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Notice of Advice

Attention	Amar Doshi	File No.	Final_Response_v0
Company	Queensland Competition Authority	Date	24-Jul-2019
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Project Name	Engineering Assessment of Aurizon Network's FY2017-18 Capital Expenditure Claim Review	Project No.	60591968
AECOM Ref	60591968_Var#1		
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From	Susheel Prabhakar		
Service	AECOM Response to Aurizon Network's Submission		
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AECOM submitted a final report on Engineering Assessment of Aurizon Network's FY2017-18 Capital Expenditure Claim (Assessment Report) on 23 May 2019; and the QCA invited submissions on the report from interested parties. Aurizon Network made one submission on the Assessment Report. The QCA has requested AECOM to respond to the submission where Aurizon Network has made reference to aspects of AECOM's assessment and findings.

In our Assessment Report, we recommended that the QCA not approve a total of $2.08m of the claim, pertaining to four (4) of the 27 projects sampled and reviewed for which we completely or partially rejected the cost claim. In their submission, Aurizon Network has sought to address those outstanding issues relating to the $2.08m raised in the Assessment Report and provide clarity about the circumstances relevant at the time of making the decision to incur the capital expenditure.

This Notice of Advice has been prepared at the request of the QCA in response to Aurizon Network's submission dated 24 June 2019 after review of the additional information and clarifications as provided by Aurizon Network. This notice briefly discusses our initial findings and the new information provided by Aurizon Network and provides our revised findings and conclusions.

Our view on proposed revised deductions is summarised in Table 1.

Table 1 Summary of revised deductions after review of Aurizon Network's submission

Projects	Issue Element	Total Project Claim	Proposed Initial Deductions	Initial Legend	Proposed Revised Deductions	Revised Legend
IV.00154 - Autotransformer Renewal	Standard	$1.44M	$1.44M	✗	$1.44M	✗
IV.00321 – Sleeper Renewal Program	Cost	$6.75M	$0.31M	✗	$0.00M	✓
IV.00323 – Track Upgrade FY2018	Scope	$23.45M	$0.15M	✗	$0.06M	✗
IV.00343 - Level Crossings Renewal	Cost	$5.42M	$0.18M	✗	$0.18M	✗
Total for the discussed issues	All	$37.06M	$2.08M		$1.67M	

1.0 IV.00154 FY17 Autotransformer Renewal Project

Project Overview

Autotransformers balance the voltages of the contact wire and secondary contact wire to the rail, as well as the current between both phases. Out of service autotransformers pose a risk that other autotransformer faults will lead to failure of the overhead system.

This project addresses the replacement of eight autotransformers on the Blackwater and Goonyella systems as they are nearing the end of their working lifecycle. It forms part of a 5-year program to replace all autotransformers at these systems. The project uses current specification 14MVA autotransformers to maintain the integrity of the overhead power distribution system and reduce Aurizon Network's exposure to reportable environmental incidents.

AECOM's Initial Assessment

IV.00154 - FY17 Autotransformer Renewal Project	Review Summary	**Scope**	✔
		Standard	✘
		Cost	✔

Capital Expenditure Claim	$1.44M
Impact of findings on Claim	$1.44M
Total accepted	**$0.00M**

Based on the condition assessments sighted and prioritisation process to identify those autotransformers requiring replacement, the project is considered prudent in scope, supported by a medium level of documentation quality.

This project is not considered prudent in standard due to the lack of justification for not addressing fire and explosion risk at the autotransformer sites. This is supported by a low level of documentation quality. It is recommended that the project is rejected from the FY17/18 claim in its entirety. It is recommended that a risk assessment is undertaken by Aurizon Network for each autotransformer site to determine the requirements for fire and explosion risk protection.

The project is considered prudent in cost, informed by a medium level of documentation quality.

Issues Raised in AECOM's Initial Assessment

The risk assessment carried out in 2013 (for feeder stations) and the 2017 autotransformer risk assessment report did not adequately address the requirements of the 2016 update of AS2067 for autotransformer sites. As such, the documentation provided by Aurizon Network which references these documents is not sufficient justification as for not addressing fire and explosion risk at the autotransformer sites.

