



Lindsay Juniper - RESUMÉ

Personal Details



Name: Lindsay Allan JUNIPER

Position: Director, Thermal Coal & Power

Date of Birth 12 May, 1943

Nationality: Australian

Languages: English (Native language)

Qualifications: Diploma of Mechanical Engineering (1962)
Bachelor of Engineering (Mech), University of Melbourne (1965)

Affiliations: Fellow, Australian Institute of Energy
Member, Combustion Institute
Member, Coal Preparation Society of Australia

Key Technical Capabilities

Technical evaluation of thermal coals for their suitability for combustion systems, including the impact of coal quality on power plant performance and costs, to determine the "value" of coals for power generation.

Development of detailed testing programs for coal evaluation, including full scale and pilot scale testing and evaluation, and programs for solving problems in operating boilers.

Evaluation and design of combustion equipment for different fuels, ranging from high rank bituminous coal, to low rank coal, lignite and biomass. Performance testing of plant components

to achieve optimum performance and to solve operational problems.

Feasibility and development of power system projects, including development of optimum coal products for economical power generation, energy transport studies, and small power sources based on renewables.

Development and management of R&D projects, including the design and construction of pilot and demonstration scale plant and equipment.

Implementation of training in coal technology, including the development and conduct of coal technology programs specifically tailored for particular audiences and training objectives.

Technical software development and applications, including combustion and boiler plant modelling, data acquisition, and engineering applications.

Innovative engineering design and assessment of new products, and the engineering inputs required to bring new ideas to commercial reality.

Career Resumé

1981- Present: Director, Thermal Coal & Power, Ultra-Systems Technology Pty Ltd. Responsible for the formation and operation of a service company specialising in fuel technology, innovative power engineering, and technical computer applications.

1991 – 1993: Executive Director, ACIRL Ltd

1989 – 1995: Manager Combustion, ACIRL Ltd.
Business Unit Manager for the Australian Combustion Technology Centre (ACTC), Riverview, Queensland. Responsible for the marketing and implementation of the program of research and commercial consulting in coal evaluation as applied to combustion systems, including management responsibilities for the long term technical viability and commercial profitability of the unit.

1981 - 1988: Director and Manager, Fuel Technology Services, ERM Consultants Pty Ltd. Responsible for the management of fuel resource evaluations of a number of bituminous and lignite coal deposits. Management of comprehensive full scale and pilot scale combustion testing programs for evaluation of coal combustion characteristics, and studies relating to cost effects of coal properties on power generation. Also, engaged on many diverse studies related to electricity generation planning, co-generation feasibility studies, design of small power sources based on biomass fuels, power station siting studies, and fuels research.



1968 - 1981: Research Engineer, Research and Development Department, State Electricity Commission of Victoria. Responsible for the management, implementation and conduct of major research projects relating to combustion, heat transfer, design and operation of large coal fired utility boilers. This work included extensive investigations on operating boilers.

1962 - 1968: Cadet Engineer (Until 1965), then Graduate Engineer, State Electricity Commission of Victoria. Time spent in power station design and operations groups, as well as hands on power station experience.

Relevant UST Projects

Analyses of the cost benefit of several Australian coals and coal blends in the export market. These analyses established the value of the coal to an overseas utility compared to a range of competitor coals, and were to be used as an aid to marketing the coals.

Member of a Due Diligence team for the possible purchase of Yallourn W Power Station in Victoria. Responsible for coal quality issues as they related to the long-term coal supplies from the Yallourn mine.

Assistance to a Queensland coal company during the tender process for coal supplies to Gladstone Power Station. Provided technical services in respect of trialling the coal at the power station, as well as economic analysis of the competitiveness of the coal compared to a range of other possible coal supplies.

Engaged by the Victorian Government engaged to review the options for brown coal briquettes, in preparation for the plant to be sold. Brief involved a review of alternative coal supplies for briquette manufacture and the technical and economic feasibility of importing black coal from NSW.

Engaged by the Queensland Transmission and Supply Corporation to carry out "Biomass Resources and their Use for Power Generation in Queensland". This study identified a range of biomass resources in Queensland, matched utilisation technologies with the resources and evaluated the economics of potential projects.

Government representative in a program of testing and evaluation of the gasification characteristics of a Walloon coal from Queensland. Project was part funded by the Queensland Government.

Review of the value of coal washery rejects for power generation. UST used benchmark

electricity prices in Queensland to place a value on the coal rejects resource.

Technical assistance with a review of tendered prices for the construction of a major turnkey power project in Queensland.

Advice on a program of combustion testing for a potential new mine in Queensland including selecting sites to collect a representative sample, review of coal quality data, planning and implementation of the testing program. UST input was part of the feasibility study to establish the marketability of the coal.

Major study to evaluate the competitiveness of Queensland thermal coals in the export market. Study included coal value analysis for power generation, costing of rail port and ocean freight charges and review of power generation costs in Japan. Competitive coals were those from NSW, Indonesia, South Africa and USA.

