

ASX Limited

Independent Expert Assessment of ASX's Actions to address the IBM Review Recommendations

November 2022

LIMITATION

The findings contained in this Independent Expert Report are based on the findings of the report prepared at the request of ASX Limited solely for the purpose of providing an Independent Assessment of ASX's Actions to address the IBM Recommendations, and is not appropriate for use for other purposes. This report is provided for information purposes only in order to provide details of the findings reported to the ASX Limited and should not be taken as providing specific advice on any issue, nor may this be relied upon by any party other than ASX Limited and ASX's regulators ASIC and the RBA. In carrying out our work and preparing this report Ernst & Young has worked solely on the instructions and information of ASX Limited, and has not taken into account the interests or individual circumstances of any party other than ASX Limited and ASX's regulators ASIC and the RBA. Ernst & Young does not accept any responsibility for use of the information contained in this report and makes no guarantee nor accept any legal liability whatsoever arising from or connected to the accuracy, reliability, currency or completeness of any material contained herein. Ernst & Young expressly disclaims all liability for any costs, loss, damage, injury, or other consequence which may arise directly or indirectly from the use of, or reliance on, this Report.

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1. Executive Summary

Reporting summary for quarter

Our assessment found that ASX has continued to make progress towards addressing and implementing the IBM Review Recommendations (“IBMRs”) this quarter and has finalised and closed off another two (2) carryover ASX Actions (items previously determined to be incomplete) from prior quarterly reviews. ASX has demonstrated that they have taken feedback from our previous quarterly IE reviews and reports (including findings in the Design Adequacy report), and incorporated learnings and improvements into this review period.

While the ASX Delivery Excellence Program (“the Program”) continues to be well run, has the appropriate governance and oversight, and is staffed and supported by individuals well suited to deliver a quality outcome against the ASX Actions, we recognise that at this stage of the Program, ASX is addressing the more substantial and complex items compared to those submitted during previous quarters. Considering several variables, including; 1) the current and historic percentage completion rate of IBM Recommendations fully addressed on their first submission, 2) the current schedule the Program is working towards which assumes a final quarter that fully addresses 100% of the final quarter’s submitted Recommendations, and the aforementioned increase in complexity, there is a high probability the Program will not fully close all fifty-nine (59) Recommendations at the end of the final quarter (Q7) in June 2023 as there will be ASX Actions submitted for the first time in the Q7 report, and to date, we have not seen a 100% completion rate in any quarterly submission. We are encouraged by the fact that all resubmissions to date have fully addressed the IBM Recommendation they are focused on and believe this improves the chance for rapid closures after the Q7 submission. Finally, we note that Covid is still a potential issue and recognise that the management team is tracking this exposure yet has limited options to address it practically.

For this quarterly report (Q4), we have reviewed the six (6) Recommendations and found that four (4) of those Recommendations have been fully addressed, with two (2) Recommendations partially

addressed and requiring follow up evaluation in subsequent review periods. Of the twenty-seven (27) ASX Actions related to the six (6) Recommendations, twenty-five (25) have been fully completed. This brings the total number of submitted Recommendations to forty-nine (49) at the end of this fourth quarterly review, with forty-one (41) of those fully addressed and closed (including carryover items from previous quarterly review periods), and eight (8) partially addressed and requiring follow up evaluation in subsequent quarters.

The forty-nine (49) Recommendations submitted by ASX to date, represent a submission completion of 83% of the total fifty-nine (59) Recommendations required to be addressed under the Licence Condition, and a completion of 84% of the planned completed submissions (41 against a plan of 49 completed submissions) as per ASX’s updated delivery workplan in June 2022.

We will continue to evaluate and offer commentary on the processes, governance, and resources as we evaluate the closure of ASX Actions addressed by the Program in the future.

Historic findings and recommendations

This is our fourth Independent Expert quarterly review report under the Licence Condition.

Below is a summary of the outcomes from our quarterly reports to date:

Period	Submissions		Fully Addressed				Partially Addressed	
	IBMR	Actions	IBMR	%	Actions	%	IBMR	Actions
Q1	22	49	18	82%	44	90%	4	5
Q2	9	23	6	67%	20	87%	3	3
Q3	12	37	5	42%	26	70%	7	11
Q4	6	27	4	67%	25	93%	2	2
Total	49	136	33*		115*			

Please note, ‘%’ refers to ‘% fully completed’.

* Excludes partially addressed IBMRs and ASX Actions from previous quarters that were re-submitted by ASX in subsequent quarterly review periods for re-evaluation.

This summary highlights an improvement in the percentage of fully addressed IBM Recommendations and Actions in this quarter's submission against a dip in these numbers in the Q3 submission. All partially addressed Recommendations from Q1 and Q2, total of eight (8), have now been resubmitted by ASX and assessed by EY as fully addressed. There are currently eight (8) partially addressed Recommendations remaining from Q3 and Q4 which will be resubmitted in subsequent quarterly review periods and assessed by EY.

During Q3, ASX resubmitted responses for all four (4) IE Recommendations made in the April 2022 Design Adequacy Report for assessment. Three (3) IE Recommendations are now deemed fully addressed. The remaining IE Recommendation relating to 'Program governance and management - Change Management Strategy' was deemed partially addressed and ASX has stated in their September 2022 report that this will be resubmitted during the December 2022 quarterly reporting period for evaluation.

We are tracking the progress of the partially addressed Recommendations in this report (section 3.1), and ASX has provided an update as part of their September 2022 quarterly review submission.

For detailed progress of the fifty-nine (59) Recommendations please refer to Appendix E.

Background

In November 2020 an outage occurred following a major upgrade to ASX Operations Pty Ltd equity trading platform (ASX Trade), called the ASX Trade Refresh project. Consequently, the Australian Securities and Investments Commission (ASIC) and the Reserve Bank of Australia (RBA) required an Independent Expert review of the ASX Trade Refresh project to be completed. ASX appointed IBM Australia Limited (IBM) to undertake this review. IBM made fifty-nine (59) recommendations ("Recommendations" or "IBM Review Recommendations") in total across the following seven key domains in the review: risk, governance, delivery, requirements, vendor management, testing and incident management.

ASX subsequently developed a management response plan ("Response Plan" or "Plan") which consists of 182 deliverables ("ASX Action") to address the fifty-nine (59) IBM Recommendations.

In November 2021, the Minister imposed certain Licence Conditions on ASX. The Australian Market Licence (ASX Limited) Additional Conditions Notice 2021 (No. 1) dated 24 November 2021 requires ASX to:

- Address each of the IBM Review Recommendations to the satisfaction of ASIC, and
- Appoint an Independent Expert ("IE") to conduct an assessment of its implementation of the ASX Actions to address the IBM Review Recommendations.

Scope

In accordance with the relevant Licence Conditions, ASX, with ASIC's and RBA's consent, engaged Ernst & Young ("EY") to review each of the Quarterly Reports produced by ASX and assess whether the actions undertaken in the period covered by the report demonstrate appropriate implementation of, and progress towards addressing the IBM Review Recommendations. Refer to section 2.2 for detailed scope related to this report.

Approach

Our approach is to assess the quarterly reports produced by ASX. This includes an assessment of the closure packs and supporting evidence for the ASX Actions reported as closed during the period. As part of our assessment, we will consider:

- Whether the ASX Actions comprehensively address the relevant IBM Review Recommendations
- Whether the ASX Action is implemented in a sustainable manner
- The skills and experience of the people engaged by ASX to implement the ASX actions

- The closure of ASX actions is supported by demonstrable evidence, and has been subject to appropriate internal due diligence and governance processes
- The consistency of the attestations reported in ASX's quarterly report with our understanding of the status of the ASX actions.

Refer to section 2.3 for detailed approach related to this report.

2. Introduction

2.1 Background

Recommendations Review

To address the fifty-nine (59) IBM Recommendations, ASX subsequently developed a management response plan which consists of 182 deliverables. The Plan is structured around the following seven elements (which are different to the seven domains from the IBM review) that seek to improve ASX's project execution capability and to reduce the likelihood of similar project execution incidents in the future:

- Ensuring diverse thinking, avoidance of group think and challenge
- Increasing resources
- Upgrading policies, standards, and frameworks
- Educating staff so that they clearly understand the standards and practices expected of them
- Monitoring individual projects and the portfolio for compliance with ASX's policies, standards and frameworks
- Improving ASX's testing capability and capacity
- Improving ASX's project reporting and quality.

In November 2021, the Minister imposed certain Licence Conditions on ASX. The Australian Market Licence (ASX Limited) Additional Conditions Notice 2021 (No. 1) dated 24 November 2021 requires ASX to:

Address each of the recommendations to the satisfaction of ASIC, and

Appoint an Independent Expert (IE) to conduct an assessment of its implementation of the ASX actions to address the IBM review recommendations.

ASX has obtained the consent of ASIC to appoint Ernst & Young (EY) as the IE to conduct this assessment.

2.2 Scope

EY has been engaged to deliver the following scope of work:

In accordance with Licence Condition 4, ASX must by 31 January 2022 and thereafter within 14 days of each quarter end date occurring during the period from 31 March 2022 to 30 June 2023, give a report to ASIC and the IE containing an update on:

- The progress of the implementation of the ASX actions to address the review recommendations, and
- If there are any issues in implementing any remediation actions, the reasons for those issues and what action ASX will take to address them.

The quarterly report must be accompanied by an attestation from the relevant oversight body from ASX.

The scope of our engagement as the IE in accordance with the relevant licence condition is to:

- Review and assess each of the quarterly reports produced by ASX (as required under Licence Condition 3) and
- Within 30 days of receipt of each quarterly report, provide ASX and ASIC with a written report setting out whether the ASX Actions undertaken in the period covered by the report demonstrate appropriate implementation of, and progress towards addressing, the IBM review recommendations.

2.3 Approach










When conducting our assessment for the delivery of this report, the following activities were performed:

1. **Documentation review:** A detailed review and analysis of ASX's actions and provided artefacts, including closure packs, written responses, and additional supporting evidence. All documentation

was provided to EY by ASX based on a documentation request. A list of documentation reviewed can be found in Appendix D.

2. **Questionnaire submission to ASX:** Following review of the documentation, the EY team submitted a set of questions (if any) related to the recommendations and subsequent ASX actions 48 hours prior to the meeting where ASX prepared responses for the joint recommendation review workshops. A list of questionnaires submitted to ASX can be found in Appendix C.
3. **Recommendation review workshops:** Workshops were held to review and discuss the recommendations between key ASX stakeholders and EY SMRs (Subject Matter Resources) to go through the pre-submitted questions related to ASX's remedial actions approach. A list of all workshops conducted with ASX can be found in Appendix A and a list of interviewed ASX stakeholders can be found in Appendix B.

Following our review of the documentation, supporting evidence and knowledge gathered from recommendation review workshops with the relevant ASX stakeholders, the EY team have determined whether the ASX Actions are appropriate to close the IBM Recommendations by adopting the following approach for each of the ASX Actions:

1. **Has the recommendation been fully addressed by the ASX Action(s)?**
Yes  / No  / Partially done 
2. **Were ASX Action(s) in response to the IBM Recommendation reasonable and appropriate?**
Yes  / No  / Partially done 
3. **Is the ASX Action(s) sustainable? Has the ASX response to the recommendation considered measures to enforce / ensure that the ASX Actions remain closed in the future?**
Yes  / No  / Partially done 

The assessment criteria described above determines if the recommendation was fully, partially, or not appropriately addressed.

For detailed and comprehensive commentary around our decision, please refer to each recommendation's 'Findings' section.

2.4 Limitations

We draw your attention to the limitations inherent in this report:

- Our work was not performed in accordance with generally accepted auditing, review, or other assurance standards in Australia and accordingly does not express any form of assurance. This report does not constitute legal opinion or advice. We have not conducted a review to detect fraud or illegal acts.
- Our work does not assume any responsibility for any third-party products, programs or services, their performance or compliance with your specifications or otherwise.
- Our work did not intend to identify, address, or correct any errors or defects in your computer systems, other devices, or components thereof ("Systems"), whether or not due to imprecise or ambiguous entry, storage, interpretation, or processing or reporting of data. We are not be responsible for any defect or problem arising out of or related to data processing in any Systems.
- Our Recommendations review was limited to the information available and provided by ASX at this stage, where for future reviews included in the plan only high-level planning has been conducted and a detailed analysis of scope and effort is pending.
- Our review was limited to documents provided by ASX as deemed relevant in line with the agreed scope and EY requests, with the expectation that ASX had those artefacts documented to satisfy its own reporting needs.
- Any projection of the outcome related to the recommendation's response and its sustainability for future periods, is subject to the risk that the actions may become inadequate due to changes

in conditions, or that the degree of compliance around remedial actions taken may deteriorate over time.

- Our scope under the licence conditions requires us to oversee the ASX Actions taken related to ASX's Plan and our Independent Expert review which are relevant to the recommendations and its remedial actions. For the purpose of our engagement, we define oversee as to observe and inspect ASX has acted accordingly. ASX is accountable and responsible for the implementation activities and EY will not act as management or direct the implementation.

2.5 Use and disclosure of our reports

We are providing specific advice only for this engagement and for no other purpose and we disclaim any responsibility for the use of our advice for a different purpose or in a different context. If you plan to use this advice on another transaction or in another context, please let us know and provide us with all material information that we can provide advice tailored to the appropriate circumstances.

