

## SUBSTATION DESIGN & INSTALLATION

Design, specify and build to order, LTL has the in-house expertise to support the most complex projects.

LTL offers turnkey main power electrical systems from traditional H-frame substation design projects to padmount designs, tamperproof equipment, polemount designs and mezzanine style transformer locations.

Whether upgrading and retrofitting an existing facility or installing a new service, LTL offers the services of our in-house Electrical Engineering team, or will work with your engineering firm to execute specified electrical requirements from substation design to substation construction.

We stock high quality surplus, new and used high and low voltage substation equipment including:

- new and refurbished transformers
- switchgear
- fuses
- lightning arrestors
- insulators
- towers
- poles
- and other related equipment for sale

You can expect minimal production interruption during installations, and on-time completion of projects is guaranteed. Substation installations comply with municipal and provincial authority regulations. LTL services all your substation construction needs:

- Transformer installations and commissioning
- All high voltage cable work
- Tower design and erection
- All methods of terminal pole construction
- Overhead line construction
- All forms of underground line construction
- High ampacity electrical equipment and service work for commercial, industrial and utility applications
- All civil work related to the above services

## SUBSTATION MAINTENANCE

Help keep operational and associated costs to a minimum, extend the life of the electrical system, and improve safety conditions for electrical system operating personnel with early detection of electrical equipment weakness or potential hazard through annual substation maintenance.

LTL's preventative substation maintenance programs provide our customers with the confidence knowing their power system is operating properly, ensuring performance reliability and personnel safety.

We offer customized maintenance programs to suit your budgetary and operational requirements and ensure all regulatory and legislated requirements are met. All substation maintenance services are directed and performed by LTL's in-house experienced certified technicians, and include:

- testing and calibration
- inspection
- adjustment
- cleaning
- repair
- analysis of electrical insulating fluids

A detailed engineering report summarizing any deficiencies noted per applicable legislated standards and codes, as well as recommendations for repair to maintain a reliable service, is provided after service. All data collected is recorded for historical reference and is used to monitor the electrical system's overall performance from year-to-year.



## TRANSFORMER SERVICES

On-site transformer maintenance and repair services:

- Complete transformer commissioning and transformer testing services
- Transformer assemble/disassemble, transportation
- Fin replacement
- Bushing replacement
- Tap changer maintenance, repair and replacement
- Oil leak termination
- Painting
- New unit specification, supply and installation
- Mobile Transformer oil regeneration
- Rewind service (shop only)

### Mobile Oil Regeneration\*

By maintaining the transformer oil at near new condition at all times, the transformer's lifespan can be significantly prolonged and the risk of dielectric breakdown reduced, resulting in significant cost savings.

LTL's fully automated, state-of-the-art mobile oil regeneration process is an environmentally friendly and cost-effective solution to extending the life of your transformer. Meeting MOE requirements, LTL's system uses a relatively low amount of electricity and can process up to four million litres of oil before changing the filter medium; the filter medium is then disposed of as clean fill. Other methods can produce oil impregnated contaminated waste.

#### Oil Regeneration Benefits:

- Protects integrity of internal components and improves reliability
- Extends infrastructure/transformer life cycle; performs as new or better
- Reduces capital expenditure



Mobile Transformer Oil Regeneration Plant



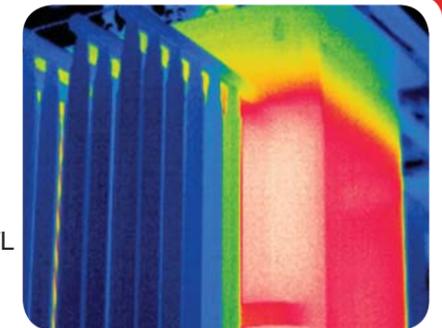
## INFRARED THERMOGRAPHY

IMPROVE PLANT SAFETY, PREVENT COSTLY DOWNTIME, REDUCE OPERATING COSTS, AND INCREASE RELIABILITY.

As a precursor to the substation maintenance service, LTL recommends infrared scanning (infrared thermography), twice yearly, of electrical equipment to detect electrical and/or mechanical hot-spots signalling possible equipment weakness or failure. Infrared scanning is performed by LTL's certified infrared thermographers one month prior to the scheduled substation maintenance date, allowing LTL technicians to include in the maintenance program whatever repairs are required as identified in the infrared scan report.

Electrical apparatus faulting-to-ground, or phase-to-phase, can produce an explosive force with intense heat. Plant personnel and persons within the vicinity can be seriously injured. By minimizing electrical equipment failures, infrared scanning helps to reduce a potentially serious risk to your plant personnel.

LTL's on-site crews include staff who are fully certified in Infrared Thermography, licensed electricians, and technicians with the qualifications and expertise to conduct full and proper inspections of all electrical equipment by opening panels as required. Equipped and protected with the proper arc flash safety gear, our thermographers open panels thereby allowing for accurate identification of hot spot locations through thermal imaging. LTL technicians are then able to target the specific component requiring repair and/or replacement to prevent costly downtime due to equipment failure, or worse, operator injury.



Colour photos of equipment hot-spots



## 24-HOUR EMERGENCY/TEMPORARY POWER SOLUTIONS\*

Lineman's Testing Laboratories provides 24-hour emergency service for all commercial, industrial, and utility sites. Professional troubleshooting and round-the-clock services in conjunction with a well planned inventory supply ensures timely recovery and reduced incidence of downtime. Rentals-Transformers, switchgear, related high voltage equipment, and generators.

\*Mobile Transformer Oil Regeneration Service available across Canada. Other services available in Ontario only.