Advice on the Queensland electricity industry and evaluation of the coal requirements for a power station as a potential market for a coal mine in Queensland.

Investigations of stone contamination in a thermal coal product. Identify the source of the contamination and advise on potential solutions.

Review of the impact of greenhouse gas issues and CO₂ emissions trading on the thermal coal industry.

Pre-feasibility study of a biomass fired co-generation facility. Work included evaluation of utilisation technologies and assessment of the fuel for use in boiler plant. Study included a number of scenarios including the viability as an Independent Power Producer (IPP).

Study and report on the costs of electricity production from competitive fuels. Study included evaluation of the capital, operating & maintenance and fuel costs for a range of fuels including coal, oil, gas, renewables (solar PV, solar thermal, wind & biomass) and nuclear. Developed a spreadsheet system to allow users to evaluate the range of options based on their particular cost structures.

Biomass resource studies for biomass fired power generation facilities including sourcing the fuels, deriving costs of sourcing and transport of the fuels and including a review of the commercial risks and contractual arrangements for securing the fuel.

ACARP funded research project "Making the Ash Fusion Test Useful". Included the development of correlations between the ash constituents, the melting characteristics of the ash and the ash



fusion temperatures. Also included a pre-feasibility study on the potential for the application of digital imaging techniques to improve the ash fusion temperature measurement. This resulted in additional funding for development of a commercial prototype ash fusion testing system using the proposed digital imaging techniques.

Review of the Queensland coal industry including coal resources, electricity generating costs, greenhouse gas issues and prospects for underground coal gasification.

Assistance with a major Queensland Government study to define infrastructure requirements to encourage development of the Surat/Dawson area in south-east Queensland.

Technical support to a coal buyer for negotiations to amend a long-term coal contract. Negotiations were centred on the Company achieving compensation for the delivery of low quality coal that caused additional costs to the plant.

Expert witness on technical issues in litigation between a utility and a coal company regarding the supply of off-specification coal.

Investigations to establish the cause of combustion problems in industrial stoker-fired boilers. Cause was found to be the excessive generation of fines during handling of the coal. Subsequent investigations were aimed at understanding the breakage characteristics of the coal in order to propose remedial measures to eliminate the problem.

Key Publications

StBaker TC and Juniper LA, 1982. *Coal Specification for Power Station Design Purposes*. 4th Conference of Electric Power Supply Industry. Bangkok, Thailand.

Joseph SD and Juniper LA, 1988. *Biomass Energy Use in Rural Industries of Developing Countries*. International Energy '88, Australian Institute of Energy, Gold Coast.

Conroy AP, Juniper LA and Phong-anant D, 1989. *The Impact of Coal Pulverising Characteristics on Power Plant Performance*. International Conference on Coal Science. Tokyo, Japan.

Juniper LA, 1989. *Research Milestones in Defining the Combustion Characteristics of Australian Coals*. Japan - Australia Workshop on Structural Characterisation and Use of Australian Coals, Osaka, Japan.

Juniper LA and Conroy AP, 1991. *Correlation between Pilot Scale Combustion Test Results and Performance of Coals in Full scale Plant*. 2nd Australian Flame Days, Sydney.

Juniper LA and Pohl JH, 1990. *Techniques to Control NO_x Emissions from Australian Coal Fired Boilers*. 1st Australian Flame Days, AusFRC, Brisbane.

Conroy AP and Juniper LA, 1993. *Thermal Coal Blending*. 3rd Australian Flame Days, Newcastle.

Borio RW, Mehta AK, Juniper LA and Pohl JH, 1994. *The Impact of Coal Quality on Power Plant Performance*. Workshop on Impact of Coal Quality on Power Plant Performance, Australian Combustion Technology Centre, ACIRL Ltd, Brisbane.

Juniper LA and Pohl JH, 1994. *Slagging Investigations at Callide 'B' Power Station*. Workshop on Impact of Coal Quality on Power Plant Performance, Australian Combustion Technology Centre, ACIRL Ltd, Brisbane.

Juniper LA and Conroy AP, 1995. *Technology Tools to Support the Marketing of Thermal Coal*. Centennial Geocongress (1995), Geological Society of South Africa, Johannesburg, South Africa.

Juniper LA, 1995. *Practical Coal Quality Evaluation of Export Thermal Coals*. 1995 Bowen Basin Symposium, Geological Society of Australia Inc.

Juniper L and Pohl J, 1997. *What Price Coal Quality in Electric Power Generation?* The Australian Coal Review, Issue 3, July 1997.

Juniper LA, 1998. *Pilot Scale Evaluation of Australian Thermal Coal for Combustion and Gasification*. Australian Coal Review, Issue 6, October 1998.

Juniper LA, 2000. *Comparison of Fuels from Efficiency and Environmental Perspectives*. Asia Coal versus Gas Conference, Singapore, June 2000.

Juniper LA, 2000. *New Technologies for Competitive Electricity Supply in Australia*. 24th Annual Conference of the Australian Mining and Petroleum Law Association, Fremantle, WA.

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