Our Reports (including the EY Summary Reports) may be relied upon by ASX and ASX's regulators, ASIC and the RBA, for the purpose outlined in this SOW only. We understand that ASIC and the RBA may issue a media release and/or a public report referring to or publishing the content of our Reports and may publish our Reports and/or the EY Summary Reports or make or issue its own summary from the content of our Reports.

For the avoidance of doubt, no other party other than ASX, ASIC and the RBA may rely on the Reports. We disclaim all responsibility to any such other party for any loss or liability that the other party may suffer or incur arising from or relating to or in any way connected with the contents of our Reports, the provision of our Reports to the other party or the reliance upon our report by the other party.

3. Monitoring of Partially Addressed Recommendations and ASX Actions

3.1 Previous quarterly review periods

The objective of this section is to monitor the status of IBM Recommendations that were submitted in previous quarterly review periods and deemed “partially addressed” or “not addressed”, and determine if it is fully executed and/or appropriate and/or sustainable following a re-submission by ASX and re-evaluation by the IE.

Q1 January 2022

In the first quarterly report submitted by ASX on 28 January 2022, we identified four (4) out of the twenty-two (22) submitted Recommendations as needing further evidence in future quarters for re-evaluation: 1.2.1, 5.1.1, 5.1.2 and 6.6.1.

ASX submitted all four (4) Partially Addressed Recommendations for re-evaluation in Q3 and these Recommendations have now all been assessed by EY as fully addressed. Please refer to our third IE quarterly report dated 12 August 2022 for outcome details and commentary.

Q2 March 2022

In the second quarterly report submitted by ASX on 13 April 2022, we identified three (3) out of the nine (9) submitted Recommendations as needing further evidence in future quarters for re-evaluation: 1.2.6, 1.3.6 and 6.4.8.

ASX submitted two (2) of the three (3) Partially Addressed Recommendations (1.2.6 and 1.3.6) for re-evaluation in Q3 and both of these Recommendations have now all been assessed by EY as fully addressed. Please refer to our third IE quarterly report dated 12 August 2022 for outcome details and commentary.

This quarter, ASX has submitted the Partially Addressed Recommendation 6.4.8 for re-evaluation in Q4 and below is the re-evaluation outcome:

6.4.8 - Consider using independent expert to review test plan for high risk projects

1. Establish model and panel for independent specialist review and advice regarding test strategy and plans and inclusion of specialist testing capabilities
2. Update estimation and delivery frameworks to include specialist review
3. Provide ongoing monitoring and reporting and feedback to ASX governance forums (TOSC/ARC), continuous improvement and QE governance

Outcome from Q2	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>While ASX has stated they will be providing ongoing monitoring, reporting and feedback to ASX governance forums (Project SGGs/ESGs, Enterprise Strategic Quality Forum and Project specific Strategic Quality forums, and other forums such as TOSC and ARC if required) to support the implementation of the Recommendation, ASX has not provided evidence that they have reported to their Enterprise Strategic Quality Forum and Project specific Strategic Quality forums or demonstrated that they have been able to maintain this new ongoing process.</p>		

	<p>As a result, we are marking the execution and sustainability of ASX Action 3 as 'Partially Addressed' until such time we can confirm that ASX has provided ongoing monitoring, reporting and feedback to the Enterprise Strategic Quality Forum and Project specific Strategic Quality forums, as stated in the 'Independent Specialist Test Strategy Reviews Metrics and Reporting' section in their QE&T Confluence space, and has been able to manage the new process.</p> <p>EY will include the completion of this 'Partially Addressed' item in its scope for subsequent reviews.</p>
Outcome from Q4 Re-evaluation	Fully Addressed
Comment	<p>This Recommendation is now fully addressed. ASX established the Quality Engineering & Testing Forum (QETF) in August 2022 and held the first QETF on Wednesday 31 August 2022. The QETF is held on the last Wednesday of each month. In the QETF Terms of Reference (ToR), ASX states that the QETF is an enterprise-level governance group made up of executive and senior leadership roles involved in software delivery, with an exclusive focus on product quality and testing process quality. Additionally, it is stated that one of the main tasks the QETF is responsible and accountable for is to <i>"review enterprise metrics against established targets to identify risks and improvement opportunities"</i>. The QETF is the QE Authority at ASX, superseding the governance forums (e.g., TOSC, Enterprise Strategic Quality Forum, ARC) mentioned in the ASX Action and Q2 report commentary.</p>

	<p>For more details on the QETF, please refer to Findings for Recommendation 6.5.2 in Section 4 'Our Findings' of this report.</p> <p>We have reviewed the QETF meeting evidence for the QETFs held to date (31 August 2022 and 28 September 2022). In the September 2022 meeting pack, ASX has shown that the Independent Testing Assessments (ITA), which is done by the external independent expert, and metrics have been included in the agenda of the QETF and discussed.</p>
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Q3 June 2022

In the third quarterly report submitted by ASX on 14 July 2022, we identified seven (7) out of the twelve (12) submitted Recommendations as needing further evidence in future quarters for re-evaluation: 1.4.1, 3.1.1, 3.2.2, 3.2.3, 3.2.5, 6.3.2 and 6.5.1.

ASX has submitted one (1) of the seven (7) Partially Addressed Recommendations (6.3.2) for re-evaluation in Q4 and below is the re-evaluation outcome:

6.3.2 - Define risk-based testing approach

1. Recruit second Test Lead (Methods, Processes, Procedures)
2. Design and implement an enhanced quality risk assessment and management methodology, aligned to risk-based pathways
3. Create a standardised quality risk and risk mitigation library aligned with ASX test methodology and techniques
4. Implement risk based testing methodology with appropriate education and communication
5. Integrate risk based testing methodology with metrics and reporting provided to QE authority

Outcome from Q3	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
ASX Action 4	✓	✓	✓
ASX Action 5	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>For ASX Action 5, while ASX has defined and documented the RBT approach and techniques into their testing policy and has recently implemented this in practice, ASX has not provided evidence that they have established the QE authority and reported the metrics to the forum.</p> <p>As a result, we are marking the execution, appropriateness, and sustainability of ASX Action 5 as 'Partially Addressed' until such time we can confirm that ASX has defined the terms of reference for the QE authority, established the forum, and reported metrics to the forum.</p> <p>EY will include the completion of this 'Partially Addressed' item in its scope for subsequent reviews.</p>		
Outcome from Q4 Re-evaluation	Fully Addressed		
Comment	<p>This Recommendation is now fully addressed. As stated in the Comment for Recommendation 6.4.8 above, ASX established the Quality Engineering & Testing Forum (QETF) in August 2022 and held the first QETF on Wednesday 31 August 2022. ASX has provided the meeting</p>		

slides for the QETFs held to date (31 August 2022 and 28 September 2022) and it is evident that the required RBT metrics have been reported to this new QE Authority. For more details on the QETF, please refer to Findings for Recommendation 6.5.2 in Section 4 'Our Findings' of this report.

ASX has stated in their September 2022 report that the Partially Addressed Recommendations 1.4.1, 3.1.1, 3.2.2, 3.2.3, 3.2.5 and 6.5.1 will be re-submitted during the December 2022 quarterly reporting period for evaluation.

For specific details relating to each Recommendation, please refer to the relevant IE quarterly review report for the period the Recommendation was originally submitted:

- First IE quarterly report dated 25 February 2022
- Second IE quarterly report dated 13 May 2022
- Third IE quarterly report dated 12 August 2022

For an overview of the status of each of the fifty-nine (59) Recommendations, please refer to Appendix E.

3.2 Design Adequacy Report

The objective of this section is to monitor the status of the recommendations we made as the IE in our Design Adequacy Report and determine if they have been addressed by ASX.

In our Design Adequacy Report, we provided four (4) recommendations ("IE Recommendations"), with two (2) relating to the overall 'Program governance and management' by ASX of its Delivery Excellence Program, one (1) relating to the 'Timing of ASX Actions' and one (1) relating to 'Adequacy of ASX Actions'.

ASX submitted responses for all four (4) IE Recommendations in June 2022 (Q3) for assessment and three (3) IE Recommendations have now been deemed fully addressed. Please refer to our third IE quarterly report dated 12 August 2022 for outcome details and commentary.

The remaining IE Recommendation relating to 'Program governance and management - Change Management Strategy' was deemed partially addressed.

#	IE Recommendation	Status	Date Due
1	Program governance and management Articulate Change Management strategy for assessing each Recommendation from an organisational change management perspective including people impact assessments, organisational change impacts, and training on implemented ASX Actions (including resourcing traceability to best ensure training completion is achieved) and communications approach	In Progress	30 June 2022 (in readiness for next quarter) Revised Date Due: 31 December 2022
Outcome	Partially addressed		
Comment	While we can see evidence of Change in the Delivery Excellence Program, the Change Management strategy should have an additional long-term plan with a target audience approach for communication and training in the long term. The shared strategy is very high level, and feasible for the duration of the Delivery		

Excellence Program, in order for the IE to deem this recommendation fully addressed, a long term strategy is required to assess, plan, and implement Change and ensure the culture of ASX has changed following the closure of the 59 IBM Recommendations. This requires recorded engagement from teams, such as HR and Change Management within ASX, going beyond Project and Risk approach, to change the culture and behavior of Projects in the future.

ASX will re-submit this item for assessment during the December 2022 quarterly reporting period.

Please refer to the Design Adequacy Report dated 27 April 2022 to read our detailed findings and commentary.

4. Our Findings

Detailed below are our Independent Expert findings following our assessment of the actions taken by ASX as part of their Response Plan to address the IBM Recommendations, on whether ASX have taken the adequate steps to close the recommendations.

The following pages provide detailed findings for each of the six (6) recommendations submitted by ASX to ASIC and RBA on 13 October 2022 as part of the fourth quarterly review period.

The 'Executed, Appropriate and Sustainable' summary table contains the final outcome of our review of the ASX Actions including the supporting materials, and whether they have been completed appropriately by ASX to close the IBM Recommendation. The 'Findings' section offers the rationale for an Action's successful completion or, in the event of an Action's failure to be successfully passed, the 'Comment' section of the summary table provides clarification of the shortcomings that should be addressed.

Summary of Review Recommendations Assessment

Of the six (6) Recommendations, four (4) were fully addressed. Within the six (6) Recommendations there were twenty-seven (27) ASX Actions. Of the twenty-seven (27) ASX Actions, twenty-five (25) were fully completed.

Below is a summarised view of the outcome of each Recommendation and its related ASX Action(s) submitted this quarter (September 2022). For detailed commentary around findings please refer to the following pages.

#	Recommendation / ASX Actions		Executed	Appropriate	Sustainable
1.3.4	Ensure key roles & responsibilities are included in PSG		Recommendation has been partially addressed		
	Action 1	Include as a topic of discussion in the Risk culture and awareness short and long-term education session in response 1.1.1-2	✓	✓	✓
	Action 2	Update Project Governance to include RACI matrix aligned to Scaled PM Framework	✓	✓	✓
	Action 3	Update the Expectations of Line 2 on PSGs to challenge on this topic	✓	✓	✓
3.2.1	Implement risk based pathways for project delivery tied to PRA		Recommendation has been partially addressed		
	Action 1	EPMO Lead to be recruited (New Headcount)	✓	✓	✓
	Action 2	Design and build a scaled PM Framework (and associated templates) that outlines the mandatory PM Framework deliverables and governance required throughout the Delivery Lifecycle and aligned to the Risk and Complexity of a project	✓	✓	✓
6.1.1	Create program to raise awareness of the importance of Testing and Testing's Vision		Recommendation has been addressed		
	Action 1	Revise ASX Quality Engineering Vision & Target State	✓	✓	✓
	Action 2	Revise ASX Quality Engineering Policy	✓	✓	✓
	Action 3	Identify stakeholders and create communications & education plan	✓	✓	✓
	Action 4	Create communication and education material	✓	✓	✓
	Action 5	Define framework for delivery of ongoing awareness, education, regular updates and communication of changes/additions	✓	✓	✓
	Action 6	Implement ongoing awareness program (broad-based and role-specific awareness)	✓	✓	✓

#	Recommendation / ASX Actions		Executed	Appropriate	Sustainable
6.4.3	Better coordination with customers on final IWT for high risk projects		Recommendation has been addressed		
	Action 1	Update QE policy (test methods and procedures section) and procedures to include guidelines for: a. Which projects should require a final stage of coordinated client testing b. Guidance on types of tests and scenarios which should	✓	✓	✓
6.5.2	Implement testing quality framework and metrics		Recommendation has been addressed		
	Action 1	Recruit Quality Engineering Lead (Metrics, Reporting and Assurance)	✓	✓	✓
	Action 2	Define RACI matrix for quality ownership, test execution and QE governance	✓	✓	✓
	Action 3	Enhance ASX delivery model to include gating approval of QE deliverables	✓	✓	✓
	Action 4	Define QE authority terms of reference and operating model	✓	✓	✓
	Action 5	Define QE authority deliverables (standing agenda, templates, etc)	✓	✓	✓
	Action 6	Link QE assurance into the broader delivery assurance	✓	✓	✓
	Action 7	QE governance for enablers (e.g., test environment management, test data management etc)	✓	✓	✓
	Action 8	Continuous refinement and improvement on path to maturity	✓	✓	✓
	Action 9	Develop key metrics to provide consistent measurement and reporting of testing and quality assurance, including a testing quality index and other metrics independent of project delivery	✓	✓	✓
Action 10	Integrate all metrics into ASX Technology governance (TOSC/ARC), QE governance and delivery reporting	✓	✓	✓	
6.5.4	Implement test quality grading metrics in test reports		Recommendation has been addressed		
	Action 1	Define metrics-based criteria and descriptions for the quality sentiment indicator	✓	✓	✓
	Action 2	Incorporate quality sentiment framework into test report templates	✓	✓	✓
	Action 3	Incorporate quality sentiment reporting into regular project quality reporting and updates	✓	✓	✓
	Action 4	Institute identification of actions relating to risk identification and continuous improvement from quality sentiment indicators	✓	✓	✓

