Economic Regulation Authority

Technical advice in relation to the efficiency and appropriateness of proposed forecast capital expenditure requested by the Australian Energy Market Operator for the AR4 Period 2016-19

December 2018

Stantons International
Chartered Accountants and Consultants

PROJECT SUMMARY

Scope	Provide advice into the Economic Regulation Authority's (ERA) assessment of the Australian Energy Market Operator's (AEMO) July 2018 supplementary proposal for the fourth Allowable Revenue (AR) period covering capital expenditure only.
Objectives	In line with the ERA's obligations (clauses 2.22A.11 (b) and 1.20.3 of the Wholesale Electricity Market Rules (Market Rules)), the ERA is required to ensure that AEMO's additional forecast capital expenditure request for AR4 only includes expenditure that would be incurred by a prudent service provider " acting efficiently, seeking to achieve the lowest practicably sustainable cost of delivering the services described in clause 2.22A.1 in accordance with these Wholesale Market Rules, while effectively promoting the Wholesale Market Objectives." This consultant's report supports the ERA in making its assessment.
	Review the approach taken by AEMO regarding the: • Transition of Systems Management systems from Western Power to AEMO's Information Technology (IT) platforms. • Implementation of its new energy management system. • Transfer of Market Operations systems from the Malaga Data Centre to AEMO's private cloud-based system.
	Assess whether these changes represent a reasonable approach given the market reform timeframe.
	Review AEMO's forecast capital expenditure for all the activities outlined in its proposal (rule changes, market reform and IT systems) and form an opinion of whether these are consistent with the expenditure approval requirements in the Market Rules.
	Provide advice if there are any implications or recommendations from the consultant's assessment of AR4 expenditure that should also be considered when the ERA is required to assess AEMO's forecasts in future review periods.
Period of consultancy	October 2018 – November 2018
Consultant(s)	James Cottrill – Principal, IT Audit and Risk Consulting / Internal Audit Rhys Gallagher – Senior Manager, IT Audit and Risk Consulting / Internal Audit

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1 SUMMARY

1.1 OVERALL COMMENTS

Stantons international (Stantons) positions and recommendations detailed within this report considered Market Rules, justification, approach, risk within the project and approach to lowest practicable cost for input into ERA's decision making. Further Stantons gave consideration of the latest submission, sought clarifications, performed analysis and benchmarking.

Commentary was provided in relation to overarching processes, such as Information and Communication Technology (ICT) project management and costing approaches not clearly aligning to Market Rules. Stantons also provided comments from the assessment of each project.

For future submissions, a package of documentation from AEMO, designed to support statements and assumptions in the submission, should be provided for review by the ERA as early in the process as possible. This would make the process more efficient, and could include:

- Increasing the level of information to support claims and statements (i.e. costing breakdowns, project concept / brief, assumptions, risks, planned, budgeted and actual costing, options analysis).
- A proposed methodology in relation to allocation of the underspend amounts (where applicable).
- Clear information around cancelled projects and how these relate to later projects.

There was a unique level of complexity for the assessment due to:

- The submission was assessed half way through the AR4 request period and AEMO was utilising underspend during this period.
- This was the fourth submission in three years by AEMO.
- There are overlapping projects, including cancelled projects with similar scopes.
- Unclear under and overspend for commenced projects.

Stantons were appreciative that AEMO have been supportive in providing further documentation to the submission when requested. Additionally, Stantons were appreciative of Western Power and also Transpower (New Zealand) for the additional clarifications and insights offered for the process.

1.2 STANTONS INTERNATIONAL

Stantons International was founded in 1978 and is a medium-sized firm with offices in Perth, Darwin and Sydney. Stantons International provides a range of services to a mix of private and public sector clients. Stantons are a member of Russell Bedford International, a global network of independent accountancy firms, business consultants and specialist legal advisers; represented by more than 300 offices in over 100 countries.

Our IT Audit and Risk Consulting/Internal Audit Division provides internal audit (strategic internal audit planning, performance audits, assurance audits, control self-assessments), probity reviews (for major procurement projects), information technology audits (including application reviews, security reviews, post implementation reviews, computer operations reviews and system penetration testing), knowledge management and a wide range of consulting services to the public and private sectors.

Stantons have provided audit, assurance and consulting services to Western Power, Synergy and Horizon Power in both operational and financial areas, including management of power systems.

Stantons International was engaged by the ERA to support the IT based assessment for the Office of Shared Services Inquiry. Stantons were responsible for analysing the suitability/performance of the Department of Treasury and Finance Shared Services Centre finance and human resources software systems for whole of government shared services provision.

1.3 APPROACH

Stantons operated as part of the ERA assessment team for the duration of the consulting engagement including deploying one staff member on-site. This involved closely working with ERA to understand the non-IT system related components for WEM reform, rule changes and facilities.

The following areas were reviewed for each of the projects in the submission:

Area	Considerations
Context	• Business purpose, interdependencies, previous submissions and assumptions.
Rationale	• Business justification for each project. • Consideration of solution, complexities, surrounding processes, risk, support and scalability. • Consideration of Market Rules/ WEM reform. • Consideration of risk management and AEMO's shared process efficiencies.
Project Approach	• Justification for the project, structures, systems, location, infrastructure and risk. • Whether cost analysis or options analysis have been undertaken and assessed. • Benchmarking, through engagement with Western Power and Transpower (New Zealand). Transpower is New Zealand's electricity System Operator, and uses the same energy management system AEMO is looking to migrate to in Western Australia. It also manages the market through a similar suite of supporting systems. The scope of Transpower's involvement was to provide context around system implementation, complexity and composition and where available similarities and costing.
Costing	• Approach and assessment of costing.

