

**IN THE AUSTRALIAN COMPETITION TRIBUNAL
AGL ENERGY LIMITED**

of 2014

**RE: PROPOSED ACQUISITION OF MACQUARIE GENERATION (A CORPORATION
ESTABLISHED UNDER THE ENERGY SERVICES CORPORATIONS ACT 1995
(NSW))**

ANNEXURE CERTIFICATE

This is the annexure marked "**GS1**" annexed to the statement of **GLENN SCHUMACHER** dated
23 March 2014

Annexure GS1

Filed on behalf of (name & role of party) AGL Energy Limited

Prepared by (name of person/lawyer) Liza Carver

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[Form approved 01/08/2011]

RESUME EXECUTIVE SUMMARY

Glenn Schumacher

QUALIFICATIONS:

- **Master of Engineering (Power Generation),**
- **Master of Business Administration (Technology Management),**
- **Bachelor of Mechanical Engineering,**
- **Graduate Certificate in Human Resource Management.**
- ***et al...***

EXPERIENCE:

- **Chief Engineer (*Engineering Leadership at Portfolio Level*)-
AGL Energy Ltd., Merchant Operations, Power Generation, Team :
278 staff.**
 - **Senior Management responsibility engineering and technical issues across one of Australia's largest and most diversified generating portfolios.**
 - **Develop a "Centre of Engineering Excellence".**
 - **Develop engineering and technical capability for AGL.**
 - **Champion the development of engineering and technical facets of the Australian Electricity Generating Industry.**
- **General Manager & Director (*Executive Management*)-
NRG Gladstone Operating Services Pty Ltd., (Operators of the Gladstone Power Station), Queensland, Power Generation, Team :
278 staff.**
 - **Executive Management responsibility for Queensland's largest single power station.**
 - **Board and / or Australian Public Officer responsibilities for NRG Energy Inc.'s (Princeton, New Jersey, USA) Australian businesses.**
 - **Develop a Management Team focused upon driving the Business in a manner to ensure its sustainability in to the future.**
- **Manager Technical Services (*Engineering, Scientific and Projects*) –
Tarong Energy Corporation, Queensland, Power Generation, Team:
38 Professionals and Sub-Professional staff.**
 - **Rebuilding of Tarong's Technical capability.**

- Leading the Team developing key plant projects such as Control System retrofit at both Tarong and Wivenhoe Power Stations.
 - Drive maintenance cultural change.
 - Lead Team undertaking major mill development project for Tarong Power Station and Future Coal Project for both Tarong and Tarong North Power Stations.
 - Provide Technical support through out Tarong Energy including an informative / educational function.
- **Production Manager (*Production, People Management*) – International Power - Hazelwood Power Station, La Trobe Valley, Victoria, Power Generation, Team: 216 Operations and performance staff.**
- Bring about operating cultural change.
 - Build co-operative operational links between Coal Mine Operations, Power Station Operations and Market and Trading groups.
 - Build linkages between Engineering, Maintenance Contractors and Power Station Operations.
- **Area Manger (*Maintenance Management*) – SILCAR Maintenance Services Burnie Pulp & Paper Mill, Burnie Tasmania, Pulp & Paper, Team : 96 Maintenance Trades staff.**
- **Maintenance Support Manager (*Maintenance Systems & Technology*) – SILCAR Maintenance Services Yallourn Power Station, La Trobe Valley, Victoria, Power Generation,**
- **Project Engineer (*Engineering Support*) – SILCAR Maintenance Services Loy Yang Power, La Trobe Valley, Victoria, Open Cut Mining & Power Generation,**
- **Area Manager Pulp & Services (*Maintenance Management*) – SILCAR Maintenance Services Burnie Pulp Mill, Burnie Tasmania, Pulp & Paper,**
- **Area Manager Shoalhaven (*Maintenance Management*) – SILCAR Maintenance Services Shoalhaven Paper Mill, Bomaderry New South Wales, Pulp & Paper,**
- **Maintenance & Plant Services Manager (*Maintenance & Infrastructure Management, Projects, Utilities*) - Australian Defence Industries Ltd (ADI), Lithgow Facility, Manufacturing.**
- **et al...**

End.

