

# ASX Limited

## Independent Expert Design Adequacy assessment of ASX's Response Plan to address IBM Review Recommendations

27 April 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 Response Plan to address the IBM Review 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.

Use of this report by any party other than ASX Limited and ASX's regulators ASIC and the RBA is subject to the terms of the Release Notice contained within Appendix G.



## Table of contents

1.	Executive Summary .....	2
2.	Introduction .....	5
2.1	Background.....	5
2.2	Scope .....	5
2.3	Approach .....	6
2.4	Limitations.....	7
2.5	Use and disclosure of our reports .....	8
3.	Our Findings and Recommendations.....	9
3.1	Program governance and management.....	9
3.2	Coverage of IBM Recommendations.....	11
3.3	Timing of ASX Actions .....	12
3.4	Adequacy of ASX Actions .....	14
Appendix A	EY Program assurance methodology .....	63
Appendix B	Assessment outcome against EY’s Cube program assurance methodology .....	64
Appendix C	Workshop list.....	67
Appendix D	Interviewed ASX stakeholders list.....	68
Appendix E	Documents reviewed .....	69
Appendix F	First Quarterly IE Final Report (February 2022).....	79
Appendix G	Release Notice .....	141

# 1. Executive Summary

## Introduction

ASX Operations Pty Ltd (ASX) has developed the ASX Response Plan (“Plan” or “Response Plan”) and subsequent Delivery Excellence Program (“Program”) following the review by IBM Australia Limited (“IBM”) of the ASX Trade Refresh project. This was required by the Australia Securities and Investments Commission (“ASIC”) and the Reserve Bank of Australia (“RBA”) due to the trade refresh outage that occurred in November 2020.

IBM made 59 recommendations (“Recommendations” or “IBM Review Recommendations”) in total, and the purpose of the Program was to address each IBM Review Recommendation to the satisfaction of ASIC.

In November 2021, the Minister imposed certain Licence Conditions on ASX which included the appointment of an Independent Expert (“IE”) to conduct an assessment of its implementation of the ASX’s 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.

In addition, EY will produce a Design Adequacy Report. The objective of this report is to set out the results of whether ASX’s Response Plan addresses the IBM Review Recommendations and is fit for purpose. Findings and recommendations (as appropriate) will be raised for any gaps identified in the Plan. EY will also assess the overall program management and governance of the Program. Refer to section 2.2 for scope details.

## Approach

To assess the design adequacy of the ASX Response Plan, our activities included holding introductory workshops between EY and key ASX stakeholders to gain an understanding of the Program background, and how ASX designed their Response Plan and Program, as well as assessing documentation related to the IBM Review Recommendations and ASX Response Plan.

At the time of writing this report, the first quarterly review had already been conducted for 22 Recommendations submitted by ASX on 28 January 2022. As a result, we also leveraged knowledge gathered from the ‘Recommendation Review Workshops’ held during the first quarterly report period in February 2022 and documentation submitted for those 22 Recommendations. For this report, we will focus on the design adequacy of the remaining 37 recommendations yet to be submitted by ASX, as they have not been comprehensively assessed in any quarterly reviews.

For this assessment, we defined “fit for purpose” across multiple dimensions:

- 1) **Governance and management of the Delivery Excellence Program** - Has the Program management considered all related Governance and Project methodology to address the Remedial actions appropriately?
- 2) **Coverage of the IBM Review Recommendations** - Has ASX designed an extensive Response Plan and Program with actions to cover each of the 59 IBM Recommendations?
- 3) **Timing of the ASX Actions** - Is the designed workplan appropriate to deploy and successfully close the IBM Recommendations in the given timeline?
- 4) **Adequacy of the ASX Actions** - Are the ASX Actions in the Response Plan designed adequately to address each of the specific IBM Recommendations?

We assessed the overall program management and established governance of the Delivery Excellence Program against EY's program assurance methodology - EY Cube, to determine whether adequate mechanisms have been put in place for rigorous governance around the delivery of the ASX Actions. Refer to section 2.3 for approach details.

### Summary findings and recommendations

Based on our findings below, our assessment found that the ASX Response Plan and Delivery Excellence Program are fit for purpose and address the IBM Review Recommendations, subject to ASX satisfying our four (#1-#4) recommendations.

- **Program governance and management** - Our assessment of the overall program management and established governance for the Delivery Excellence Program against our EY Cube methodology indicates that the Program has the appropriate governance and oversight, and satisfies a majority of the relevant focus areas in our EY program assurance methodology. However, we have identified gaps in the focus area of 'Organisational change management (G5)'.

Over the course of our engagement, we have seen materials that ASX provided showing reasonable change management disciplines in practice including communications announcing a set of changes to be made in December 2021, evidence of a change impact assessment mindset, and a series of walkthroughs to communicate the impacts. ASX acknowledged that they are continuing to focus on refining and improving their change management discipline including additional resourcing.

Furthermore, when assessing the program artefacts, we did not observe a full Program Charter that provides a single source of reference of ASX's approach on how the Program is run (i.e. specific details around RAID, RACI, Roles and Responsibilities of stakeholders and project resources, forums and their frequency, escalations management, etc.).

**#1 We recommend** that the Delivery Excellence Program consider articulating their 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.

**#2** To provide full visibility around the Delivery Excellence Program governance and project activities, we recommend that the Program develop a detailed Program Charter where all management aspects of the program identified in this report are included for assurance purposes. The Charter will act as a guide and reference, and all EY's Cube focus areas highlighted in this report should be incorporated, including a specific strategy and approach for the successful implementation of this initiative.

ASX do not have a formal Program Charter document in place, however, they have very strong clarity on the objective and purpose of their Program due to the Licence Conditions imposed on them, which is to address the recommendations in the IBM Review, engage openly and transparently with the IE, provide the quarterly reports as required, and respond to the IE's findings. In terms of governance and oversight, ASX has an Executive Steering Group, consisting of four senior executives, that reports to the Board regularly on the progress of the Program.

ASX has stated they intend to create a Program Charter to address our recommendation and will share it with EY.