Area	Considerations
	• Review of project overs, unders, cancellations and delays. • Contingency costing and assumptions. • Useful life of the projects. • Reasonableness of costing against Market Rules. • Consideration of risk management, AEMO structural efficiency and costing methodology.
Risk items	• Items identified that inform the approach, decisions or considerations.

Key engagement dates:

- AEMO Information Request 1: sent 30/08/18, interim 17/09/18, final received 28/09/18
- AEMO Information Request 2: sent 02/10/18, interim 10/10/18, final received 11/10/18
- AEMO Information Request 3: sent 16/10/18 interim 25/10/18, final received 26/10/18
- AEMO Information Request 4: discussed/sent 31/10/18, final received 7/11/18
- Project walkthrough with AEMO and associated Project Managers 08/10/18
- Discussions with Western Power 09/10/18
- Western Power Information Request: requested 09/10/18, received 22/10/18
- Discussions with Transpower relating to benchmarking 18/10/18
- Transpower Information Request 1: sent 24/10/18 received 30/10/18.

2 GENERAL OBSERVATIONS

2.1 INTEGRATION OF MARKET RULES INTO ICT STRATEGIC PLANNING

AEMO operates both the National Electricity Market (NEM) and the Western Australian Wholesale Electricity Market (WEM). This provides an opportunity to seek efficiencies through consolidating platforms and leveraging benefit from shared platforms and technologies. However, this also presents a risk that the AEMO organisation-wide strategy and business processes cater for a NEM environment due to its larger scale compared to the WEM and the supporting Market Rules.

Within the context of the current submission, AEMO's overarching ICT strategy is still being finalised and has not been provided for review. Once finalised, it would be critical to ensure that the document considers the WEM and the Market Rules as part of the decision making process.

Observation:

For current and future funding applications, the overarching strategy should include or align with the WEM and associated Market Rules 2.22A.11(b):

> *"incurred by a prudent service provider of the services described in clause 2.22A.1, acting efficiently, seeking to achieve the lowest practicably sustainable cost of delivering the services described in clause 2.22A.1 in accordance with these Market Rules, while effectively promoting the Wholesale Market Objectives."*

Risk:

There is an increased risk that:

- Decisions based on AEMO ICT strategy may not consider implications to the WEM, resulting in misalignment with the Market Rules and reduced value to WEM participants (Compliance).
- There is potential for disjoint between the underpinning business assumptions and processes set through the NEM (i.e. ICT strategy and holistic ICT based decisions) and alignment to the Market Rules, resulting in reduced value to WEM participants (Compliance).
- The needs of the WEM are not considered, due to being a smaller and simpler market than the NEM.

Recommendation:

1. The Market Rules for Western Australia will need due consideration and integration into AEMO's ICT strategic planning.

2.2 INTEGRATION OF MARKET RULES INTO PROJECT COST METHODOLOGY

The project governance model and project costing guidelines were reviewed to identify if there was consideration of the Western Australian Market Rules. The model and guidelines were not considered to align with the Market Rules due to project costing not integrating the 10 per cent variance rate detailed in section 2.22A.9 of the Market Rules.

The following diagram seeks to reinforce three areas Stantons provided comment on in relation to the project costing methodology:

1. Project contingency.
2. Overspend and underspend.
3. 10 per cent additional contingency available without needing to seek approval from ERA.

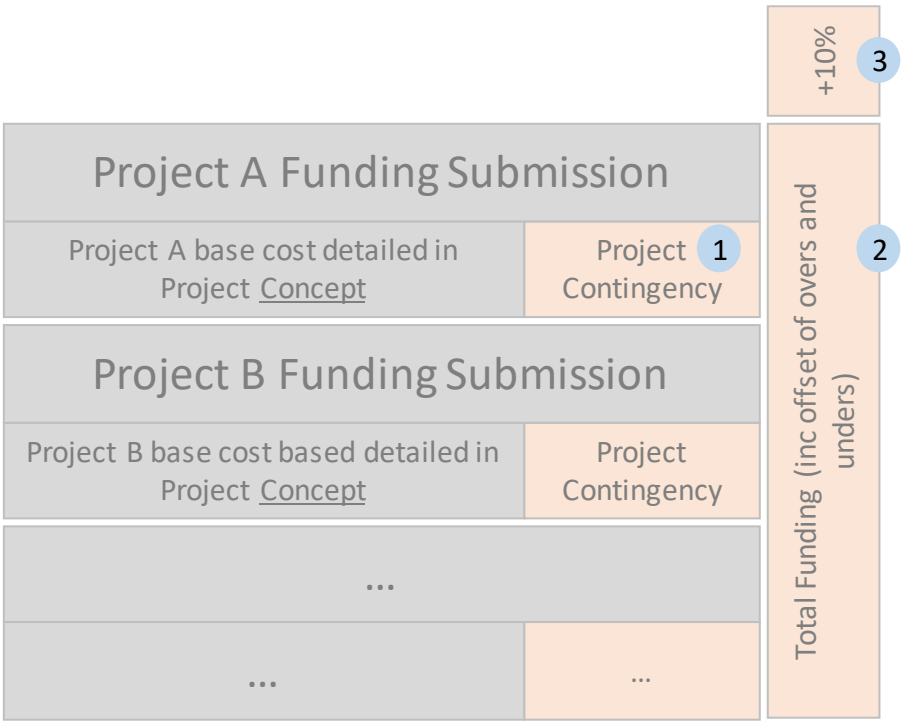

Diagram 1: Breakdown of contingency, offsets and 10 per cent variance

The following sections provide further detail in relation to review of the project costing methodology.