CURRICULUM VITAE

GLENN SCHUMACHER

HOME ADDRESS:

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BERWICK
Victoria
AUSTRALIA**

BUSINESS ADDRESS:

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Email: gschumac@agl.com.au

PERSONAL DETAILS:

DATE OF BIRTH: 29 December, 1959
PLACE OF BIRTH: LITHGOW, NSW, AUSTRALIA
MARITAL STATUS: SINGLE

PERSONAL INTERESTS:

History of technology. Reading. Cooking. Education of Engineers.

QUALIFICATIONS:

Doctor of Engineering (<i>honoris causa</i>) Central Queensland University [CQUAustralia]	2012
Master of Engineering University of Queensland (External Studies)	2007 - 2008
Master of Business Administration Deakin University (External Studies)	1997 – 1999
Bachelor of Mechanical Engineering University of Technology, Sydney [UTS]	1987 – 1990
Graduate Diploma of Management (Technology Management) Deakin University (External Studies)	1992 – 1996
Graduate Certificate of Management (Human Resources) University of Southern Queensland (External Studies)	2001 - 2002
Certificate of Mechanical Engineering (Honours) NSW College of Technical and Further Education, Lithgow	1982 – 1985
Industrial Radiography – Operators Course College of Technical and Further Education, Sydney	1979

PROFESSIONAL STANDING:

- Fellow – Institution of Engineers, Australia (FIEAust.).
- Chartered Professional Engineer (CPEng).
- Member – College of Mechanical Engineers.
- Associate Fellow – Australian Institute of Management (AIM).
- Member – Australian Institute of Energy (AIE).
- Registered Professional Engineer – Queensland (RPEQ).
- Member – Asset Management Council (AMC).
- Engineers Australia (IEAust.) – Queensland Professional Engineer of the Year 2010.

INDUSTRY & COMMUNITY ACTIVITIES:

- Inaugural Co-Chair – CQUniversity Australia Conference on Asset and Maintenance Management.

PROFESSIONAL EXPERIENCE:

November 2013 to date

AGL ENERGY Limited,

CHIEF ENGINEER - MERCHANT OPERATIONS.

Responsibilities:

Engineering oversight across AGL Energy's mining and major electricity generating operations. Key areas:

- Technical oversight of engineering and operational issues,
- Development of engineering capability,
- Development and maintenance of engineering standards,
- Compliance and technical risk management,
- New technology review and application development,
- Provide engineering advice within AGL,
- Interface with key engineering professional, academic and research bodies,
- Interface with engineering service providers,
- Technical interface with the Electricity Generation Industry.

October 2007 to October 2013

NRG GLADSTONE OPERATING SERVICES Pty. Ltd.

(GLADSTONE POWER STATION)

GENERAL MANAGER GLADSTONE OPERATIONS

DIRECTOR NRG GLADSTONE OPERATING SERVICES Pty. Ltd.

Responsibilities:

Executive Management responsibility for the operation and maintenance of Queensland's largest thermal power station. Key areas:

- Setting the strategic direction for the NRG Gladstone Business in a time of both significant changing external operating environment and internal plant life renewal,
- Providing vision to the NRG Gladstone Business following a period of uncertainty,
- Building an Management Team capable of leading the Business into the future,
- Renewal of the Business in light of an ageing workforce reaching maturity in a period of high skills shortage (knowledge management, employee retention),
- Refocus the Business upon key fundamentals of operating a large heavy industrial undertaking (for example, Asset Management),
- Build a repour with the Community,

- Build strong and trusting relationships with the Gladstone Power Station Joint Venture Participants,
- Represent NRG Energy Inc.'s interests in Australia in a constructive manner,
- Provide advice to NRG Energy Inc. (USA) on Australian issues.