- **Coverage of IBM Recommendations** - Our assessment did not identify any significant gaps in relation to the proposed ASX Actions to address the IBM Recommendations. We have assessed the ASX Response Plan and have deemed it to be reasonable. We have no recommendations on the coverage of IBM Recommendations.
- **Timing of ASX Actions** - Our assessment of the current timeline proposed in the ASX Response Plan against the ASX Actions did not identify any significant exceptions. ASX has shown evidence

that in developing their proposed timeline, they considered the complexity of the IBM Recommendations and the resourcing and capability requirements in order to deliver the actions.

As part of IBM's final report, IBM have provided ASX with an estimation of the duration and effort it would take for ASX to address their recommendations. ASX has made the decision to create their own delivery timeline based on the complexity of the actions to address the IBM Recommendations. This is a reasonable approach as ASX has taken appropriate measures to evaluate the complexity of their environment.

We acknowledge that the Delivery Excellence Program timeline will need to continue to actively adapt to unexpected circumstances and we will monitor how ASX manages these changes.

We observed that ASX did not achieve their desired delivery target of 40% of Recommendations addressed during the first quarter review and note that this increases the overall delivery risk to the planned timeline.

**#3 We recommend** that if ASX does not meet their 80% closure target by the June 2022 quarterly review period as previously planned or prior to June 2022 recognises progress against plan continues to fall behind, ASX should carry out a workplan review for corrective action.

- **Adequacy of ASX Actions** - We have reviewed the alignment of the ASX Actions to the IBM Recommendations and found that twenty-four (24) of those Recommendations have actions that are fit for purpose to address the intended outcomes. We have identified thirteen (13) Recommendations that are partially addressed and, in our experience, this is not unusual at this stage of the delivery of a program of this nature, scale and complexity.

Four (4) of those partially addressed Recommendations have been submitted by ASX for assessment and closure as part of the upcoming second quarterly review period (April 2022), and the

remaining nine (9) will be submitted in the later quarters. We note the following:

**#4 We recommend** that ASX take into consideration our findings and recommendations outlined in section 3 of this report for IBM Recommendations we have deemed "partially addressed". Consideration should be given to how ASX address these items in a more holistic manner than outlined currently to ensure closure in the relevant quarterly review.

### Next Steps

Under Licence Condition 4, our next report as the IE will be the second quarterly report due on 13 May 2022. We will continue to produce these reports every quarter, with the last IE report due in August 2023.

We note that some of the more complex ASX Actions are executed in later quarters due to the complex nature of the Recommendation and believe this to be a reasonable strategy, provided the ASX begin focusing on those actions well in advance of their due date. To this end, we have observed the Program identifying resource expertise needs in advance and securing talent to maintain its scheduled completion of the ASX Actions.

## 2. Introduction

### 2.1 Background

On 16 November 2020, ASX went live with the ASX Trade Refresh project. This project upgraded ASX's equity market matching engine from Nasdaq's Genium INET Trading version 3 to Nasdaq's Financial Framework. Immediately after the go-live an incident occurred that resulted in ASX closing the cash equities and equity exchange-traded options markets for the duration of the trading day.

Consequently, ASIC and the RBA required a review of the ASX Trade Refresh project to be completed. ASX appointed IBM Australia Limited (IBM) to undertake this review. IBM made 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 created a management response plan ("Plan" or "Response Plan") in August 2021, which consists of 182 deliverables ("ASX Actions") to address the 59 IBM Recommendations.

#### Delivery Excellence Program and IBM Recommendations Review

To address the 59 IBM Recommendations, ASX developed a management response plan and created the Delivery Excellence Program to implement the recommendations. The ASX Response Plan is structured around the following seven elements (which are different to the seven domains from the IBM review) that seeks 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

The Delivery Excellence will focus on closing all 59 Recommendations by June 2023 and reporting on the progress to ASIC, RBA and the IE in the form of quarterly reports.

#### ASX Licence Conditions

On 24 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.

### 2.2 Scope

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

1. Quarterly Reports: To review whether the remedial actions undertaken in the period covered by the report demonstrate appropriate implementation of, and progress towards addressing the IBM review recommendations
2. In addition to the Licence Conditions, ASIC has required EY to produce a Design Adequacy Report on ASX's Response Plan ("Plan"), where we will set out the following results:

- Whether the ASX Actions are fit for purpose to address the relevant IBM Review Recommendations
- Whether the overall Program Governance and Program Management of the Delivery Excellence Program are subject to appropriate internal due diligence
- Findings and recommendations (as appropriate) will be raised for any gaps identified in the plan

This document refers to the Design Adequacy Report to be submitted within the first 3 months of the commencement of the engagement or later as agreed with ASX and ASIC. The due date of 29 April 2022 to finalise this report has since been agreed between ASIC, RBA, ASX and EY during the Monthly Status Update meeting on 25 February 2022.

### Design Adequacy Report

At the time of writing this report, the February 2022 first quarterly Recommendations Review Report (*ASX Independent Assessment of IBM Recommendations Review\_FINAL*) covering 22 IBM Recommendations had already been submitted to ASIC, RBA and ASX on 25 February 2022, detailing the comprehensive findings from our review.

We found that all actions taken by ASX were appropriate, with 18 out of 22 Recommendations 'addressed' and 4 out of 22 Recommendations 'partially addressed'. The 'partially addressed' Recommendations will be re-presented by ASX in subsequent quarterly reports for closure. For detailed findings on the 22 Recommendations, please refer to Appendix F.

As a result, this Design Adequacy report will focus on the remaining 37 Recommendations yet to be submitted by ASX in future quarterly reports and provide commentary on the actions and processes ASX intend to take in order to address the intended outcomes of the IBM Recommendations. We expect to see the specifics of the outcomes from the ASX Actions in the upcoming quarterly reports over the next quarters until July 2023.

## 2.3 Approach

The objective of this report is to cover the results of the design adequacy assessment. The scope of our engagement as the IE for producing the Design Adequacy Report is:

- **Program governance and management:** Assessing the overall program management and established governance of the Delivery Excellence Program, including change management and ongoing maintenance to determine whether adequate mechanisms have been established for rigorous governance around the delivery of the ASX Actions.
- **Coverage of IBM Recommendations:** Assessing how the ASX Response Plan, and subsequent Delivery Excellence Program, was designed and to assess the breadth of the Plan to determine whether there are any IBM Recommendations not addressed in the proposed ASX Actions.
- **Timing of ASX Actions:** Assessing the proposed timing for the ASX Actions to be completed and determining whether they have been scheduled at the right time in alignment to the complexity of the IBM Recommendation and associated project risks.
- **Adequacy of ASX Actions:** Assessing the ASX Actions proposed and determining if they are fit for purpose for addressing the outcomes intended by the IBM Recommendation.