AECOM recommended that a risk assessment is undertaken by Aurizon Network for each autotransformer site to determine the requirements for fire and explosion risk protection. The following three items were further discussed in Aurizon Network's submission and are important in relation to determining the prudency of standard:

Item 1

The Assessment Report stated that, *'It is noted that no design drawings have been provided for the connection of the bund to the earth grid, and Aurizon Network has advised that these do not exist. A design drawing for the bunds has been provided which is signed off by a structural RPEQ, however this does not show the connection to the earth grid. Photos and drawings of the fences' connection to the earth grid have been provided.'*

Item 2

Section 4.2.6, Item 2(a), Lightning arrestor of the Assessment Report stated that, *'The 2017 report is silent on whether the risk control of a lightning arrestor is applicable to the Autotransformer. There is not enough information to determine if lightning arrestors are installed at the Autotransformer sites. If not, then this risk control cannot be claimed, and this needs to be reflected in the risk assessment and may have an impact on the overall risk profile.'*

Item 3

The risk assessments carried out for each site identify a hazard of catastrophic AT fault, resulting in explosion and intense fire with the following controls of primary track feeder protection and secondary protection functions (e.g. fault locator). Section 4.2.6, Item 2(b), Mechanical Trip Signals' of the Assessment Report, stated that, *'There is not enough information to demonstrate proven reliability of the Fault Locators to be an effective risk control to avoid ignition of an explosion. In a separate capital funding request labelled 'CFR Traction Fault Locator Renewals' dated (19 September 2014), fault locators have previously been proven to be unreliable to provide exact fault location and to relay the Autotransformer Mechanical Trip Signals back to the Feeder Station for fast clearing of the supply feeding the autotransformer fault.'*

New Information Provided by Aurizon Network

Item 1

No response has been provided by Aurizon Network in relation to the lack of design drawings for the connection of the bund to the earth grid.

Item 2

In its submission to AECOM's initial assessment, Aurizon Network has provided a new report titled, 'Trackside Autotransformer Fire Wall Assessment', dated June 2019 to provide justification for not including the AS2067:2016 recommendation of installing fire walls at each autotransformer site. As part of the study, Aurizon Network has re-assessed the risks associated with fire and explosion at trackside autotransformer stations and has conducted individual risk assessments for each site.

Aurizon Network 's response, detailed in the Trackside Autotransformer Fire Wall Assessment report, states, *'Aurizon Network's specification, 'SAF/SPC/5175/ELE/NET High Voltage Electric Traction System Construction and Commissioning clearly states that surge arrestors are installed at all trackside AT sites'* at specific locations detailed in the report.

Item 3

Aurizon Network response detailed in the Trackside Autotransformer Fire Wall Assessment report, states, *'The ability of the Traction Fault Locators to relay mechanical trip signals to traction substations is seen as a backup protection function. The protection system is designed so that any severe internal AT fault would be detected by the primary track feeder protection relays. If the primary protection failed to operate, the Fault Locator would serve as this backup to arrest the source of ignition of a fire by tripping the relevant circuit breakers.*

Furthermore, it should be noted that the telecommunications system that this protection runs on, is a highly available carrier-grade PDH system. Such systems have long been used for tele-protection purposes and adhere to IEC 60834 requirements. On this basis Aurizon Network is justified in claiming that the Fault Locators provide a valid backup risk control for fire at trackside AT sites.'

AECOM's Review of New Information

Item 1

Electrical RPEQ signed off drawings for each individual site, showing the modification to the earth grid, following the new bund installations, and the connection of the rebar into the earth grid still have not been sighted. Photographs sited show the gates opening outwards which would mean that the earth grid should have been extended to ensure that there are no excessive step and touch potentials when the gate is in the open position. As no design drawings have been made available, it is difficult to determine if the earth grid is in accordance with AS2067:2016.

Item 2

The site-specific risk assessment dated 20th June 2019 provided by Aurizon has generally addressed the seven key points raised in our initial assessment with the exception of surge arrestors (this item) and transformer protection systems (next item). There is no documentary or photographic evidence indicating that surge arrestors have been installed at these sites to protect from direct and indirect lightning strikes. The risk assessments have assumed that both surge arrestors and lightning rods have been installed at the sites in accordance with SAF/SPC/5175/ELE/NET, to mitigate risks of such a hazard from occurring.

Without documentary or photographic evidence to show that these surge arrestor systems are in place, it is difficult to determine if the lightning protection is in accordance with AS2067:2016 and if they are a valid control to mitigate the risk of fire/ explosion at trackside AT sites.

