

HEAVY INDUSTRIAL CONSTRUCTION  
MAINTENANCE  
POWER STATION OVERHAUL  
UPGRADE PROJECTS



POWER PROJECTS INTERNATIONAL

toward new he





# ights of excellence

## WORKING WITH PPI

Power Projects International (PPI) is a privately owned, medium size Australian company, operating in the areas of heavy industrial maintenance and power station overhaul, upgrade and construction.

PPI was formed in 1997 by Mr Keejoo Kim. With extensive experience in power station construction and maintenance in Australia, he decided to develop this line of business with a distinctly different approach, and in pursuit of excellence in project outcomes for our customers.

Building on the previous experience and knowledge of key staff members, PPI has forged strong relationships with customers by achieving outstanding results with complex, tightly scheduled projects for overhaul and upgrade of plant.

These achievements are based around a flexible management approach founded on simple and effective quality and safety management systems.

Our capabilities have been effectively demonstrated in the recent upgrade of Eraring Power Station's coal-fired units from 660MW to 720MW.

The successful commissioning of the first 3 units during 2009, 2010 and 2011 has been a significant achievement for our company.

Our scope included all site works associated with upgrade of turbine and boiler plant.

PPI has also developed a number of partnerships with larger corporations based in Korea who are able to offer unsurpassed technical support for the design, manufacture and servicing of large industrial plants.



# Design Clean Energy For Tomorrow



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## PPI HISTORY

<b>1997</b>	Established
<b>1999</b>	Bayswater Power Station Turbine & Generator Overhaul Works
<b>2000</b>	Eraring Power Station Turbine & Generator Overhaul Works
<b>2002</b>	Eraring Boiler Economiser Repair Works
<b>2005</b>	Shell Refinery TA1 Turbine Works
<b>2006</b>	Vales Point Power Station Economiser Replacement Works
<b>2007</b>	Bendeela Hydro Power Station Overhaul Works
<b>2008</b>	Eraring Power Station Turbine & Generator Upgrade Works
<b>2009</b>	Eraring Power Station Boiler Upgrade Works
<b>2011</b>	South Australia Pelican Point Gas Turbine Overhaul Works
<b>2012</b>	Commencing Power Plant Service Workshop Construction



### **TURBINES**

We provide a full range of maintenance, repair, overhaul and upgrade work for steam turbines and gas turbines from any manufacturer. Our relationship with KPS gives us unrivalled engineering experience in this field, and a genuine alternative to OEM service agreements.

### **GENERATORS**

Our specialists perform the complete range of generator repairs including rewinds, stator bar leak repairs, re-wedging, testing and fault diagnosis.

### **BOILERS & RELATED PLANTS**

We can provide full repair and overhaul service for large utility boilers, including pressure parts maintenance and repair of all mechanical equipment. Through our partners, we can provide process reviews, pressure parts design and supply of new pressure parts components.

### **INDUSTRIAL PLANTS & OTHER SERVICES**

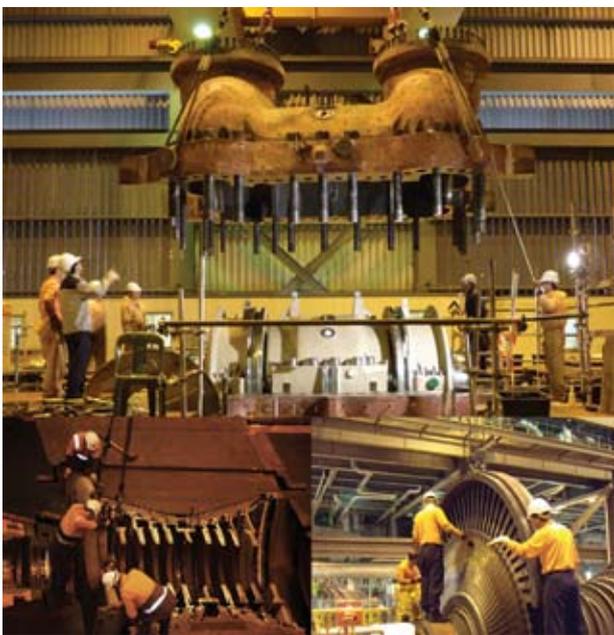
Our experience with pumps, piping, valves and heat exchangers enables us to tackle the full range of plant construction and maintenance works on heavy industrial equipment.