#	Recommendation / ASX Actions		Executed	Appropriate	Sustainable
	Action 5	Integrate with risk management and continuous improvement processes to implement actions	✓	✓	✓

Recommendation 1.3.4: Ensure key roles & responsibilities are included in PSG

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>For ASX Action 2, while ASX has created the 'Project Deliverable RACI' template and aligned it to the new Scaled Project Management Framework (see Recommendation 3.2.1 for details), the new framework and associated templates were recently launched on 1 November 2022, and ASX has not yet transitioned all in-flight projects to the new framework and templates. Although, ASX currently does have early adopters (i.e., projects that started in September 2022 or October 2022) which have already started using the new framework and templates, at the time of writing this report, these projects had not yet reached the stage of producing the 'Project Deliverable RACI'.</p> <p>As a result, we are marking the sustainability of ASX Action 2 as 'Partially Addressed' until such time we can confirm that ASX has transitioned in-flight projects onto the new framework and templates, and projects have produced the 'Project Deliverable RACI'.</p>		

	EY will include the completion of this partially addressed item in scope for subsequent reviews.
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Background/Tasks

Ensure that key roles and responsibilities are included in the governance functions through the use of a RACI aligned to Project Priority and Risk Assessment, for example, as it relates to the test function to ensure independence, focus and continuity.

ASX Action(s)

1. Include as a topic of discussion in the Risk culture and awareness short and long-term education session in response 1.1.1-2
2. Update Project Governance to include RACI matrix aligned to Scaled PM Framework
3. Update the Expectations of Line 2 on PSGs to challenge on this topic

Findings

ASX Action 1:

As part of Recommendation 1.1.1 submitted by ASX during June 2022 third quarterly review period (Q3), ASX rolled out their long-term staff education plan and conducted 10 face-to-face classroom sessions in June 2022 to highlight a number of changes that occurred to improve ASX risk management and raise awareness of ASX risk culture.

These sessions were facilitated by an L&D specialist with subject matter expertise delivering the content to a wide range of ASX stakeholders, including Project Sponsors, Project Owners, Delivery Managers, Program Managers, Project Managers, Business Analysts, Change & Delivery Enablement (CaDE), EPMO and Line 2. EY SMR(s) attended and observed the launch session held on 16 June 2022. ASX provided evidence of a confirmed schedule for the long-term training sessions to be held over the next 12 months (up to June 2023), which comprises of quarterly face-to-face and virtual sessions. The scheduling and running of future

sessions will be the responsibility of the project risk capability owner i.e., Project Risk Specialist.

Prior to this, ASX had conducted short-term staff education, and delivered 3 tactical training sessions in December 2021 to highlight and uplift the visibility and awareness of risk management and its relationship to governance. ASX provided evidence of the attendance tracker for staff who attended the sessions.

Following the implementation of Recommendation 3.2.1 (Scaled Project Management Framework) this quarter, ASX has subsequently updated their Risk Culture Training material to include contents informing training attendees of the role of governance in project delivery once a decision on project tier has been made. The content specifically covers:

- **Scaled Project Management Framework and Governance (Practise/Process)**
 - Project Tier Allocation Process
- **Project Tier Allocation and Governance**
 - Tier Governance and Roles and Responsibilities
- **Project Deliverables RACI**
 - Project Deliverable RACI outlines roles and responsibilities as they relate to key project governance and project management activities

During the Q3 Recommendation Review Workshop held on 26 July 2022 (Q3 ASX Remedial Actions - Q&A Review for Recommendation 1.1.1), ASX stated that the long-term risk culture training is their strategic solution, and will be available to new joiners, anyone transitioning into a new role (e.g., Project Sponsor, Project Owner) or anyone who wants a refresher. These sessions are mandatory for key project roles and part of the onboarding program.

ASX Action 2:

This activity has been performed as part of Recommendation 3.2.1, also submitted during this quarterly review period (Q4). Please refer to

Findings for Recommendation 3.2.1 for details about the 'Scaled Project Management Framework' and the 'Tier Allocation Process'.

As part of Recommendation 3.2.1, ASX designed and built a new 'Scaled Project Management Framework' and associated templates, which have been launched on 1 November 2022. The 'Scaled Project Management Framework' has been created to assist in defining the delivery pathway, the mandatory project deliverables through a project's lifecycle and the project governance and governed reporting requirements for an ASX project.

One of the key mandatory deliverables that the new Scaled Project Management Framework has introduced is the 'Project Deliverable RACI' template. ASX states that the purpose of the 'Project Deliverable RACI' is to ensure that the roles and responsibilities as they relate to key project governance and project management activities are clearly articulated and understood by project teams and stakeholders. Included within the RACI template are all Project Management deliverables and activities from the Scaled Project Management Framework to facilitate the identification, agreement, and continued adherence to roles and responsibilities throughout the project lifecycle.

To determine the Project Tier (i.e., Tier 1, Tier 2 or Tier 3), project teams will need to go through the project 'Tier Allocation Process' by completing the new 'Project Risk and Complexity Assessment' template. Tiering informs the minimum RACI requirements and standards for each project role, providing clarity on levels of endorsement and approval for the various deliverables, as well as what level of governance forum (i.e. SGG, PWG or PGG) may be required for decision making. Projects with lower Tier allocations have the option to go above the minimum requirements as desired.

The Project Manager is responsible for ensuring the Project Deliverable RACI is completed, signed off, and kept up-to-date through the life of the project, including directly engaging EPMO front-door (workflow) processes of the teams identified within the RACI.

ASX Action 3:

ASX has updated the document titled 'Guidance for Line 2 on Project Risk Governance' to reflect Project Tiering terminology (i.e., change from Priority to Tiering) and what the expectations for Line 2 are for Tier 1 and high-risk projects.

The document explicitly states that *'all Tier 1 and high risk projects are required to engage with Line 2 for review and representation at Steering Governance Group (SGG)/Executive Steering Group (ESG) meetings' and that 'Line 2 play a key independent oversight and objective challenge role in the delivery of Tier 1 and high risk projects i.e., ensure appropriate governance, risk management rigour, escalation and reporting is practiced in delivery of all ASX Tier 1 or high risk projects.'*

As part of the expectation and responsibility of Line 2 for 'Project Risk Assessment', 'Process Risk Assessment' and 'Implementation Readiness', ASX has included in the guidance document that Line 2 will need to confirm whether:

- all relevant participants required to complete a Project Risk Assessment/Process Risk Assessment/Implementation Readiness have been identified, engaged and included in the activity (as referenced in the 'Perform Risk Assessments')
- the participants in the Project Risk Assessment/Process Risk Assessment/Implementation Readiness are aware of their responsibilities in participating in and completing this activity (as referenced in the 'Project Risk Management Framework')

Under the 'Other Activity' section, there is a point for 'Project Governance', noting that roles and responsibilities related to how an ASX project is governed is clear with project stakeholders (i.e., Project Owner/ Sponsor role, BA role, Project Manager, Line 2 and any other member or invitee to a project SGG/ESG).

During the Recommendation Review Workshop held on 26 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 1.3.4 and 3.2.1), ASX stated that there are currently five Line 2 representatives in the ERM space and the change from 'Priority' to 'Tiering' has not had a material impact (i.e., labelling/terminology

changes) to the Line 2 representative's role. The reason is that Line 2 would continue to perform their role in the same way i.e., review and challenge, represent at the SGG/ESG forums for Tier 1 and high-risk projects.

In their written response from 28 October 2022, ASX confirmed that the categorisation updates to the 'Guidance for Line 2 on Project Risk Governance' document were discussed at a number of weekly ERM Team meetings/stand-ups between the end of September 2022 to mid-October 2022. This involved team members discussing and contributing to the guidance content updates regards the impact of categorisation change and ultimately documenting the impact of the change in their guidance document.

ASX Action(s) update Communication Log:

Channel	Description	Date
Outlook Email	Launch comms to introduce the new Scaled Project Management Framework and inform go-live will be on 1 November 2022	24/10/2022
Outlook Email	Launch email - Delivery Uplift: Scaled Project Management Framework next steps and links to key documents	1/11/2022

Recommendation 3.2.1: Implement risk based pathways for project delivery tied to PRA

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>For ASX Action 2, while ASX has designed and built a new Scaled Project Management Framework with associated templates, these were recently launched on 1 November 2022, and ASX has not yet transitioned all in-flight projects to the new framework and templates. However, ASX currently does have early adopters (i.e., projects that started in September 2022 or October 2022) which have already started using the new framework and templates.</p> <p>As a result, we are marking the sustainability of ASX Action 2 as 'Partially Addressed' until such time we can confirm that ASX has completed the November 2022 governance cycle, in order to validate the proposed tiering rating for the 3 in-flight projects that had a material change to their project categorisation (i.e., 2 projects changed from P3 to Tier 1 and 1 project changed from P1 to Tier 2), and apply the new framework and templates accordingly.</p> <p>EY will include the completion of this partially addressed item in scope for subsequent reviews.</p>		

Background/Tasks

Implement risk-based paths for project delivery, tied to the PRA and periodic review of the PRA. For example, medium and high-risk projects should execute the product development lifecycle differently, with variance in scope, control needs or constraints, e.g., pooled vs dedicated staff. The Project Risk Assessment is the right foundation for assessing the risk in delivery and change. A High-Risk project could have a mandatory independent assessment at certain key gates for example, the depth of requirements that need to be produced could also be linked to the risk rating.

ASX Action(s)

1. EPMO Lead to be recruited (New Headcount)
2. Design and build a scaled PM Framework (and associated templates) that outlines the mandatory PM Framework deliverables and governance required throughout the Delivery Lifecycle and aligned to the Risk and Complexity of a project

Findings

ASX Action 1:

ASX recruited a full-time EPMO lead who started on 12 August 2021. This person remains in the role.

During the recruitment process, ASX included as part of the 'Position Description' that the position will *"develop, implement and support high quality project controls and governance across the breadth of ASX"*, and specifically:

- Develop and implement project and governance protocols and policies for the organisation as a whole
- Develop and implement frameworks to effectively and reliably deliver and govern projects across the ASX Delivery landscape
- Support the development and implementation of frameworks to efficiently manage Risks, Assumptions, Issues and Dependencies across the ASX Delivery landscape

ASX Action 2:

During the second quarterly review period in March 2022 (Q2), ASX submitted Recommendation 1.2.6 which required ASX to “review the categorisation and differences in approach between the various project priority levels to ensure it is suitable against risk appetite and control needs”. As a result of that review, ASX deemed that their existing process was not fit for purpose. Following Recommendation 1.2.6 from Q2 and this current Recommendation, ASX designed and built a new ‘Scaled Project Management Framework’ (embedded in the ‘ASX Delivery Framework’ on Confluence) which has been launched on 1 November 2022.

The purpose of the Scaled Project Management Framework is to describe:

1. How ASX assigns Tiers used to determine delivery & governance pathways, and
2. Guidelines for what is required (mandatory or optional) per pathway, including when / what / why / how / who (what team)

The objectives of this framework are to ensure project activities and associated outcomes result in:

- Efficient and effective adherence to mandatory framework artefacts and activities that trigger risk controls that keep ASX safe, whilst facilitating engagement and input from the right people at the right time
- Ability to appropriately scale governance for projects of different complexities and risk
- Objectively understood project attributes used to focus Executive, Senior leader and specialist time
- Built-in mechanisms to review the Tier so ASX can ensure governance is right sized as new information is available
- Right-sized controls and delegation pathways to ASX’s least risky and complex projects, including empowered decision making

(PWG, SGG, Project Sponsor, Project Owner and Line of Business Portfolio Owner)

- Provide clarity and confidence around decision making across the project life-cycle

Prior to applying the Scaled Project Management Framework, project teams must first go through the new ‘Project Tier Allocation Process’, so that the appropriate governance and execution controls are applied to the project based on the level of risk and complexity determined by the Project Tier. There are three Tier levels and ASX has defined them as per the below:

- **Tier 1:** highest risk and complexity projects
- **Tier 2:** projects with some risk and complexity
 - Note: may have targeted additional risk controls where high risk but not complexity
- **Tier 3:** lowest risk and complexity projects

As per the Project Tier Allocation Process, a Complexity Assessment (CA) and Project Risk Assessment (PRA) must be completed, via the new ‘Project Risk and Complexity Assessment’ template, and each of these assessments will produce a rating. A matrix then uses the two ratings to determine the Project Tier. Similar to the PRA, which is required to be reviewed every 6 months, the Project Tier will be reviewed as a result of the 6 monthly re-assessment process or as triggered by a significant change to the project.