2.2.1 PROJECT CONTINGENCY

This section seeks to clarify contingency rates (lowest project cost multiplied by a percentage to factor in contingency which is typically informed by risk and project complexity). The following is a summary of contingency percentages applied by the AEMO to the individual projects included in its July 2018 proposal:

Table 1: Project contingency summary

Project	Contingency Original / Revised
WEM Reform	53%
Rule Change: New Notional Wholesale Meter Manifest Error	25%
Rule Change: Reduction in Prudential Exposure	22%
Energy Management System e-terra	(1) 12% / 14%
WEM System Management Systems Transition	(2) 30% / 35%
Market Operations IT Upgrade / Migration	(3) 9% / 11%
Facilities	N/A

(1) revised project costing contingency increased from 12% to 14%
(2) revised project costing contingency increased from 30% to 35%
(3) revised project costing contingency increased from 9% to 10%

For the three notes detailed above, both an original and revised costing information was provided to support contingency rates review. Where a project had already been commenced, the revised contingency rate was available.

Stantons notes that 15-30% contingency for complex ICT projects can be considered reasonable. Additionally, contingency should be based on clear and documented risk information to justify the values. Where assessing high technology risk projects, Stantons utilises the Department of Finance – ICT Business Case Guide, which details that contingency values of up to 30 per cent can be considered appropriate for complex ICT projects.

As such, the WEM reform contingency value of 53 per cent and revised System Management Systems Transition of 35 per cent are highlighted as out of standard range and further detailed within the project assessment section of this report.

2.2.2 OVERSPEND AND UNDERSPEND

The following model matches previous project activities to new projects to provide an indicative representation of previous projects. Projects were mapped based on name / similar scope and are not necessarily a direct correlation to those previously approved.

Table 2: ERA summary of project under and overspend against similar previous period projects

Business unit	Project	$m approved in July 2016	$m approved in July	$m total approved	$m Over/ Underspend	Current request
MO	Business As Usual (BAU)	6.29	-	6.29	-1.63	-
SM	BAU	2.21	-	2.21	-2.21	-
SM	SM Systems Transfer	5.51	-	5.51	-2.6	4.94
MO	RCM3 and RCM Auction	-	3.67	3.67	1.55	-
SM	Power System Operations	-	1.75	1.75	-	3.74
MO/SM	Data centre	-	3.44	3.44	-0.88	-
MO/SM	WEM Reform	-	2.73	2.73	-2.53	4.28
MO	Rule Changes	-	-	-	-	3.61
MO	IT update	-	-	-	-	2.03
MO/SM	New facilities	-	-	-	-	0.8
MO/SM	**Total**	**14.00**	**11.60**	**25.6**	**(8.29)**	**19.47**

Underspend leading into the latest AR4 submission review was $8.3 million. Due to timing of this submission in the AR4 period combined with the underspend, this has led to projects for approval in this submission being commenced while concurrently seeking funding.

The following summarises project status, previous project and whether the previous project was cancelled for context to understand the underspend.

Table 3: Project status and cancellation

Project	Project completed in this period?	Previous project?	Previous Project Cancelled?
Reform	Ongoing	Yes	Yes
Notional Wholesale Meter	Yes	No	No
RoPE	Ongoing	No	No
PSO	Ongoing	Yes	No
SMS	Ongoing	Yes	Yes
Infrastructure	Ongoing	No	No
Facilities	Ongoing	Yes	No

2.2.3 PROJECT COST 10 PER CENT VARIANCE

Review was undertaken of the AEMO project governance model and supporting project costing guidance. Stantons did not identify reference or inclusion of the 10 per cent variance available through the Market Rules for the calculation of project contingencies. The following is an extract from the Market Rules detailing the ten per cent variance available for total approved funding:

"2.22A.9. AEMO must apply to the Economic Regulation Authority to approve the adjusted Forecast Capital Expenditure for the current Review Period if the budget for a Financial Year is likely to result in capital expenditure, over the relevant Review Period, being at least 10% greater than the Forecast Capital Expenditure approved by the Economic Regulation Authority."

This variance is detailed in the Diagram 1 located in Section 2.2 above.

Observation:

Review of AEMO's project governance model and project costing guidance did not identify consideration of this variance for the calculation of project contingencies. Stantons views that the costing model does not appear to align with 2.22A.11(b) of the Market Rules due to not considering the available funding contingency arrangements:

> *"incurred by a prudent service provider of the services described in clause 2.22A.1, acting efficiently, seeking to achieve the lowest practicably sustainable cost of delivering the services described in clause 2.22A.1 in accordance with these Market Rules, while effectively promoting the Wholesale Market Objectives."*

Risk:

There is increased risk that:

- Project approval will be considered to have the entitlement for ten percent overspend over AEMO project contingencies, resulting in an additional capacity for 10 per cent overspend.
- Project costing methodology does not integrate the requirements of the Market Rules resulting in funding being requested that is not being costed at the lowest practicable sustainable cost.