When conducting our assessment of the scoped items stated above in section 2.2 to deliver this Design Adequacy Report, the following activities were performed:

1. **Documentation review:** A detailed review and analysis of the ASX Actions in the ASX Response Plan against the detailed findings and recommendations in the IBM Independent Review of ASX Trade Refresh Project Final Report ("IBM Review Final Report"). This includes an assessment of the closure packs and supporting evidence for the IBM Recommendations reported as closed in any already submitted quarterly reports produced by ASX. All documentation was

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

2. **Context workshops:** A number of 'context setting' workshops were conducted prior to the commencement of the ASX Remedial Actions project in January 2022 for EY to gain an understanding of ASX's Response Plan and Delivery Excellence Program. A workshop was also conducted in early February 2022 to provide an overview of ASX's Testing Capability Uplift Plan. Additionally, leveraged knowledge gathered from the 'Recommendation Review Workshops' held during the first quarterly report period in February 2022, where we held sessions to review and discuss the IBM Recommendations between key ASX stakeholders and EY Subject Matter Resources (SMRs) to go through the pre-submitted questions related to ASX's remedial actions approach. A list of workshops conducted with ASX can be found in Appendix C, and a list of interviewed ASX stakeholders can be found in Appendix D.
3. **Delivery Excellence Program design adequacy assessment:** Our evaluation of the breadth and depth of the ASX Response Plan and subsequent Delivery Excellence Program has included the following assessments:
  - Review of Program Management and Governance activities against EY's program assurance methodology - EY Cube.
  - Assessment of the ASX Actions against our understanding of the IBM Recommendations.

Refer to section 3 for detailed findings.

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

1. **Is the proposed ASX Action fit for purpose to address the IBM Recommendation?**

Yes ✓ / No ✗ / Partially ✓

2. **Has or will the IBM Recommendation be addressed by the proposed ASX Action(s)?**

- **Addressed:** We have assessed the ASX Action(s) proposed and found that the action(s) address the IBM Recommendation.
- **Partially addressed:** We have assessed the ASX Action(s) proposed and found that the action(s) partially address the IBM Recommendation.
- **Not addressed:** We have assessed the ASX Action(s) proposed and found that the action(s) do not address the IBM Recommendation.

The assessment criteria described above determines if the ASX Action(s) are fit for purpose and address the intended outcomes of the IBM Recommendations. For detailed and comprehensive commentary around our conclusions, please refer to each recommendation's 'IE 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 review the ASX Actions to be taken related to ASX's Response 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 or will act accordingly. ASX is accountable and responsible for the implemented activities and EY is not acting as management or directing 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. Our Findings and Recommendations

Detailed below are our Independent Expert findings and recommendations following our assessment of the Response Plan developed by ASX in August 2021, on whether the ASX Actions proposed in the ASX Response Plan address the IBM Recommendations and are fit for purpose as well as whether the program has the appropriate governance and management in place.

### 3.1 Program governance and management

The objective of this section is to assess the overall program management and established governance of the Delivery Excellence Program, including change management and ongoing maintenance, to determine whether adequate mechanisms have been established for a rigorous governance around the delivery of the ASX Actions. As part of our assessment, we considered the below applicable focus areas from EY's program assurance methodology - EY Cube:

- Complexity profile (G2)
- Capability and maturity (G3)
- Decision framework (G4)
- Organisational change management (G5)
- Progress management (G6)
- Governance effectiveness (G7)
- Compliance and regulatory (G8)
- Time management (P2)
- Human resource management (P4)
- Procurement management (P5)
- Integration management (P6)
- Quality management (P7)
- Risk management (P8)
- Communications management (P9)

Please refer to Appendix A for full details on the EY Cube program assurance methodology utilised, including assessment of focus areas covered in this report.

#### Context

ASX has developed the Delivery Excellence Program, led by the Chief Risk Officer ("CRO"), to address the 59 IBM Recommendations.

ASX identified resourcing needs in order to achieve their delivery schedule and subsequently recruited a number of new resources. The Plan identified nine new FTE roles across Enterprise Risk (1), Enterprise Project Management Office (4) and Testing/Quality Engineering (4).

The Program consists of dedicated resources focused on closing the recommendations, and includes:

- Program Manager
- Accountable Executives and their teams
- Executive Steering Group (ESG)
  - CRO (Chair)
  - Chief Customer & Operations Officer (member)
  - Group Executive of Markets (member)
  - Group Executive of Technology & Data (member)
  - Chief Technology Officer (attendee)
  - General Manager Enterprise Delivery (attendee)
  - General Manager Enterprise Risk (attendee)
- Testing and Quality Engineering, resourcing onboarded from a specialist third party partner

Accountable Executives are assigned their ASX Actions with due dates specified. Documentation of what has been done and decisions taken are recorded in ASX's Program Management tool. The ASX program team have a dedicated Agile online tool with detailed folders for each of the IBM Recommendations and ensured that a consistent template and methodology has been adopted in delivering each of the recommendations.

The Recommendations submitted for closure and sign-off are presented in the form of a 'closure pack' with each recommendation having its own

closure pack. The closure pack contains all of the evidence of the work done to support the completion of each recommendation, including information stored in ASX's Program Management tool extracted and presented as PDFs. Each closure pack contains:

- A 'Summary Consolidation Page' that includes the IBM recommendation taken directly from the IBM review, a Solution Short Description and a Directory of Change
- The Directory of Change then describes what changes/upgrades have been made to what existing ASX framework documents and how and when this has been communicated to staff
- Each underlying document that has been upgraded has changes highlighted for ease of identification

As each 'closure pack' is a stand-alone package, it provides full traceability of the actions taken by ASX to complete each IBM Recommendation. This enables the IE to readily follow the actions that ASX has taken against each recommendation and to assist them in determining whether these actions are sufficient to close the recommendation upon the quarterly review period.

