

# **NILSEN** *REVIEW*

2012 ISSUE 20

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## **HOSPITALS & MEDICAL RESEARCH**

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**NILSEN – AUSTRALIA WIDE**

# From the MD

As 2012 draws to a close I reflect with pride and pleasure on the projects large and small that we have been involved with this year. The November issue of the Nilsen Review also provides me the opportunity to wish our many clients across the length and breadth of Australia the complements of the season and to thank them for their confidence in our technologies and skills as a leading Australian electrical engineering and contractor company.

In these pages you will find a rich diversity of projects that demonstrate Nilsen's abilities as an innovative organisation and one devoted to providing customer satisfaction. You will see reports on projects involving the huge scope typical of large mining infrastructure construction in WA, ones that showcase our 'outside the square' ways of scoping and designing large electrical reticulation systems using virtual construction software (see story on the new Royal Adelaide Hospital) and stories on works although appearing modest in scale, such as fitting in new switchboards in

RMIT University's main switch room, that were executed with the absolute minimum of interruption. They show in tangible ways how we live our corporate philosophy "To be Preferred"!

I thank our staff for their devotion to maintaining the highest standards of work and safety—they represent the invaluable human capital of our Company and I wish them and their families a joyous festive season and a healthy, prosperous New Year.

**Mark Nilsen, Managing Director**

## Desal – a Successful Partnership with Thiess

**Nilsen has built strong relationships with many major builders and with the ETU. The Desal project was a demonstration of how Nilsen's relationship with those builders can deliver positive outcomes – on time and within budget.**

Nilsen had worked with Thiess over an extended period on possible options to assist Thiess deliver the electrical and instrumentation requirements of the seawater lift and pretreatment areas of the Desalination



plant. Together, Thiess and Nilsen developed a plan that focused on ensuring the tight delivery time frame was met, the ETU was supportive of our plans, the stringent quality standards were met and importantly it was done safely all within a budget. Yes - it was an awesome challenge for our team.

The flexibility of the National Nilsen Group enabled Nilsen Victoria to quickly source the experienced project management, trades staff, OH&S staff, quality management staff, and administrative staff - over 150 staff in all.



Staff with major Industrial experience was the key to success. Supplementing the Nilsen team were the comprehensive systems that ensured each step of the delivery process was managed and made transparent to our customer, Thiess.

Nilsen met each of Thiess' goals – time, cost, safety, and quality. Thiess stated that Nilsen's delivery was exceptional and Thiess have commended Nilsen for its performance.

## NILSEN CONTRACTING –

# Leading the way in new technology

Nilsen has always prided itself on being a leader in the use of new technologies. As industry needs grow and change, so must the solutions offered – to continue to meet the requirements in the most effective way. Technology is always progressing and we recognise the importance of putting resources into developing new technologies to ensure our customers can benefit from the cost reductions, greener outcomes and effectiveness in meeting complex requirements.

Here are some of the Contracting projects that Nilsen has been busy working on over the last year, including some exciting technologies in use!

### Virtual Contracting Technology – an innovative approach

Mechanical, electrical, and plumbing (MEP) engineering is a complicated business when large projects are involved. Nilsen is one of the small number of non-building construction companies to adopt the Autocad™ technology in its contracting business. It is typical of our innovative approach, and determination to be a consistent leader in our chosen fields of electrical engineering and construction.

We are able to visualise electrical installation designs of great complexity in buildings as yet not constructed and this has great advantages for our clients in many areas, not the least being highly accurate quantity estimation. Whereas ‘guesstimation’ or over-estimation has often been practiced in the industry, we provide our clients with highly accurate bills of material costs—and very importantly, headache-free construction proceeding smoothly without unpleasant surprises or project overruns in time or money.

This virtual world of electrical contracting is being used and further developed at Nilsen. Take the new Royal Adelaide Hospital, a massive project, which at this stage is still a ‘hole in the ground’ on the corner of North and West Terraces in Adelaide’s CBD. Once in operation, some time in 2016, it will be an 800-bed hospital.