Once the project has finalised the Project Tier rating, the Scaled Project Management Framework will provide guidance on the different deliverables and governance required throughout the Delivery Lifecycle aligned to that Tier. Under the ‘Mandatory & Optional Deliverables / Activities’ section of the framework, ASX has included as part of the framework a list of deliverables, their descriptions and links to artefacts (e.g., templates), for each phase of the ASX project delivery cycle:

- **Phase: Prioritisation, Selection**
 1. Proposal

- **Phase: Setup**
 2. Complexity Assessment
 3. New Project Questionnaire (NPQ) - Stage 1
 4. Project Checkpoint 1 - New Initiative: Ready To Start Checklist
- **Phase: Define & Plan**
 5. Seed Funding
 6. Project Initiation Workshop (PIW)
 7. New Project Questionnaire (NPQ) - Stage 2
 8. Organisational Change Management (OCM) Assessment
 9. Project Deliverables RACI Matrix
 10. Project Risk Assessment (PRA)
 11. Tier Allocation
 12. ERM Line 2 Attestation
 13. Vendor Supplier Selection / Engagement
 14. Delivery Approach / Project Charter
 15. Project Timeline
 16. Project Cost Questionnaire
 17. Establish Budget
 18. Cash Flow Model
 19. Short Form Business Case
 20. Full Business Case
 21. Project Checkpoint 2 - Business Case Readiness Checklist
 22. Benefit Map
 23. Benefit Profile
 24. Benefits Realisation Plan
- **Phase: Refine & Implement**
 25. Project Change Request
 26. Implementation Readiness
 27. Go / No Go meeting minutes
- **Phase: Embed, Review & Close**
 28. Post Implementation Review (PIR)

29. Project Closure Report

Under the 'Governance and Reporting Pathways' section of the framework, ASX has outlined the required reporting and governance forums a project is required to engage based on an allocated Project Tier. The list (in a table format) includes the following Reporting and Governance Forums:

- Project Status Report
- Financial Forecast
- Strategic Guidance Group (SGG)
- Joint Steering Group (JSG)
- Portfolio Working Group (PWG)
- Portfolio Governance Group (PGG)

ASX has also provided a description of the report / governance forum, the cadence, and link to the artefact (e.g., template) as part of the list.

Additionally, under the 'Roles' section of the Scaled Project Management Framework, ASX has outlined the minimum required roles based on an allocated Project Tier. The roles include:

- Project Manager
- Business Analyst
- Quality Engineer
- Solution Engineer

With the introduction of the new Project Categorisation and Scaled Project Management Framework, ASX has created a number of new templates and updated existing artefacts (i.e., templates, frameworks) to incorporate the changes. The new templates and updates are as follows:

- **ASX Delivery Governance model**
 - Updated with minor changes to include new context and labelling around Tiers
- **SGG Terms of Reference template**
 - Updated 'Purpose' section to include Tier labelling and 'Delegated Authority' section to include change in process for forums

- Composition of the SGG has been extended to include standing invitees from QE&T (i.e., Test Manager / Test Lead, Team Lead Solution Engineer)
- **PWG Terms of Reference**
 - Updated with minor changes to reflect tiering, authority and delegation
- **PGG Terms of Reference**
 - Updated with minor changes to reflect tiering, authority and delegation
- **Proposal (initiating new work)**
 - Updated ASX's definition of a project [REDACTED]
- **Tier Allocation Process**
 - New process that provides a project member (Sponsor, Owner, Project Manager, other important or contributing stakeholders) with the information required to determine the tier allocation of a defined project
- **Project Risk and Complexity Assessment Guidance**
 - New guide to support the Tier Allocation Process and introduces those responsible for defining a tiering outcome with the steps and templates to perform a Tier Allocation Assessment
- **Project Risk and Complexity Assessment Template**
 - New template that brings together two existing independent assessments (Complexity Assessment and PRA)
- **Scaled Project Management Framework**
 - New framework to assist in defining the delivery pathway, the mandatory project deliverables through a

- project's lifecycle and the project governance and governed reporting requirements for an ASX project
- **Project Deliverable RACI Guidance**
 - New guide for project resources to understand how to apply and use the Project Deliverable RACI template in a project setting
 - Supports the Project Deliverable RACI templates completion, by informing who and when to complete and the outcome of completing
- **Project Deliverable RACI template**
 - New mandatory template used to facilitate a process to compile an agreed Tier based RACI including verification & sign off for each PM artefact and activity
- **Business Case Guidance**
 - Updated guide to reflect simplification of business case development when the circumstances and conditions of complexity and risk warrant
 - Tier 2 and Tier 3 no longer need to produce a full business case using the Full Business Case template - it is only mandatory for Tier 1 projects
 - Tier 2 projects will need to use the Full Business Case template but not all sections will be applicable
 - Tier 3 projects will use a new Short Form Business Case template that is significantly simplified
- **Full Business Case template**
 - Updated template to reflect simplification of business case development
- **Short Form Business Case template**
 - New template that is significantly simplified for Tier 3 projects to use

- **Seed Funding Guidance**
 - New guide to reflect simplified process for securing funds to commence project phase 'Define & Plan'
- **Seed Funding Release Form**
 - New form to replace existing 'Concept Approval Form' following new simplified process for securing seed funding
- **Project Health Monitoring & Reporting Guidance**
 - Updated with minor changes to include new context and labelling around Tiers
- **Project Risk Management Framework**
 - Updated with minor changes to include new context and labelling around Tiers
- **Delphi Technique**
 - Updated with minor changes to include new context and labelling around Tiers, and notes that a pre-requisite Complexity Assessment (CA) is completed prior to a Project Risk Assessment (PRA)

ASX notes in the 'Summary Consolidation Page' provided in the closure pack for 3.2.1, that there were no changes to the 'Key Roles and Responsibilities' page on Confluence. During the Recommendation Review Workshop held on 26 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 1.3.4 and 3.2.1), ASX stated the reason the 'Key Roles and Responsibilities' page did not require any updates was because it was a high level overview of the key roles which had not changed, and the specific details for responsibilities are found in the new 'Project Deliverable RACI', which has been updated based on the tiering process and Scaled Project Management framework.

At the time of the workshop, ASX confirmed they had not officially launched the Scaled Project Management Framework but had launched the broad communications on 24 October 2022 to inform the delivery

community that the new framework and templates would be going live on 1 November 2022. The new framework and templates have since been launched, and ASX has provided evidence that the ASX Delivery Framework on Confluence has been updated to reflect the new links. ASX stated that in terms of the roll out, they had taken a pragmatic approach and allowed early adoption of the new Scaled Project Management Framework and templates for projects that began in September 2022 and October 2022.

ASX has developed an implementation plan and timeline to transition to the new Project Categorisation and Scaled Project Management Framework, taking into account the impacts for inflight projects and new projects. ASX's implementation roadmap is as follows:

- **Pre-launch activities - October 2022**
 - Pilot projects begin using new framework and templates with direct instruction from 1 October 2022
 - Broad communications begin from 15 October 2022
- **Transition - November 2022 to December 2022**
 - Launch of new framework content and templates begins 1 November 2022
 - Endorse PWG Terms of References (ToRs) and finalise allocated Tier via governance forum ~ 23 November 2022
 - All PWG and PGG reporting in new format
- **Cutover - January 2023 to March 2023**

ASX has completed the 'Project Complexity and Project Risk Assessment' across the inflight project portfolio and determined a proposed tiering i.e., migrating from Priority to Tiering categorisation. As a result of this activity, ASX has identified 3 projects out of the total inflight portfolio which have had a material change in their project categorisation rating:

- Two projects changed from P3 to Tier 1
- One project changed from P1 to Tier 2

During the workshop, ASX stated that the proposed tiering from their initial analysis across the inflight portfolio will be validated via the governance cycles and in bundles during the Transition phase. The November 2022 governance cycle will focus on the 3 projects which had a material change in their rating. Once validated, the EPMO team will assist these projects with the transition to the new mandatory deliverables and required governance. ASX will transition all their projects onto the new framework and templates.

ASX also stated during the workshop that in terms of monitoring the progress of the implementation plan, the General Manager of Enterprise Delivery and the Head of EPMO will be responsible for ensuring the implementation is tracked and progressed over the upcoming months. The Head of EPMO meets with their team on a weekly basis to discuss various topics and ensure operations run smoothly. Updates are provided on Confluence and accessible by the wider delivery community.

ASX Action(s) update Communication Log:

Channel	Description	Date
Outlook Email	Launch comms to introduce the new Scaled Project Management Framework and inform go-live will be on 1 November 2022	24/10/2022
Outlook Email	Launch email - Delivery Uplift: Scaled Project Management Framework next steps and links to key documents	1/11/2022

Recommendation 6.1.1: Create program to raise awareness of the importance of Testing and Testing's Vision

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
ASX Action 4	✓	✓	✓
ASX Action 5	✓	✓	✓
ASX Action 6	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	Recommendation has been addressed, as evidenced by the findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

Background/Tasks

Create a program to raise awareness of the ASX Testing Vision: "ASX is entrusted to operate systemically important national infrastructure with a near zero appetite for service disruption on many of our services. Customer and industry testing is critical and ongoing customer confidence must be instilled and maintained through early quality."

ASX Action(s)

1. Revise ASX Quality Engineering Vision & Target State
2. Revise ASX Quality Engineering Policy
3. Identify stakeholders and create communications & education plan
4. Create communication and education material

5. Define framework for delivery of ongoing awareness, education, regular updates and communication of changes/additions
6. Implement ongoing awareness program (broad-based and role-specific awareness)

Findings

ASX Action 1:

This activity has been addressed as part of Recommendation 6.2.2 submitted by ASX during the March 2022 quarterly review period (Q2). As part of Recommendation 6.2.2, ASX created a centralised 'Quality Engineering Repository' which can be accessed via the 'Quality Engineering & Testing (QE&T) Home' page on the Confluence site. The QE&T home page is the landing page and entry point for all management system related artefacts that support the 'what, why and how' of the QE&T methodology and identified in a single space the QE&T services provided within ASX. For the launch of the centralised repository during Q2, ASX had also revised and launched their new ASX Quality Engineering Vision, Roadmap and Policy.

The 'Quality Engineering & Testing (QE&T) Home' page contains a link to the 'ASX Quality Engineering and Testing Vision' page, and clearly defines the following sections of the QE&T function at ASX:

- Our Goals
- Our Purpose
- Our Guiding Blueprint
- Our Strategy, Roadmap & Policy
- Our Values
- How are we achieving transformation?
- What is Quality Engineering?
- Organisational Goal Alignment

Under the 'Our Guiding Blueprint' section, ASX outlines the high level characteristics of the QE desired target state.

As part of Recommendation 6.2.2, ASX conducted live demonstration sessions of how to use the new central repository at 6 forums to create awareness. For individuals that were not able to attend one of the

demonstration sessions, peers would provide support to them. If further support is required, individuals can contact the email QET.Support@asx.com.au.

ASX states in their 'Summary Consolidation Page' provided as part of the closure pack for Recommendation 6.1.1, that the ownership of the vision sits with the Head of Quality Engineering, Head of Testing and Chief Technology Officer. These roles are tasked with the responsibility of maintaining and updating the QE&T Vision Statement, and the Vision Statement will be reviewed annually, prior to the commencement of a financial year to ensure continued alignment of a vision with annual objectives and ways of working.

Please refer to the Q2 quarterly report '*ASX Independent Assessment of IBM Review Recommendations_May 2022 Final Report_13052022*' for full details and findings for Recommendation 6.2.2.

ASX Action 2:

This activity has been addressed as part of Recommendation 6.2.2, submitted during the March 2022 quarterly review period (Q2). As stated in the Findings for ASX Action 1 for Recommendation 6.2.2, ASX reviewed their Quality Engineering Policy as part of the delivery of Recommendation 6.2.2.

Please refer to the Q2 quarterly report '*ASX Independent Assessment of IBM Review Recommendations_May 2022 Final Report_13052022*' for full details and findings for Recommendation 6.2.2.

ASX Action 3:

ASX has created a 'Quality Engineering and Testing Communication Plan - Vision, Target State and Policy' document, which is a people change plan to support communications and training for the QE&T Vision, Roadmap and Policy. ASX identified the stakeholders as:

- Test practitioners
- Test Managers
- Test Leads
- Tech General Managers
- Line of Business (LoB) Members (technical, project and others)

- CoE Practitioners

ASX has outlined their Communication and Awareness Approach, which includes the following processes:

- **Initial Awareness sessions** to introduce the QE&T Vision, Target State and Policy
- **Ongoing Awareness sessions** in existing forums to introduce for new practice members and reinforce to existing practice members QE&T Vision
- **Monthly Delivery Excellence Update Email** sent to new distribution list **ASX Delivery Framework Blog** published in QE&T section
- **Onboarding sessions (current onboarding)** QE&T Vision, Target State and Test Policy inclusion

With the launch of the QE&T Vision, Roadmap and Policy in March 2022 as part of Recommendation 6.2.2, ASX has completed the Initial Awareness component of their education plan via the demonstration sessions done in March 2022. In terms of Ongoing Awareness, ASX has conducted targeted training for its QE&T community with each new QE&T topic launched as part of an IBM Recommendation e.g. Recommendation 6.3.2 Risk Based Testing (RBT) Fundamentals (Q3), Recommendation 6.5.1 Defect Management Strategy Fundamentals (Q3). ASX has provided evidence of the training materials and that the trainings that had taken place to date.

