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Robert Finch

13 October 1997

The Manager
AUSTRALIAN BLACK COAL INDUSTRY INQUIRY
Locked Bag 2
Collins Street East Post Office
MELBOURNE VIC 8003

Dear Sir,

We would like to submit this document for consideration by the Australian Black Coal Industry Enquiry. This sub
Performance of Coal infrastructure, specifically the cost of transport of black coal by rail.

Long-Airdox Australia (LAA) specialises in the supply a number of products related to the mining industry. LAA is market leader in Australia for design and supply of rail loading systems into the mining industry

Some 18 months ago, LAA identified a loading technology in North America know as Batchweigh Rail Loading been used extensively in the American coal industry for more than 10 years. This technology allows for the desire of coal to be accurately pre-weighed in an electronic load cell supported weigh hopper, before being deposited in This concept provides a number of significant benefits over volumetric loaders, which are the most commo currently in Australia namely:

· Significantly higher wagon filling speed.

· Significant improvements in transport efficiency as a result of maximising the coal carried by a unit train.

· Accurate wagon unit loading, eliminating under and overloading of rail wagons.

· Improved safety as a result of not overloading wagons.

· National Standards Commission and Weights & Measures approved weighing system, accurate to +/- 0.05 00,000kg).

· Irrefutable rail wagon loading data, eliminating disputes between carriers and rail track infrastructure provider.

The first such system was installed in Australia by LAA at BHP's Mount Owen open cut coal mine in the Hunt Since commissioning of this system late in 1996, it has operated efficiently, reliably and has exceeded all client expectations. At present there are at least three companies offering this technology in Australia.

The then Freight Rail reportedly offered BHP a freight rebate of 65c per tonne at Mount. Owen for installation o system. The batchloader concept is referred to in the enclosed Freight Rail Category document.

Since this time Freight Rail was split into a number of autonomous bodies. Freight Corp the rolling stock p publicly acknowledged the benefits of the batchweigh system to both itself and the mine operator. However, as Owen, has apparently not provided any significant financial incentive for implementation of this technology.

Freight Corp apparently holds freight rate negotiations confidentially with each individual client. As a result, cli to formally relate details, however, freely recount this information verbally. In recent months, we have spoken several mining companies about these negotiations and all confirm that Freight Corp rate weighing performan priority in a list of desirable rail wagon filling attributes. We are aware of a number of mining companies wh decision not to consider the batchweigh system as a result of the lack of importance and the rebate level afforde Corp.

Attached to this submission is a copy of a letter sent to the Manager of Freight Corp by the undersigned on the Contained within this letter is a statistical study of loading performance information provided to the writer b Newcastle Manager. We have not received a reply to date. The information provided by Freight Corp is the gross of wagons filled in the Hunter Valley by existing volumetric rail loader installations. This information suggests trains are being underloaded by 1.67°~. More disturbing however, is the fact that the newer larger style wago tonnes net capacity) are being underfilled by 3.18%. These newer wagons are being introduced at a fast rate an supersede the older lower capacity wagons. Part of the reason for the poor loading efficiency of the newer wag volume to weight ratio they have compared to the older wagons. ie: there is less empty space when the new v correctly. This means that it is easier to underload than overload the wagon using volumetric loading equipment.

The author calculates that in the order of 15 - 18c per tonne reduction in the average Hunter Valley coal freig possible if the more efficient batchweigh systems were used. Added benefits provided by batchloaders include; due to no overloads, and the availability of irrefutable evidence of weights carried in the event of disputes w infrastructure provider.

The batchweigh system is used extensively throughout the North American coal industry, with over 100 installa deregulated rail freight system. It is our belief that widespread implementation of this technology into Australi significant long term efficiency gains and lead to overall reduced freight charges.

We would be happy to discuss this submission in more detail or provide additional information.

Yours faithfully
LONG-AIRDOX
AUSTRALIA PTY LIMITED

T.R. Coggles
DEPUTY MANAGING DIRECTOR

Long-AirdoxAustralia Pty Limited 53 7 Lake Road, Argenton PO Box 102, Boolaroo New South Wales Australia

(049) 58 3133 Fax:58 5754

18th. July, 1997.