Nilsen personnel are on site and checking the most detailed parts of the electrical installation using three-dimensional models of the buildings and special surveying instrumentation to ‘pace out’ where main switchboards, risers, control panels, etc. are going to be placed. And the complexity of the new Royal Adelaide hospital is huge. There will be eight substations, sixteen transformers, multiple ring mains, twenty main switchboards, six hundred plus switchboards, two data centres, and over fifty floor sub-distribution panels.

Projects of this scale require the very best of design offices – and that is what we are about at Nilsen. Although there is as yet no building in existence, our design team is on site interfacing with the building construction team, consulting engineers and architects. The building plans are embedded in software that forms part of Nilsen’s design package, and our engineering personnel, able to interact with the design as though it already existed, can pre-empt design conflicts.

The advantages of this method of design are many, one critical aspect being that of avoidance of design clashes—these become apparent in the virtual 3D design so that later headaches, cost and time overruns can be avoided. The technology is still quite new to Australian contractors. Nilsen is at the forefront!



*The new Royal Adelaide Hospital Plaza View – artist's impression*



*Aerial View from South – artist's impression*

# NILSEN CONTRACTING – Leading the way in new technology

## Victoria's largest independent data centre covers power interruptions with flywheels

Nilsen is in the forefront of technology when it comes to data centres. A good example of the imaginative solutions we are involved in is the NEXTDC data centre in Port Melbourne, which was recently opened by the Minister for Communications, Senator Stephen Conroy. It's Victoria's biggest data centre with an electrical power consumption of 12 Megawatts.

Nilsen is about to finish the electrical installation and commissioning of this landmark in Australia's communications industry. One of the high tech features is the stand-by power generation system with thirteen diesel generator sets and flywheel energy storage. The flywheels provide 'ride through' while the standby generators are starting up during a power failure. We took on the complete electrical project including high voltage main switchboards, generator transformers, thirteen main switchboards and an enormous number of main distribution boards.

## Reducing the Carbon Footprint

Nilsen is involved in reducing the energy consumption of Coles stores in NSW by the installation of new technology voltage regulators. The idea behind the use of these voltage regulators, which are an Australian product manufactured by Exact Energy is to provide the right voltage for appliances, cooled displays, refrigerators, etc. Excess voltage causes unnecessary energy consumption, and also shortens the life of equipment. Nilsen will also carry out further installations for various Clubs and the Ian Thorpe Swimming Centre.



Top: The NEXTDC data centre

Bottom: The Transformer rooms

## Infrastructure – Transport

Nilsen Contracting's involvement with rail projects goes back some time having completed the refurbishment of both Hallet Cove and Hallet Cove Beach railway stations south of Adelaide, Nilsen was also the electrical contractor on the new rail maintenance facilities project located at Dry Creek.

Civil Construction Company Bardavcol Pty Ltd asked Nilsen to be part of the design and construct team for the construction of the new Munno Para railway station to be located on the Gawler Line North West of Adelaide. This team was awarded the project by the Department of Transport, Energy and Infrastructure and site works commenced in September 2011 with a project completion date of April 2012 to coincide with the rail line reopening following track relaying. One of the special features of this project was the design and construction methods which again show why Nilsen continue to receive recognition for our electrical contracting project outcomes. The electrical, communication and passenger

information systems all had to fulfil specific requirements, with the design allowing for all cabling and supports systems not only being hidden from view but also from vandalism. The Munno Para railway station has been awarded best project in Category 3 of the Civil Contractors Federation 2012 SA CCF Earth Awards as well winning a NECA award of Excellence in the Industrial (Medium) Category at the recent NECA SA Awards of Excellence – another great achievement for Nilsen Contracting.



The new Munno Para railway station



2012 SA CCF Earth Awards winners

# Nilsen People – Speaking out for Safety

At Nilsen, our teams of dedicated and experienced staff are our strength and our clients know us for our expertise, our reliability and our excellent safety record. Maintaining these critical aspects of our business is an ongoing task – we don't take our eye off the ball.