May 2004 to October 2007

TARONG ENERGY CORPORATION
MANAGER TECHNICAL SERVICES

Responsibilities:

Managerial responsibility for the provision of all engineering and scientific services (with the exceptions of long term asset development and environmental) within the Operations Group of Tarong Energy Corporation. Key areas:

- Leadership of a multi site team dealing with thermal, hydro and wind power generation.
- Develop the technical and personal skills of the Technical Services Team.
- Management of Capital Projects on Operating Sites,
- Develop and carry out medium to long term asset management strategies,
- Support of Maintenance teams in terms of both the engineering support as well as development of maintenance skills and techniques.
- Support of Production in terms of plant performance / efficiency improvement.
- Support of Production in the provision of Scientific Services.
- Provide Tarong Energy Corp. with in-house engineering advise and support.
- Develop, maintain and implement engineering standards.
- Establish and enhance relationships with key technical organisations.
- Enhance the appropriate technical capital of Tarong Energy Corporation.
- Lead the incorporation of potential new fuel supplies (coal) for both Tarong and Tarong North Power Stations.
- Lead a number of initiatives in key areas such as water, ash and particulates management.
- Identify and support emerging technologies suitable for adoption by Tarong Energy.
- Support the Operations Management Team in the conduct of the Operations Group.

September 1999 to May 2004

INTERNATIONAL POWER HAZELWOOD
PRODUCTION MANAGER – HAZELWOOD POWER STATION, MORWELL
 VICTORA

Responsibilities:

Managerial responsibility for the operation of a 1,600 MW, Brown Coal fired Power Station operating on a 24 hour a day, 7-day week, 52 weeks per year basis. Key areas:

- Leadership of the Plant Operations Teams and associated Support Team (216 personnel),

- Management of the interfaces between Operations and support functions such as Maintenance and Asset Management,
- Develop in association with the Station Engineering Team, Engineering Strategies in such as:
 - Outage planning,
 - Plant item life improvement,
 - Waste (ash & water) disposal management,
 - Effective plant repair methodologies and activities,
 - Operational procedures aimed at better plant performance.
- Provide specialist engineering advise to the Station Engineering Team from time to time,
- Provide mentoring support to junior members of the Station Engineering Team,
- Development and implementation of Operating Strategies in collaboration with the Sales & Marketing department,
- Develop fuel supply management strategies with Hazelwood Mine,
- Involvement in the development and implementation of employee relations over the whole range of issues from industrial relations to personnel welfare including:
 - The negotiation of a new Enterprise Bargaining Agreement for Hazelwood Power during 2001.
- Lead the team developing and implementing Operations training and development processes,
- Management responsibility for Safety within the Power Station,
- Responsibility for the development and effecting of the Station Operations budget,
- Varying duties, along with other members of the Management Team for interfacing with the local community and other external groups who have as interest in the Operation of the Station.

March 1996 to September 1999

SILCAR MAINTENANCE SERVICES

POSITION 1

AREA MANAGER – BURNIE PULP AND PAPER MILL, TASMANIA

Responsibilities:

Silcar Maintenance Services was contracted to provide a complete maintenance services to Australian Paper at their Burnie, Wesley Vale and Shoalhaven sites including:

- All planned and shutdown type maintenance,
- All preventative and predictive type maintenance,
- On line breakdown type maintenance and,
- All maintenance related commercial, stores and purchasing activities.

As Area Manager at Burnie, my responsibilities included:

- Management of 'field' maintenance operations in both the Pulp and Paper Mills,
- Provision of overall leadership in a self directed work team environment,
- Develop and maintain customer relations at various levels,
- Oversee maintenance related engineering issues including:

- Lead the Team developing improved fluidization in the Burnie Mill DARS Plant Fluidized Bed Furnace,
- Develop erosion control mechanisms for the Burnie DARS Plant Gas Path,
- Design of improved DARS Plant Fluidized Bed Furnace Discharge Expansion Joints,
- Rebuild of Paper Machine B4 Drive Train,
- Rebuild of #8 Boiler Grate,
- Engineering Authority for WAO High Pressure Plug Valve rebuilds.
- Focus on developing practical 'quality' practices,
- Planning of routine and shut down maintenance,
- Work with Maintenance Teams to develop safety as a priority,
- Involvement with strategic planning of Maintenance Strategy,
- Responsibility for driving the development of team culture,
- Responsibility for maintenance of all plant on the Burnie site including:
 - Paper machine (2),
 - Chemical Pulp Mill including:
 - Pulping process equipment including bulk material handling,
 - Chemical production & handling plant,
 - Waste handling plant,
 - All services including:
 - Steam generating plant including waste heat boilers, coal & wood fired travelling grate / spreader stoker boilers,
 - Steam turbine (condensing & throttling) generating plant,
 - Compressed air plant,
 - Finishing equipment (including packaging plant),
- Human resources – 94 tradespeople, 6 staff including:
 - Mechanical Engineers,
 - Shut Down Coordinator,
 - Support Officers (Team Leaders),
 - Electrical Tradespersons (Dual Trade),
 - Boilermakers and Pressure Welders,
 - Mechanical Tradespersons,
 - Riggers,