Item 3

Transformer protection systems rely on two different types of protection devices, ones which measure the electrical properties of the system, and ones which measure the physical quantities of the transformer, known as mechanical protection. Autotransformers utilise both types of protection devices to fully protect the transformer from catastrophic damage, of which neither is regarded as primary or back-up. For example, a Buchholz relay is designed to operate before the fault would be seen by the electrical protection systems. Aurizon Network's new report fails to mention that the trip signals are required to be processed by the SCADA system prior to sending a trip signal to the relevant circuit breaker for fault disconnection. This can result in long clearing times, even for back-up protection systems.

Without evidence to show that the mechanical protection systems have been tested and proven to provide rapid fault disconnection within the required tripping times, it is difficult to determine if the mechanical protection systems are a valid control to mitigate the risk of fire/ explosion at trackside AT sites.

Revised Conclusion by AECOM

AECOM understands that many of the recommendations detailed within AS2067:2016 are not mandatory and as asset owners, Aurizon Network can choose to ignore them. The revised risk assessments provide evidence of compliance with the requirements of AS2067:2016 for the protection against fire and explosion. However, there is a lack of documentary evidence to support that the risk mitigation controls are in place and proven to operate.

While AECOM is generally satisfied that Aurizon has justified that fire walls are not required for these trackside AT sites, we also believe that it is reasonable to expect that infrastructure and systems would have been designed, installed and tested in accordance with the relevant standards. However, overall there is a lack of electrical RPEQ sign off and lack of documentation provided to AECOM which proves that the installations have been designed, installed and tested in accordance with the relevant standards.

On this basis AECOM is still unable to confirm that this project meets all relevant standards. The aforementioned issues are of such fundamental nature that we are unable to separate the effects of non-compliance, if there is, from the overall project. It is therefore, recommended that the project is rejected from the FY17/18 claim in its entirety based on medium level of documentation. The provision of appropriate documentation would have a bearing on our assessment. It is recommended that Aurizon Network provides:

1. ***Electrical RPEQ signed off drawings for each individual site, showing the modification to the earth grid, following the new bund installations, and the connection of the rebar into the earth grid and evidence to support correct installation has been achieved.***
2. ***Documentary evidence to support that the protection systems such as lightning surge arrestors, lightning rods and transformer mechanical protection fault locators have been installed and tested in accordance with relevant standards.***

IV.00154 - FY17 Autotransformer Renewal Project	Review Summary	**Scope**	✔
		Standard	✘
		Cost	✔

Capital Expenditure Claim	$1.44M
Impact of findings on Claim	$1.44M
Total accepted	**$0.00M**

2.0 IV.00321 Sleeper Renewal Program FY18

Project Overview

Sleepers are a fundamental component of the track structure that ensures the reliable passage of trains by keeping the track aligned, holding the rails and distributing the load of the trains to the underlying soil.

The purpose of the project is to replace priority life expired and ineffective timber sleepers and corroded fist fastened concrete sleepers designed with current standard 28tal Pandrol E-clip concrete sleepers at numerous identified sites within the Goonyella, Moura, Newlands and Blackwater systems. The project will also replace derailment damaged sleepers and upgrade timber sleeper tracks with high maintenance and replacement requirements. The upgrades ensure the track can carry the current and future traffic tasks and provide an asset suitable to the corrosive environments within the coal network.

AECOM's Initial Assessment

IV.00321 - Sleeper Renewal Program FY18	Review Summary	**Scope**	✔
		Standard	✔
		Cost	✘

Capital Expenditure Claim	$6.75M
Impact of findings on Claim	$0.31M
Total accepted	**$6.44M**

The scope of work is considered to be prudent, supported by a high level of documentation quality.

The standard of work is considered to be prudent, supporting a high level of documentation quality.

The cost of work is considered to be not prudent, supported by a low level of documentation quality. A deduction of $0.3M from the capital claim is recommended, reflecting the difference between the FY17/18 unit rates and the FY16/17 unit rates.

Issues Raised in AECOM's Initial Assessment

The original cost for the project was budgeted for [redacted] per sleeper, for 25,512 sleepers. The actual cost for works incurred was [redacted] per sleeper, for 9,638 sleepers. The scope was reduced by Capital Challenge project removing 10,570 sleepers from the scope. This resulted in a cost reduction of $4.761 million. A further 1,621 sleepers were removed due to design constraints.

