

## EXMOUTH POWER STATION CONTROL SYSTEM

*Applicon's skills in system integration and robust project delivery methods allowed Burns and Roe Worley to successfully commission their new Exmouth Power Station project in 2006.*

### Project Name

Exmouth Power Station  
Control System

### Client

John Thompson Engineering

### End User

Exmouth Power Station Pty  
Ltd (Burns and Roe Worley  
Pty Ltd)

### Project Location

Exmouth, WA

### Services Provided

Control System Design,  
Installation and  
Commissioning

### Key Technology

Citect SCADA  
GE Fanuc PAC RX3i

### Project Value

\$1.25M

### Project Completion

April 2006

### PROJECT SUMMARY

In 2003, the Western Power (now Horizon Energy) entered into a Power Purchase Agreement with Exmouth Power Station Pty Ltd (a subsidiary of Burns and Roe Worley Pty Ltd, now WorleyParsons Projects Pty Ltd) to supply electricity in Exmouth for a term of 18 years. As a result, a new gas-fired power station was constructed to initially supply 6MW of reliable generating capacity to the region. The station design included 8 generators, of which 7 operate on dual gas fuel (CNG/LPG) and 1 operates on diesel fuel. The main generators are fuelled by natural gas taken from the Dampier-to-Bunbury Natural Gas Pipeline, compressed to 20MPa and transported by road to Exmouth.

### SCOPE OF WORK

Applicon delivered control and communications equipment, including GE Fanuc PLCs, Citect SCADA HMI, design, engineering, testing, commissioning and site support; also covering the gas compression station located adjacent to the Natural Gas Pipeline, approximately 220km from Exmouth.

Control functions included:

- Normal generator operation
- Black start control
- Spinning reserve algorithm
- Pre-emptive load shedding algorithms
- HV switching and yard management
- Fuel systems, including LPG unloading and storage
- Fuel decompression (skid mounted module)
- Gas detection and shutdown
- Frequency synchronisation (GPS time source)
- Integrated communications from sub-systems, including Caterpillar EGCP3 engine controllers, Woodward generator controllers, Woodward Synchroniser, gas metering equipment, paging system, protection equipment, fire and gas detection system.
- At the isolated gas compression station, power management algorithms were designed to ensure safe operation with correctly charged batteries at all times.



Quality  
ISO 9001

SAI GLOBAL

## BUSINESS IMPROVEMENTS

- Applicon's work on the project provided a state-of-the-art, fully integrated control system for the power station, including balance of plant and ancillaries.
- To complement our system integration skills, Applicon was able to provide expert engineering assistance by developing the specification for the overall station control as well as communications and integration specifications.
- The control of the compression station, on-site gas storage and the station itself can be performed not only on-site but also from remote locations via a satellite link.

## TECHNOLOGIES

- GE Fanuc RX3i PLC
- GE VersaMax05
- Citect SCADA HMI
- Woodward EGCP3 Generator Unit Controllers
- Woodward SPM-D synchroniser
- Satellite link

## ABOUT APPLICON

Applicon is an engineering company specialising in Process Automation & Control, Communications, Network Integration, Renewable Energy Systems, Power & Water, Security and Fibre Optic technologies. Our ISO 9001:2000 certification and engineering discipline means we approach technology using a structured and consultative methodology, to ensure the solution achieves the desired business outcomes.

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