The Steering Group Executive (Line of Business (LoB) Executive) is responsible for their Accountable Executive who is assigned to the IBM Recommendation and responsible for its closure. As part of the sign-off process, both the LoB Executive and Accountable Executive need to sign-off to attest that the work has been done to an appropriate quality for the recommendation. Once this is done, the CRO will sign off on all recommendations to be submitted during the relevant quarterly reporting period after reviewing the closure packs.

For IBM Recommendations that involve updating policies, standards and frameworks, ASX have ensured that a cascading approach has been taken so that the impact of an update in one document is taken into account, and subsequently updated in related documents. This is done by ensuring that the relevant Accountable Executives are working closely together to make sure there is alignment e.g. Line 1 and Line 2 risk.

Furthermore, each policy, standard and framework has an owner (an executive) who is responsible for approving any changes. ASX will need

to show how they communicated the changes to the relevant executives e.g. via a meeting, newsletter or email. For any board level documents that need updating, such as the Risk Appetite Statement (RAS) which applies to the whole organisation, approval from the board will be required. Similarly, communication of changes is required to the relevant business stakeholders for changes in business processes and functions.

As the Delivery Excellence Program is identified as a high priority project at ASX, it has its own dedicated monthly SGG (Strategic Guidance Group) and ESG (Executive Steering Group) forum for risk reporting, progress reporting and decision making.

### Findings

Our assessment of the overall program management and established governance of the Delivery Excellence Program including review against our EY Cube methodology indicates that the Program is well run, has the appropriate governance and oversight, and satisfies the majority of the focus areas analysed in our EY Cube program assurance methodology.

ASX's Program Management approach and key areas identified in their governance is consistent with our EY Cube and utilised as a benchmark and industry practices to develop activities in relation to Project implementation.

Our assessment did not identify any significant gaps in relation to Complexity profile (G2), Capability and maturity (G3), Decision framework (G4), Progress management (G6), Governance effectiveness (G7), Compliance and regulatory (G8), Time management (P2), Human resource management (P4), Procurement management (P5), Integration management (P6), Quality management (P7), Risk management (P8) and Communications management (P9). As per the commentary detailed in this section '3.1 Program governance and management', and the below sections '3.2 Coverage of IBM Recommendations' and '3.3 Timing of ASX Actions', ASX have adequately covered these areas in their Delivery Excellence Program by implementing the appropriate mechanisms.

We have observed that, in terms of '**Organisational change management (G5)**', ASX do have communication and training plans in place for

individual recommendations, however they do not have a detailed Change Management strategy and approach for the program.

Over the course of our engagement, we have seen materials that ASX provided showing reasonable change management disciplines in practice including communications announcing a set of changes to be made in December 2021, evidence of a change impact assessment mindset, and a series of walkthroughs to communicate the impacts. ASX acknowledged that they are continuing to focus on refining and improving their change management discipline including additional resourcing.

Furthermore, when assessing the program artefacts, we did not observe a full Program Charter that provides a single source of reference of ASX's approach on how the Program is run (i.e. specific details around RAID, RACI, Roles and Responsibilities of stakeholders, forums and their frequency, escalations management etc.)

**We recommend** that the Delivery Excellence Program consider articulating their Change Management strategy for assessing each Recommendation from an organisational change management perspective including people impact assessments, organisational change impacts, training on implemented ASX actions (including resourcing traceability to ensure training completion is achieved) and communications approach.

To provide full visibility around the Delivery Excellence Program governance and project activities, we recommend that the Program develop a detailed Program Charter where all management aspects of the program identified in this report are included for assurance purposes. The Charter will act as a guide and reference, and all EY's Cube focus areas highlighted in this report should be included, including a specific strategy and approach for the successful implementation of this initiative.

ASX confirmed that they do not have a formal Program Charter document in place, however, they have very strong clarity on the objective and purpose of their Program due to the Licence Conditions

imposed on them, which is to address the recommendations in the IBM Review, engage openly and transparently with the IE, provide the quarterly reports as required, and respond to the IE's findings. In terms of governance and oversight, ASX has an Executive Steering Group, consisting of four senior executives, that reports to the Board regularly on the progress of the Program.

ASX has stated they intend to create a Program Charter to address our recommendation and will share it with EY.

## 3.2 Coverage of IBM Recommendations

The objective of this area is to assess how the ASX Response Plan and Delivery Excellence Program was designed, and to assess the extensiveness of ASX's Plan to determine whether there are any IBM Recommendations not addressed in the proposed ASX Actions.

### Context

In August 2021, ASX issued the ASX Response Plan detailing how they intend to respond to each of the 59 IBM Recommendations [REDACTED]

ASX has developed a program to address the IBM Recommendations called the 'Delivery Excellence Program' with ASX's CRO as the Program Sponsor and have dedicated resources focused on closing the 59 recommendations.

Prior to EY commencing its role as the IE, a number of introductory workshops were held between EY and ASX to help the EY team understand the background of the Delivery Excellence Program.

During the meeting 'Introduction to ASX - ASX Remedial Actions' on 17 January 2022, ASX's CRO explained the purpose of the Delivery Excellence Program is to transform the way ASX designs, builds, implements and governs change. The Delivery Excellence Program would not only address all the 59 IBM Recommendations by the end of 2022

and some embedding by June 2023, but also focus on continuous improvement of their ASX Delivery Framework and standards.

### Findings

Our assessment did not identify any gaps with regards to whether there were adequate ASX Actions assigned to each one of the IBM Recommendations, and the ASX Response Plan is reasonable.

Following the issuance of the IBM Independent Review of ASX Trade Refresh Project Final Report in June 2021, ASX's management analysed the IBM Findings and Recommendations, and subsequently developed a Response Plan that consisted of 182 deliverables mapped up to the 59 IBM Recommendations, with a clear traceability construct.