Safety in the workplace is certainly an important area that has become more and more talked about in various industries and it's an area that Nilsen are committed to maintaining through various means. Nilsen's Safety Leadership Programs cover all the bases from Site Supervisors right through to Divisional and General Managers, ensuring that all our people are across the importance of workplace safety and what they in their different roles can do about it.

Our "Speak out for Safety" workshops have been a great success and a very positive experience for our Nilsen people in their work environments.

The 3-hour, regularly enhanced workshops are designed to encourage a shared understanding of our safety vision and the strategies for realising accident-free work sites.

The program includes critical examinations of incident records and evaluating these for



possible changes to procedures, ensuring that common terminology is in use so as to avoid misunderstandings between staff, and the evaluation of new technologies appropriate to further improving our performance.

## Nilsen, experts in instrumentation

Sewage treatment plants require extensive monitoring and control instrumentation and Nilsen is about to complete the installation and commissioning of the vast diversity of monitoring and control equipment for Melbourne Water's Eastern Tertiary Treatment Plant. The scope includes a large range of recording systems and valve controllers, all necessary to keep turbidity in check, to provide the required levels of disinfection, and to reduce colour and foaming.

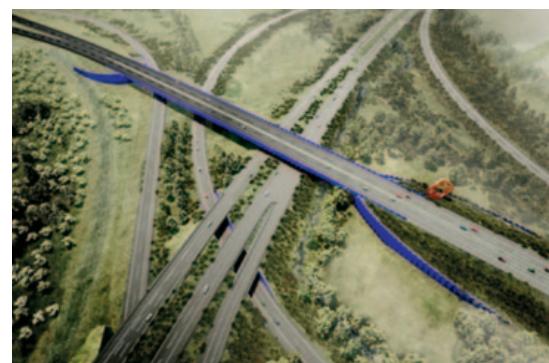
## We're reliable; count on Nilsen when fast-tracking is necessary

When major TV station Channel Nine, in Melbourne needed to relocate its studios and broadcasting operations to Melbourne's Docklands Precinct, Nilsen was called onto the job. Time always means money but even more so in commercial television where each second counts heavily. Nilsen's scope of supply was huge and it had to be completed absolutely without hold-ups. We were chosen

because we have that unique 'one-stop shop' ability that provides clients with the assurance they are not going to 'fall between two chairs'. We did the job smoothly, sticking to budget as well as time lines – and there was a lot involved, everything from total electrical reticulation to stand-by generator switchboards, UPS systems, battery rooms, controls and monitoring.

## Nilsen hits the road

We were selected by ABGroup to provide the electrical and communication network for the Peninsula Link freeway extension to Victoria's Mornington Peninsula. And this is a big job involving Nilsen in the installation of traffic light controls of eleven on-off ramps and three freeway-to-freeway connectors, vehicle detector loops and traffic advisory annunciator boards over a distance of 27 kilometres. Traffic control, highway lighting and communication systems are areas in which we have demonstrated expertise.



The new Peninsula Link freeway extension



Construction on the new Royal Adelaide Hospital site has commenced

**HOSPITALS & MEDICAL RESEARCH**

# **Nilsen – a leader in health care projects**



Northern view of the Royal Adelaide Hospital – artist's impression

**It's no accident that Nilsen teams have been used in fulfilling the electrical contracting requirements of health care facilities all across the country for many years. It's one of our core areas and we're proud of the reputation we have built for efficiently completing all manner of different projects within this important industry. We understand that hospitals and medical facilities have very specific needs and our people have the expertise and industry experience to work effectively for the best outcomes, no matter what the scope of the job.**

Upgrades to working hospitals, in particular, require careful assessment and implementation to ensure that it's still business as usual while the works take place. Our strategies, developed in consultation with our clients, ensure that operation requirements are met, including critical stand-by power to ensure stringent patient safety needs are always met. Assess, consult and implement with a multi-faceted approach means we do it once, and do it right. That's our approach and this attitude has seen our success in this area grow with a number of exciting projects underway.