The Manager FreightCorp Locked Bag 90, Parramatta~ NSW' 2124.

Attn: Mr. Terry Kearney. cc. Mr. Kevin Craze.

Dear Sir,

As you are probably aware, Long-Airdox Australia Pty Ltd recently introduced the batchweigh rail loading co mining industry in Australia with the successful installation of the first system at BHP's Mt Owen coal mine in Valley. Since then a batchweigh system manufactured by a South African company has been sold to Shell Austr Moranbah North coal mine in the Bowen Basin, Queensland.

The batchloading concept is used extensively throughout the USA, and South Africa, with over 100 individual ir US alone. The same concept is gaining acceptance in China, with the third system recently being sold into this belief of many people within the coal industry that batchweigh rail loading is the way of the future.

It is therefore of some concern to us that we are receiving feedback from a number of sources within the coal ind that FreightCorp may not be able, or prepared to provide mines with sufficient financial incentive for them to jus of batchweigh systems for new rail loading developments.

We also understand that FreightCorp has recently decided to withdraw from the practice of setting rail freight rate coal based on the rail wagon loading category system. Further, that freight rates wil1 now be negotiated co individual coal mining clients.

In order that we might quantify the benefits of the batchloading system, we requested and received some typica wagon loading data from your Newcastle office. This information does not represent a large sample, however, i research conducted in the US and previously by engineering personnel within our own company.
Providing Expert Mining Solutions Worldwide A member of The Marmon Group of companies A.C.r4. ooo /33 s:

In summary, using the entire sample comprising a variety of wagon types with a total theoretical capacity o Tonnes, actual measured net loads were 732.5 Tonnes short of theoretical optimum. This represents an average 1.67%. Of greater concern is the performance of volumetric loaders on NHRH type wagons. Over the three train and a theoretical optimum capacity of 20277.6 Metric Tonnes, the total underload amounted to 645.25 tonnes. T average underload of 3.18%. We understand that these larger wagons are being used more often and will event smaller wagon fleet. A batchloading system would eliminate underloading.

If the sample provided is indicative of current volumetric loading performance, then the losses to FreightCorp ov tonnes of coal transported to coastal ports annually are very significant. An example is that if 58,000,000 Tonn NHRH wagons with an average underload of 3.18%, total underloads are 1,844,400 Tonnes, or 19,374 additiona 230 x 8000 tonne capacity trains.

Obviously not all of the coal is shipped in these wagons, however, even 50% of the above underloading is a sign loss and will limit FreightCorp's ability to provide world class freight rates to its clients.

The approximate price difference between a new volumetric train loader and a batchweigh train loader is in the Assuming that for a green field 5 M tonne per annum mine site this price difference could be justified with a thr period. The reduction in freight over this period would need to be in the order of 10.7c/tonne to justify a batch 535,000 per annum). A conservative loading efficiency improvement of 1.7% would result in a theoretical reduc tonne capacity trains per year to transport the 5 M tonnes of coal. Without knowing the cost per train it is difficult the cost of the freight reduction against the cost of the additional trains. However, the difference between cost a appear to be very small. After the pay-back period the freight rate could be adjusted to enable both FreightCorp share in the ongoing efficiency gains.

We accept that the above argument is based on a number of assumptions and a relatively small statistical inf Accordingly we would appreciate the opportunity to visit your Parramatta office to discuss this matter in greate contact you in this regard cnnn

In the mean time we would welcome your comments on the above matter.

Yours sincerely,
Long-Airdox Pty Ltd

Robert Finch, Sales Manager - Surface Products.

cc. Mr. Terry Coggles - Deputy Managing Director, Long-Airdox Austraha Pty Ltd. Enc: Copies of volume provided by FreightCorp Newcastle.

Statistical summary of loading information provided bv FreightCorp Nevvcastle.

Guidelines For Coal Loading and Unloading Facilities

Infrastructure and Operations Guidelines for Unit Train Loading and Unloading Facilities for Coal:

1 Scope

This Document sets out the Freight Rail guidelines for the design of terminals handling unit coal trains. IniUal contact with Freight Rail on terminal proposals should be made to the General IVlanager, Coal Services, or nominated representative.

