

## ENGINEERING SERVICES



## THE NILSEN TEAM

Nilsen, founded in 1916, has an unbroken record of excellence in electrical and communications engineering, contracting and maintenance services. A responsible corporate citizen, Nilsen maintains a strong ethical code in its relations with customers, personnel and suppliers. The rewards have come by way of major infrastructure, commercial, industrial, defence and other government projects, and in the recognition received year after year by Australia's leading industry association, NECA.

## COMMUNICATING WITH CLIENTS

*'Keeping you in Business'*

We keep you in business through effective communication to establish service and maintenance requirements. We have expertise in a very broad range of industries and assets. Strategic management practices provide you with highly cost-effective upkeep of your buildings, production plant, and other facilities. You are therefore assured of a high degree of availability of your plant at an economic price.



## BUILDING TRUST

*'We're there when you need us'*

We solve technical issues so that you have the minimum of unscheduled stoppages of your plant and equipment at an affordable price. It's done without the headaches of organising a number of disparate maintenance crews. Nilsen provides you with a single company solution. The skills, the organization, the overall management are all in house. We provide transparent maintenance proposals with costings allocated in a way that suit your cost-accounting practices.



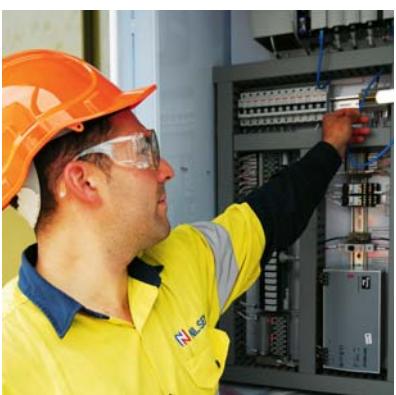


## OUR EXPERTISE

### *'Seamless Service'*

Our seamless service covers the typical line diagram of an electrical installation from the point of common coupling (the 'poles and wires') to the furthest outlying distribution boards and connected loads.

We work on high, medium and low voltage systems as well as mission critical systems typically associated with medical suites, data centres, hospitals and finance and insurance businesses. In addition we maintain and repair a wide range of industrial apparatus including pneumatic systems and fibre-optic control and communication.



### *'Just a sample'*

Below we list just some of the areas of expertise. The accent is, however, on providing you with exactly what you need!

- Preventative maintenance from power point to power station
- TEGG maintenance including thermographic analysis
- Switchyard supply, installation and commissioning
- Transformer commissioning, maintenance, and oil testing
- MV to LV Switchboard supply, installation, commissioning, maintenance and power factor correction gear
- Light, power and communication cable installation
- High voltage cabling, termination and VLF testing
- Harmonics mitigation and phase balancing
- Grading verification of protective gear
- Circuit breaker maintenance
- UPS service/installation
- Standby generators supply, installation, commissioning and maintenance auto transfer switches
- Variable speed drives, industrial control gear

## OUR EXPERIENCE

*'You name it – we've done it'*

We provide our maintenance services to a very broad market encompassing infrastructure such as:

- Roads
- Water Treatment & Storage
- Electricity Generation
- Municipal Projects
- Mining & Smelting and Beneficiation
- Freezing Plant
- Steel Manufacture
- General Manufacturing
- Shopping Centres
- Waste Water Processing
- Transmission & Distribution
- Hospitals
- Commercial Developments
- Stacker/Reclaimers
- Shipping Terminals
- Port Loading Equipment
- Automotive Industries
- Tunnels

The key benefit for you is that you can trust us to perform. No matter what the application or the category, you name it – we've done it.

## THE HUMAN ELEMENT

*'Highly Qualified & Highly Trained'*

The Nilsen people are amongst the most highly qualified and trained in the industry. It is not a proud boast but a fact. Training in our companies is embedded in the most fundamental way. It is our personnel that is our competitive advantage, and we are generous in the allocation of resources to achieve effective training in areas such as safety, project management, as well as technology developments and negotiation skills. We help you in our processes of site assessments so that both parties can work safely and effectively, and that lost time through accidents is negligible and unsafe work practices do not occur.

We are award winners in Health ,Safety and Environment, and continuously drill our operative personnel in both procedures and behaviour. It is all part of the professional approach we use in everything we do.





## STRATEGIC MAINTENANCE

*'Cost-effective Services'*

Our maintenance proposals take into account useful asset life, and cost-effective maintenance procedures as well as ensuring that installations comply with statutory requirements. Nilsen understands your main requirements; -- a high level of availability of supply at minimum energy cost meaning low energy loss in the electrical reticulation system, and with static and rotating loads operating reliably and efficiently. Nilsen tailors maintenance schedules, identifying priorities such as mission-critical areas that recognize economic life limitations of the supply network and connected loads.

## WE ARE PRO-ACTIVE

*'Prevention is better than the cure'*

Thermographic analysis is just one of the important diagnostic tools, we have at our disposal. Nilsen's strategic and unique alliance with TEGG Service, a global preventative maintenance organization, provides comprehensive maintenance for your electrical assets from sub-station transformers to distribution board level.