Power Projects International provides a full range of professional services on heavy industrial maintenance and power station overhaul upgrade and construction

# STEAM TURBINES

By combining an efficient local labour force with the engineering excellence of KPS, we are able to offer unrivalled performance and value for money in the overhaul of steam turbine, gas turbine and hydro plants. We offer

- Fast response and flexible planning
- Expert, independent advice
- Outstanding technical support
- Highly trained and experienced engineers and technicians



## CAPABILITIES

### Maintenance and Inspection

Routine maintenance of turbines including:

- Cylinder overhauls
- Rotor inspection and replacement
- Coupling alignment adjustment
- Bearing inspection and replacement
- Blade inspections
- Emergency Repairs

### Specialist Services

Access to KPS specialists for the following services:

- Turbine vibration analysis
- Field balancing of turbines
- Diagnosis and repair of bearing problems

### Ancillary Plant Maintenance

Repair and overhaul of critical plant associated with turbines:

- Governor and emergency governor inspection and repair
- Main Stop Valve and Throttle Valve dismantling, inspection and repair
- MSV and TV actuator repairs
- Boiler Feed Pump and BFPT overhauls



# GENERATORS

By accessing the advanced technologies and experience of KPS, we can provide generator services that:  
Provide fast and cost effective repairs to your generators  
Recommend the best solution without OEM bias towards particular technologies  
Access highly trained and experienced engineers to control all work

## CAPABILITIES

### Maintenance and Inspection

Routine maintenance of generators including:  
Diagnostic testing - electrical tests (HV, PI), hydraulic integrity tests (Pressure decay, Vacuum decay, In-leak)  
Dismantling and rotor removal  
Cooler inspection, cleaning and repair  
Internal inspection

### Rotor Repairs and Rewinds

Overhaul of rotors including:  
Diagnostic testing of rotor (RSO test and pole drop test)  
Removal and replacement of retaining rings  
Retaining ring NDT  
Removal of slot wedges and inspection of slot insulation  
Rewinding of field with upgraded insulation systems  
Modifications to overcome initial design flaws

### Stator Leak Repairs and Rewinds

Stator inspection and repairs including:  
Diagnostic testing (ELCID, DDF, HV withstand test, bump test for

enwinding analysis)  
Visual inspection of stator  
Stator bar water leak detection and identification  
Stator bar leak repairs by brazing or VPI  
Stator bar replacement  
Stator endwinding repairs  
Stator slot wedge replacement



### Reference Work

Our experience list in Australia includes the following projects:  
Eraring Unit 2 stator rewedge (660MW Toshiba)  
Eraring Unit 2 rotor - retaining ring removal, partial wedge replacement and modification  
Eraring Unit 2 stator bar leak repairs using CERT method and VPI method  
Bayswater Unit 2 stator rewedge (660MW Toshiba)  
Bayswater Unit 4 HV bushing replacement  
Shell Clyde Refinery TA1 rotor rewind, stator rewedge and enwinding repair (Siemens 5MW)  
Rewind and modification of NSW system spare generator rotor (Toshiba 660MW)