2 Coal Terminal Classification

Coal terminal facilities are rated into six (6) levels based on performance and tonnages of coal loaded by the customer. This rating is then used in conjunct,ion with other factors to determine the formal freight rate agreement between Freight Rail and the customer.

The following is a description of these levels based on loading rates and recharge capacities only. Further operating standards apply to the performance of the facility and these can be obtained through the General Manager Coal Services.

2.1 Level 1

2.1.1 Any terminal failing to meet U,e criteria set out in Levels 2, 3, 4, 5, 6.

2.1.2 Damage and derailment of. railway wagons must be prevented during loading operations. Where facilities use only front end loaders. for the loading of coal into railway wagons, details of the procedures for loading and associated equipment including barriers, must be submitted to the Freight Rail for approval.

2.2 Level 2

2.2.1 Loadina Rate

The loading system at the facility shall load, by means of an overhead loading bin or front end loader, either
or

in the North of the Sta~ a standard 3200 tonnes net capacity train, up to 800 metres in length, in 120 minutes.

in the South and West of the State, a standard 2400 tonnes net capacity train, up to 625 metres in length, in 120 tninutes.

Front snd loaders are to be operated with a weightometer to assist correct loading of wagons.

Refer To Section 2.1.2 for further requirements.

The time allowance for loading includes:

actual coal loading

and

any shunting or examination time due to the configuration of siding.

In respect of balloon loop facilities the 120 minute allowance is for coal loading only.

2.3 Level 3

2.3.1 Loadina Rate

The loading system at the facility shall load, by means of an overhead loading bin or front end loader, either

In the North of the State, a standard 3200 tonnes net capacity train, up to 800 metres in length, in 60 minutes.

Or

In the South and West of the State, a standard 2400 tonnes net capacity train, in 60 minutes.

Front end loaders are to be operated with a weightometer to assist correct loading of wagons.

Rofer to Section 2.1.2 for further requirements.

The time allowance for loading includes:

actual coal loading

and

any shunting or examination time due to the configuration of the siding.

In respect of balloon loop facilities the 60 minutes allowance is for coal loading only.

2.3.2 Recharge Canacity

The ability to load four consecutive trains at a rate set out in 2.3.1 with maximum headway of 70 minutes between trains is required.

4.1 Loadina Rate

The loading system at the facility shall load either -

In the North of the State a standard 3,200 tonnes net capacity train, up to. 800 metres in lensith, in 60 minutes. ~ -

or

In the South and West of the State ,a standard 2400 tonne net capacity train, up to 625m in length, in 60 minutes.

2.4.2 Overheacl Coal Loading and Balloon Loop

The facility shall have a balloon loop and an overhead coal loading bin. The facility shall also provide an approved train loading control system.

2.4.3 Recharge Capacitv

The ability to load four consecutive trains at a rate set out in 2.41 with maximum headway of 70 minutes between trains is required.

2.5 Level 5

2.5. 1 Loading Rate

The loading system at the facility shall be capable of loading a standard 6400 tonne net capacity train, up to 1600m in length, in 120 minutes at a rate of loading of not less than 3,200 tonnes per hour.

2.5.2 Overhead Coal Loadinq

The facility shall have an overhead coal loading bin and a balloon loop with capacity to accommoclate one 1600m long train in advance of the loading bin and one 1600m long train on the departure side of the bin. The facility shall also provide an approved train loading control system.

2.5.3 Recharne Canacity

The ability to load two consecutive 6400 tonne trains, at a rate set out in 2.5.1 with maximum headway of 140 minutes between trains is required.

2.6 Level 6

2.6.1

Loading Rate

The loading system at the facility shall be capable of loading a 9000 tonne net capacity train irr 120 minutes, starting from the time the first wagon is positioned under the loading bin until the time the last wagon is clear of the loading bin.

2.6.2 Overhead Coal Loadina

The facility shall have an overhead coal loading bin and a balloon loop with capacity to accommodate 1600m clear standing for a train before the bin and 1600m clear standing room for a train on the departure side of the bin.

