Introduction

The Polish ABB Transformer Service (PL TRES) group consists of professional engineers experienced in transformer installations and maintenance worldwide. To face the challenges of modern era and comply with the universal concept of sustainability leading to the sudden growth of offshore wind farms, PL TRES has developed a team of highly qualified and offshore-certified servicemen with remarkable hands-on expertise. The team, headquartered in Lodz, along with the local ABB transformer factory cooperates on a daily basis to deliver top-quality transformers with outstanding assembly and commissioning service. Thanks to this mutual collaboration, complex engineering solutions are strengthened by the R&D support of the local factory. We offer technical consultancy and solutions to meet market requirements on the local market and beyond, especially when offshore-installed transformers are concerned.
Standard offshore services
Services portfolio for marine substation power transformers cover the following:
- Installation and commissioning,
- Tests, measurements and functional checks,
- Troubleshooting, basic repairs, paint touch-up,
- Spares delivery and replacement,
- Oil treatment,
- Tap changers maintenance and repairs,
- Transformer monitoring and remote supervision,
- Modifications and upgrades,
- Internal inspections,
- Emergency aid,
- Post-failure dismantling,
- Maintenance programs.

Whereas the given activities apply specifically to power transformers, Polish TRES engineers are also certified to work at heights and in the confined spaces of wind turbine nacelles and towers where small oil-filled or dry-type step-up transformers are frequently used. Therefore, in case of dry-type transformers the listed services are offered:
- Basic maintenance: cleaning of surface and air ducts, checks of electrical connections and mechanical tightness,
- Condition diagnostics, failure investigation,
- Upgrades, modifications and repairs: terminals, control box installation, enclosure amendments, adjustment and installation of temperature control system: temperature control unit settings, temperature sensors, fans,
- Electrical tests and measurements.

Maintenance contracts
Due to remoteness, marine environment and significant cost of outage, offshore wind farm installations are extremely susceptible to the consequences of equipment malfunction. In the light of this, ABB Transformer Service offers its expertise in order to develop tailored maintenance programs for those customers who decide to leave their units in capable hands of transformer specialists. As part of a contractual maintenance agreement, PL TRES will:
- Define the frequency and scope of service required on each and every transformer unit,
- Provide instant, round the clock technical consultancy,
- Keep servicemen on alert and guarantee short reaction time in case of emergency,
- Suggest a list of spare parts which should be kept on hand considering typical failure rates, cost and significance in the system.

OHS on offshore installations
Whenever PL TRES is involved in an on-site service activity, operational health and safety (OHS) as well as environmental aspects are of the utmost importance. The marine environment of offshore installations leaves absolutely no room to compromise on any safety standards which renders even simple tasks extremely complex and hazardous while performed at sea. The following aspects are to be considered for any offshore activity:
- Access to such installations is limited and highly dependent on the weather,
- Work stops frequently at short notice due to deteriorating weather conditions,
- High power generation occurs at strong wind and rough sea which allows no access to the platform,
– There is very little space for manoeuvre in the transformer room,
– Heavy lifting equipment is usually unavailable,
– There is significant risk of sea water contamination,
– Aggressive environment creates additional risk for cellulose insulation.

ABB TRES in Poland developed standard rules to face these challenges. Considering OHS standards and the character of offshore work, the chosen aspects constitute the core of service operations:
– First rule “hurt nobody”,
– Awareness of environmental and personal threats related to a given task,
– Site survey to prepare generic and site-specific risk assessment,
– RAMS procedure (Risk Assessment and Method Statement) to define all possible threats and develop measures to mitigate all risks to acceptable levels,
– Certified equipment,
– Offshore team members are certified by participating in a number of trainings related to marine activities and are fully qualified to work offshore,
– Time management and strict discipline to stop work at short notice when the weather deteriorates,
– Confined space management,
– Complex lifting solutions to ensure sufficient lifting capacity.

Experience and references

Being close to the transformer manufacturing process, TRES engineers are well-qualified with regard to power transformer installation, operation, construction and maintenance. Many of them have significant international hands-on experience by having supervised or performed installations and maintenance works in numerous countries of Europe, Asia, Africa and North America. From the icy coldness of Russia and Canada to the burning sun of Mozambique and Sri Lanka transformer service group was challenged to deal with harsh environments, remoteness and seemingly insoluble technical problems to the eventual satisfaction of the customers. These lessons learned allowed the Polish team to embark on the challenge of offshore activities and successfully complete a great many installations and interventions at sea. Gunfleet Sands, Sheringham Shoal, Q7, Ormonde, Walney and Thornton Bank offshore wind farms have all experienced TRES servicemen craftsmanship in action and the scope of service provided ranging from basic maintenance interventions to advanced on-site upgrade projects.