Planned Services
Reconditioning

IGBT modules
Insulated gate bipolar transistor (IGBT) is a three terminal voltage-controlled power semiconductor device, which is primary used as an electronic switch. In a frequency converter, IGBTs are typically used in inverter and/or rectifier unit. In most cases, the IGBTs are packed in a module which consists of multiple parallel IGBT chips, forming a several different converter topologies depending on the chip arrangement. Attaching multiple IGBT chips side by side, a high current handling capacity can be achieved.

The lifetime of an IGBT module is affected by a variety of application specific factors such as electrical load and environmental conditions. Typical environmental factors involve temperature, humidity, vibration and mechanical shocks. IGBT chips generate heat because of the on-state and switching losses. Therefore, the electrical load profile has a significant impact on the temperature fluctuations inside the IGBT module.

Reasons for the maintenance actions
An IGBT module is an ageing component. In time, IGBT modules are exposed to various thermomechanical stresses, during normal switching operation. IGBT modules are multilayer structures consisting of several material interfaces. Those materials have good electrical insulation properties, enough mechanical stability and also very good thermal conduction properties. As a result, a typical IGBT module consists of several layers with different material properties. These materials contract and expand during use, causing strain and thermo-mechanical stress to material interfaces. Temperature swings leads to tensile stress causing thermal fatigue, deterioration and degradation in the material junction layers.

Following effect are caused by IGBT module aging:
- Local hotspots between IGBT chips
- Current instability inside IGBT module
- Heat transfer inequality
- Loss of power quality towards motor

Reconditioning your drive in an authorized ABB Drive Service Workshop updates all your drive’s aging components (incl. IGBTs) to their original condition using latest technology, thus improving your drive’s reliability and extending its lifetime. The Reconditioning Service includes a full inspection and individual component analysis, and replacement of worn components with genuine ABB spare parts. Every reconditioned drive is thoroughly cleaned and tested, and comes with a two-year warranty. Reconditiong service, restores your drives to their original condition and extends their operational lifetime.

ABB recommends including IGBT modules as part of maintenance program in certain applications and environmental conditions in order to avoid risk of failures in frequency converter.