2.6.3 Train Loadinq Telemetrv Control Svstem

The facility shall also provide an approved train loading telemetry control system compatible with current system provided in Freight Rail Locomotives and capable of relaying the following information from coal loader to lead

locomotive;
- required speed
- speed up
- slow down
- stop
- start

2.6.4 Recharge Capacitv

The facility shall be able to consistently load consecutive 9000 tonnes net capacity coal trains, with a maximum of 130 minutes headway (being the lapsed time between the arrival of one train and the arrival of the next).

2.6.5 Accuracy of Loading

The facility shall be able to load each wagon to within = 0.5 tonnes of its maximum load limit.

2.6.6 Electronic Train Performance Monitoring

The facility shall provide an electronic train perfonnance monitoring system which provides, independently auditable information on times of each;

- train arrival (urhole train inside loop)

- commencement and completion of loading.

2.6.7 System to Avoid Derailment due to Coal Soillane

The facility shall provide a suitable means of avoiding derailment due to coal spillage, durir~g loading operations, either resulting from failure of wagon doors or spillage from loading shute. A suggested means of achieving this is via a clean out pit below the bin, which is capable of holding 100

tonnes of coal.

2.6.8 Derailment Detection Ecuiornent

The facility shall have installed and keep operational at all times a device capable of detecting derailed wheel(s) or dragging equipment, which provides immediate stop indication to the train driver through the telemetry system. This device is to be installed in close proximity to the loading -bin on the departure side.

2.6.9 0 oeration of Faciiitv

2.6.9.1

The facility will commence loading of a train within 10 minutes of the first train's arrival at loop, consecutive trains loaded as stated in 2.6.4.

2.6.9.2 The facility will be available for loading coal trains 24 hrs per day 7 days per week.

2 6.9.3 Ongoing performance rev iew will be jointly carried out to ensure continued compliance with these conditions.

Track Standards

The following is provided to assist either new or existing Freight Rail Customers in obtaining Department of Transport Accreditation, for their Coal Terminal Facilities constructed and, to meet the transport task required of their facility.

3.1 Where 30 tonne axle load trains. are to run, coal terminals should be constructed to a minimum of Class 1XC track standards as set out in TS.3101.

Other coal terminals should desirably be constructed to a minimum of Class 1 siding standards as set out in TS.3101.

3.3 Track under the loading bin is to be constnJcted to allow easy cleaning and removal of spilt product, either a concrete slab design with the rail supported on pedestals as shown on SRA Drawing No. SS435, or where it is also proposed to load road vehicles, to SRA Drawing No.SS - 32, or as specifically designed to satisfy clause 2.6.7.

3.4
Track over unloading bins is to be designed in accordance with Metric Cooper.
M270 loading as specified in the ARA Bridge Design Code.

3.5 Earthworks will be constructed to the standards set out in TS.3423.

3.6 Trackwork will be constructed to the standards set out in TS.3103.

4. Track Layout and Signalling Aspects

4.1 **Balloon Loons**

4.1.1 Figure 1 shows the typical rail siding layout for a balloon loop facility. Where such a facility is to be located on a double mainline track section a facing crossover is required. Signalling control over the junction between the balloon loop siding and n~ainline is required including provision of catchpoint protection of mainline, unless otherwise specified by the Rail Access Corporation (RAC). This signalling system, to control the entry and departure of trains using the proposed facility must be approved by the RAC.

In the event that a Branch Line is required to connect between the RAC mainline and the balloon loop it shall be necessary to install an RAC approved signalling system to regulate the working of trains.

4.1.2 Balloon loop sidings should accommodate the largest sized trains to be operated.- Ongoing operational improvements may progressively lengthen coal trains requiring the modification of balloon loop facilities if they are to attract the highest freight rate concessions. It is therefore advisable that the initial siting and design of such facilities take into account the ease and flexibility to handle future track extensions and signalling ~odih.cations. In particular consideration should be giver; to fiature civil and signalling works required to relo~te the balloon loop's mainline junction with RAC track. ;

4.1.3 Train movements around the balloon loop are preferably anticlockwise but where all rail track gradients and other physical: factors mitigate otherwise, clockwise operation is acceptable. Where radio telemetry control of train loading or unloading~ operations is provided at the terminal the train movement can be in either direction.