After reviewing the IBM Final Report, the ASX's Delivery Excellence Program team ("ASX team") prepared the ASX Response Plan as follows:

- The ASX team looked at the essence of each IBM Recommendation and allocated the appropriate executive to the recommendation. This was generally a single person, or sometimes two, such as if addressing the recommendation required actions to be done by another line of business (for example Line 1 and Line 2 risk)
- The executive assigned to the IBM Recommendation considered how they would respond to the recommendation and if there were sufficient resources available, and came back with actions to be added to the response plan document
- The ASX team went through the actions and determined whether they were sensible or not, and approved the plan of action against each IBM Recommendation via their governance process
- The ASX team set up a governance process to manage the Response Plan, including establishing an Executive Steering Group (ESG) with the CRO as the Chair. Please refer to **section 3.1 'Program governance and management'** of this report for more details

- [Redacted]

As part of the above process, ASX identified that the overall Testing Uplift Plan was significant and needed a dedicated project manager. As a result, ASX engaged an external Testing and Quality Engineering specialist partner to assist in managing this area of the Plan, and created the 'Quality Engineering Transformation Plan'.

Prior to submitting the ASX Response Plan and [Redacted] ASX's CRO summarised the key objectives of the Plan into the 7 points outlined on section 2.1 based on the 7 Domains and 17 Sub-Domains identified IBM, so that members of the Board who are not involved in the project day-to-day are able to understand the objectives easily.

ASX have discussed the IBM review and the Delivery Excellence Program response plan over the past months (since July 2021) with ASX staff across a number of meetings, forums and management committees, [Redacted]

- [Redacted]

### 3.3 Timing of ASX Actions

The objective of this section is to assess the proposed timing for the ASX Actions to be completed and determine whether they have been

scheduled at the right time in alignment to the complexity of the IBM Recommendation and associated project risks.

## Context

As previously stated in section 3.2 'Coverage of IBM Recommendations', ASX intends for the Delivery Excellence Program to not only address all the 59 IBM Recommendations by the end of 2023, but also focus on continuous improvement of their ASX Delivery Framework and standards.

In the IBM Review Final Report, IBM have provided their view of the 'Effort, Duration and Impact' of each IBM Recommendation, indicating the effort ASX should take to respond to their recommendations. During the meeting 'Delivery Excellence Program - ASX Remedial Actions' on 20 January 2022 with EY, ASX explained they have made the decision to approach the effort and timeline differently than initially proposed by IBM. As a result, the proposed delivery timeline in the ASX Response Plan has been scheduled from ASX's perspective and based on the complexity of the actions ASX have chosen to execute in order to address the IBM Recommendations.

ASX have acknowledged that the delivery timeline in their Response Plan is a deviation from the original IBM Review Final Report and have explained that they believe it is more beneficial for them to execute this uplift at a sensible pace and delivered at the appropriate quality, rather than delivering fast but at low quality.

ASX have chosen to target the less complex items (IBM Recommendations primarily related to updating documents and hiring new resources), to be addressed earlier on in the project timeline and for the technically complex recommendations to have a later completion date. The Delivery Excellence Program's priorities are to:

- Address the 7 key IBM focus areas
- Deliver 182 ASX Actions (deliverables) mapping up to the 59 IBM Recommendations
- Deliver in a phased approach - approximately 40% of the plan (measured by recommendations addressed compared to recommendations remaining) completed by December 2021,

80% by June 2022 and complete by December 2022 with some embedding of the actions to follow until June 2023

## Findings

We have assessed the current timeline proposed in the ASX Response Plan against the ASX Actions to determine whether they have been scheduled appropriately and found ASX have been reasonable with the timing of their actions.

For the first quarter, ASX submitted 22 out of 59 IBM Recommendations for closure at the end of January 2022, accounting for approximately 37% of the plan. Originally ASX intended to submit 28 recommendations, however 5 recommendations were delayed due to the delay in recruitment of the Line 1 Project Risk Specialist for EPMO team. [REDACTED]

[REDACTED] ASX eventually successfully recruited the new candidate in December 2021, with the candidate starting on 1 February 2022.

A further recommendation had been delayed related to evaluating the need for a clean contract baseline with Nasdaq. The delay had been caused by modifying the success criteria from diarising the need for the upgrade to actually executing it.

We believe the delay in addressing the 6 recommendations were caused by circumstances outside of ASX's control and the 37% completion rate indicate they are at low to moderate risk of not meeting their projected delivery targets, as at the time of writing this report. However, this risk will be deemed mitigated if ASX meet their 80% completion target by June 2022, as previously planned.

We recommend that ASX review the project plan and take corrective actions to best ensure they are back on plan in the next two quarters.

We acknowledge that the Delivery Excellence Program delivery timeline will need to continue to actively adapt to unexpected circumstances. ASX have confirmed that their ESG occurs on a monthly basis, and a progress report is provided to the attendees to highlight any potential risks and issues that may result in a delay in delivery. During the first quarter

review, ASX had shared the progress pack used at the ESG on 17 December 2021.

Additionally, ASX have a monthly status meeting with ASIC, RBA and EY to provide an update on the progress of their Program.

### **3.4 Adequacy of ASX Actions**

The objective of this area is to assess each of the ASX Actions proposed and determine if they are appropriate for addressing the intended outcome of the IBM Recommendations.

Detailed findings are found below for each of the 37 IBM Recommendations:

## Summary of design adequacy assessment of ASX Actions

Below is a summarised view of the design adequacy assessment of the ASX Action(s) to address the IBM Recommendations. For detailed information around the findings please refer to the following pages.

The 22 ASX Actions reviewed in Q1 2022 are not subject to the following evaluation as they have been reviewed previously. For detailed findings please refer to Appendix F.