Recommendation(s):

2. AEMO to revisit project costing methodologies to integrate the 10 per cent variance rate detailed in the Market Rules in its future funding proposals.
3. ERA, when approving components of the submission, to take into account the late stage of the AR4 period, and to consider an adjusted calculation to factor in the 10 per cent.
4. AEMO to provide an increased level of transparency for how contingency values are calculated for future submission requiring ERA review.

3 PROJECT ANALYSIS

3.1 MARKET OPERATIONS IT UPGRADE / MIGRATION

PROJECT OVERVIEW

This project is to migrate the Wholesale Electricity Market Systems (WEMS), the Reserve Capacity Mechanism (RCM) and the Gas Bulletin Board (GBB) systems from the AEMO Malaga Data Centre to the AEMO private cloud (located in the Eastern States) as the supporting coding platforms and infrastructure at Malaga are reaching the end of life. AEMO noted that equipment at Malaga does not conform to internal infrastructure and security standards and subsequently proposes consolidation onto the AEMO private cloud.

AEMO has requested $2.03 million for this project and advised that this is currently the most cost effective option, given the required level of system security and the availability of spare capacity in the AEMO private cloud. AEMO confirmed that cost associated with the GBB systems has been compartmentalised for costing and is not included in the July 2018 submission.

RATIONALE

Capacity exists within the AEMO private cloud to migrate the WEM systems and AEMO considers an ongoing cost saving when compared to retaining a larger footprint the Malaga Data Centre. The solution utilises three terrestrial paths, with two running in parallel and across multiple providers. Other options, such as the public cloud, were assessed and were not progressed due to considerations of security risk, costs and reduced control. Based on assessment of security requirements and risk, Stantons consider the private cloud approach reasonable, given the sensitivity of the software applications and AEMO's operational requirements.

Options analysis to determine staying at Malaga vs AEMO private cloud was reviewed. AEMO's rationale for this was that utilising shared infrastructure will result in minimal hardware and software requirements. Leveraging efficiencies from consistent and shared AEMO infrastructure to support the NEM and WEM was considered appropriate.

APPROACH

The following approach was undertaken for reviewing the project:

- Walkthrough was undertaken for current and previous submissions.
- Walkthrough of the project with AEMO.
- Multiple clarifications processes including: project documentation, costing, assumptions, systems and components.
- Re-calculation of costing using AEMO costing model and resourcing provided.
- Options analysis was reviewed.
- Breakdown of hardware and software costs provided and reviewed.

USEFUL LIFE

AEMO noted this project has a five year useful life. The useful life was considered reasonable when considering reform timeframes and potential for change in these systems, once the new market design is finalised. The useful life aligns with AEMO's Fixed Assets and Intangibles Policy.

COSTING

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model. The approach was considered structured and reasonable.

The level of detail in relation to non-personnel costing provided was high level. Stantons assumed multiple environments, multiple locations and overlayed high availability and security in relation to the systems. The costing excluding contingency was considered reasonable on this basis.

Contingency rate for the project was 11 per cent, which was based on a structured project costing model and informed by project risk, assumptions issues and dependencies documented in the project concept. The approach for informing and calculating the contingency was considered reasonable and within an acceptable ICT project contingency values.

RISK

The following potential risk events were noted:

- As AEMO operates the NEM and the WEM, efficiencies can be sought through consolidating to shared platforms. However, secondary risk may present where holistic support and management processes are not reflective of the WEM and the Market Rules. This does not represent risk to this project, but to overall AEMO processes.

RECOMMENDATION(S)

5. Base costing provided was considered reasonable and aligned with requirements in Market Rules, contingency rates were considered an acceptable value for an ICT project.

3.2 ENERGY MANAGEMENT SYSTEM E-TERRA

PROJECT OVERVIEW

This project relates to additional funding for the implementation of the Energy Management System (EMS) e-terra. AEMO is implementing e-terra for the Western Australian market as the replacement for Western Power's XA/21 EMS. E-terra is also the energy management system in place for the NEM. Western Power is comfortable with the choice of system by AEMO (e-terra), and discussions with Transpower in relation to the benchmarking component of the assessment outlined that it also operates an e-terra implementation for the New Zealand market.

The ERA previously approved $1.75 million for the Power System Operations project, which covered three systems AEMO uses to manage the South West Interconnected System (SWIS), including the EMS, a SWIS model and a demand forecasting model. To date two of the systems have been implemented. AEMO previously advised that it would seek an additional $3.04 million to complete the project, which has increased to $3.74 million in the latest submission.

AEMO is seeking to implement the e-terra system at version 2.5 in the first quarter of the 2019 calendar year. E-terra version 2.5 is currently on a 'legacy support arrangements', which means it is an outdated, but still supported version of the system (the duration of this support is often vendor and volume of clients dependent). In the February 2017 funding submission, AEMO has provided a roadmap for implementation and upgrade of the system to version 3.x and the current submission supports this approach. AEMO advised that the recommended upgrade timeframe for e-terra from version 2.5 to version 3.x from the vendor General Electric (GE) is by the end of the 2019 calendar year and that implementation of version 3.x in the NEM is not yet complete.