Multiple mobilisations and demobilisations at various sites were required due to the scope of works at each site exceeding available timeframes, incurring additional costs over that budgeted. This has resulted in a high unit rate for works completed. The budgeted unit cost of [redacted] per sleeper is considered to be a stretch target, as the actual cost of works incurred in FY16/17 was [redacted] per sleeper. Considering this, we have used the difference between the FY17/18 and FY16/17 unit rates to calculate the recommended cost deduction.

New Information Provided

Aurizon Network 's submission does not provide any new information to support the increase of sleeper unit costs, however, prompted AECOM to further review all the previously provided information.

Review of New Information

On a further review of the information we notice two items that have impact on our initial assessment. These can be explained as follows:

1. The team had based sleeper replacement unit cost calculations on the amount of $7,083,000 as included in the project's completion report. The actual claim for IV 000321 included in the Aurizon Network's submission to QCA was however based on the SAP report amount of $6,747,175.43.
2. Our initial review did not account for the reference to the requirement for Heavy Duty (HD) insulator replacements at a cost of $226,527.50 as a discreet and separate cost item to the sleeper replacement. We now consider that this cost should not form part of the sleeper replacement unit cost calculations.

Accounting for Item 1; the amount charged per sleeper replacement is in fact [redacted] not [redacted] as our initial assessment stated. Further, accounting for the HD insulator replacement in Item 2, the per unit sleeper replacement cost comes down to [redacted] per sleeper in FY17/18 when compared to [redacted] per sleeper for FY16/17. The difference between the two-unit costs is now about 1.1%. We are satisfied that this small increase is a reasonable percentage increase over the previous year given the number of scope changes documented and the additional mobilisation and demobilisation requirements.

Revised Conclusion

The cost of work (claimed $6,747,175.43) is considered to be prudent, supported by a medium level of documentation quality.

IV.00321 - Sleeper Renewal Program FY18	Review Summary	**Scope**	✔
		Standard	✔
		Cost	✔

Capital Expenditure Claim	$6.75M
Impact of findings on Claim	$0.00M
Total accepted	**$6.75M**

3.0 IV.00323 Track Upgrade FY18

Project Overview

A track upgrade site is the combination of a site with worn rail and an area of fist fastened concrete or timber sleepers of which both the rail and sleeper require replacement. In some cases, the scope may also request replacement of the ballast. Upgrading the track structures together maximises the efficiency of multiple asset renewal activities by only mobilising to a site once.

The mainline track was constructed with concrete sleepers with fist clips which fasten the rail to the sleeper. Constant exposure to coal and coastal environments has corroded the pins and clips of the sleepers, which may lead to a wide gauge or failure of the sleeper. These sleepers are also rated at 22.5tal while current track standards call for 28tal sleepers.

The project involved upgrading 24.6km of track and 32,860 sleepers with galvanized Pandrol E-clips and new ballast in the Goonyella, Newlands, Moura and Blackwater systems. The renewal of track assets at these locations ensures the ongoing integrity of the below rail infrastructure to facilitate the current and future traffic task.

The Track Upgrade Program aims to deliver supply chain benefit through increasing transit time, increasing reliability and maintaining compliance to standards and regulations.

AECOM's Initial Assessment

IV.00323 - Track Upgrade FY18	Review Summary	**Scope**	✗
		Standard	✓
		Cost	✓

Capital Expenditure Claim	$23.45M
Impact of findings on Claim	$0.15M
Total accepted	**$23.30M**

The scope of work is considered to be not prudent, supported by a low level of documentation quality. A deduction of $150,000 is recommended, reflective of the additional costs of rerailing at locations where condition information does not support rail renewal. It is recommended that Aurizon Network collect and store condition documentation with the project scope definition to combine all the supporting information that should be available for the IAR.

The standard of work is considered to be prudent, supported by a high level of documentation quality.

The cost of work is considered to be prudent, supported by a medium level of documentation quality.

Issues Raised in AECOM's Initial Assessment

A sampling approach was taken to access condition documentation for inclusion in the scope. Based on the provided information, for two of the 11 scope items the replacement of rail was considered to be not prudent, due to the following:

GA Coppabella Yard DN RD 145.612-146.046km

Rail wear of approximately 50% did not support the decision to rerail as part of the sleeper renewal works.

GA Coppabella-Broadlea UP RD 147.83-148.100km

No rail wear information was provided for the location.