4.1.4 The entrance and exit to the balloon loop is normally Vi8 a single turnout from the main line.

4.1 5 Where the loading bin is proposed to be located adjacent to an existing main line no portion of the structure and foundations shall be closer than 6200mm to the centre line of the nearest mainline.

4.1.6 The balloon loop shall be ideally designed to accommodate one maximum sized trains ahead of the loading bin and one maximised sized train beyond the loading bin .

4.1.7 The bin facility shall be located on tangent (straight) track so that each wagon being unloaded or loaded is always on this straight. The absolute minimum straight length shall be 26m. (See Figure 1)

4.1.8 Where a balloon loop is to be worked under a joint user arrangement (ie. v~hen two parties share the loop) the preferred loading operation is via a singlo loading bin fed by conveyor from separate stockpiles.

4.1.9 The regulation of train speeds during loading or unloading is required using either: - .

An approved radio telemetry system.

An approved loading light system operating in unison, set at maximum intervals of 100 metres, from the bin to a point where the train driver is able to observe the final loading signal when the last wagon is being loaded.

4.1.10 An approach 'signal light (SRA type) shall be provided ahead of each loading or unloading bin to regulate entry by approaching trains and shall be under the control of an employee of the facilitis owner. For overhead loading bins with retractable loading chutes, an approach signal light shall be provided and interlocked to ensure the signal light cannot be cleared with a lowered loading chute.

4.1.11 Balloon loop departure and mainline junotion signals, including track circuits, shall be of an RAC approved design and installed under RAC authorised supervision.

Loading lights where installed, and loadinglunloading approach signal lights are to be of a distinctive appearance to distinguish them from SRA signals. See copy of SRA Plan No.M01 -235 attached.

Runaround Loops

4.2.1 If agreed by the General Manager Coal Services, or a nominated representative, the terminal may be designed as a runaround loop. The"location of the loop in relation to the bin shall be determined to suit the site and the frequency of trains. General layout for such a facility is shown in Figure 2.

4.2.2 Locomotive run -round faciliUes shall be clear of the mainlines unless otherwise approved.

.

4.2.3 Many of the requirements for balloon loops also apply to runaround loops. The sections in this Standard that also apply in the case of runaround loops are:

Section 4 1.1
Section 4.1.2
Section 4.1.4Just substitute runaround loop
Section 4.1.5for balloon loop and Figure 2
Section 4.1.7for Figure 1.

Section 4.1.8
Section 4.1.9
Section 4.1. 1 0
Section 4.1. 1 1

5. Track Design Requirements

5.1 Grading and Curvature

5.1.1 The loading of trains is to be generally carried out on a rising grade with the train in motion. The ideal loading grade is a constant rising grade of 1 in 300 for a train length each side of the loading facility but Preight Rail will evaluate each case individually as per Section 5.1.2.

5.1.2 The preliminary design of the facility should be submitted to the General Manager Coal Services, indicating the horizontal alignment and a longitudinal section to allow approval in principal to be obtained prior to final design being commenced. Ideally this documentation should be accompanied by a computer simulation of the movement of a train through the loader to relate locomotive drawbar force to total individual vehicle resistances induced by their loadedlempty state and their relationship to grades and curves. This simulation wili then be used to identify excessive drawbar loads and difficulties in maintaining constant loading speeds.

5.1.3 The minimum curvature of a balloon loop shall be 200m.

Turnout and Catchpoints

5.2.1 All turnouts required for the loading/unloading facilities shall be of a standard type as defined in TS.3502.

5.2.2 That Standard also defines the crossing rate, switch length and weight of rail to be used dependent on the train speed requirement for the facility.

5.2.3 In the case of balloon loops which are remote from the main line, the junction turnout and iritervening track from the main iine to the loop shall be capable of sustaining a train speed of 50kmlh.

5.2.4 The bifurGation turnout within the loop will have a crossing rate and s~yitch length commensurate with the required train speed which for design purposes wlil be either

30krnih or 50kmth and depend on the crossing rate of the Junction turnout. ~

5.2.5 Where duplicated mainlines necessitate the siting of a facing crossover in advance of the junction tumout, this crossover will comprise turnouts with the same parameters as the junction turnout.