RATIONALE

Western Power's XA/21 platform is reaching end of its roadmap. The vendor GE and supporting skills in the market for this system are likely to become increasingly difficult to source and probably more expensive. Continued usage of the XA/21 system would require transition, upgrade and arrangements for continued Western Power and vendor support. Western Power estimated it would cost $6-8 million to upgrade the XA/21 system. Reliance was placed on this figure, although Western Power's full assumptions and basis for costing was not reviewed.

Implementation timeframes in relation to the EMS and System Management systems will extend beyond the 31 March 2019 expiry of the Service Level Agreement (SLA) with Western Power for the use of XA/21 and other the System Management systems. Re-negotiation of the SLA for longer periods would result in a higher risk of cost increases (likely operational-expenditure in nature) due to the commercial nature of the contract re-negotiation. Moving away from Western Power systems to e-terra version 2.5 to align with expiry of the SLA would result in saving further funding associated with continued usage of XA/21. The movement away was considered a reasonable approach.

AEMO noted where possible it will seek to standardise general components of the software application i.e. configuration such as layout between the NEM and WEM. This is designed to enable cost efficiencies in areas such as upgrade, support and accessibility from a remote disaster recovery site. AEMO clarified that to date there is a low level of customisation to the system. This will likely have the result of lower upgrade and support complexity of the system. AEMO notes that efficiencies in staff skills and lessons learned will be available for the WEM from an initial implementation of version 3.x within the NEM, this position was considered valid although arriving at a monetary value for efficiencies is very difficult.

AEMO noted the project approach is '…reducing the overall risk of introducing a new Operational Technology (OT) system into the WA operations (e.g. by bringing in a known version of e-terra)' and this represented the 'lowest operational risk/most cost effective approach'.

Once version 2.5 is implemented, a project has been noted and scheduled to commence in the AR5 period (2019 calendar year) to upgrade e-terra from version 2.5 to version 3.x. The NEM is currently in the process of upgrading from version 2.5 to version 3.x, which will effectively limit the available internal and external resources for an earlier WEM upgrade (or combined implementation / upgrade), resulting in either delays or increased costs. The selected approach was considered reasonable given the constraints and planning communicated to date.

The ERA explored the feasibility of delaying the e-terra upgrade (to version 3.x) to after the AR5 period. AEMO responded that this was not an option and would create significant operational risk, as system will be at end of support. Stantons considers that as far as reasonably practical the upgrade should be delayed, but does not consider AEMO should accept support related risk to the system. The approach was considered reasonable on the basis of resourcing already working on version 3.x in the NEM, efficiencies of lessons learned for the future WEM upgrade, not running the risk of concurrent upgrades including inefficiencies and stretched resources / costs.

APPROACH

The following approach was undertaken for reviewing the project:

- Walkthrough was undertaken for current and previous submissions.
- Walkthrough of the project with AEMO.
- Clarifications including: project documentation, costing, upgrade timeframes and specific costs, complexity of system implementation and customisation.
- Extracts from the SLA between AEMO and Western Power were provided in relation to the expiry and level of support.
- Re-calculation of costing using AEMO costing model and resourcing provided.
- Cost benefit assumptions were reviewed.
- Further clarifications were requested from AEMO.
- Benchmarking of system and market similarities and structures with Transpower.

USEFUL LIFE

A five year useful life for the project was noted (which aligns with AEMO capitalisation policy). The e-terra system can be argued as having a longer useful life i.e. 10-15 years considering long term asset investment of an EMS.

COSTING

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model. The approach was considered structured and reasonable.

The level of detail in relation to non-personnel costing provided was high level. Stantons assumed multiple environments, multiple locations and overlayed high availability and security in relation to the systems. Stantons were also informed from Transpower, who operate the same energy management system (albeit with configuration differences) as AEMO. The costing excluding contingency was considered reasonable on this basis.

AEMO confirmed hardware and infrastructure for e-terra were purchased on the basis of supporting the latest e-terra version. Therefore, indicative upgrade costs were noted as being resourcing and not hardware / software costs, which supports this statement. AEMO stated 'expectation that an upgrade would be an order of magnitude lower than the initial implementation' and provided a preliminary /

working figure of $500k (+/- 50%) subject to further project planning (to be included in the AR5 submission). The information although preliminary, provided a level of comfort that future proofing from a software license and hardware perspective has been undertaken for the implementation.

Options analysis was evidenced which utilised the Western Power $6-8 million upgrade value of XA/21 against implementation of the e-terra system per the amounts in the funding submission. Even when the indicative figures for the upgrade are considered, the cost of the e-terra option is still lower.

The contingency rate for the project was 14 per cent, which was based on a structured project costing model and informed by project risk, assumptions, issues and dependencies documented in the project concept document. The approach for informing and calculating the contingency was considered reasonable and within an acceptable ICT project contingency value.

Although very challenging to quantify, utilising as much common functionality and lessons learned from the NEM upgrade, will deliver synergies for support and upgrades of the system in the WEM. It is considered benefits will be realised in this area.

RISK

The following potential risk events were noted:

- Current reliance on the XA/21 system maintained at Western Power through the SLA. This agreement is extended on the basis that a system transition plan is in place.
- As AEMO operates the NEM and the WEM, efficiencies can be sought through consolidating to shared platforms. However, secondary risk may present where the strategies and approach do not align back to the WEM and the Market Rules (i.e. lowest practicably sustainable cost). This does not represent risk to this project, but to overall processes.
- Recovery timeframes from market participants may not align with actual useful life of the system, resulting in quicker recovery timeframes for AEMO.