ASX Action 4:

As part of Recommendation 6.2.2 submitted by ASX during the March 2022 quarterly review period (Q2), ASX was required to perform a demonstration on how to use the new central QE&T repository, as well as provide an overview of ASX's new QE&T Vision, Policy and Roadmap.

ASX conducted these live demonstration sessions of how to use the new QE&T central repository at the below forums to create awareness:

- 16th March 2022 - Test Management session
- 16th March 2022 - ASX Delivery Framework Working Group session

- 23rd March 2022 - All Testers session #1
- 23rd March 2022 - Solution Engineering session
- 24th March 2022 - All Testers session #2
- 25th March 2022 - Application Support session
- 29th March 2022 - Test Management session

These demonstrations formed ASX's series of communications and education to raise awareness of their new QE&T Vision, Policy and Roadmap.

Following these initial announcements, ASX has subsequently created communications and education materials with the launch of each new QE&T topic introduced as part of the delivery of an IBM Recommendation during a particular quarter.

For example, most recently, during the June 2022 quarterly review period (Q3), ASX submitted Recommendation 6.3.2 and Recommendation 6.5.1. These Recommendations covered the topics of Risk Based Testing Strategy and Defect Management Strategy, respectively, and as part of the launch of these new QE&T strategies, ASX produced targeted training material and communications. Evidence of the training material and communications was shared by ASX. Please refer to the Q3 final report (*ASX Independent Assessment of IBM Review Recommendations_August 2022 Final Report_12082022*) for details.

ASX Action 5:

ASX has included the section titled 'QE&T Vision, Target State and Policy Communication & Awareness Framework: March - November 2022' in the 'Quality Engineering and Testing Communication Plan - Vision, Target State and Policy' document, which provides a more detailed overview of the different channels that ASX will utilise to roll out their communication and education plan and the frequency:

Initial Awareness

1. QE&T Role Based Awareness Sessions

- All Test Practitioners
- Targeted Face to Face Communication Sessions for stakeholders who are impacted by the change

- March - November 2022

2. QE&T Email and Blog

- All Test Practitioners
- One way email communication to stakeholders that need information - sent by CTO / Head of QE&T
- March - November 2022

Ongoing Awareness

3. Test Leadership Meetings

- Test Managers and Test Leads
- Weekly forum to bring the Test Managers together to share upcoming releases, risks and introduce Capability Practice changes to inform and receive feedback
- Weekly

4. Community of Practice Events

- All Test Practitioners
- Community of Practice Events for Practitioners to share knowledge and learn more about their craft in context of ASX goals
- Monthly from August

5. LoB Meetings

- LoB Members (technical, project and others)
- LoB Meeting to provide general updates on initiatives that will impact teams
- Monthly as invited

6. ASX Centers of Excellence Events

- All CoE Practitioners
- Centre of Excellence ecosystem meetings for all Community of Practice members to attend and learn what they are all doing
- Twice Yearly

ASX Action 6:

As stated in ASX Action 5, ASX has created the 'Quality Engineering and Testing Communication Plan - Vision, Target State and Policy' document which includes a section titled 'QE&T Vision, Target State and Policy Communication & Awareness Framework: March - November 2022'.

Since the initial launch in March 2022 (delivery of Recommendation 6.2.2) of their updated QE&T Vision, Roadmap and Policy, ASX has been continuously educating their QE&T community as per their plan. ASX provided meeting evidence of the Securities and Payments LoB meeting held on 30 June 2022, the recently held CoP virtual event on 12 September 2022, the monthly recurring invites for the QE&T Forum, and the invite for the in-person CoE event on 13 October 2022.

During the December 2022 quarter, ASX is scheduled to launch their Role Based Testing Training and Onboarding Program, as part of Recommendation 6.3.1, which will be a comprehensive program covering everything ASX has launched to date.

ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting (Virtual)	Quality Engineering Vision Update 2022 (multiple sessions held in March 2022)	March 2022
Outlook Email	Launch email to introduce new Quality Engineering & Testing repository in Confluence	31/03/2022
Meeting	QE&T Introduction and Roadmap Securities & Payments LoB Meeting	30/06/2022
Outlook Email	QE&T August Delivery Excellence Update	1/09/2022
Blog Post on Confluence	Blog post on launch IWT Guide and QE&T Roadmap	6/09/2022
Outlook Email	QE&T September Delivery Excellence Update	6/10/2022
Meeting (Virtual)	CoP Event September 2022	12/09/2022
Meeting (In-Person)	ASX CoE Community Launch Event	13/10/2022

Recommendation 6.4.3: Better coordination with customers on final IWT for high risk projects

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	Recommendation has been addressed, as evidenced by the findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

Background/Tasks

The final IWT/DR test weekend for High Priority projects should be more co-ordinated in nature between Participants, whilst preceding weekends remain for conformance testing purposes. For example, suggest partitions, instruments, product types and scenarios that Participants share to ensure matching.

ASX Action(s)

1. Update QE policy (test methods and procedures section) and procedures to include guidelines for:
 - a. Which projects should require a final stage of coordinated client testing
 - b. Guidance on types of tests and scenarios which should be included to support that

Findings

ASX Action 1:

ASX has updated their 'Quality Engineering and Testing (QE&T) Policy' to include under the 'Test Coverage' section, the requirement for

'Customer Testing' to be done in order to ensure that the customer perspective is represented in test coverage.

For 'Customer Testing', ASX has detailed the following:

- **Definition:** Test type where the Customer stakeholders determine whether the solution meets their expectations and functions as expected
- **Minimum Standard:** The requirement for the Customer Testing test type has been reviewed for applicability and an exemption approved where it is determined as not required
- **Evidence:** Test plan and test results documented in a test completion report

In their written response from 27 October 2022, ASX stated that any exemptions to test type requirements need to be documented as part of the evidence. During the Recommendation Review Workshop held on 25 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4), ASX explained that external stakeholders are informed of the exemptions through the standard information channels (e.g., market announcements and notices) and any feedback or questions from external stakeholders, captured by customer facing teams (e.g., Technical Account Managers, CTS or BDMs), are reported and discussed in the newly established QE&T Forum (QETF). Please refer to Findings for Recommendation 6.5.2 for details on the QETF.

Under the 'Quality Engineering Guidelines' section of the QE&T Policy, ASX has included a sub-section dedicated to 'Customer Testing' and defines the following:

- **Objective**
 - The testing required to be undertaken by customers of ASX platforms or services, that is required to verify and validate in a staging or pre-production environment that the platform or service functions as expected post the deployment of changes (e.g., platform changes, service upgrades etc.)

- **Design Principles**
 - Customer testing scope will be determined based on the change scope and an assessment of the change pattern
 - Based on the change pattern, determine the test pattern including the appropriate test types (details provided in the 'Customer Testing Requirements' document)
- **Exemption Process**
 - A matrix of test patterns versus customer change patterns is detailed in the 'QE Strategy - Risk Based Testing' section of the QE&T Home site
 - If a project or test effort wishes to deviate from the testing types prescribed in this matrix then an exemption must be sought in the QE Authority governance forum
- **Outcomes**
 - When the recommended test pattern for a specific type of change pattern is applied, Customer Testing will ensure that:
 1. The platform or service changes under tests do not adversely impact customers
 2. The "customer perspective" is represented in the ASX test coverage
 3. The deployment or release process has been tested with customers

ASX under the 'Test Methodology' page of the 'QE Strategy - Approach' section of the QE&T Home site, ASX has included a section on 'Customer Testing', which provides a high-level overview of Customer Testing and links to specific Customer Testing resources and procedures recently created at ASX as part of other IBM Recommendations (6.7.1 Customer Testing Requirements and 6.3.2 Risk Based Testing Approach) submitted by ASX in previous quarters.

As part of Recommendation 6.7.1 submitted by ASX during the March 2022 quarterly review period (Q2), ASX created a 'Customer Testing Requirements' document which provides guidance and scenarios that project team members (i.e., platform owners, project owners, project managers, testing teams and customer technical support teams (CTS)) should consider to determine what customer testing would be required to support various testing activities in preparation for a platform or service upgrade. ASX states in the document that customer testing requirements will differ between projects as there is no 'one size fits all' approach, and it will be up to the Platform Owner to work with the Technology teams and SMEs to determine if the proposed changes are significant enough and to what scale customer testing is required.

In order to prepare customers to assist ASX with testing, customer facing teams at ASX, such as the Technical Account Managers (TAMs) and Business Development Managers (BDMs), are available to assist in facilitating the conversations between ASX and the customers.

ASX notes that in order to determine the scope of testing required, considerations that may be taken into account include, but are not limited to, the following:

- **Are there infrastructure changes?**
 - New, removed or upgraded network devices and/or application servers?
 - Are there direct interfaces to the devices or servers for customers OR
 - Are the devices or service internal within ASX?
 - Modified system architecture (e.g. moving from on-prem equipment to centrally-hosted)
- **Are there interface changes?**
 - Header file changes, new, modified or removed messages or fields in messages?
 - New API kits available? A re-compilation may be required but no code change

- Code change required?
- **Are there changes to the business logic?**
 - Does the change impact upstream or downstream systems (Clearing/Settlement)?
 - Does the change modify or add any functionality?
 - If a customer application does not use that logic then conformance testing may not be required.

The customer testing types covered in the document are:

- Standard Test Platform Access
- Self Testing
- Conformance Testing (Accreditation)
- Industry Wide Testing (IWT)
- Dress Rehearsals (DRs)
- Go-live Weekends

The guidance document also details the attestation process for customer testing:

- For small projects, the attestation can be an email
- For larger projects, the standard attestation template (PDF format) provided by ASX will need to be completed and signed by a senior person presenting the customer entity

The attestation is used to evidence that the impacted customer has attested to their readiness for go-live.

As stated in our May 2022 quarterly IE report, during the Recommendation Review Workshop held on 28 April 2022 (Q&A Review for Recommendation 6.7.1), ASX informed that the list of customer testing types they use has been built up over time in consultation with customers based on what customers feel works best for them, as well as what ASX determines is required from a project point of view. Additionally, ASX has looked at what other exchanges around the world use for customer testing and have informed that the testing types ASX use are typical of those used by other exchanges.

Furthermore, during the workshop, ASX also explained that there are exceptions that can be made when it comes to customer testing. If a customer requests for additional testing to be done, this is something ASX will take into consideration and make available if appropriate. Similarly, if a customer feels that there should be less testing, ASX will make a determination on that as well, keeping in mind that ASX's role is to protect the market and not an individual customer.

During the third quarterly review period in June 2022 (Q3), ASX submitted Recommendation 6.3.2 which introduced the concept of Risk Based Testing (RBT) and implemented this new QE strategy. The section titled 'Recommended Assessment Method (RBT Workshop)' under the 'QE Strategy - Risk Based Testing' page details the recommended method for performing an RBT assessment, which is through a collaborative workshop, hosted by the Test Manager and involving various SMEs relevant to the change. The purpose of the workshop is to complete the RBT assessment collaboratively and leveraging the experience and knowledge of SMEs and, thereby, determine a proposed testing scope and identify any residual risks.

As part of the new Risk Based Testing approach, ASX has taken into consideration Customer Testing types from the perspective of the potential impact from changes to external, customer facing interfaces. Application Criticality and Project Risk Rating are also factored in. The categorised change patterns and method for identifying appropriate Customer Testing types are described in 'QE Strategy - Risk Based Testing' page, under the 'Customer - Customer Change Characteristic' section.

Depending on the Customer Change Characteristics and Change Scope Criteria identified, ASX will apply the appropriate Customer Test Type from the Test Treatment Library and Customer Testing Requirements document.

Additionally, ASX has created a separate guide in the QE&T Strategy section titled 'QE Strategy - Guidance for IWT for Dress Rehearsal' to specially focus on the IWT and Dress Rehearsal (DR) Customer Testing types. This guide provides guidance to Test Managers on planning the test activities related to IWT and DRs, and covers the following:

- What is IWT
- What is Dress Rehearsal
- Test Planning
 - Test Scoping
 - Governance
- Test Schedule & Co-ordination
 - Schedule
 - Co-ordination with Market Participants
- Defect Management
- Test Reporting
- Roles and Responsibilities
 - Business Owner
 - Test Manager
 - Customer/Market Participant
 - Co-ordinator for Market Participants

In particular under the 'Test Schedule & Co-ordination' section, ASX has stated that market announcements and notices are the mediums by which market participants are notified and informed about the schedule and details with regards to Dress Rehearsal and Industry Wide Testing. As part of the planning, all projects requiring a Dress Rehearsals and IWT, will identify individuals from within ASX (e.g. Project Manager, TAMs or Customer Support) that would co-ordinate with market participants.