#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
<b>1. Risk Related Recommendations</b>			
1	1.1.1	Enhance the risk aware culture, where risks and issues are freely identified, documented, analysed, managed and treated appropriately.	Partial
2	1.2.1	Ensure that ERM Line 2 resources assigned to projects have sufficient expertise such that they can provide adequate oversight and challenge to the project. Post the Project Risk Assessment (PRA) exercise, a suitable ERM Line 2 expert or set of experts should then be assigned to the project, based upon the detailed understanding of the scope.	Reviewed - Q1 2022
3	1.2.2	Update the necessary policies to ensure that at project initiation and especially during the Project Risk Assessment phase, resources with relevant risk expertise should be involved to leverage their diverse expertise.	Yes
4	1.2.3	Enhance the control framework to ensure that there are suitable controls, alternative and independent viewpoints during the Project Risk Assessment template completion exercise and/or after the template completion by the project teams. This will add alternative diverse viewpoints, and is also a means to challenge the team's rationale. Consider the use of the Delphi technique to independently complete the form, and use the average output or use the range, to reduce risk of groupthink. This is also relevant to the Process Risk Assessment exercise.	Yes
5	1.2.4	Update the necessary policies to ensure that the risks highlighted in the Project Risk Assessment are transferred to the delivery risk register. This is also relevant to the Process Risk Assessment exercise.	Reviewed - Q1 2022
6	1.2.5	Expand the scope of the Project Risk Assessment template to consider both delivery risk and the future delivered risk, to also include the transition/migration/cut-over risks.	Partial
7	1.2.6	Review the categorisation and differences in approach between the various project priority levels to ensure it is suitable against risk appetite and control needs.	Yes
8	1.3.1	Update the necessary policies to ensure that the Project Risk Assessment and Process Risk Assessment are revisited at key points in the delivery project, as this will provide an additional set of risk identification dimensions that may have been omitted by the delivery team.	Reviewed - Q1 2022



#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
9	1.3.2	Ensure that risks are identified and logged from key sources, such as the Project Risk Assessment, Process Risk Assessment, Governance functions meetings and minutes, delivery team stand-ups, independent teams, ERM Line 2, Internal Audit/Line 3.	Reviewed - Q1 2022
10	1.3.3	Ensure that the full project risk and issue log metrics are shared with the governance functions - e.g. number of open risks, number of risk owners, number of risks in delivery vs risks in change, categorisation of risks (e.g. how many are strategic vs delivery, how many are infrastructure vs personnel, how many are supplier versus in-house) in addition to the key risks that the project team deem material.	Reviewed - Q1 2022
11	1.3.4	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	Yes
12	1.3.5	Ensure that the ERM Line 2 function (could be more than one person) are invited by the project delivery team in good time, ideally contributing in the preparation workshops, business case production and project risk assessment exercises.	Reviewed - Q1 2022
13	1.3.6	Project risks should periodically be identified using a Delphi-style technique to reduce risk of group think and normalcy biases. Other risk identification techniques described in ISO 31010 should also be considered at key project milestones. Risk identification should also be tagged against standard categories, to enable reporting of categorisation coverage to control functions.	Partial (Q2 Submission)
14	1.3.7	Update the implementation readiness templates and supporting guidance, such that the risks in the implementation readiness document clearly highlights whether they are inherent or residual in nature. The likelihood and impact assessment should be noted, to produce the risk rating. Controls/treatments should be tagged clearly as whether having been performed (preventative) or actions to take should an event occur (detective / corrective). In addition, the listed risks should have lineage to the project risk register.	Partial
15	1.3.9	Ensure that project risks, issues and statistics are tracked to completion and reported to governance functions in a timely function - e.g. average time to close issues, longest open issue, ownership quantities, number of open risks.	Reviewed - Q1 2022
16	1.3.10	Project risks should be quantified in likelihood and impact terms, according to standard definitions of risk assessment.	Reviewed - Q1 2022
17	1.4.1	Ensure that Technical Account Managers formally document risks and issues from customers/participants so such information can be factored into Executive decision making.	Yes
<b>2. Governance Related Recommendations</b>			
18	2.1.1	Document the key roles and functions that must be in attendance of a governance function, based on the risk, complexity, priority and needs of the project. In addition, include roles independent from the project and ideally the organisation.	Reviewed - Q1 2022

#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
19	2.1.2	Evaluate the need to update the necessary policies to require an independent viewpoint, that the delivery team and its reporting line cannot exceed a given percentage of the total governance function membership.	Reviewed - Q1 2022
20	2.1.3	Evaluate the need to update the policies to require that for Priority 1 and High-Risk projects key governance functions have dedicated meetings that only cover the project.	Reviewed - Q1 2022
21	2.1.4	Update the policies such that the governance forums check that the project is tracking and reporting against the metrics defined at project initiation.	Reviewed - Q1 2022
<b>3. Delivery Related Recommendations</b>			
22	3.1.1	At project initiation, formally determine metrics that are carried over, and tracked during project delivery defining the boundaries of operation. Examples include financial variance, product quality, business outcomes, risks, productivity, delivery quality, earned value, customer satisfaction and schedule.	Yes
23	3.1.2	Produce a due diligence checklist to increase scope of coverage and to capture material lessons learned.	Reviewed - Q1 2022
24	3.1.3	Update the project delivery process and policies to require that prior Post Implementation Reviews/Lessons Learned are considered, especially in the initiation phases of the project.	Reviewed - Q1 2022
25	3.1.4	Update the project delivery process and policies to require that for priority 1 projects the Enterprise Project Management Office (EPMO) team is directly involved from initiation in establishing, for example, the delivery framework, reporting, risk/issues register, financial management systems.	Reviewed - Q1 2022
26	3.2.1	Implement risk-based paths for project delivery, tied to the PRA assessment 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.	Yes
27	3.2.2	Investigate and determine the benefits of formalising upon quality management framework (e.g. ISO 9001 or similar), for embedding into project process and policies.	Partial
28	3.2.3	Update the policies such that for Priority 1 projects the EPMO team is part of the governance functions to ensure compliance to ASX's processes, this is to ensure quality before a Line 3 audit is involved.	Yes
29	3.2.4	Consider enhancing the policies such that for Priority 1 and Medium/High Risk projects, governance related reporting frequency is increased to every 2 weeks. In addition, consider the move to a dynamic dashboard style reporting rather than document based.	Reviewed - Q1 2022