### **Mackay Hospital upgrade**

The Mackay Hospital upgrade expands this important regional hospital from the current 160 beds to 318 beds. Nilsen's scope of work for this state-of-the-art hospital is extensive including DALI lighting control with its light and motion sensors, and close to 10,000 light fittings. DALI buses operate over multiple circuits, will be IP addressable and 5-core plug-and-play soft wiring is used throughout the hospital for rapid installation and enormous flexibility as well as high installation labour efficiency.

### **Green health**

Energy conservation for large hospitals is of enormous importance given the typical electrical energy consumption of an important teaching hospital like the new Royal Adelaide Hospital. This major project is just getting underway and in due course, Nilsen will be working on the electrical installation, which includes the interface for the new hospital's tri-generation plant.

Tri-generation is highly efficient technology providing electrical energy, hot water and chilling for air conditioning. So rather than

reject the waste heat from the production of electricity, tri-generation technology can not only use this waste heat as energy for hot water systems and other heat loads (as in cogeneration, or CHP – Combined Heat and Power), but it can also provide what a building really needs in Summer – energy for cooling. So this technology also allows for the waste heat to power a cooling system. That's three ticks for tri-generation – a real step up for working towards greener solutions and energy conservation.

# HOSPITALS & MEDICAL RESEARCH

## Nilsen – a leader in health care projects

### Major 800-bed hospital for Adelaide

The new Royal Adelaide Hospital project, due for completion in April 2016, also includes other important electrical installations that Nilsen will be responsible for planning and installing. Two high voltage switchboards, multiple ring mains and two data centres utilising copper and fibre backbones will be part of this state-of-the-art hospital's systems. New 3D technology is being used by Nilsen to realise the complex electrical design. This advanced technology has very exciting implications with its ability to enhance effective surveying and planning and avoiding possible design clashes, all ensuring better cost-effectiveness and timely project completion. Be sure to read our article on Virtual Contracting Technology in this issue for more about this impressive technology that Nilsen is at the forefront of developing in Australia.

### New Cancer Centre for Whyalla

Nilsen is undertaking the complete refurbishment of all electrical, lighting, communications and security for this large and very important regional centre for cancer-

suffering patients. This \$84 million project will deliver improved cancer services and outcomes for rural and regional patients with a new day chemotherapy centre, in-patient and palliative care facilities, a Wellness Centre, educational and research facilities and more accommodation for patients and staff.

Nilsen will be using our vast experience in the hospital sector to fulfil the project needs in areas such as strategies for power supply reliability, selecting wiring systems and equipment for hazardous areas and patient safety in important treatment areas.