Risk based assessment was made for the e-terra upgrade timeframes and in consideration of delays in WEM reform:

- Initial build and testing onto the version utilised in the Eastern States (version 2.5).
- Sustained arrangements with Western Power are not expected to be favourable to AEMO, given the support arrangements are reliant on low staff resourcing available (four-man team).

RECOMMENDATION(S)

6. Base costing provided was considered reasonable and aligned with requirements in Market Rules, contingency rates were considered an acceptable value for an ICT project.
7. As far as reasonably practical the upgrade should be delayed, but not to accept support related risk to the system.
8. Useful life of e-terra be reviewed with consideration of whether a 10-15 year life and longer participant recovery timeframe would be suitable.

3.3 WEM SYSTEM MANAGEMENT SYSTEMS TRANSITION

PROJECT OVERVIEW

This project is to complete the transition of all remaining System Management systems (such as dispatch and outage planning) from Western Power to AEMO. It includes moving the current system functionality (through a 'cut and paste' of existing code) to supported IT platforms and infrastructure on AEMO's private cloud solution.

The ERA has previously approved $5.5 million for an initial project relating to System Management transition. AEMO has underspent by $2.6 million and is currently seeking additional funding of $4.9 million. The current project includes re-platforming the systems and a 'cut and paste' of existing code to effectively retain the functionality, but on AEMO supported software platforms and hardware. Re-platforming will be to the AEMO private cloud, which is a based in the Eastern States and controlled by AEMO.

System Management systems are currently housed and supported by Western Power and an SLA is in place detailing areas such as support, availability and reliability. The SLA expired on 30 September 2018 and is currently in a six-month extension exercised until 31 March 2019.

It was noted that AEMO's 2016/17 Compliance Audit (independent assurance report) recommended that AEMO puts a very high priority on addressing the future of these systems.

RATIONALE

The current SLA with Western Power covers hosting and support of System Management systems and is extended up to March 2019. While AEMO is responsible for the operation of the WEM, it is reliant on Western Power (through the SLA) for system operation and support. The System Management systems are at end of life for both the application platforms and the underlying infrastructure. AEMO advised that the agreement with Western Power for the support of these legacy systems does not contain any penalty clauses relating to performance of the agreement and AEMO has limited recourse for performance. The approach to re-platform, transition and support the System Management systems was considered reasonable.

Benchmarking outlined that the suite / composition of supporting systems was commensurate with operating an energy management system and market systems.

APPROACH

The following approach was undertaken for reviewing the project:

- Walkthrough was undertaken for current and previous submissions.
- Walkthrough of the project with AEMO.
- Clarifications including: project documentation, options analysis, costing, composition of systems and functionality and timeframes.
- SLA with Western Power was reviewed.
- Re-calculation of costing using AEMO costing model and resourcing provided.
- Options analysis was reviewed.
- Further clarifications were provided to AEMO.
- Benchmarking of system and market similarities and structures with Transpower.

USEFUL LIFE

A three year useful life for infrastructure and five year useful life for business software was noted and was considered to align with industry standard and AEMO's Fixed Assets and Intangibles Policy.

The useful life also aligns with the approach of transitioning, where the software applications might need to change once the final market design has been set.

COSTING

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model. The approach was considered structured and reasonable.

If the project was not to progress in accordance with planned timeframes, renegotiation of the SLA is unlikely to be favourable through increased costs to AEMO for continued hosting / support.

The level of detail in relation to non-personnel costing provided was high level. Stantons assumed multiple environments, multiple locations and overlayed high availability and security in relation to the systems. Benchmarking with Transpower provided comfort in relation to the complexity of the IT environment supporting energy management and market operations being reasonable. The costing excluding contingency was considered reasonable on this basis.

Costing analysis performed by AEMO noted that the following options were considered to arrive at transitioning the systems:

- Remaining with Western Power: costing range was calculated as $6.47 to $7.73 million.
- Transitioning to AEMO: costing range was calculated as $4.09 to $5.31 million.

The contingency rate has changed since the project concept reviewed and increased from 30 per cent to 35 per cent. The project also had a $650k decrease in low cost resourcing. AEMO noted that approximately $500k was deferred to AR5, however, without deferring associated contingency into the AR5 period. Retaining the full allocation of contingency for the AR4 period, while deferring costs into the AR5 period (increasing the contingency rate to the higher 35 per cent) did not provide confidence that the contingency rate was reviewed for the project. Considering the level of information provided, the contingency based on the original rate of 30 per cent should be applied to the revised AR4 cost.

RISK

The following potential risks were noted:

- Secondary risk of AEMO leveraging AEMO wide efficiencies for the WEM is that the organisation-wide model for support and management processes may not reflect the WEM and the associated Market Rules. This does not represent risk to this project, but to overall processes.
- WEM System Management systems are not currently within direct control of AEMO, as these systems are housed and supported by Western Power through a SLA.
- Western Power's team, which support AEMO, have key staff member reliance risk due to the small size of the team (four staff), each with dedicated support areas.
- Systems reside on Western Power legacy hardware approaching end of life.
- The requests for funding from the Access Arrangement (AA) AA4 submission by Western Power for SMST and related projects have not been approved to date. This presents an increased risk to AEMO for re-negotiation, or extension of SLA and the level of recovery from AEMO to Western Power: i.e.
    - AA4 Initial proposal - Western Power – funding was not approved for $8.9 million
    - AA4 Revised proposal– Western Power System Management System Transition Costs – $4.1 million not approved (pending Further Final decision).

