanism. Operating time and mechanical switching frequency can accelerate dashpot aging impacting the operational safety and reliability of the equipment. A periodic assessment is required to maintain dashpot performance in addition to the usual visual inspection for oil leakage.

GE Vernova Solution

GE Vernova recommends assessing the condition of the dashpot during scheduled maintenance for circuit breakers more than 20 years of age. Services can include:

- **Measurement** of the circuit breaker travel curve
- **Analysis** of the travel curve and maintenance **recommendations**
- **Long-term observation** with annual visual inspection
- **Replacement** with new dashpot if required
- **Rotation program** to replace a fleet of dashpots

A visual inspection alone doesn't necessarily ensure that there is no oil loss in the dashpot. An analysis of the travel curve is the more accurate methodology to guarantee the switch-off operation.

Applications

Dashpot assessment is recommended for GE Vernova SF₆-insulated outdoor circuit breakers with a CRR-X spring mechanism:

- S1-52, 72,5-123-145-170-245
- S2-420 from 52 kV to 245 kV

Function of the Dashpot

During the switch-off process of a circuit breaker with spring mechanism, the dashpot absorbs energy released by the spring. This mitigates any damage to the crank case, insulated or switch rod. Since the dashpot is immersed in a cylinder of oil, complete absorption of the energy cannot be guaranteed if oil levels are decreased due to evaporation. This may lead to damage to moving parts and the crank case of the S-type circuit-breaker during a switch, which can damage the entire circuit breaker.



Easy to Implement

- Dashpot assessment and replacement can be performed during scheduled maintenance
- No extra tools or measurement kits are required
- Travel curve analysis can be done remotely

Accurate Assessment

- Travel curve measurement provides accurate condition data of the operation
- Replacement recommended only when required

Cost Effective

- Increased equipment availability and reliability
- Only one day of work to assess and replace a dashpot
- Direct exchange on site



Travel Curve Analysis

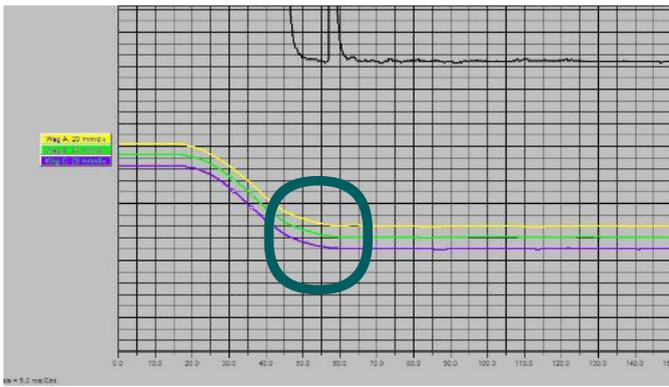
A visual inspection is not sufficient to fully evaluate dashpot condition. Because the insulating oil can evaporate over time without any residues, a visual inspection alone does not provide the full picture of dashpot operation. The travel curve measured during circuit breaker switch-off gives more accurate information about the completion of the damping of the dashpot. This measurement detects issues in both the dashpot and the interrupter unit, as well as identifying mechanical issues in the operating mechanism. Measured values from the travel curve are compared to S-type circuit-breaker reference data.

The measurement of the travel curve requires the installation of a rotary potentiometer sensor on the moving part and is not required to open the S-type circuit breaker. The motion is presented as a curve displaying distance versus time. The analysis of the travel curve can be performed remotely by a GE Vernova field expert.

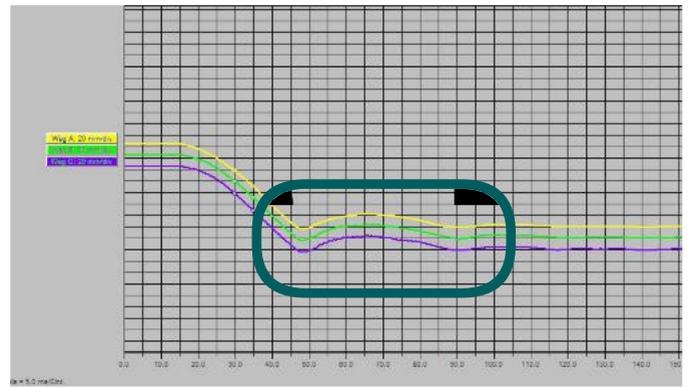
Measured values are compared with routine test values supporting dashpot assessment and classification in three categories:

- Category A: The travel curve show a full damping. No further measure is required. The dashpot is fully operational.
- Category B: The travel curve shows an incomplete damping. The dashpot must be checked regularly during visual inspection.
- Category C: The travel curve shows no damping. The dashpot must be replaced as soon as possible.

Travel Curve During a Switch-off



Category A: Switch-off with 100% damping and the required level of oil in the dashpot



Category C: Switch-off with 0 percent damping and no oil in the dashpot

For more information, visit
[governova.com/grid-solutions](https://www.governova.com/grid-solutions)