### New Data Centre for the Lyell McEwin Hospital

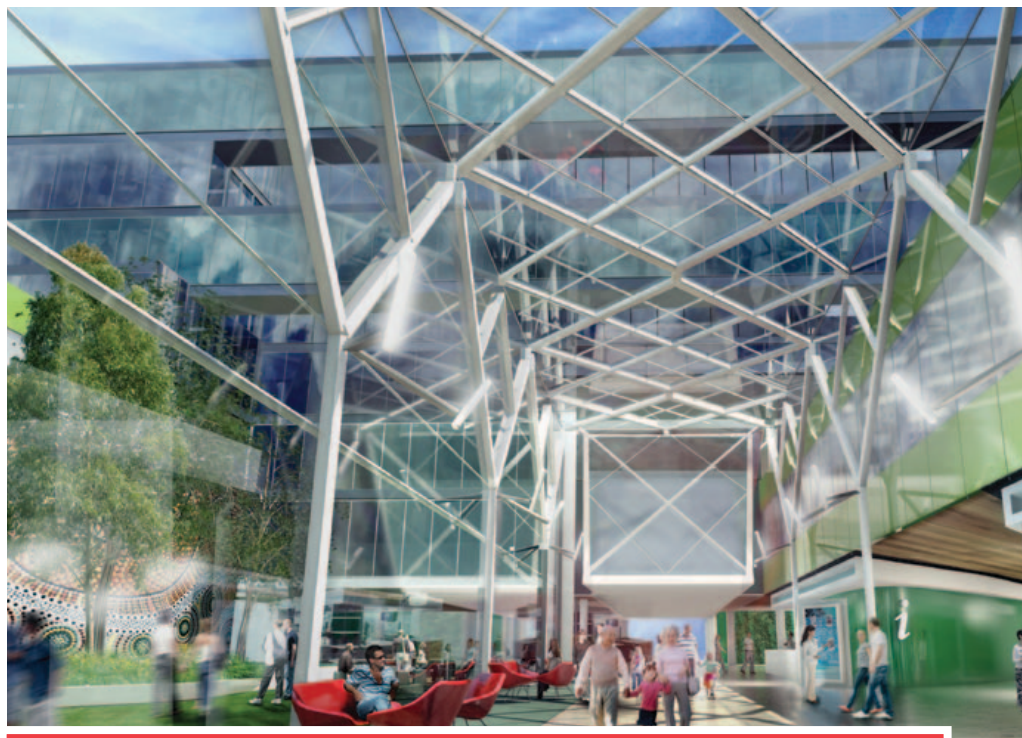
Upgrading the data centre for this hospital was an important contract, and brought to the fore Nilsen's expertise in communication networks. Extensive works were required, but Nilsen is no stranger to the special requirements of this important area. The planning and implementation of the cabling and related works have been successfully completed on-time and on-budget – another Nilsen success.



Intensive Care Unit bedroom



Hospital concourse view



The new Royal Adelaide Hospital – artist's impression of entry and cloister





Our Nilsen Engineers at work

# **NILSEN ENGINEERING SERVICES – Nilsen Maintenance Programs are a highly economical plant insurance policy – now that’s security!**

**Prevention has always been better than cure but now that the national focus is strongly on energy efficiency, expert maintenance is more important than ever. Nilsen Engineering Services provides you with the electrical equivalent of a regular and thorough medical check-up and minimises the risk of unexpected or catastrophic breakdowns. Nilsen, using our TEGG program of unique testing regimes for your electrical assets, can pinpoint problem areas in switchboards, distribution and sub-distribution boards. Hot spots are uncovered using thermographic analysis, and incipient faults in cables are uncovered before they surprise you when least expected. Required repairs under our TEGG recommendation umbrella are warranted – that’s security for Nilsen clients!**

Transformers are thoroughly examined and the insulation oil put through severe tests to ensure the reliability of these mission-critical components of your electrical installation. Nilsen’s expertise brings to light any electrical plant not operating according to acceptable efficiency – something you need to know when your electricity bill is an increasingly costly and difficult factor in maintaining a lid on costs. In short, Nilsen Engineering

Services Maintenance Programs are a highly economical insurance policy for your plant. Nilsen Engineering Services is on the job maintaining electrical plants in diverse locations such as the Southern Ship Loading facility at Point Lonsdale (SA), Westfield Shopping Centres throughout Australia, art galleries including the SA Art Gallery and the Museum of Contemporary Art in Sydney, and

various universities and hospitals around the country. We provide our expertise across a wide spectrum of tasks from testing and tagging electric appliances and tools to maintenance for high voltage switchboards and vacuum circuit breakers – and everything in between, seamlessly.

# Green is Good

## The climate for energy conservation changes

The climate for energy conservation has become more noticeable post July with the additional focus on the Carbon Tax. We have the knowledge and technology to clean up energy consumption, and have been busy for many clients helping them save dollars – and our world’s climate. The fact is that there are considerable savings in electrical energy charges to be made by increasing the power quality of electrical installations.

We often start with an energy audit and a comprehensive survey of an electrical installation and this not only helps our clients in identifying energy savings, but also uncovers problem areas that can lead to breakdowns if not remedied. Areas we address include harmonics mitigation, power factor correction, phase unbalance, excessive loss in conductors and switchboards.