RECOMMENDATION(S)

9. Base costing provided was considered reasonable and aligned with requirements in Market Rules, contingency rates should be decreased and be proportionally allocated.

3.4 RULE CHANGES

PROJECT OVERVIEW

Two rule change projects were detailed within the July 2018 submission with coverage of the following Market Rule changes:

- RC_2017_06 – Reduction of the prudential exposure in the Reserve Capacity Mechanism.
- RC_2018_01 – New Notional Wholesale Meter Manifest Error.

Reduction in Prudential Exposure (RoPE)

This rule change project relates to a prudential risk in the WEM resulting from the market customers' Individual Reserve Capacity Management obligations. The implementation of the rule change was costed at $2.7 million in the Final Rule Change report. However, AEMO is now seeking funding of $3.5 million in AR4 and a further $1.6 million in the first year of AR5 (2019/20).

The project details changes to AEMO's IT systems across two phases:

- Phase 1: software changes required to implement the reduction in prudential exposure rule change by June 2019. Mostly related to the WEMS, RCM and interfacing systems.
- Phase 2: delivery of a new WEMS sub-system to improve the responsiveness of the outstanding amount calculation (Phase 2 will be part of the AR5 submission and is procedural in nature).

New Notional Wholesale Meter Manifest Error (Notional)

This rule change project relates to a manifest error in the method for annually setting and monthly adjusting market participants' Individual Reserve Capacity Requirements, as set out in Appendix 5 of the Market Rules. This project has a low level of complexity change compared to RoPE. AEMO's recent submission requested $112k for the project. In this instance the project has been completed in August 2018 below budget at an amount of $73,387.

RATIONALE

Reduction in Prudential Exposure (RoPE)

The change required is a high complexity change, impacting 21 WEMS sub-systems. The high level of complexity is due to the level of interconnectivity/interfacing of software applications (and subsequent design, implementation and testing of this). Benchmarking clarifications in conjunction with Transpower outlined that for complex market rule changes involving this level of interconnected/interfaced systems, costing of this magnitude would be reasonable.

Stantons worked with the ERA to better understand the wider factors, considerations and complexities of RoPE, these included:

- Final Rule Change Report: Reduction of the prudential exposure in the Reserve Capacity Mechanism (RC_2017_06) – Rule Change Panel – AEMO confirmed costing of the project at $2.7 million (note the additional $0.8 million in AR4 and the further $1.6 million in the first year of AR5 are procedural in nature).
- Given the late stage within the AR4 period and original commitment to $2.7 million, utilisation of additional funding for resourcing is unlikely.
- During clarification meetings AEMO identified that commencement of Phase 2 is likely to be in the AR5 period.
- Low levels of consultation for costing with Market participants.

New Notional Wholesale Meter Manifest Error (Notional)

The project is now completed and had a relatively low level of complexity. There was a low level of interconnected/interfaced software applications which required change.

APPROACH

The following approach was undertaken for reviewing the projects:

- Walkthrough was undertaken for current and previous submissions.
- Walkthrough of the project with AEMO.
- Clarifications including: project documentation, tender outcomes, costing, systems impacted by the change and functionality and timeframes.
- Re-calculation of costing using assumptions provided and AEMO costing model.
- Review of outcomes for the competitive tender process.
- Further clarifications were provided to AEMO.
- Benchmarking of similarities and structures with Transpower for suite of software applications impacted by the rule change component.

USEFUL LIFE

A five year useful life for both rule changes noted and was considered to align with industry standard, AEMO's Fixed Assets and Intangibles Policy and WEM reform timeframes.

COSTING

Reduction in Prudential Exposure (RoPE)

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model. Contracted services were per a fixed price tender, scoring and outcomes were provided in relation to this tender to demonstrate value for money assessment and risk considerations. The approach was considered structured and reasonable. Stantons were also informed from Transpower in relation to a similar IT environment supporting market operations in a complex interconnected/interfaced environment.

The amount of $3.5 million in the current submission includes $2.7 million for the rule change and the remainder to commence the procedural change (with additional funding to be requested in the AR5 period). Given the timing of the submission and the low likelihood of the procedural component commencing in the AR4 period, approval relates to the rule change component only.

Contingency rate for the project was 22 per cent, the approach for informing and calculating the contingency was considered reasonable and within an acceptable ICT project contingency value.

New Notional Wholesale Meter Manifest Error (Notional)

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model.

Contingency rate for the project was 25 per cent, which was based on a structured project costing model and informed by project risk, assumptions issues and dependencies. The approach for informing and calculating the contingency was considered reasonable and within an acceptable ICT project contingency value. However, this project has an actual value for project implementation and ERA's approval should consider this value.

RISK

The following potential risk events were noted for RoPE:

- Concern around complexity of the rule change and potential for overspend/time overruns for implementation.

- Timeline in relation to Phase 2 procedure change (due to commence in six to eight months May/June 2019) – reasonableness of spending $0.8 million in this period for the project.

