

**Ref:** QCAAB170613

Mr John Hall  
Chief Executive Officer  
Queensland Competition Authority  
GPO Box 2257  
Brisbane QLD 4001

17 June 2013

Dear Mr Hall

**AURIZON NETWORK'S 2013 BLACKWATER ELECTRIC TRACTION PRICING DRAFT AMENDING ACCESS UNDERTAKING ('DAAU') – RESPONSE TO QUEENSLAND COMPETITION AUTHORITY'S (THE 'AUTHORITY'S') INVITATION FOR SUBMISSIONS**

We refer to Aurizon Network's 2013 Blackwater Electric Traction Pricing DAAU and the submission prepared by Sapere Research Group ('Sapere') in support of the DAAU.

UGL is a privately owned supplier and maintainer of diesel locomotives to Australian haulage operators and resources companies. As an interested party in respect of the DAAU, UGL gratefully accepts the Authority's invitation to provide commentary. It is hoped that the following commentary will assist the Authority in evaluating the DAAU.

UGL's submission outlines its concerns with the DAAU in relation to the following:

1. Impact on traction choice
2. Total Cost of Ownership (TCO) analysis used to compare electric and diesel traction
3. Impact on competition in locomotive supply markets

**1. Traction choice**

In its submission to the Authority dated 23 November 2012 in respect of the Authority's draft decision on the 2011 Electric Traction DAAU, UGL supported the position that traction choice should be left to the competitive market and noted the Authority's statement in its draft decision that *"the measures in the [proposed 2011 Electric Traction] DAAU would almost compel train operators to use electric traction"*.

UGL's view is that the 2013 DAAU would also distort traction choice in favour of electric traction. Under the 2013 DAAU, there would be a disincentive to choose diesel traction due to the increased risk (in comparison to choosing electric traction) of being liable to pay an under-utilisation payment (UUP). Each user choosing diesel traction contributes to a reduction in the probability of achieving 85% electric utilisation on the Blackwater network and therefore increases the risk of all Blackwater users being liable for UUP payments. Furthermore, for all levels of electric utilisation less than 85%, any decision to choose diesel traction increases the size of that user's (and all Blackwater users') proportional UUP liability.

The DAAU proposal which sets the AT<sub>5</sub> access charge at a fixed level with the intention of not distorting traction choice fails to consider the higher UUP liability risk for users choosing diesel traction. A profit-maximising private firm is unlikely to make a traction choice decision without considering the future UUP liability risk and the increase or decrease in that risk associated with its own choice of traction.

This UUP liability risk inequality between diesel and electric traction clearly distorts traction choice in favour of electric haulage.

## **2. Diesel Traction versus Electric Traction**

The DAAU indicates that the fixed price path proposed for AT<sub>5</sub> is supported by Aurizon Network's internal TCO analysis. The TCO analysis finds that electric traction is less expensive per Gross Tonne Kilometre (GTK) than diesel traction at high utilisation of the electric infrastructure.

UGL re-iterates the view expressed in its previous submission dated 23 November that this analysis did not taken into account the impact of technological advances in locomotive engineering. Aurizon Network advised that it had "taken the simplifying assumption that equivalent technological improvements are likely to be achieved for each traction mode." Given the current and likely technology advances explained below (see sections 'Immediate Diesel Technology Advances' and Future Diesel Technology Advances'), UGL proposes that the TCO analysis has potentially understated the current and future value of diesel locomotive technology when compared to electric locomotive technology. Consequently, the DAAU's position that electric traction provides "cost superiority" may not be well founded.

The economic analysis by Sapere supporting the DAAU assumes that all input data provided by Aurizon Network is correct. Therefore, without independent analysis of this input data, it is questionable how much weight can be placed on Sapere's support of Aurizon Network's conclusion that electric traction is less expensive per GTK than diesel traction where there is moderately high utilisation of electric infrastructure.

UGL is of the view that the cycle time advantage of electric traction locomotives provides no efficiency advantage in terms of haulage throughput due to network and operational constraints such as signalling, scheduling and queuing on Blackwater network. Furthermore, Aurizon Network's TCO analysis that concludes electric traction has a cycle time advantage over diesel traction becomes less convincing when high powered diesel locomotive technology is properly considered (see section below 'Immediate Diesel Technology Advances').

It was also noted that the cycle times for diesel locomotives as used by Aurizon Network in undertaking the TCO analysis were based on the Callemondah Yard. This yard was originally developed for a much smaller rail network. The provisioning times at this yard may not be indicative of what could be actually achieved. Infrastructure developments on other networks are being undertaken to provide significant provisioning cost and cycle time savings.