#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
30	3.2.5	Delivery gaps should be challenged and highlighted by the governance, delivery, and EPMO functions during delivery addressed prior to Line 3 internal or external audit involvement.	Yes
31	3.2.6	Update the policies such that Priority 1 projects are required to be run by in-house project managers who have detailed knowledge of the ASX delivery processes, procedures and tools. If this is not viable, then an EPMO member should be accountable for compliance to the project delivery processes.	Reviewed - Q1 2022
32	3.2.7	Ensure that key go-live related meetings are minuted and actions are clearly documented.	Reviewed - Q1 2022
<b>4. Requirements Related Recommendations</b>			
33	4.1.1	ASX should maintain their own detailed requirements log to mitigate against over reliance upon a single vendor and in case ASX would ever need to change supplier. This log would provide a means to validate the vendors position and would be in addition to the test cases, documenting non-functional, process, integration as well as functional needs.	Reviewed - Q1 2022
<b>5. Vendor Management Related Recommendations</b>			
34	5.1.1	Perform contract acceptance at the end of the project lifecycle, once integration and end-to-end testing have also been factored in. This would also increase the percentage of test cases and automated test cases available to execute with greater confidence. We note that this is subject to existing contractual terms and obligations, so may not always be possible.	Reviewed - Q1 2022
35	5.1.2	Create guidelines for supplier related contract acceptance testing e.g. X% of the final functional and non-functional test cases must be available to start the process, e.g. Y% of functional and non-functional test cases must be automated.	Reviewed - Q1 2022
36	5.1.3	At the next major upgrade, ASX should evaluate the need to create a clean contractual baseline with Nasdaq to reflect current ways of working, terminology, conditions, schedules.	Yes
<b>6. Testing Related Recommendations</b>			
37	6.1.1	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."	Yes
38	6.1.2	Establish an independent testing quality assurance service for internal projects.	Yes
39	6.1.3	Design, document and implement a Continuous Test Process Improvement process.	Yes
40	6.2.1	Enhance in-house capabilities for combinatorial testing strategies, methods, tools and datasets to combine functional, negative-functional, non-functional and operational testing at volume with representative data (real or simulated) in an end-to-end environment to create "production-like"	Yes

#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
		testing scenarios targeted at reducing the risk of latent defects causing catastrophic failures in production situations.	
41	6.2.2	Review and update the central repository for all testing related policies, procedures, methods, tool description, to prove a uniformly accessible source for reference.	Yes
42	6.3.1	Describe role-based ASX test training program within the ASX test policy that supports the ASX test policy and guidelines, the ASX test methodology, and their concepts.	Partial
43	6.3.2	Define and document the risk-based testing approach and techniques in the testing policy.	Yes
44	6.3.3	Adopt an overarching and detailed ASX Test Methodology which includes templates, methods and processes, job role and guidelines to ensure any compliance to ISO29119 guidelines.	Yes
45	6.4.1	As part of the Design Authority checklist, include a solution maturity assessment that covers the market and technology maturity dimensions.	Partial (Q2 Submission)
46	6.4.2	Engage the market to understand the benefits and demand for the re-introduction of a performance testing environment. Post market engagement, determine the required implementation, if any.	Yes
47	6.4.3	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.	Partial
48	6.4.4	Evaluate the need to update the necessary policies to require that a full ITDR/BCP test be conducted as part of the testing program prior to implementing any major system or raise a formal delivered risk.	Yes
49	6.4.5	Create a detailed interface and integration log, and for high importance interfaces ensure that end-to-end test coverage is completed. Where interfaces are not tested, then a clear rationale should be identified, the risk should be logged in the risk register and added to the implementation readiness document. Require that all high-risk feeds and interfaces, internal and external must be included in integration and end-to end tests using test or live feeds rather than a virtualised or simulated stub	Partial
50	6.4.6	Design, document and implement a test selection and prioritisation process supported by test design optimization methods and/or combinatorial test tools	Yes
51	6.4.7	Document a test planning guide that prompts delivery teams to consider a wider coverage of the requirements due to inherent risks and complexities involved. For example, consider dynamic functional scenarios e.g. at start of day, in a slow market, in a very fast market, with many cancels, in a top of book scenario, in a non-top of book scenarios, across partition.	Yes
52	6.4.8	For complex high-risk projects, consider using an independent specialist party for an independent specialist party for an independent review of the plan and provide for a wider set of test	Yes

#	Reference	IBM Recommendation	ASX Action(s) Fit for Purpose?
		capabilities in addition to internal testing. For example, for the test strategy and planning, to extend the depth and breadth of risk identification, greater test plan execution coverage.	
53	6.5.1	Institute on-going defect analysis techniques (including defect prediction and defect modelling). Work with production tracking systems to accurately track Defect Leakage into production. Define and implement a method of linking defects to specific releases, tests and business functions. Begin tracking Defect Removal Efficiency into UAT and Production and Mandate Root Cause recording in defect analysis.	Partial
54	6.5.2	Design and implement a rigorous quality metrics framework and testing quality index for both Testing (Product Quality) and Quality Assurance (Process Quality).	Yes
55	6.5.3	Design, document and implement a test coverage tracking approach to measure coverage of tests to be executed. Apply the tracking to the current base of test cases to ensure proper coverage.	Partial
56	6.5.4	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.	Yes
57	6.6.1	Ensure ASX Trade included in next annual ITDR exercise.	Reviewed - Q1 2022
58	6.7.1	Review the policy to consider whether mixing any form of customer testing with go-live weekend activities is appropriate for critical new system deliveries.	Partial (Q2 Submission)
<b>7. Testing Related Recommendations</b>			
59	7.1.1	During an outage where the Market is not in a fully open state, identify what length of time would require a default decision of closing the market and performing end of day activities, unless there are other overriding circumstances.	Partial (Q2 Submission)

## Recommendation 1.1.1

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #16
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

### IBM Detailed Findings

There was an enterprise delivery risk process managed by the Project Managers, however [redacted] and process risks were not carried through and the Project used an outdated risk template. They do appear to have been sufficient risks identified and consistently reported to the governance functions. Project issues, whilst being managed, were not numerous and were not routinely being updated in the tooling evidenced by long closure periods.

### IBM Recommendation Summary

Enhance the risk aware culture, where risks and issues are freely identified, documented, analysed, managed and treated appropriately.