ASX has provided examples of projects applying the new RBT strategy and how IWT and DR have been identified, and included in the test activities as the required Customer Testing types following the RBT assessment process.

ASX Action(s) update Communication Log:

Please note, the below Communication Log is a consolidation of the past communications completed by ASX as part of Q2 and Q3 when the related Recommendation concept was first introduced.

Channel	Description	Date
Fortnightly Test Management Meeting	Q2 Recommendation 6.7.1 - Changed to Non-functional Testing requirements tabled for discussion and awareness	29/03/2022
Outlook Email	Q2 Recommendation 6.7.1 - Communication of new QE transformation items from test management meeting	30/03/2022
MS Teams Meeting	Q3 Recommendation 6.3.2 - 'Risk Based Testing Strategy -Fundamentals v1.0' training session	23/06/2022 and 24/06/2022
MS Teams Meeting	Q3 Recommendation 6.3.2 - Brown Bag Sessions - Delivery Excellence IBMR Information Session	27/06/2022-1/07/2022

Recommendation 6.5.2: Implement testing quality framework and metrics

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
ASX Action 4	✓	✓	✓
ASX Action 5	✓	✓	✓
ASX Action 6	✓	✓	✓
ASX Action 7	✓	✓	✓
ASX Action 8	✓	✓	✓
ASX Action 9	✓	✓	✓
ASX Action 10	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	Recommendation has been addressed, as evidenced by the findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

Background/Tasks

Design and implement a rigorous quality metrics framework and testing quality index for both Testing (Product Quality) and Quality Assurance (Process Quality).

ASX Action(s)

1. Recruit Quality Engineering Lead (Metrics, Reporting and Assurance)
2. Define RACI matrix for quality ownership, test execution and QE governance

3. Enhance ASX delivery model to include gating approval of QE deliverables
4. Define QE authority terms of reference and operating model
5. Define QE authority deliverables (standing agenda, templates, etc)
6. Link QE assurance into the broader delivery assurance
7. QE governance for enablers (e.g., test environment management, test data management etc)
8. Continuous refinement and improvement on path to maturity
9. Develop key metrics to provide consistent measurement and reporting of testing and quality assurance, including a testing quality index and other metrics independent of project delivery
10. Integrate all metrics into ASX Technology governance (TOSC/ARC), QE governance and delivery reporting

Findings

ASX Action 1:

ASX recruited a new Quality Engineering Lead (Metrics, Reporting and Assurance) who started on 16 May 2022. This person was an external recruit.

During the recruitment process, ASX explicitly included as part of the 'Position Description' that the position *"will be directly responsible for providing and embedding structured, mature and contemporary reporting and metric capabilities across ASX, including the Testing Policy and associated processes, tools, templates and performance metrics"*, and that as part of the role, this person will be working to uplift ASX's Quality, Metrics and Assurance.

However, this external recruit resigned in August 2022 and ASX appointed an interim specialist consultant in Quality Engineering from 12 August 2022 - a handover was completed from 1 August 2022 to 12 August 2022.

ASX has since recruited a new permanent Quality Engineering Specialist who commenced on 24 October 2022. The interim specialist consultant will continue to work at ASX for another 9 months (from mid-October

2022) as a direct report to the Quality Engineering Lead to ensure a smooth handover and provide continuity.

ASX Action 2:

ASX has created the 'QE Strategy - Quality Metrics Framework' page under the 'Quality Engineering and Testing (QE&T)' homepage on Confluence. This page documents the purpose, model, method, machinery and mindset of the Quality Metrics Framework which ASX has introduced and implemented.

The components of the Quality Metrics Framework are:

- **Metrics Definition and Implementation Method**
 - Process
 - Measurement Plan Catalogue
 - Measurement Plan Template
- **Refinement and Improvement Method**
 - Process
 - Framework & Metrics Improvement Backlog
- **Accountability Definitions**
 - RACI
- **Governance Method (QE Authorities)**
 - Integration with QETF
 - Integration with QE&T Capability Practice

The Quality Metrics Framework is owned and managed by the 'QE Lead - Metrics and Reporting' role within the QE&T Capability Practice. Measurements are defined within the framework through Measurement Plans.

Under the 'Method' section, ASX has included a sub-section titled 'Roles & Responsibilities (RACI)' which defines the alignment of activities and tasks with role, forum or group. The RACI Matrix provides clear guidance on who is Responsible, Accountable, Consulted and Informed for the following activities/tasks:

- Defining the minimum set of enterprise product quality metrics
- Defining the minimum set of enterprise testing process quality metrics
- Setting enterprise product quality goals
- Setting enterprise testing process quality goals
- Setting LOB product quality goals (which are independent of enterprise product quality goals)
- Setting LOB testing process quality goals (which are independent of enterprise testing process quality goals)
- Setting delivery product quality goals (which are independent of enterprise product quality goals)
- Setting delivery testing process quality goals
- Defining enterprise product quality measures and metrics
- Defining enterprise testing process quality metrics
- Producing measures and metrics
- Reporting on measures and metrics
- Assessing performance against quality goals - raising risks and improvement opportunities
- Definition and oversight of the Quality metrics framework including RACI, operating model, and continuous improvement at ASX

The roles and responsibilities of the RACI Matrix in the Quality Metrics Framework align with the wider key QE&T roles and responsibilities found under the 'QE Strategy - Approach' page and what is documented as part of the terms of reference for the newly established QE&T Forum (QETF). During the Recommendation Review Workshop held on 25 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4), ASX stated that the RACI Matrix and the 'Key Roles and Responsibilities' page should be read in conjunction with each other to gain the overall understanding of the quality ownership, test execution and QE governance.

ASX Action 3:

Under the 'Model' section of the 'QE Strategy - Quality Metrics Framework' page, ASX has included a sub-section titled 'Gating approval of QE deliverables'.

This section provides guidance on how metrics implemented through the Quality Metrics Framework can be used as inputs into gating approval of QE deliverables produced during each phased of the ASX Delivery Framework. ASX states that this strategy recommends the inclusion of metrics in gating approval of QE deliverables only where the metrics enable better informed decisions and are demonstrably valuable in achieving the desired gating outcomes.

The list of QE deliverables produced through the ASX Delivery Framework phases (Define & Plan, Refine, Implement) are:

- Independent Testing Quality Assurance Framework
- High Level Test Estimates
- Risk Based Testing
- Test Strategy / Test Plans
- ASX Vendor Quality Guidelines, Standards and Controls
- Test Automation Plan
- Test Cases
- Defect Management
- Test Summary Reports

During the Recommendation Review Workshop held on 25 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4), ASX stated that in order to determine the level of testing required to be taken by customers, ASX's Risk Based Testing approach will be used to define the testing patterns based on the scale and scope of change, which is then captured as part of the test strategy / test plans. If there is a need for customer attestations or customer involvement, this would be captured in the test strategy / test plans. Thereafter, the test strategy, including any exemptions, would be presented to the QE&T Forum (QETF) for approval. In terms of exemptions, external stakeholders are informed of the exemptions through the standard information channels (e.g., mark announcements and notices as stated in Recommendation 6.4.3), and the QETF is a forum for questions and feedback from external parties, captured by customer facing teams, to be discussed.

Furthermore, ASX states that gating approval of capability-level QE deliverables is only for:

- quality control as part of deliverable production
- as means of driving enterprise-wide consistency
- continually improving capability design and implementation

ASX has noted in their Quality Metrics Framework that this type of capability-level deliverable gating using metrics should only be introduced after careful consideration and widespread shared understanding of the intent, the desired outcomes, and the impact on QE delivery and project delivery.

ASX Action 4:

ASX established the Quality Engineering & Testing Forum (QETF), a QE Authority, in August 2022 and has created a 'Quality Engineering & Testing Forum (QETF) - Terms of Reference (ToR)' page under the QE&T Home Confluence site. In the QETF Terms of Reference, ASX includes and clearly defines the following sections:

- **Purpose**
- **Model**
 - Transparency
 - Independent Governance
 - References
 - Standards
 - Guiding Principles of Strategy
 - Strategy Considerations
- **Method**
 - Community
 - QETF Activity RACI within the Quality Metrics Framework
 - QETF Membership RACI within the Quality Metrics Framework
 - Meeting Details
- **Machinery**
- **Mindset**

ASX states that the QETF is an enterprise-level governance group made up of executive and senior leadership roles involved in software delivery, with an exclusive focus on product quality and testing process quality.

Quorum for the meeting is defined by ASX as follows:

- Head of Quality Engineering & Testing
- QETF Coordinator, QE Lead Metrics & Reporting, or delegate for Head of Quality Engineering & Testing
- 3+ General Managers
- CIO or CTO

The QETF is run once per month on the last Wednesday of each month but may meet more frequently to address any urgent matters outside of a formal meeting when required. The first ever QETF held on Wednesday 31st August 2022. ASX has provided meeting evidence of the QETF meetings held to date (i.e., August 2022 and September 2022).

ASX Action 5:

ASX has stated the first ~3 meetings will be used to establish the QETF as a QE Authority at ASX. Thereafter, the QETF will continue to meet to review and action opportunities for improvement identified via the Quality Metrics Framework and review opportunities for improvement to the Quality Metrics Framework.

The standing agenda of the QETF, as described in the ToR, is:

- Review and approve previous QETF Meeting Minutes
- Review and close actions from previous QETF
- Review performance against enterprise quality metrics - Identify progress, improvement opportunities, and/or risks
- Assess suitability of metrics and measurement plans - Identify opportunities for continuous refinement of metrics framework
- Assign owners and due dates to action items (such as raising risks or improvement opportunities to appropriate forums)

The QETF meetings are scheduled by the QETF Coordinator or person acting in the role of the QETF Coordinator. In preparation for the meeting:

- **QETF Coordinator:** Coordinate metrics gathering from all required LOB (GM and TM) by 2 Mondays before the QETF Session.
- **QE Lead (Metrics and Reporting):** Aggregate and produce metrics reporting to incorporate into "QETF Pre-read Pack" by the Friday before the QETF session (includes any required approvals/signoffs)
- **QETF Coordinator:** Send "QETF Pre-read Pack" by 48 Hours before the QETF session
 - Meeting agenda
 - Action Items and follow-up from previous QETF
 - Enterprise metrics reporting
- **QETF Coordinator:** Ensure attendance of all required members or their representatives by the Monday before the QETF session

Activities performed post-meeting:

- **QETF Coordinator:** Send meeting minutes to all participants and representatives including:
 - Attendee list
 - Agenda items and detailed updates for each
 - Action items and assigned owners
- **QETF Coordinator:** Coordinate action item completion between QETF
- **Assigned Owners:** Complete all action items before next QETF

ASX states under the 'Machinery' section of the QETF ToR that the appointed QETF Coordinator will create draft meeting agenda from a Confluence template. The template will include:

- **Title:** "Quality Engineering & Testing Forum - <Date of QETF meeting>"
- **Label:** "QETF" to ensure the page appears in the QETF Agendas, Action Logs, and Meeting Minutes page

- **Attendees:** The list of required attendees/roles (and their appointed representatives if applicable). The list is updated with attendance or apologies for each attendee during the meeting.
- **Pre-read Material:** A section to attach pre-read material, including metrics reporting and any other information required before the meeting
- **Agenda Items:** A section for each item in the standing meeting agenda, including estimated time to discuss and topic owner. During the meeting, each section is filled out with meeting minutes based on the content of the discussion in the forum.
 - Link to previous meeting minutes (QETF Coordinator)
 - Open action items from previous QETF sessions (As assigned)
 - Enterprise metrics reporting (QE Lead - Metrics and Reporting)
 - New action items including due dates and owners for each (As assigned)
 - Additional required agenda items if applicable (QETF Coordinator)

ASX has provided evidence of the completed reporting presented to the recent QETF meetings (i.e., August 2022 and September 2022) and the templates used for the standard presentation of metrics and measures.

ASX Action 6:

As part of Recommendations 3.1.1, 3.2.2, 3.2.3 and 3.2.5 submitted by ASX during the June 2022 quarterly review period (Q3), ASX built a new Project Delivery Assurance Framework (PDAF) which at that point in time, was going through its first iteration with the project delivery teams (including Project Owners and Sponsors) from June 2022 to mid-late September 2022.

The Quality Assurance process applies throughout the life of programs and projects to:

- Review and evaluate project health execution

- Assess and monitor how risks involved in planning, delivering and managing projects are being managed

The PDAf seeks evidence of effective controls across the project lifecycle, assessing against the following assessment criteria (where applicable):

- Change Management
- Financial Management
- Project Management
- Risk Management
- Stakeholder Management
- Technology Delivery and Management
- Procurement/Vendor Management

This assessment criteria explicitly identifies that software engineering and testing are within the scope of delivery assurance.

Furthermore, as part of Recommendation 6.4.8 submitted by ASX during the March 2022 quarterly review period (Q2), ASX updated their 'ASX Delivery Framework', under 'Quality Engineering and Testing', to include the new 'Independent Testing Quality Assurance' page on their Confluence site. This page includes the 'Independent Testing Quality Assurance' document which describes the framework for independent testing quality assurance at ASX. It sets out the following:

- What are the goals and the scope of independent test assessments and assurance
- What are the criteria for independent assessments of test strategies and testing processes (e.g., mandatory versus optional, internal versus external), and when an independent assessment should be conducted
- Who conducts the independent assessment and provides assurance and what are the roles and responsibilities in this process
- How will findings and recommendations from the independent assessment process be dealt with

As stated in the Findings for ASX Action 3, as part of the new 'QE Strategy - Quality Metrics Framework', ASX has included a sub-section

titled 'Gating approval of QE deliverables', which provides a further layer of quality assurance prior to the involvement of the broader Delivery Assurance function.