Green is good – there’s strongly increased drive for making Australia’s office buildings more energy efficient. Take as an example the replacement of conventional T8 fluorescent

fittings by LED lighting. Nilsen Engineering Services is on the job doing the evaluation for Woodside for their Woodside Plaza head office building in Perth. It is all part of the energy saving path Australia is on and Nilsen is part of this progressive path. For example many of the maintenance contracts require inspecting, testing and where necessary repairing as well as commissioning of lighting and energy management, as is the case for the Woodside building.

Woodside wants its tenants to have attractive shopping conditions with good lighting and

congenial surroundings, as well as enjoying the economy of efficient electrical energy. Nilsen Engineering Services carries out power quality analysis and energy auditing for Westfield sites, nationally. Our activities also include the testing of power factor correction, the latter being critical to minimising electrical energy costs, as well as assuring the longevity of the electrical installation. In addition we are involved in lighting upgrades to more efficient forms including LED lighting.



*Conducting testing & repairs as part of the Woodside maintenance program*



*Nilsen Engineering at work at Woodside Plaza head office*

## Shoehorning in switchboards – quickly

Fitting in new switchboards in RMIT University’s main switch room, a crowded place – and doing so with the absolute minimum of interruption is truly a challenging task.

The easiest thing is, of course, to simply interrupt power for the convenience of the electrical contractor involved. If the minimum of interruption is required, and when isn’t that the case, we have the expertise to do just that.

An important part of the job is the meeting with the client, and where necessary, key

departments. Before we start the actual job, a logistics plan will have been created in which the timing of power interruptions will have been fully considered. Not only that, all critical building functions are studied and here’s where our creativity in coming up with ingenious solutions for minimising or

avoiding power interruptions comes to the fore. In the case of RMIT University, this was accomplished with just a few weekend-only brief shut-downs. It is the sort of work that had Nilsen once again in the top category of the NECA nominations for excellence awards.



# NILSEN RESOURCES

## The Top Speed Economy – Nilsen Resources leads the way

**Capitalising on the resource demand boom requires strict compliance with deadlines and adherence to specifications, as well as careful cost management. It's these sort of jobs that Nilsen Resources is eminently equipped to handle. The CITIC-Pacific SINO magnetite project located at Cape Preston, some one-hundred kilometres from Karratha is an excellent example of our capabilities. The project, which involves the mining of as much as six billion tonnes of magnetite iron ore in due course, is an ongoing job for Nilsen Resources.**

Quite separate to the enormous scale of the project and the consequent large scope of electrical installation works requiring our expertise, is our demonstrated on-time, on-budget performance. Nilsen Resources is therefore continuing with contracting, installation and commissioning, even as various individual contracts have been brought to successful conclusions.

Take a look at some of the features of the SINO project. A power station with an output of 540 Megawatts, comprising of 12 combined-cycle gas turbines is required for the mine and port. Nilsen Resources installed all HV and LV cabling, instrumentation and controls and performed commissioning tasks. But that was only the start because Nilsen Resources is now working on other sections including the concentrator, stockpile, two crushers, conveyor belt, two transfer towers just to name principal operations.

To provide some idea of the extent of the electrical works, Nilsen Resources built four 33 kV substations, including the largest in the Pilbara. As already mentioned, Nilsen Resources on-time, on-budget performance has provided us with additional works including the environmental dam that we are currently working on. Other works in progress are the dewatering plant for the port including

instrumentation and control – in itself a huge electrical construction, installation and commissioning project.

The Cape Lambert Port B Development, when fully operational, will be exporting 85 million tonnes of iron ore yearly. The Port B development includes both marine and onshore works, which will eventually increase the capacity of the port to 130 million tonnes per annum.

Nilsen is building nine motor control centres for the massive number of motors and variable speed drives for the port conveying systems. The job requires intensive coordination with prime contractors and it is typical of our record for 100% reliability in meeting deadlines so that complex projects go ahead smoothly. The Port Lambert project is typical of the other fifty-plus resource projects we are working on at the moment.



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