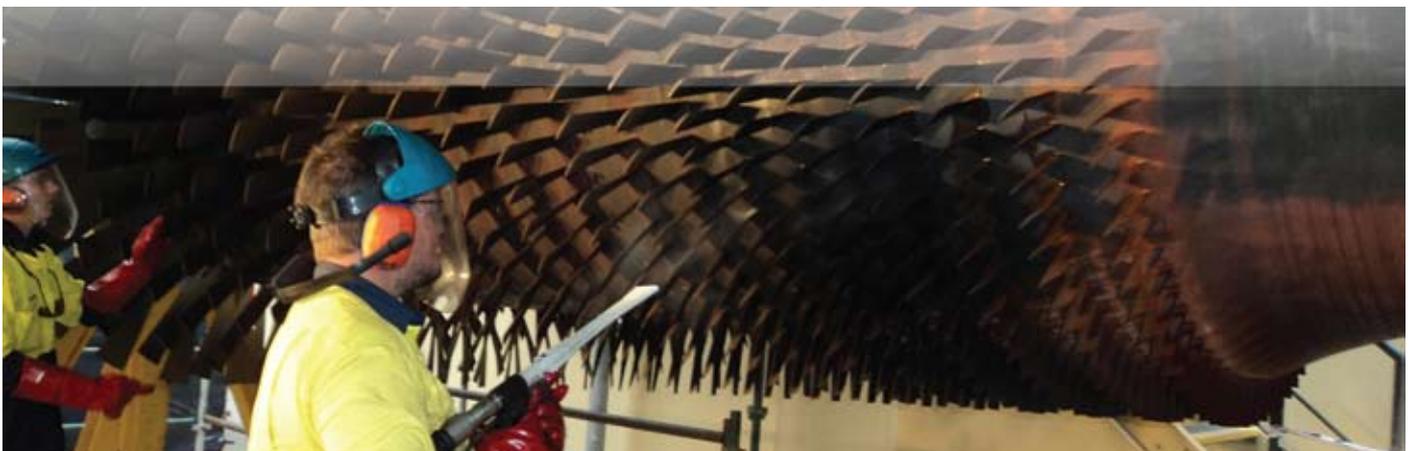


# GAS TURBINES

With our partners, KPS, we have recently successfully completed the major overhaul of an ABB/Alstom GT13E.

In a period where the availability of skilled and experienced labour for these critical projects is limited and unpredictable, we can offer access to over 4,000 skilled KPS staff for short term projects.

For customers with existing service agreements, we are able to work co-operatively in conjunction with your OEM to provide local and specialised staff, site project management, OHS systems and tools and equipment.



We have extensive experience in the overhaul and repair of coal-fired utility boilers and ancillary equipment. Our services include:

- Survey and inspection work
- Pressure welding
- Erosion protection maintenance
- Rotating machinery overhaul (fans and pumps)
- Weld repairs to ducting, ash hoppers etc

## CAPABILITIES

### Outage Overhauls

We specialise in high intensity maintenance during plant shutdowns:

Full survey and report

Tube replacement

Modifications and upgrades

Burner overhauls

Fan overhauls, motor replacements, bearing replacements

Duct and damper erosion repairs

Airheater Basket Changes and modifications

### Routine Maintenance

Routine maintenance of boiler plant including:

- Sootblower maintenance
- Defect repairs

### Routine Maintenance

- Breakdown services
- Emergency Tube Leak repairs
- Breakdown repair of rotating equipment

### Design and Manufacture (with our partners)

- Process Design Review
- Pressure Parts Design
- Pressure Parts Manufacture, including headers and main steam piping.



# OTHER SERVICE

Our capability extends to overhaul, upgrade and construction work associated with heavy industrial plant of all descriptions. We can perform:

- Fabrication
- Design and drawing works
- Procurement Project Management
- Site Supervision

## CAPABILITIES

### Design and Fabricate

Through allied companies, we can provide a complete design and fabrication service for new plant:

- Structural steel
- Walkways
- Tanks and hoppers

### High Pressure Welding

We provide services on High Pressure Welding for any type of material.

### Heat Treatment

We provide services on large bore Pipe Welding & Heat Treatment.

### Heat Exchangers

We provide services on large heat exchangers including:

- Cleaning
- Pressure testing
- Tube plugging
- Re-tubing

### Pump Overhauls

We are experienced with the on-site overhaul of large pumps:

- Survey and Inspection
- Dismantling
- Corrosion repairs and application of protective coatings
- Installation and commissioning



PPI represents a number of Korean corporations in Australia. These organisations provide access to a formidable technical resource for the electricity, petrochemical and heavy industry sectors.

## AGENT



**Kepeco Plant Service and Engineering** is a company specialising in the servicing of heavy industrial equipment, especially electricity generating equipment. Together with PPI, KPS has carried out major overhauls of large and small turbines, generators and ancillaries in Australia since 1999. As well as being the dominant provider in the Korean domestic market, KPS is active in the SE Asian region and Middle East as a maintenance and O&M service provider.

KPS has already demonstrated their technical capability in Australia for major turbine overhauls, generator repairs (including rotor rewinds, stator bar leak repairs, stator re-wedging and generator diagnostic testing).

## CONSORTIUM PARTNER

Doosan  (formerly Korea Heavy Industries) design and manufacture power station equipment. Their capability ranges from small HRSG boilers and heat exchangers to 800MW nuclear utility plants. Their Changwon manufacturing plant is extraordinary in scale and capability. Doosan provide high level technical support for all GE-derived utility turbines and generators.

