ABB Ability™ inspection for transformers – TXplore™
Oil-filled transformer internal inspection service

Use ABB’s inspection service to examine the internal structure of your power transformer without having to remove the oil or sending an inspector into confined spaces.

TXplore inspection benefits
Ability to perform an internal inspection of an oil filled transformer without needing to drain the oil.

Safety
• Eliminates the need for a human to enter harsh and confined-space environments
• Can reach zones inaccessible to humans
• Inspection team works from outside the transformer

Speed
• Immediate deployment
• Significantly reduces outage time (from weeks to days)

Simplicity
• Minimal oil is handled as the TXplore can enter through a top manhole cover
• No need for a confined-space on-site rescue team

Expert support
• Near real-time images are available to ABB experts
• Experts from around the world are able to support inspection as it happens
• ABB Ability platform provides remote access to images
• Option for customers to receive a comprehensive report with solutions to resolve issues identified by the TXplore

Informed decisions
• The challenge of oil handling and entering the transformer can be a barrier to performing an inspection
• Guesswork is eliminated with the support of high-quality images

Inspections can become more routine
The TXplore can assist in emergency inspections of critical transformers when operational issues are detected. TXplore can be deployed as soon as the transformer is de-energized. This additional data supports a more accurate evaluation of the transformer’s ability to continue to operate reliably. TXplore can become part of a routine periodic inspection, combined with typical oil samples analyzed for chemistry, dissolved gases and electrical tests such as ratio, power factor, SFRA and others.

This evaluation allows the transformer operator to confirm asset readiness/reliability and to use baseline data for future condition comparisons.
The need for understanding your asset condition
Power transformers are critical to moving electrical energy over long distances. They have very long service lives, typically providing reliable energy transfer for several decades. To ensure a long service life, maintenance must be carried out as the transformer ages and issues arise. The largest transformers are typically filled with mineral oil, which acts as a coolant and provides electrical insulation for the high voltages the transformer must withstand. Both the mineral oil and cellulose insulation break down from the stresses of use and aging.

The challenges of traditional inspections
In the past, to evaluate if a specific internal component or system required repairs, it was necessary for someone to perform an internal inspection of the transformer. This required bringing oil processing and storage equipment to the site and removing the oil from the transformer. An internal inspection expert would then enter the transformer and perform the inspection. All of this causes a significant outage and considerable expenses for the customer.

The internal inspection is quite challenging because spaces are tight and the environment is not human-friendly. It is also dangerous, as the confined space requires effort to ensure the air inside is breathable. The process can result in the need for extensive processing to remove gas, moisture and re-establish oil impregnation of the insulation system.

The ability to perform an internal inspection while the transformer is filled with oil
ABB has developed the TXplore to function as a remotely controlled inspection submarine. This allows an inspection of the transformer with minimal to no oil being removed by inserting the device through a top manhole cover. This completely eliminates the need to place a human inspector at risk and expose the transformer’s internal structure to external contaminants and potential damages from the weight of a human performing an inspection.

An on-site operator directs the TXplore using a wireless controller. The TXplore has multiple lights and high-definition cameras that are able to provide photographs and video during the internal inspection. With local communication and support through the ABB Ability platform, transformer experts and customers can watch inspections in near real-time from remote locations. This feature allows ABB to bring the experts in to help with the evaluation and remotely direct operators to look at specific areas in more detail, improving the ability to accurately identify the root cause of a problem.

Get connected and make better decisions
TXplore inspection can be viewed by our experts via an internet connection. Experts can review information collected during the inspection and develop action plans to improve the reliability of the critical transformer asset.

TXplore service can be scheduled to take advantage of a planned outage with little or no increase in the outage duration. ABB can also deploy a team to perform an inspection when unforeseen issues are encountered with same- or next-day response.