In light of these factors above and the technological advances detailed in the sections below, UGL reiterates its position that the competitive market (and not the DAAU) should be the primary influence for traction choice. This will ensure that the respective technologies advance in a manner that best responds to the market's needs.

### ***Immediate Diesel Technology Advances***

UGL's PowerHaul diesel electric locomotive product is a contemporary example of technology development in diesel locomotives. Prototypes of the PowerHaul are currently being manufactured. The following are some of the product aspects:

- PowerHaul diesel electric locomotive uses GE Transportation proven traction technology, having first been deployed by GE in the United Kingdom in late 2010.
- The PowerHaul product has been specifically designed for the narrow gauge Queensland bulk haulage market for compliance with the unique Queensland rolling stock outline gauge, Australian Standards, environmental requirements and customer operational requirements.

- The PowerHaul technology represents a step change in diesel efficiency for the rail market through the use of the latest engine technologies such as common rail fuel injection, inverter driven variable speed auxiliary engine and traction motor cooling equipment.
- The diesel engine in PowerHaul achieves class leading fuel consumption of 192g/kW.h (in notch 8) whilst complying with at UIC 3a exhaust emission standards. The maximum efficiency of the diesel engine in converting fuel energy into traction performance is in the order of 44%.
- The advances in power and efficiency of the PowerHaul technology can provide significant improvements in cycle time and fuel use for Queensland based diesel locomotive coal haulage operators. UGL route simulations of the Blackwater system have indicated similar cycle time performance between PowerHaul locomotives and existing electric locomotives. It is noted that real world operational constraints will provide greater influence on cycle time performance than simulated, regardless of whether a diesel or electric locomotive is used.

Generally within diesel locomotive technology there are other current advances, including GE's Automatic Engine Stop Start (AESS), Consist Manager and Trip Optimiser. AESS is a control outcome that is currently used in Australia to reduce diesel fuel usage by up to 2%. GE's Consist Manager and Trip Optimiser allows for reductions in fuel usage by up to 10% depending on consist configurations, route alignments, run conditions and network traffic.

### ***Future Diesel Technology Advances***

UGL provides the following likely performance developments for diesel locomotive technology in the future:

- Dual fuel engine technology allowing the substitution of diesel with natural gas. Dual fuel engine technology can be expected to be realised within the next 5 years. Australia has an abundance of natural gas and significant LNG plant development, especially within dedicated mine to port rail operations such as those on the Blackwater. Such areas provide the ideal environment to take maximum advantage of the dual fuel engine technology.
- Hybrid locomotives technology employing the use of battery and other energy storage devices.
- Dual mode technology allowing the interface to electric overhead wire for power and/or power regeneration under dynamic braking.

It is further noted generally that:

- Advances in electric motor technology that apply to electric locomotives will apply equally to diesel locomotives. Electric locomotives use the same or similar traction motors as diesel locomotives.
- There is expected to be a high level of investment in diesel engine technology given the world wide size of the general diesel engine market. Such investment is expected to benefit the development of diesel locomotive technology.

### **3. Competition in locomotive supply market**

By distorting traction choice in favour of electric haulage, the proposed electric traction pricing mechanism and UUP regime will reduce competition in locomotive supply markets due to the targeted shift towards 85% electric traction utilisation. This lack of competition within the electric locomotive supply market in Queensland is due to the high barriers to market entry for global electric locomotive manufacturers outlined below.

- Difficulty of packaging high performance in restrictive gauge outline. For example, constraints in the size of the traction motor due to narrow gauge width, underframe platform height and cab height (overall gauge height).

- Satisfying Queensland and Australian requirements (for example toilets, ergonomics, noise, air conditioning).
- Achieving product accreditation.
- Unwillingness of operators to risk a new product as reliability is paramount to meet operation contract commitments.
- Significant investment in spare parts pool and Queensland-based maintenance services and facilities.

The above market barriers are important considerations in assessing the likely effects of the DAAU on competition in the locomotive supply market and the potential for inefficient outcomes.

Another point for the Authority's consideration is the scenario of continued Australian Dollar depreciation in the context of locomotive local content. Under the proposed DAAU, this scenario may lead to inefficient market outcomes, as users are compelled (due to the proposed electric traction pricing structure) to procure fully imported electric locomotives when procurement of diesel locomotives with a significantly higher proportion of Australian content would be the more cost-efficient decision in a competitive market.

We trust that the information and comments contained in this letter will be of assistance to the Authority in determining its decision with respect to the DAAU.

For further information in relation to this submission, please contact Matt Plunkett-Cole on Ph: [REDACTED]

Yours sincerely,

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Alan Beacham  
**EXECUTIVE GENERAL MANAGER – RAIL**