A unit rate of [redacted] for material rail costs was used to calculate a recommended cost deduction of $150,000 for these two scope items, reflective of the additional costs of rerailing. Only material rail costs were accounted for, as the rail would still need to have been removed to complete the sleeper renewal works at these locations.

New Information Provided

Aurizon Network has provided further information regarding the two locations, described as follows:

GA Coppabella Yard DN RD 145.612-146.046km

Aurizon Network replaced two, short, reverse curves (both c. R1000m) at this location for a number of reasons, outlined below:

- According to the last head wear reading (January 2018, approx. three months before the renewal) three of the four legs were only marginally under 50% of CETS limits and the fourth leg was just over 50%;
- This particular job required replacement of three glue insulated joints (GIJs). It is important to understand that welds are typically weak points in track and therefore from a track structure perspective it is deemed a lower risk and a much safer option to have fewer welds;
- If Aurizon Network had reused existing rail it would have needed to weld new GIJs to 50% worn rail which would have required an additional six taper rails and associated welds, thereby introducing unnecessary operational risk, which could lead to increased costs and supply chain impacts; and
- From a track possession perspective, replacing the existing rail with new rail at the time meant no additional track possession time was required to complete the rail upgrade later. This ultimately reduced the impact to the overall supply chain and increased throughput for customers.

Therefore, Aurizon Network considered the benefit of replacing the existing rail with new rail resulted in eliminating the requirements for an additional six taper rails; and the requirements for additional welds (from twelve to six) ultimately mitigated any unnecessary risk.

GA Coppabella-Broadlea UP RD 147.83-148.100km

Aurizon Network upgraded the rail at the level crossing (ID3216 Private Cattle Crossing) located in Coppabella-Broadlea Section between 147.83-148-148.100km for the following reasons:

- Site walkouts for the level crossing identified derailment damaged 22t fist clip sleepers, which posed a derailment risk and could not be ignored;
- The track structure in this location are circa 1980s era; and
- The rail in this location has accumulated approximately 1,200 mgt over its life, introducing increased operational risk, which could lead to increased costs and supply chain impacts.

Therefore, Aurizon Network considered the benefits of mitigating a potential derailment risk in this location as a result of damaged fist clip sleepers and fatigued rail far outweighed the alternative to utilising the rails remaining 50% wear limits. Safety is the number one priority of Aurizon Network.

Review of New Information

GA Coppabella Yard DN RD 145.612-146.046km

The main reason for works at this location was to replace derailment damaged sleepers. The original information identified “4 GIJ’s need replacement” as the only information in the rail condition and new rail requirements section of the Technical Scope Track Form for this location as shown in Figure 1.

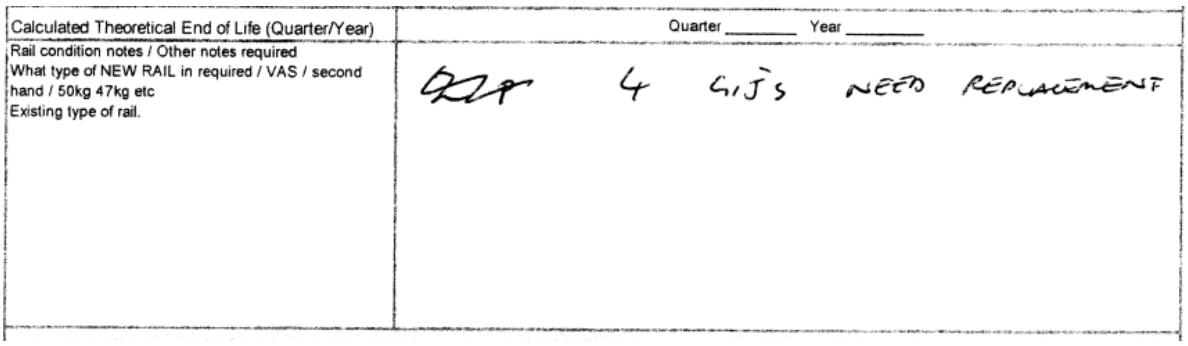

Figure 1 Except from Technical Scope Track Form GA Coppabella Yard DN RD 145.612-146.046km

This was seen to be identifying the number of GIJ's within the rail section requiring replacement as part of the rerailing whilst no adequate reasoning for rerailing in the first place was provided.