POSITION 2

ACTING MAINTENANCE SUPPORT MANAGER – YALLOURN POWER STATION, VICTORIA

Responsibilities:

Provide liaison between Silcar and Yallourn Energy regarding boiler and coal processing plant performance analysis and continuous improvement.

POSITION 3

PROJECT ENGINEER – LOY YANG TENDER – LOY YANG POWER, VICTORIA

Responsibilities:

Assemble, analysis and report on technical aspects of the 2,000 MW Brown Coal Power Station, and its associated Open Cut Mine operations, that relate to the Outsourcing Maintenance Contract offered by Loy Yang Power.

Actively participate in the production of SILCAR Maintenance Services tender for the Loy Yang Power Outsourcing Maintenance Contract.

POSITION 4

AREA MANAGER PULP & SERVICES - BURNIE PULP AND PAPER MILL, TASMANIA

Responsibilities:

- Responsibility for maintenance of plant including:
 - Pulping process equipment including bulk material handling,
 - Chemical production & handling plant,
 - Waste handling plant,
 - Steam generating plant including waste heat boilers, coal & wood fired travelling grate / spreader stoker boilers,
 - Steam turbine (condensing & throttling) generating plant,
 - Compressed air plant,
- Human resources:
 - Mechanical Engineer,
 - Shut Down Coordinator,
 - Support Officers (Team Leaders),
 - 11 Electrical Tradespersons (Dual Trade),
 - Boilermakers and Pressure Welders,
 - 15 Mechanical Tradespersons,
 - Rigger,

POSITION 5

AREA MANAGER SHOALHAVEN - SHOALHAVEN PAPER MILL, NEW SOUTH WALES

Responsibilities:

- Responsibility for the maintenance of plant including:
 - Paper machines (3),
 - Waste paper processing plant,
 - Services (boilers, water, air),
 - Finishing equipment,

23 April 1993 to 3 March 1996

AUSTRALIAN DEFENCE INDUSTRIES LTD (ADI) **FACILITY MAINTENANCE & PLANT SERVICES MANAGER**

Responsibilities:

- Provide leadership of the multi-disciplined Maintenance Team,
- Managing of the maintenance function over a wide range of manufacturing equipment ranging from robotics through PLC controlled heat treatment furnaces to specialist machine tools and steam generation plant.
- Providing engineering input to Production Departments on machine, project and maintenance issues,
- Responsibility management of maintenance goods and services procurement,
- Control of maintenance expenditure to budget,
- Management of plant infrastructure:
 - Process and heating steam generation and distribution,

- Compressed air generation & distribution,
- Reticulation of electricity, gas and water,
- Treatment and/or disposal of liquid and solid waste,
- Building and structure maintenance,
- Plant project management: projects included the installation and commissioning of a 6 MW natural gas fired boiler and the replacement of reciprocating plant air compressors with new screw units,
- Engineering input to project planning and execution,
- Capital expenditure preparations.

November 1990 to 23 April 1993

AUSTRALIAN DEFENCE INDUSTRIES LTD (ADI)
ADI INVESTMENT CASTING MANAGER

Responsibilities:

- Establishment of Investment Casting (IC) as a strategic business unit,
- Heavy focus on people issues,
- Development of a customer focus based upon delivery, quality and capability,
- Internal issues – scrap cause identification, scrap reduction, job quotation speed and accuracy, upgrading of process technology along with key equipment,
- The building of teams to best harness the knowledge and capabilities already present,
- Commenced a process of benchmarking with the aim of improving unit performance,
- Develop a focus on manufacturing and operational technology and practices.