ASX Action 7:

Under the 'Model' section of the 'QE Strategy - Quality Metrics Framework' page, ASX has included a sub-section titled 'Governance of QE Enablers'.

ASX defines a quality enabler, in the context of the Quality Metrics Framework, as *"an input or dependency to the test process that enables successful completion of QE deliverables but is not under direct control of the QE&T Capability Practice"*.

This section clearly defines the acknowledgement, acceptance and management of enablers (e.g., environment management) and sets out the action to be taken when inputs or dependency enablers occur. ASX states that the governance of QE enablers is implemented by their respective ownership groups, but governance of the service boundaries between the QE&T Capability Practice and its enablers is provided by the Quality Engineering & Testing Forum.

ASX Action 8:

Under the 'Method' section of the 'QE Strategy - Quality Metrics Framework' page, ASX has included two sub-sections titled 'Changing the Framework or Measurements' and 'Refinement and Improvement Activities' to demonstrate that ongoing continuous improvement activities have been built into the Quality Metrics Framework.

ASX states under the 'Changing the Framework or Measurements' section that improvements could include:

- new/proposed product quality or test process quality measurements
- improvements, refinements, and changes to quality metrics, measurement plans, reporting process(es), and metric usage
- changes to the Quality Metrics Framework strategy and operating model

Improvement within the framework is a structured activity led by the framework owner, the QE Lead - Metrics & Reporting role, and requested, tracked, managed and process through the 'Refinement and Improvement Backlog' in Jira.

Additionally, the Quality and Metrics Framework and enterprise metrics implemented through it are reviewed monthly by the QE Lead - Metrics & Reporting role, and is part a formal agenda item within the QETF to routinely evaluate the framework's effectiveness in serving enterprise QE&T governance.

In the 'Refinement and Improvement Activities' section, ASX has created a table to clearly describe the method through which the Quality Metrics Framework 'Refinement and Improvement Backlog' is managed by the different roles and forums in the QE&T Capability Practice.

The RACI Matrix provides further details of the roles within QE&T who are responsible for applying continuous improvement and measuring the effectiveness. These roles are:

- Head of Quality Engineering and Testing
- QETF Chairperson
- Program Test Manager
- Test Manager

ASX Action 9:

ASX has included a section titled 'Metrics' under the 'Quality Engineering & Testing Policy' page on Confluence. The section introduces the concept of metrics, and covers metrics and key performance indicators to measure and track software quality and quality of testing and quality engineering processes. It provides an overview of the following:

- Objectives
- Design Principles
- Key Metrics Categories

In terms of 'Key Metrics Categories', ASX has provided the following high-level representation based on the level of reporting:

- **Level of Reporting: Strategic**
 - Monitoring Business Results
 - Strategic Quality Objectives
 - Metrics included:
 - Strategic QE&T Capability metrics
 - TMMi maturity level
 - Defect leakages into production
 - Budget and estimate variance
- **Level of Reporting: Managerial**
 - Process Improvements
 - Monitoring Resources
 - Capacity Management
 - Metrics included:
 - Automation ROI
 - Cycle Time Reduction
 - Requirements stability index
 - Managerial test environment metrics
- **Level of Reporting: Operational**
 - Productivity
 - Variance
 - Coverage
 - Compliance
 - Metrics included:
 - Requirements and test coverage metrics
 - Automation coverage
 - Test schedule variance
 - Test design and execution productivity
 - Defect metrics
 - Test environment and test data metrics

ASX notes that metrics and targets for ASX Product, Service, and Testing Quality are selected and approved through the Quality Engineering & Testing Forum (QETF) and implemented via Measurement Plans in the 'QE Strategy - Quality Metrics Framework'.

Under the 'Quality Engineering Guidelines' page on Confluence, ASX has included another section titled 'Metrics' which introduces the strategic, managerial and operation metrics for measurement, monitoring and reporting of quality aspects, test progress and burn down of quality risks. This 'Metrics' section covers the following in detail:

- Suggested Metrics and Definitions
- Suggested Collation Requirements
- Available Metrics for Agile Based Projects
- Available Reporting

Furthermore, ASX has created a 'Measurement Plan - Testing Quality Index' template and 'Measurement Plan - Enterprise Quality Sentiment Indicator (eQSI)' template, to provide consistent, comparable and meaningful measures and insights against which decisions and actions can be taken in the pursuit of quality objectives and outcomes.

ASX states in the 'QE Strategy - Quality Metrics Framework' that the metrics will be supported by the measurement plans and recorded in the Test Summary Report, and ASX has provided an example of the Test Summary Report template which includes a section for this.

ASX Action 10:

As stated in the Findings for ASX Action 4, ASX has established the Quality Engineering & Testing Forum (QETF) in August 2022.

The role and responsibility of the QETF is to be a quality forum to evaluate metrics and measurements results for improvement. ASX has stated that the governance structure at ASX enables for the QETF's findings to be presented or escalated to the Technology Committee (TC) when required.

During the Recommendation Review Workshop held on 25 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4), ASX explained that the new QETF is the QE Authority at ASX, replacing the governance forums (TOSC and ARC) mentioned in the ASX Action. The Technology and Operations Steering Committee (TOSC) no longer exists and has evolved into the Technical Management Committee (TMC) and Technology Committee (TC) - the TMC is management level

and the TC is Board level. The mandate for the Audit and Risk Committee (ARC) is oversight of risk controls, risk management systems, internal controls and regulatory compliance. As the QETF includes the CRO, CIO and CTO as members, the ARC is not required to be reported to.

ASX provided the meeting pack for the September 2022 QETF meeting, held on 28 September 2022, to demonstrate that the relevant metrics (where available) have been reported and integrated into the QETF governance process.

ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting (In Person/Virtual)	'Quality Engineering & Testing Forum (QETF) Pre-Read Pack' session to introduce the new QETF	31/08/2022
Outlook Email	Email from the Head of Testing - QE&T Capability Practice to ASX Testing and Project Management staff to raise awareness about the 'Quality Engineering and Testing - September Delivery Excellence Update'. Quality Metrics Framework Information Pack attached to the email.	6/10/2022

Recommendation 6.5.4: Implement test quality grading metrics in test reports

	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
ASX Action 4	✓	✓	✓
ASX Action 5	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	Recommendation has been addressed, as evidenced by the findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

Background/Tasks

Create metric-based definitions for the Quality Sentiment in the test reports to understand the difference between ratings (e.g. Defined difference between good and average). Additionally, identify what actions should be taken as a result of a Quality Sentiment rating.

ASX Action(s)

1. Define metrics-based criteria and descriptions for the quality sentiment indicator
2. Incorporate quality sentiment framework into test report templates
3. Incorporate quality sentiment reporting into regular project quality reporting and updates
4. Institute identification of actions relating to risk identification and continuous improvement from quality sentiment indicators
5. Integrate with risk management and continuous improvement processes to implement actions

Findings

ASX Action 1:

As stated in the Findings for Recommendation 6.5.2, ASX has created a Quality Metrics Framework as part of their QE Strategy, and this is supported and implemented by measurement plans which are reviewed and approved at the Quality Engineering & Testing Forum (QETF). For details relating to the Quality Metrics Framework, please refer to the Findings for Recommendation 6.5.2.

One of the measurement plan templates created by ASX as part of the Quality Metrics Framework is the 'Measurement Plan - Enterprise Quality Sentiment Indicator (eQSI)' template, which provides guidance on metrics to capture and their definitions so that eQSI is interpreted in a standardised way. ASX has included the sub-sections titled 'Interpreting the ASX Stakeholder eQSI' and 'Interpreting the Test Summary eQSI' to provide additional clarity for interpretation.

The template includes the following sections to be completed:

1. Plan Summary
2. Quality Objective
3. Relevant, Measurable Outcomes
4. Measurement and Metrics Definition
5. Operational Definition
 - Measurement Execution
 - Plan Maintenance
6. Implementation Plan
7. Document Change History

Under the 'Measurement and Metrics Definition' section, ASX has included a column titled 'Interpretation and Response Recommendations' to provide guidance how the measurement should be interpreted and used, and appropriate responses based on measured values i.e., eQSI rating.

ASX Action 2:

ASX has created a standardised 'Test Summary Report' template which is used to capture the results from the SDLC and then included in reporting to support decision making.

The template includes a section titled 'Defects and Quality', and the 'Enterprise Quality Sentiment Indicator (eQSI)' ratings are captured in this section along with supporting evidence of the ratings. Once the data is captured, the Test Summary Report is aggregated and reported on at the QETF.

ASX Action 3:

The Implementation Readiness process is an existing process at ASX. Following the introduction of the new Enterprise Quality Sentiment Indicator (eQSI), ASX has made it a requirement to include the eQSI as a piece of information to be captured in the 'Implementation Readiness Plan Go/No-Go Decision' template to assist in decision making on whether to proceed with software/code to production based on the quality sentiment i.e., Go or No-Go. This is included in section 3.2 'Release Readiness', where the Test Manager/Lead will need to capture eQSI and evidence from the test summary report.

As defined in the Terms of Reference for the newly established QETF, the QETF is the designated function for the management of quality across ASX and can/will influence, with its standing members, projects to attain high standards of quality where relevant. If required, quality issues and risks can be escalated to the project's SGG/ESG - this allows for quality issues to be dealt with at the project level, as well as the Line of Business (LoB) or portfolio level.

During the Recommendation Review Workshop held on 25 October 2022 (Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4), ASX stated that in addition to the reporting for the Implementation Readiness decision making process, the eQSI is captured in test summary reports on a regular basis. In order for an eQSI to be developed, a project needs to complete a full cycle of testing at regular intervals to produce the interim eQSI. This is then recorded in the interim/draft test summary report as the project progresses through the

execution cycle for reporting purposes. For projects where there is a governance forum (e.g., SGG or ESG), quality sentiment can be reported as part of the forum's standard agenda or part of the status update reporting. In the case where there is no governance forum, the quality accountability sits with the project sponsor and project owner. ASX's defect reporting is also a complementary metric measure for assisting with the quality at the project level to inform progress.

Furthermore, ASX stated during the workshop that the test summary report has five (5) stakeholders listed - Regulators and Auditors; Customers; Internal Users; External Users (non-customer); and Delivery Team), and additional stakeholders can be added as required. Determining the eQSI is a role based and evidence-based activity. The author of the test summary report needs to take into consideration the perspective of all the key stakeholders and rate the quality sentiment on a scale and provide supporting evidence. Once this is completed, the test summary report is shared with the key ASX stakeholders for review and signoffs.

While the QETF is only attended by internal stakeholders, external stakeholders are able to provide feedback on the testing process and outcomes via attestations and through the standard ASX customer service channels (i.e., Technical Account Managers, Customer Technical Support, Business Development Managers), and this will be reported to the QETF and discussed.

ASX Action 4:

As stated in the Findings for ASX Action 1, under the 'Measurement and Metrics Definition' section of the 'Measurement Plan - Enterprise Quality Sentiment Indicator (eQSI)' template, ASX has included a column titled 'Interpretation and Response Recommendations' to provide guidance on how the measurement should be interpreted and used, and appropriate responses based on measured values i.e., eQSI rating.

For low eQSI ratings relating to Test Summary Reports which indicate that there is high confidence (i.e., rating of 1) or confidence (i.e., rating of 2) that the proposed change will not align with the enterprise definition of product quality, ASX has specially made reference to the 'Project Risk Management Framework (PRMF)' and noted that the Test

Manager/Lead will need to follow the risk management process outlined in the PRMF to address the issues and risks. Response recommendations listed by ASX include:

- If not already done, raise "delivered risks" via the PRMF
- If not already done, raise defects/issues in the project to reflect the provided evidence
- If not already done, raise actions to address gaps in product quality and product quality evidence
- Include associated evidence in the Test Summary
- Recommendation and Test Status Report

Furthermore, ASX has stated that the QETF is where measurement plans are reviewed and approved, and has included explicitly as part of the standing agenda that one of the items will be to 'review performance against enterprise quality metrics - Identify progress, improvement opportunities, and/or risks', as well as the other agenda item to 'assess suitability of metrics and measurement plans - Identify opportunities for continuous refinement of metrics framework'.

ASX Action 5:

As stated in the Findings for ASX Action 4, ASX has referenced the overarching 'Project Risk Management Framework (PRMF)' and noted that the Test Manager/Lead will need to follow the risk management process outlined in the PRMF to address the issues and risks if there is a low rating for the eQSI.

In addition to this, as part of Recommendation 6.5.1 which was submitted by ASX during the June 2022 quarterly review period (Q3), ASX created a 'QE Strategy - Defect Management' section under the 'QE&T Strategy' page on Confluence, which describes the enhanced Defect Management Strategy, including Defect Analysis techniques, SDLC integration processes, metrics and reporting and alignment with standards.