Aurizon Network in their submission stated that the GIJ's required replacement. From this statement and without the benefit of further detailed clarifications, we infer that GIJ replacement along with sleeper replacement were the main drivers for undertaking works at this location. Given the stated need to replace the 3 GIJ's (not 4 as identified in the original information) and existing rail wear requiring taper rails at each end of the GIJ's an additional 12 welds would have been required (4 welds at each GIJ assuming taper rails each side of the GIJ). Aurizon Network has also identified the issue of welds as a weaker point in the track.

Based on the additional information the decision to replace the rail as part of the works for the main purposes of sleeper and GIJ replacement can be considered as prudent.

GA Coppabella-Broadlea UP RD 147.83-148.100km

AECOM identified the replacement of sleepers in this location to be prudent based on the originally provided information, however, no rail condition information was provided to justify rerailing.

The new information provided by Aurizon Network identified that the rail had a remain life of 50% without any further supporting information. No data to support the rail fatigue, such as rail defects, has been provided to support an identification of a potential safety risk. Any rail fatigue, when identified should have been clearly noted in the systems and investigated in detail. Without defect information to support rail replacement due to number of defects rather than the wear, we maintain the original recommendation that the rail replacement at this location is not considered prudent.

Revised Conclusion

The scope of work (partial) is considered to be not prudent, supported by a medium level of documentation quality. AECOM has adjusted the length of rail considered to be not prudent in scope from 1408m to 540m rail. At a unit rate of [redacted], the recommended deduction equates to $59,400.

IV.00323 - Track Upgrade FY18	Review Summary	**Scope**	✗
		Standard	✔
		Cost	✔

Capital Expenditure Claim	$23.45M
Impact of findings on Claim	$0.06M
Total accepted	**$23.39M**

4.0 IV.00343 Level Crossings Renewal Program FY18

Project Overview

Rail level crossings are the intersection between road and railway lines, allowing road users to travel over the railway tracks. Aurizon Network manages the rail infrastructure of 763 rail level crossings within the CQCN.

This project aims to identify and renew level crossings on a cyclical basis within the Goonyella, Moura, Newlands and Blackwater systems. Works for this project include upgrading control systems, signage and remote monitoring systems, as well as rectifying level crossings that have inadequate flangeways. The project seeks to mitigate against level crossing failures to minimise safety risks to all stakeholders and prevent disruption of traffic.

AECOM's Initial Assessment

IV.00343 - Level Crossings Renewal Program FY18	Review Summary	**Scope**	✔
		Standard	✔
		Cost	✘

Capital Expenditure Claim	$5.42M
Impact of findings on Claim	$0.18M
Total accepted	**$5.24M**

The scope of work is considered to be prudent, supported by a low level of documentation quality as informal evidence was used. Evidence to support condition ratings would help to raise the documentation quality score.

The project standard is considered to be prudent, supported by a medium level of documentation quality.

The cost of work is considered to be not prudent, supported by a low level of documentation quality. It is recommended that $177,766 for 'FY19 Engineering Design' included in total project costs be deferred until next year.

Issues Raised in AECOM's Initial Assessment

Focussing on the cost of claim, we reiterate that the project was completed within the allowed budget of $6.3 million with a contingency of [redacted] which was not spent. Works were completed by Aurizon Network staff and external contractors, using existing supply agreements, demonstrating prudency and efficiency of costs.

Review of SAP data has indicated that costs for *'FY19 Engineering Design'* of $177,766 have been included in the FY17/18 claim. It was recommended that these costs should be deferred until the FY18/19 claim.

There is insufficient information to assess the effectiveness of project management and if the program was appropriate regarding timing, project management costs and risk allowances.

New Information Provided

No new information has been provided by Aurizon Network , however Aurizon Network submits that the UT5 does not specifically define whether or not 'design costs' alone are to be claimed in the year of expenditure. Aurizon Network submits that AECOM has contradicted itself by assessing that the cost of project was prudent but still recommending deferment of costs for *'FY19 Engineering Design'* of $177,766 until the FY18/19 claim.

Review of New Information

We note that AECOM's intention to state in its initial assessment that the costs are not prudent are not because the project costs for the given scope in FY18 in total are not prudent and efficient but because claiming of *'FY19 Engineering Design'* of $177,766 in FY17/18 does not pass the prudency test because we do not have the information to review the scope or designs that these relate to as the work is planned for FY19. Therefore, we maintain that AECOM initial assessment is not contradictory in itself.