January 1987 to November 1990

AUSTRALIAN GOVERNMENT SMALL ARMS
FACTORY / AUSTRALIAN DEFENCE INDUSTRIES LTD
PROJECT OFFICER / TRAINEE ENGINEER

Responsibilities:

- Part time and Sandwich studies in engineering at undergraduate level,
- Project role in Investment Casting process development,
- Project outline:
 - Establish viability of continued operation,
 - Investigate customer and general market features,
 - Identify and investigation key process issues,
 - Introduce process improvements,
 - Establish both customer and supplier framework,
- Key project process improvement:
 - Adoption of new technology waxes,
 - Tighter injection control,
 - Introduction of new metal tooling,
 - Design and installation of new shell firing technology.

25 March 1985 to January 1987

DEPARTMENT OF DEFENCE - OFFICE OF DEFENCE PRODUCTION,

**AUSTRALIAN GOVERNMENT SMALL ARMS FACTORY (SAF) – LITHGOW
N.S.W.
TECHNICAL OFFICER**

Responsibilities:

- Completion of the NSW TAFE Mechanical Engineering Certificate,
- Six month period in SAF Metallurgical Laboratory,
- Move to Production to undertake investigation dealing with the production of 81mm Mortar at Lithgow,
- Mortar investigation covered all production processes ranging from forging through machining to mass finishing. Issues such as material variations and operator ergonomics were also assessed.
- As a follow on from the existing Mortar Project, assisted the SAF Development Department in work on a prototype, new generation mortar.
- Other areas investigated for the Development Department included:
 - Component deburring methods,
 - Mass finishing technology,
 - Ceramic Shot Peening,
 - IC ceramic removal.
- Team member of Production department Team responsible for plant procurement project.
- Equipment purchased as a result of the Team's work included:
 - CNC turning centres,
 - CNC machining centres,
 - Complete turn key rubberising plant,
 - Honing equipment,
 - Three coordinate measuring system,
 - Machine loading robot.

6 July 1981 to 25 March 1985

**BLUE CIRCLE SOUTHERN CEMENT LTD (BCSC)
CHEMICAL ANALYST - PORTLAND CEMENT WORKS, PORTLAND N.S.W.**

Responsibilities:

- Assessment of raw material quality against requirements,
- Boiler feed water quality control,
- Preparation of solutions for use in Works Process Control Laboratory,
- Rotary Kiln flue gas analysis,
- Gas flow and load efficiencies on electro-static precipitators,
- Circulating load analysis on cement and raw mills (ball / tube type),
- Chemical analysis of:
 - Kiln raw feed,
 - Kiln product (clinker),
 - Final cement product.
- Determination of process control databased upon test results e.g., LSF and LCF. This information supplied to production personnel for process adjustments.

21 May 1979 to July 1981

**INTERNATIONAL COMBUSTION AUSTRALIA LIMITED (ICAL),
POSITION 1, VALES POINT POWER STATION, N.S.W.
INDUSTRIAL RADIOGRAPHER / TECHNICAL ASSISTANT**

Responsibilities:

- Assist in the determination of the extent of pressure part damage due to a major failure of Boiler #6,
- Coordinate between repair crews and the control of auxiliary services such as rigging, supply of replacement componentry, removal of damaged componentry and preparation of areas welding.
- Transferred to the position of assistant to the Asbestos Removal Engineer on Vales Point Boiler #3 Rehabilitation Project.
- Supervision of specialist sub-contractor undertaking the removal of asbestos and also the disposal of all asbestos and any contaminated materials. Both white and blue asbestos was encountered on the project.
- Transferred to the position of Site Radiographer at Vales Point, with responsibility for all NDT at Vales Point and also radiography on repair work on Unit #2 Liddell Power Station.