Techniques such as ultrasonic and power quality analysis as well as visual inspection by highly competent professionals prevent incipient problems from interfering with the availability of supply and equipment.

Thermal inspection using a range of infrared/visual cameras and associated software provides timely information on the condition of busbar joints, cable terminations, switchgear contacts, motor bearings and windings as well as for protective gear. Through careful record keeping, we are able to flag incipient problems, and therefore to be able to take corrective action before an unscheduled stoppage takes place.



*'High Energy'*

High-energy maintenance work requires special certification. Nilsen has the capacity to carry out service work at voltages as high as 66 kV. In this capacity we have an excellent record for expertise and reliability in maintenance work on distribution lines, and sub-stations including service of protective relays and associated switchgear.

*'Connections to the grid'*

Transformer testing is essential to detect incipient problems. Our abilities in this area are in very high demand, and testing procedures include transformer oil testing for withstand voltage and loss angle, occluded gas testing, winding and insulator integrity, and temperature rise tests. Furthermore we are able to test protective equipment including differential protection relays, over and under-voltage relays, earth bonding and other ancillary equipment.



## 'Protection'

Switchboard and circuit breakers are two of the most important areas for regular inspection and maintenance. Inspection for heat sources can reveal faulty busbar joints, cable terminations, etc. We perform joint resistance tests also for circuit breaker contacts. In addition arc chute inspections are carried out, and protection relays examined. This latter area (coordination or grading) is important to you because without these types of test, the shift in relay characteristics can cause a downstream fault to shut off large sections of upstream equipment.



## 'Mission Critical'

Nilsen has specialist teams to maintain your mission critical equipment. Our areas of expertise include regular battery room inspections and cell testing, checking of by-pass switches, testing the integrity of redundancy systems, examination and verification of switch-in voltage levels and associated equipment including stand-by engine generator sets. Under-loading diesel engines, which are prone to poor power performance due to unburned fuel coating the combustion chambers under light loading, makes engine inspection vital as well as the operation of load banks.

## 'Clean Power'

Nilsen is often called in to test and advise on improvement of power quality. Power quality is very much dependent on the level of harmonics generated by loads such as variable speed drives, power electronics (steam raising, case hardening, annealing furnaces, induction heaters etc.). Where clients have sub-station transformers and/or power factor correction gear, regular testing for harmonic distortion, i.e.: power quality, is critically important in order to prevent damage by way of elevated circulating currents. We can install mitigation filters, harmonic traps, chokes and the like to help overcome overloading of transformers and protective gear.

## 'Communications and Controls'

Nilsen maintains more than just electrical apparatus, and examples include pneumatic process control gear for use in explosive atmosphere environments, and other process control and automation equipment.

In the communications area we provide a full suite of installation, testing, maintenance and repair services for copper as well as fibre-optic links. Testing regimes include far end and near end cross talk, cable testing for spilt pairs, and fibre splicing and re-termination.





## 'Green and Smart Lighting'

Nilsen understands the need to reduce our Carbon footprint. We are experts in lighting and building management systems for residential, commercial buildings, shopping centres and malls, and hospitals. Nilsen lighting and energy management control installations play a significant role in reducing energy consumption. Nilsen expertise covers energy management protocols such as C-Bus (designed to also integrate with larger systems including BACnet, LonWorks and TCP/IP). In addition Nilsen installs DALI (stands for Direct Addressable Lighting Interface) systems which are independent of physical backbone (i.e.: can run on a number of bus systems including Ethernet) and are designed for large-scale lighting projects.

### 'C-Bus'

- A proven global market leader,
- Nilsen Networks Platinum Partner
- Tailored energy management solution
- High level integration to all major BMS systems, AV, security etc

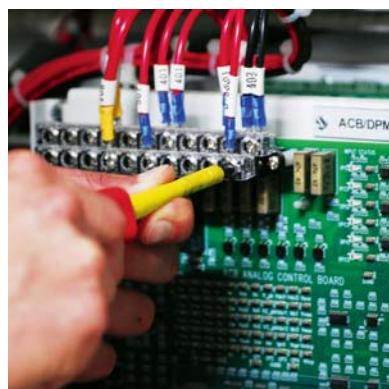
### 'DALI Control'

(Digital Addressable Lighting Interface)

- Based on international DALI standard
- Simple 5 core soft wiring
- Distributed Intelligence
- Control of individual luminaires
- Live Lamp/Ballast error reporting
- NABERS and Greenstar accreditation
- High level integration to all major BMS systems, AV, security etc

### 'Ask us'

We are a vibrant, progressive team and our services expand over time. We stay abreast of technological developments and if you do not see the things you are looking for in this publication, please contact us. Your may find it well worth your time to speak with us.



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**N** NILSEN  
CELEBRATING 100 YEARS  
1916 – 2016