5.2.6 All catchpoints required tor the loading/unloading facilities shall be of a standard type as defined in TS.3504.

5.2.7 In balloon loops a catchpoint shall be installed between the main line junction and the bifurcation turnout to protect the main line traffic.

6.3 **Formation**

5.3.1 The formation is to be in accordance with TS.3421 and Drawing No. SP521 for sidings.

5.3.2 Wagon and examination areas and walkways are to be provided as specified for the particular location. Walkways should be on the 'inside' of any curves and suitable lighting installed.

5.3.3 Allowance for future electrification shall be provided in formation widths where specified.

5.4 **Documentation**

5.4.1 Prior to the commencement of construction a full set of transparencies showing the setting out detaiJs of all .trackwork, should be submitted to the Freight Rail, for review and retention for [uturo reference. ThE,se plans should show, to scale, the horizontal and vertical alignment and typical cross sections.

6. Overhead Loading Structure Design

6.1 The loading of trains will be by a continuous flow overhead loading

chute and bin of capacity approved by the General Manager Coal Services. The loading rate shall be as specified by the designated terminal level classification in Section-2.

The loading structure shall, not Infringe the standard structure gauge as detailed in C.2104, **Figure 1. The minimum clear width to** be maintained each side of the track centreline is given in Section 3.3 of C.2104.

6.3 All structures on-sidings in areas where main line electrification exists or is-to be allowed for, must make provision for electrification of the facility:-

6.4

In electrified areas where the locomotive is to pass under the loading structure, the minimum height clearance of the supporting structure must be 5650mm. (DC traction) or 5900 (AC traction), as appropoate. Loading, chutes in the retracted position only must be a minimum 5300mm above rail.

6.5

Provision for skids controlling the pantographs of the electric locomotive and the connection of the electric overhead system to the structure must be to the satisfaction of the Freight Rail .

6.6 Where the loading chute is designed to lower into the rail vehicle, the chute in the raised position must be a minimum of 5300mm above the designed rail level, the chute in th'e lowered position must be suitable for the range of vehicles to be loaded and extend to a minimum of 3500mm to the rail level. The maximum width of the loading chute is to be 1600mm.

The control to the chute must be adequate **to ensure that it can be** rapidly raised in an emergency.

6.7 In areas where the track - layout does not provide for a locomotive to pass under the,chute, the minimum height of any part of the supporting structure may be 5000mm above rail.

The actual loading chule in the raised position must be a minimum of 5000mm above rail.

6.8 The structural design of the overhead loading facility must be in accordance with appropriate Building Codes and Australian Standards and certified by a qualif~ed, practicing Structural Engineer recognised by the Institute of Engineers Australia.

6.9 The arrangen~ent to operate and secure the moveable facilities that can foul the stmcture gauge should be submitted in detail for review by the relevant Freight Rail Engineer to ensure safety.

Unloading Bins

7.1 The capacity of the bin should be adequate for unloading the

proposed maximum size unit train continuously' travelliny at

approximately 2kmlh.

7.2

Any weather -proof structure covering the bin must conforms to the clearance requirements of C.2104.

7.3 The bin shall Pe const~cted to accommodate a loading requirement of,l\Aetric Cooper M270 as specified in the HARA Bridge Design code

8. Mass Control at Loading Facility

8.1

For categories 1 to 5 an approved method of controlling the amount of product loaded into each wagon **is required to ensure** that the rail vehicles are not overloaded in terms of axle Joad or spillage of material on the track.

8.2 Ths preferred method is a batch **weighing system that pre-weighs** the amount placed into each vehicle. Altematively, a track weighbridge for ~veighing the loaded train could be installed.

8.3 Other alternative methods of control may be considered, but must be app roved by the Freight Rail.

9. References

Reference to T.S . or A.P can be found in the State Rail

Authority Branch Instruction Manual - Way and Works Branch. These references are provided to assist Freight Rail's customers with the necessary Department of Transport accreditation, of their facility.

This document is provided forthe use of either existing or new Freight Rail Customers, as part of ~ our ongoing commitment to cL stomer service.