The 'QE Strategy - Defect Management' page includes a section titled '4. Defect Governance, Reporting and Metrics', to further highlight the

importance of gathering and calculating meaningful metrics, such as data points from defect management process, in order to:

- Assess the defect profiles at a specific point-in-time to make judgements about product quality, and enable informed decisions such as progressing to the next phase, running a quality gate, determining if additional project/program time and budget will be required to uplift the change to the required quality standards etc.
- Assess defect residual risk ratings to determine if those defects can be accepted into production at a go/no go decision that could potentially impact production quality and result in incidents and/or additional operational workload
- Utilise defect trends and patterns to, for example:
 - Understand the efficacy of testing, risk mitigation, and defect removal efforts and identify measurable opportunities to improve and uplift testing, risk mitigation, and defect removal techniques
 - Assess product quality over time using facts and evidence to identify opportunities to improve product quality
 - Identify high-risk, high-failure applications/components/services that can be targeted for enhanced risk mitigation and/or problem management initiatives
 - Support the identification and reduction of waste related to defects, rework, and defect management overheads by identifying opportunities for defect prevention over defect detection
 - Demonstrate that the hypothesised benefits and outcomes of implementing the defect management process and strategy are being realised (or otherwise) through defect metrics and reporting correlated to

implementation of alignment to the defect management process and strategy

- Analyse vendor performance against established defect KPIs and SLAs developed with our vendors (ASX Vendor Quality Guidelines, Standards and Controls)
- Provide reporting, insights and recommendations to independent mechanisms and forums, for example, the Enterprise Quality Forum (EQF), the Quarterly CTO Report, and auditors

Furthermore, through the implementation of other IBM Recommendations (3.1.2 - Lessons Learned and 3.1.3 - Post Implementation Review (PIR) and Project Initiation Workshops (PIW)) in the January 2022 quarterly review period, ASX has a series of activities to capture project outcomes in a structured manner and learn from them in order to contribute to continuous improvement for future projects.

ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	'Quality Engineering & Testing Forum (QETF) Pre-Read Pack' session to introduce the new QETF	31/08/2022
Outlook Email	Email from the Head of Testing - QE&T Capability Practice to ASX Testing and Project Management staff to raise awareness about the 'Quality Engineering and Testing - September Delivery Excellence Update'. Quality Metrics Framework Information Pack attached to the email.	6/10/2022

Appendix A Recommendation review workshops list

#	Date	Meeting Title
1	25/10/2022	Q4 ASX Remedial Actions - Q&A Review for Recommendations 6.5.2 and 6.5.4
2	26/10/2022	Q4 ASX Remedial Actions - Q&A Review for Recommendations 1.3.4 and 3.2.1
3	<i>(Workshop not held, written response provided)</i>	Q4 ASX Remedial Actions - Q&A Review for Recommendation 6.4.3
4	<i>(Workshop not held, written response provided)</i>	Q4 ASX Remedial Actions - Q&A Review for Recommendation 6.1.1
5	10/11/2022	Q4 ASX IBM Recommendations: EY IE Draft Report Factual Accuracy Check Review

Appendix B Interviewed ASX stakeholders list

Role
Group Executive, Technology and Data and CIO
General Manager, Enterprise Delivery
Head of Enterprise PMO, Enterprise Delivery
EPMO Lead, Enterprise Delivery
Head of Quality Engineering & Testing
Quality Engineering Lead (Methods, Processes & Procedures)
Project Manager, Enterprise Delivery
Project Manager, IBMR

Appendix C Recommendations Questionnaire submitted to ASX post SMR documentation review







Appendix D Documents reviewed

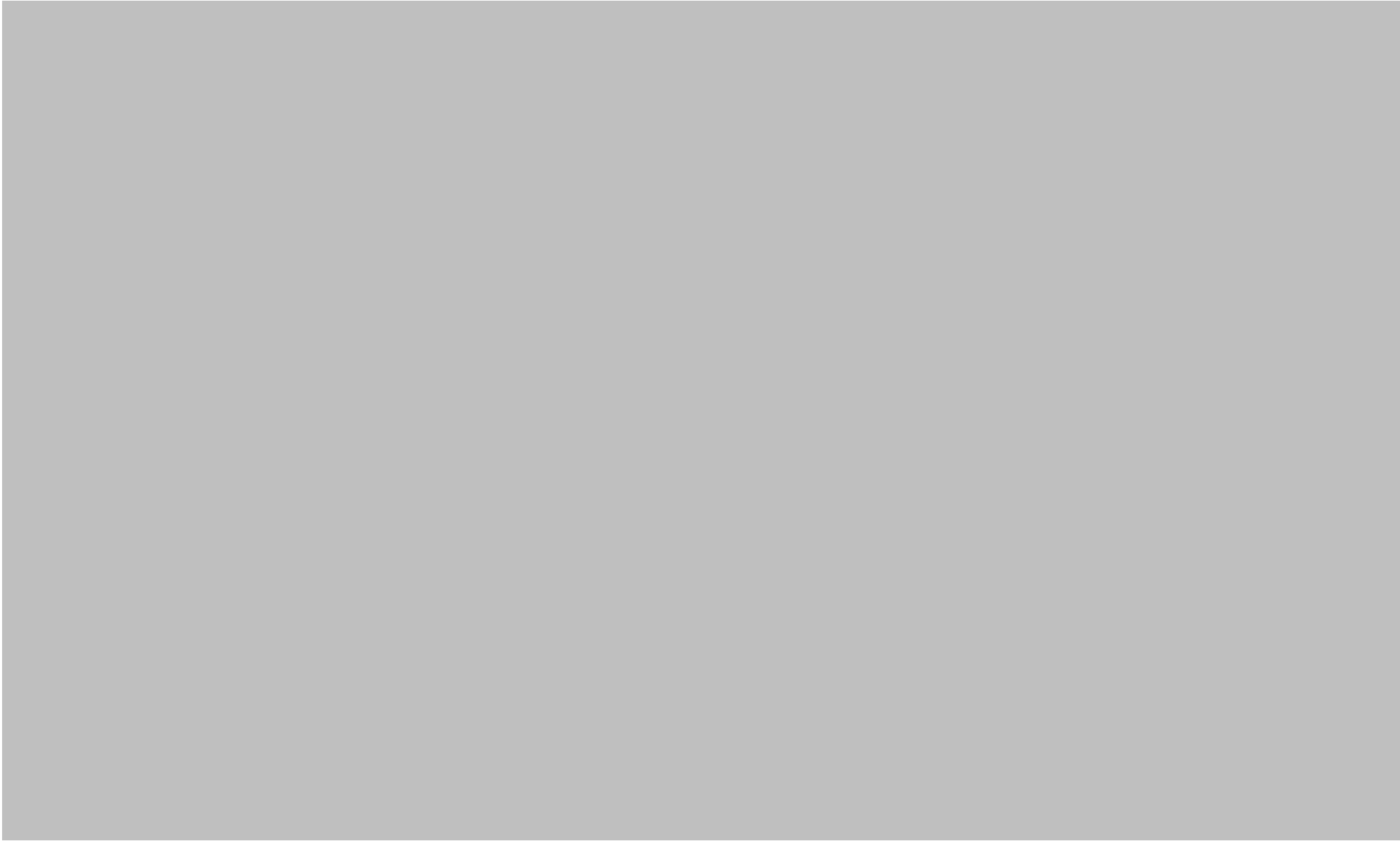














Appendix E Status summary of all 59 Recommendations

ASX has submitted forty-nine (49) Recommendations for closure to date. Out of the forty-nine (49) Recommendations, forty-one (41) Recommendations have been deemed 'fully addressed' and closed, with eight (8) Recommendations deemed as 'partially addressed' and requiring further evaluation in upcoming quarterly review periods.

The Design Adequacy ("DA") Report submitted on 27 April 2022 identified that 13 Recommendations out of the remaining 37 Recommendations which had yet to be submitted at that point in time, were partially addressed and did not have ASX Actions fit for purpose to address the IBM Recommendations. In order for ASX to fully address the Recommendations during the relevant quarterly submission period, ASX should take into consideration the Independent Expert Recommendations for those partially addressed Recommendations in the DA Report.

Below is an overview of each of the 59 Recommendations and their closure / submission status at the end of the third quarterly review period (11 November 2022):

Status	Description	Total (59)
✓ Closed	Recommendation reviewed by the IE and deemed fully addressed	41
✓ Partially Addressed	Recommendation submitted by ASX, reviewed by the IE but currently deemed partially addressed	8
Not Submitted	Recommendations not yet submitted by ASX (expected due date indicated)	10
✗ Original Submission Date	Indicates the original date Recommendation was submitted by ASX but deemed partially addressed by IE after review. <i>*Applicable for Recommendations deemed fully addressed in subsequent quarterly review periods.</i>	

#	IBMR	Design Adequacy - Fit for Purpose?	Status	Q1	Q2	Q3	Q4 (Current)	Q5	Q6	Q7
1. Risk Related Recommendations										
1	1.1.1	Partial	Closed			✓				
2	1.2.1	N/A	Closed	✗		✓				
3	1.2.2	Yes	Closed			✓				
4	1.2.3	Yes	Closed			✓				
5	1.2.4	N/A	Closed	✓						
6	1.2.5	Partial	Closed			✓				
7	1.2.6	Yes	Closed		✗	✓				

#	IBMR	Design Adequacy - Fit for Purpose?	Status	Q1	Q2	Q3	Q4 (Current)	Q5	Q6	Q7
8	1.3.1	N/A	Closed	✓						
9	1.3.2	N/A	Closed	✓						
10	1.3.3	N/A	Closed	✓						
11	1.3.4	Yes	Submitted				✓			
12	1.3.5	N/A	Closed	✓						
13	1.3.6	Partial	Closed		✗	✓				
14	1.3.7	Partial	Closed			✓				
15	1.3.9	N/A	Closed	✓						
16	1.3.10	N/A	Closed	✓						
17	1.4.1	Yes	Submitted			✓				
2. Governance Related Recommendations										
18	2.1.1	N/A	Closed	✓						
19	2.1.2	N/A	Closed	✓						
20	2.1.3	N/A	Closed	✓						
21	2.1.4	N/A	Closed	✓						
3. Delivery Related Recommendations										
22	3.1.1	Yes	Submitted			✓				
23	3.1.2	N/A	Closed	✓						
24	3.1.3	N/A	Closed	✓						
25	3.1.4	N/A	Closed	✓						
26	3.2.1	Yes	Submitted				✓			
27	3.2.2	Partial	Submitted			✓				
28	3.2.3	Yes	Submitted			✓				
29	3.2.4	N/A	Closed	✓						
30	3.2.5	Yes	Submitted			✓				
31	3.2.6	N/A	Closed	✓						
32	3.2.7	N/A	Closed	✓						

#	IBMR	Design Adequacy - Fit for Purpose?	Status	Q1	Q2	Q3	Q4 (Current)	Q5	Q6	Q7
4. Requirements Related Recommendations										
33	4.1.1	N/A	Closed	✓						
5. Vendor Management Related Recommendations										
34	5.1.1	N/A	Closed	✗		✓				
35	5.1.2	N/A	Closed	✗		✓				
36	5.1.3	Yes	Closed		✓					
6. Testing Related Recommendations										
37	6.1.1	Yes	Closed				✓			
38	6.1.2	Yes	Not Submitted							
39	6.1.3	Yes	Not Submitted							
40	6.2.1	Yes	Not Submitted							
41	6.2.2	Yes	Closed		✓					
42	6.3.1	Partial	Not submitted							
43	6.3.2	Yes	Closed			✓	✓			
44	6.3.3	Yes	Not Submitted							
45	6.4.1	Partial	Closed		✓					
46	6.4.2	Yes	Not Submitted							
47	6.4.3	Partial	Closed				✓			
48	6.4.4	Yes	Closed		✓					
49	6.4.5	Partial	Not Submitted							
50	6.4.6	Yes	Not Submitted							
51	6.4.7	Yes	Not Submitted							
52	6.4.8	Yes	Closed		✓		✓			
53	6.5.1	Partial	Submitted			✓				
54	6.5.2	Yes	Closed				✓			
55	6.5.3	Partial	Not Submitted							
56	6.5.4	Yes	Closed				✓			

#	IBMR	Design Adequacy - Fit for Purpose?	Status	Q1	Q2	Q3	Q4 (Current)	Q5	Q6	Q7
57	6.6.1	N/A	Closed	✘		✓				
58	6.7.1	Partial	Closed		✓					
7. Incident Management Related Recommendations										
59	7.1.1	Partial	Closed		✓					

Appendix F Release Notice

Ernst & Young ("EY") was engaged on the instructions of ASX Operations Pty Ltd ("ASX", "Client" or "you") to conduct an Independent Assessment of ASX's Actions to address the IBM Recommendations ("Project"), in accordance with the engagement agreement dated 22 December 2021 including the General Terms and Conditions ("the Engagement Agreement").

The results of EY's work, including the assumptions and qualifications made in preparing the report, are set out in EY's report dated 11 November 2022 ("Report"). ASX and ASX's regulators ASIC and the RBA, should read the Report in its entirety including any disclaimers and attachments. A reference to the Report includes any part of the Report. No further work has been undertaken by EY since the date of the Report to update it.

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