Doosan and PPI have established a jointly owned subsidiary company to pursue major projects in the Australian market. This company, Doosan PPI Projects Australia Pty Ltd (DPPA), serves as a local commercial entity to efficiently serve our customer's requirements whilst maintaining the full commercial and technical support of Doosan and PPI.

DPPA is currently engaged in the upgrade of Boilers, Turbines and Generators Eraring Power Station near Newcastle. Performance testing of Units 2 and 3 is complete, with results exceeding contract performance requirements.



# PPI PROJECTS ACHIEVE



## ACHIEVEMENTS

### Macquarie Generation Bayswater Power Station Maintenance Contracts for Turbine Generator Overhaul awarded 2010 KPS / PPI

Since 1999, KPS / PPI has been the main contractor for Bayswater Power station's Maintenance works for Turbine & Generator. KPS/ PPI is the most experienced company for this type of work in Australia.

### 5th December 2007 & 17th December 2008 Doosan-PPI Consortium wins Earing Turbine Upgrade Contract and Earing Boiler Upgrade Design Contract

Earing Energy, owners of the Earing Power Station on the shores of Lake Macquarie, NSW, have awarded the contract for upgrade of their turbo-generators to Doosan PPI Projects Australia. Following previous success with securing the contract to upgrade Earing Energy's 4 X 660MW turbo-generators, Doosan PPI Projects Australia (DPPA) has won a contract for the design, supply and installation of boiler upgrades to provide increase steaming rate to match the upgraded turbines.



# MENTS



## Eraring Energy's Eraring Power Station has awarded KPS/PPI Maintenance Contract of Turbine Generator 2000

Since 2000, KPS/PPI has been servicing Eraring Power Station for Boiler, Turbine & Cooling Water System.

## Kangaroo Valley Bendeela Hydro Power Station Overhaul Contract

2007, PPI has carried out Bendeela Hydro Power Station Overhaul works successfully.

Pelican Point Power Station ( International Power) awarded 2011 KPS / PPI GT11 Gas Turbine Overhaul  
KPS/PPI have carried out Pelican Point Power Station Overhaul works for the first time as a non OEM company and KPS/PPI achieved a successful outcome.



# THE ERARING UPGRADE



## THE ERARING UPGRADE PROJECT

PPI have recently achieved success with our most significant project to date.

Ering Power Station, located near Newcastle NSW, is being upgraded from a capacity of 660MW to 720MW. PPI with our consortium partner Doosan was awarded the contract for supply and installation of components to upgrade the turbines, generators and boiler to achieve the required performance.

PPI provided all site installation works, as well as turbine governor controls, turbine supervisory instrumentation and local project management services.

Unit 2 was the first of the units to be completed, and was independently performance tested against contract requirements. As a result, our consortium was awarded contract bonuses for exceeding contract performance requirements for turbine efficiency, generator output and reliability.

Retrofit projects on this scale provide many challenges. Adapting standard solutions to meet customer requirements and fit within an operating power station, and achieving demanding engineering results in tight timeframes presented numerous challenges. Through our relationship with our client, Eraring Energy and the selection of suitable suppliers, we were able to develop innovative solutions to meet the challenges of the project and achieve outstanding results.