**INTERNATIONAL COMBUSTION AUSTRALIA LIMITED (ICAL),
POSITION 2, WALLERAWANG POWER STATION, N.S.W.
INDUSTRIAL RADIOGRAPHER / TECHNICAL ASSISTANT**

Responsibilities:

- Initial task was the assistance of the Site Radiographer in the conduct of a wide range of Non Destructive Tests (NDT) including Gamma Radiography, Magnetic Particle and Dye Penetrant crack detection,
- After training in Industrial Radiography I was promoted to the position of Site Radiographer,
- Responsible for all NDT work carried out on the site,
- Responsible for up to four isotopes at any time,
- Supervision of up to six personnel on a shift basis, the organisation of the work program, the processing and analysis of results, as well as project planning,
- Development of radiography set up methods to overcome many situations, which could not be met by existing methods.
- Initial task was the assistance of the Site Radiographer in the conduct of a wide range of Non Destructive Tests including Gamma Radiography, Magnetic Particle and Dye Penetrant crack detection,

17 January 1979 to 26 April 1979

**MACQUARIE DRAFTING AND PRINTING SERVICES
BATHURST, N.S.W.
TRAINEE DRAFTSMAN**

- Macquarie Drafting was a contract drafting operation servicing the building industry in the Bathurst area of NSW. I was employed as a trainee architectural draftsman and performed general duties associated with a junior position in a drawing office (tracing, basic drawing layout, drawing completion etc).

End.

Publications:

Creelman, R. A., Ward C. R., Schumacher, G., & Juniper, L. A., 2013, 'Relation between Coal Mineral Matter and Deposit Mineralogy in Pulverized Fuel Furnaces', *Energy Fuels*, 2013, 27 (10), American Chemical Society, Washington, DC, USA, p.p. 5714–5724.

Schumacher, G., 2009, 'NRG Big Cajun II Power Plant Unit #1 & #2 Mills', NRG Gladstone Operating Services Pty. Ltd., Gladstone, Queensland, Australia.

Schumacher, G., 2010, *How Electricity Is Generated – Coal Fired Thermal Plant*, Ed. 1a., NRG Gladstone Operating Services Pty. Ltd., Gladstone, Queensland, Australia.

Schumacher, G., 2011, 'Coal Mills', The 36th International Technical Conference on Clean Coal & Fuel Systems, June 5 to 9, 2011, Sheraton Sand Key, Clearwater, Florida, U.S.A.

Schumacher, G., & Juniper, J. A., 2012, 'Practical Aspects of Slagging in Operating Boiler Furnaces', Proceedings International Conference - Impacts of Fuel Quality On Power Production and the Environment, September 23th – 27th, 2012, Puchberg am Schneeberg, Austria.

Schumacher, G., Creelman, R. A., Windsor, C., Lee, C., & Juniper, L. A. (ed), 2013, *Managing Boiler Slagging*, The Community of Practice for Coal Utilisation, Lindsay Juniper Pty. Ltd., Brisbane, Queensland, Australia.

Schumacher, G., Marks, P., & Juniper, L. A. (ed), 2013, *Producing & Burning Pulverised Coal*, The Community of Practice for Coal Utilisation, Lindsay Juniper Pty. Ltd., Brisbane, Queensland, Australia.

Schumacher, G., & Juniper, L. A. (ed), 2013, *Coal in the Cement Industry*, The Community of Practice for Coal Utilisation, Lindsay Juniper Pty. Ltd., Brisbane, Queensland, Australia.

Schumacher, G., 2014, *Coal Pulverising Mill Types*, Ed.2. v1., Community of Practice for Coal Utilisation, Brisbane, Lindsay Juniper Pty. Ltd., Queensland, Australia.

Schumacher, G., & Juniper L. A., 2014, 'Coal utilisation in the Cement and Concrete Industries', in Osborne, D. (ed.), *The Coal Handbook: Towards Cleaner Production Coal Utilisation: 2*, Woodhead Publishers, Cambridge.

Schumacher, G., & Juniper L. A., 2014, 'Advances in pulverised fuel technology: Understanding coal comminution, combustion and ash deposition', in Osborne, D. (ed.), *The Coal Handbook: Towards Cleaner Production Coal Utilisation: 2*, Woodhead Publishers, Cambridge.

Schumacher, G., et al, 2014, 'Future directions toward more efficient and cleaner use of coal', in Osborne, D. (ed.), *The Coal Handbook: Towards Cleaner Production Coal Utilisation: 2*, Woodhead Publishers, Cambridge.