Revised Conclusion

It has been demonstrated in numerous instances within the Aurizon Network submissions that the scope and program of works often changes and the design that these costs relate to could potentially change and/or be deferred to a later financial year and that is the reason we still recommend the costs for the design for works which seems to be planned to be incurred in the next financial year be deferred until that year i.e. until the FY18/19 claim.

If UT5 does not specifically define whether or not 'design costs' alone (or any other cost elements of a project for that matter) are to be claimed in the year of expenditure, as Aurizon Network submits, the decision to allow for such a claim is not for AECOM to make. however, we cannot assess the prudency of these costs.

AECOM therefore clarifies that claiming of 'FY19 Engineering Design' in year FY17/18 claim is considered to be not prudent, supported by a low level of documentation quality. It is recommended that claim for $177,766 for 'FY19 Engineering Design' included in total project cost claim for year FY17/18 be deferred until FY18/19.

IV.00343 - Level Crossings Renewal Program FY18	Review Summary	**Scope**	✔
		Standard	✔
		Cost	✘

Capital Expenditure Claim	$5.42M
Impact of findings on Claim	$0.18M
Total accepted	**$5.24M**

5.0 Revised Summary of Final Assessment

A revised summary of final Engineering Assessment of Aurizon Network's FY2017-18 Capital Expenditure Claim is presented in Table 2.

Table 2 Revised Final Assessment Summary

Project	Prudency Asessment			Project Cost ($ million)		
	Scope	Standard	Cost	Claim	Adjust.	Accepted
A.04599 - Havilah Culverts Upgrade	✔	✔	✔	$8.72		$8.72
All Growth Projects (AUGEX)				**$8.72**		**$8.72**
IV.00004 - Traction Fault Locator Renewal	✔	✔	✔	$1.99		$1.99
IV.00049 - Radio System Replacement	✔	✔	✔	$23.35		$23.35
IV.00144 - Rail Renewal FY17	✔	✔	✔	$2.06		$2.06
IV.00145 - Track Upgrade FY17	✔	✔	✔	$5.15		$5.15
IV.00146 - Sleeper Renewal FY17	✔	✔	✔	$2.84		$2.84
IV.00154 - FY17 Autotransformer Renewal Project	✔	✘	✔	$1.44	$1.44	
IV.00168 - Turnout Renewal FY17	✔	✔	✔	$2.69		$2.69
IV.00170 - Bridge Ballast Renewals FY17	✔	✔	✔	$1.28		$1.28
IV.00261 - Telecommunications Infrastructure Renewal	✔	✔	✔	$1.88		$1.88
IV.00267 - Asset Protection Equipment Replacement	✔	✔	✔	$0.24		$0.24
IV.00270 - Ethernet to Corner SCADA Upgrade FY17	✔	✔	✔	$3.02		$3.02
IV.00283 - Traction SCADA System	✔	✔	✔	$2.08		$2.08
IV.00294 - Goonyella Supersite FY17	✔	✔	✔	$2.15		$2.15
IV.00321 - Sleeper Renewal Program FY18	✔	✔	✔	$6.75		$6.75
IV.00322 - Rail Renewal FY18	✔	✔	✔	$21.47		$21.47
IV.00323 - Track Upgrade FY18	✘	✔	✔	$23.45	$0.06	$23.39
IV.00334 - Bridge Ballast Renewal Program FY18	✔	✔	✔	$7.27		$7.27
IV.00343 - Level Crossings Renewal Program FY18	✔	✔	✘	$5.42	$0.18	$5.24
IV.00344 - Formation Renewal FY18	✔	✔	✔	$12.24		$12.24
IV.00346 - Package 1 FY18 Control Systems Renewal	✔	✔	✔	$8.22		$8.22
IV.00347 - Package 2 FY18 Control Systems Renewal	✔	✔	✔	$8.04		$8.04
IV.00360 - Network Asset Mgt System Tranche 2	✔	✔	✔	$5.31		$5.31
IV.00364 - Turnout Renewal FY18	✔	✔	✔	$11.50		$11.50
IV.00375 - Corridor Security & Fencing FY18	✔	✔	✔	$0.77		$0.77
IV.00384 - OH Equipment Renewal FY18	✔	✔	✔	$3.46		$3.46
IV.00399 - 2017 Cyclone Debbie Rectification	✔	✔	✔	$4.44		$4.44
All Renewal Projects (REPEX)				**$168.50**	**$1.67**	**$166.83**
All Projects Reviewed				**$177.22**	**$1.67**	**$175.55**