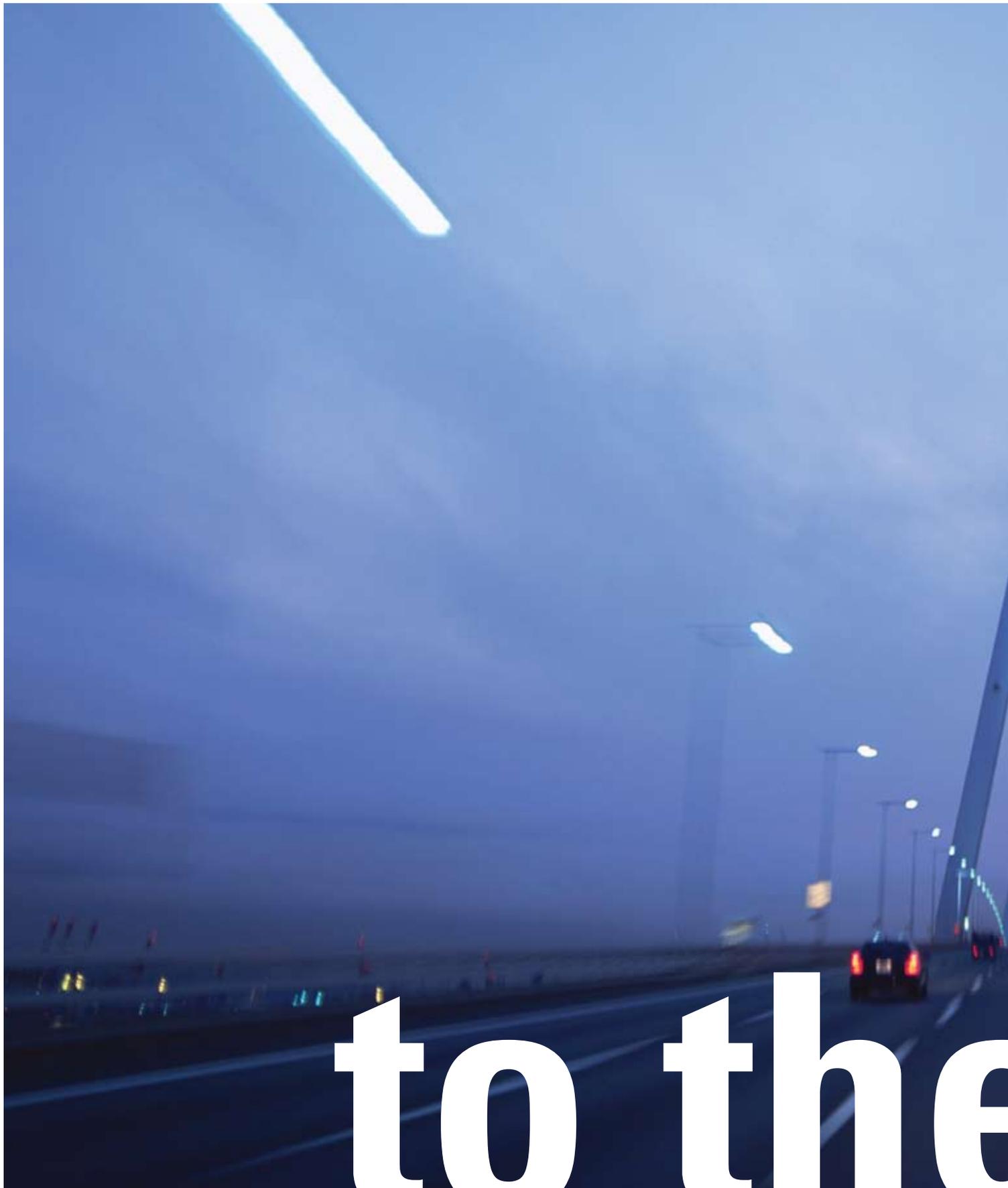
# E PROJECT

“the most significant project to bring success to PPI”

We congratulate our suppliers for their involvement in this project:

- Kepco Plant Services (KPS), who provided engineering staff for the turbine and generator upgrade site works, including balancing and commissioning support.
- Yokogawa Australia, who provided turbine control hardware and engineering services, including detailed design of turbine control circuits.
- GE Energy, who provided the hardware and engineering services for the turbine supervisory instrumentation and overspeed detection equipment
- Austpower Engineering, who provided NDT services including the development, testing and implementation of small-bore phased array ultrasonic testing of some 25,000 tube butt welds.
- Downer-EDI, who provided switchboards and cabling for the project.
- Mightylagg, providing insulation and scaffolding services to our boiler and turbine project groups.





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## PPI FUTURE DEVELOPMENTS

December 2010, PPI has lodged a development application to Wyong Council for a New Head Office & Turbine Generator Workshop (About 60,000m<sup>2</sup>). The site is located within the Enterprise Business Park at Berkeley Vale, which is in close to the F3 Freeway and Main Northern Rail Line.

Nature of Development

The development involves:

- Turbine & Generator Rotor Workshop
- Gas Turbine & Generator Workshop
- Boiler & Structural Steel Workshop
- Office Building and attached Training Building
- Water and Wastewater treatment Plant
  - Internal access roads
  - Car parking and
- Associated landscaping

# e future



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