RECOMMENDATION(S)

10. RoPE: Given that the high cost value for the implementation of the rule has already been endorsed by the Rule Change Panel (excluding procedural change), this was considered reasonable and is accepted to be aligned with requirements in the Market Rules.
11. Notional: Actual cost information provided by AEMO was considered reasonable and aligned with requirements in the Market Rules.

3.5 WEM REFORM

PROJECT PURPOSE

This project was triggered by the amended Market Rule 1.20, which requests AEMO to commence work on the development and implementation of the WEM reforms program and constrained network access reform, as determined by the Public Utilities Office.

The ERA has previously approved $2.7 million in forecast capital expenditure for WEM reform projects. However, to date AEMO has only spent $0.2 million. It is now seeking $4.3 million, mostly to recruit additional staff to provide project management, subject matter expertise and initial IT solution design activities.

There are three WEM reform activities detailed in the documentation provided:

- Project management.
- Market and regulatory design.
- System, business and process design.

RATIONALE

There was a lack of detailed information and supporting information included in the submission for this project to support costing details. The project relates to a significant scope of work from two previously funded and subsequently cancelled projects being Market Solution Design and Market Development. The rationale for cancellation and creation of a new project was not clear within the submission and follow-up clarifications.

AEMO advised that a project concept / project brief was not required (although AEMO advised that it went through the development process to arrive at costing information for the submission).

APPROACH

The following approach was undertaken for reviewing the project:

- Walkthrough was undertaken for current and previous submissions.
- Walkthrough of the project with AEMO.
- Clarifications including: project presentation, walk through and costing.
- Re-calculation of costing using assumptions provided and AEMO costing model.
- Further clarifications were provided to AEMO.

USEFUL LIFE

AEMO detailed a five year useful life. Given the WEM reform timeframes, the useful life was considered reasonable for the project.

COSTING

The use of a standard project model was utilised for costing resources to the project. Review of the calculation outlined internal staff rates and contractor rates were in alignment with this model.

Analysis was performed in relation to the low, medium and high costing ranges. The potential cost high rates appear to be the rationale for high levels of contingency rates, which result in a rate of 53 per cent for mid costing (costing basis for the submission) options and 80 per cent for high costing options and was considered very high.

Due to the delays in WEM reform activities, it is unlikely AEMO to require the full planned amount for detailed design consultants during this period.

RISK

Constrained network access reform is current lagging in relation to intended timeframes, which is likely to have the effect of resourcing in the submission not being fully required for the period.

RECOMMENDATION(S)

12. This project was considered not to receive additional funding and that reliance should be placed on the previous funding. The project relates to a significant scope of work from two previously funded and subsequently cancelled projects, the rationale for cancellation and creation of a new project was not clear within the submission and clarifications.

3.6 FACILITIES

PROJECT OVERVIEW

This project relates to additional office space and fit-out during the 2018/19 period to support staff required to undertake the projects included in the AR4 July 2018 submission. AEMO has requested $0.9 million to cover fit-out, leasing and IT costs until the end of 2018/19. AEMO has already secured additional floor space at its Perth office and has completed the fit-out of the working stations to be able to accommodate 38 additional resources during the busiest project periods for the WEM reform. The headcount figure was based on projected project resources.

In the original AR4 submission, published September 2016, AEMO noted the following scope in relation to the new office facility:

> *'A new, fit-for-purpose office facility capable of housing all employees and necessary infrastructure, will provide the workspace and environment for AEMO to develop standalone systems and prepare for new market structures to be introduced in July 2018'.*

RATIONALE

The current submission was unclear for how the additional resource spacing requirements deviated from original 2016-19 submission or the Head Office Relocation, especially given the level of cancelled projects within the AR4 period. Whilst justification for staff volumes across projects indicated additional space was needed, it was unclear why this was not included in the original new office scope of work.

APPROACH

The following approach was undertaken for reviewing the project:

- Walkthrough was undertaken for current and previous submissions.
- Clarifications with AEMO in relation to assumptions, costing and targeted queries.
- Review of process to appoint and select providers.

USEFUL LIFE

AEMO noted this project has a five year useful life and office fit-out was noted as not aligning with the lease period. The lease period for the original two floors (levels 44 and 45) occupied is ten years with an option for a further five years. The lease for Level 46 was required by the Landlord to be taken for a period correlating with the expiry of the original lease term for levels 45 and 44 resulting in a nine year lease expiring in August 2027 (the level 46 lease does not have any option for a further period). Both leases include the provision for AEMO to sub-lease or assign to another party any spare space not required in future years.

COSTING

As noted in the project overview, the 2016-19 allowable revenue submission to the ERA, published September 2016, included consideration of WEM reform funding.

AEMO did not go through a competitive tender process in relation to the fit-out, but utilised services with the same terms and conditions as the work previously undertaken for new office.

RISK

The following potential risk events were noted:

- Recovery of costs for the fit-out of the additional level could be utilised for purposes outside the scope of the submission.
- Timing for recovery of costs may not align with the useful life of the project.

RECOMMENDATION(S)

13. This project was considered not to receive additional funding. Whilst AEMO noted the rationale for the fit-out, AEMO should have provided clarity for how the additional space requirements from the original 2016-19 new office scope did not sufficiently cater for revised space requirements or how this approach related to the lowest practicably sustainable cost per the Market Rules.

    Additionally, the useful life for the office fit-out did not align with the lease period of nine years.