### ASX Action(s)

1. Risk Culture in policy updates. The following policies are to be updated to include special focus on risk culture and awareness in projects:
  - a. ASX Risk Appetite Statement (RAS)
  - b. Enterprise Risk Management Framework (ERMF)
  - c. Expectations of Line on PSGs document
  - d. Enterprise Project Risk Management Framework (EPRMF)
  - e. Project Risk & Issues Management framework (PRIMf)
2. Risk Culture education:

- a. Short term staff education on these issues through sessions with all General Managers and above staff, and anyone involved in a new P1 or high risk project
- b. Longer term staff education through inclusion of this topic in Project Steering Group/Sponsor & Owner induction sessions designed as part of Delivery Excellence program

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

The introduction of the short-term and long-term Risk Culture education programs for staff aims to enhance the risk awareness culture at ASX. During our first quarter review cycle in February 2022, ASX provided a copy of the slide deck used for staff training sessions held in December 2021 that look into their short-term education program. The sessions were held virtually, recorded and mandatory for all the stakeholders ASX identified needed to attend the training, which included executives, risk representatives and core project team members. For staff who could not attend the session (not on the attendance report), ASX required for them to watch the session recordings and provide attestation that they had completed the training. ASX further explained that as part of their long-term Risk Culture education program to ensure sustainability, they are looking into creating e-modules to ensure it is embedded in an ongoing plan by June 2022.

The education program's objective is also to be supported by the updates to ASX's key risk management artefacts/frameworks described in Action 1, which aims to provide staff with clear guidelines on Roles and Responsibilities, standard templates to be used to document risks and issues identified, and reporting cadences required, in order to promote consistency in risk management.

As part of our Program and Governance recommendation "consider articulating Change Management strategy for assessing each Recommendation from an organisational change management perspective" and, Action 2b's statement not defining the long-term

education approach to enhance risk awareness culture, we have found that this action does not address the IBM Recommendation in full. For ASX to address this recommendation, we expect to see ASX's long-term education program fully defined and implemented into their risk culture and framework.

## Recommendation 1.2.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 5, #7
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

Whilst the ERM function has significantly improved in depth and breadth in recent years, the Line 2 team would have benefited from the involvement of more team members providing complementary and diverse set of experiences.

experiences resources may have added to the robustness of the self-assessment conducted by the Project team.

### IBM Recommendation Summary

Update the necessary policies to ensure that at project initiation and especially during the Project Risk Assessment phase, resources with relevant risk expertise should be involved to leverage their diverse expertise.

### ASX Action(s)

- See response to 1.2.1
  - A new Senior Manager, Enterprise Risk Management will be recruited to be the Line 2 representative on P1 and/or high risk projects (excluding CHES)
  - Post the PRA, the Sponsor and the CRO will attest that appropriate expertise for Line 2 challenge is available
  - Review the current Expectations of Line 2 on PSGs documentation
- The following principles will be updated to refer to this point:
  - Enterprise Risk Management Framework (ERMf)
  - Enterprise Project Risk Management Framework (EPRMf)
  - Project Risk & Issues Management framework (PRIMf)
- Post the PRA, the Sponsor and the CRO will attest that appropriate expertise with relevant risk experience has been involved

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

The updates to ASX's key risk management artefacts/frameworks, specifically the ERMf, EPRMf and 'Guidance for L2 representatives on project governance' document, require L2 to be assigned to the project in a timely manner when the outcome of the Project Risk Assessment (PRA) in the 'Define & Plan' phase (ASX's initiation phase) is P1 or high risk. While the L2 representative is not involved in the PRA at present, in the next Recommendation (1.2.3), one of the ASX Actions (Action 1) is to address this suggestion from IBM and have the L2 representative involved in the PRA for P1 and high-risk projects.

With the recruitment of a new Senior Manager in the ERM space to be the Line 2 (L2) representative for P1 and high-risk projects, ASX intends to bolster up their resources in this area and mitigate the risk of having resourcing shortages in the immediate future.



The introduction of an attestation from the Sponsor and CRO post the PRA is aimed to enforce this requirement and ensure the assigned risk resource has the appropriate expertise.

### Recommendation 1.2.3:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
IBM Findings Reference	Chapter 5, #6
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The [redacted] and process did not consider the full impact scope of the change. The process itself, due to the policy at the time, lacked challenge. A Line 2 Enterprise Risk Management (ERM) representative should have been involved to guide, challenge and sign-off the risk assessment process.

#### IBM Recommendation Summary

Enhance the control framework to ensure that there are suitable controls, alternative and independent viewpoints during the Project Risk Assessment template completion exercise and/or after the template completion by the project teams. This will add alternative diverse viewpoints, and is also a means to challenge the team's rationale. Consider the use of the Delphi technique to independently complete the form, and use the average output or use the range, to reduce risk of groupthink. This is also relevant to the Process Risk Assessment exercise.

#### ASX Action(s)

1. The PRA will be performed by all members of the PSG and formally discussed at the PSG. For lower risk projects where

there is no PSG, the PRA will be performed by the Sponsor, Owner and core project team

2. This will also be the case for the ensuring six monthly PRAs
3. The Process Risk Assessment will also be subject to an equivalent level of diverse input and challenge/scrutiny by the PSG
4. The EPRM framework will be updated to reflect this

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

Each P1 and high-risk project has their own dedicated PSG (known at ASX as SGG (Strategic Guidance Group)) and consists of a diverse number of core project members, the Sponsor, Owner and Line 2 representative from ERM. By having all members of the SGG be involved in conducting the PRA for P1 and high-risk projects, this will allow for alternative and independent viewpoints and reduce the risk of group-thinking. For lower risk projects where there is no dedicated SGG but instead a group forum, ASX should be continuing to use their current process as appropriate to perform the PRA.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX implementation of the Delphi technique or equivalent process to ensure the actions are executed and appropriate.

During the Q1 Recommendations Review Workshop 'ASX Remedial Actions - Review of Recommendations 1.2.4, 1.3.1, 1.3.2, 1.3.5 & 1.3.10' for Recommendation 1.2.4, ASX confirmed the PRA is required to be done at the start of the project and then required to be done every 6 months after that - unless go live is within a 6 month period, then the Implementation Readiness session is used as the formal risk assessment step.

ASX has stated they intend to apply the above process for the Project Risk Assessment to the Process Risk Assessment. Through updating the EPRMf, ASX aims to formalise the requirement and ensure that suitable controls are in place.

## Recommendation 1.2.5:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
IBM Findings Reference	Chapter 5, #6
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation

### IBM Detailed Findings

The [REDACTED] process did not consider the full impact scope of the change. The process itself, due to the policy at the time, lacked challenge. A Line 2 Enterprise Risk Management (ERM) representative should have been involved to guide, challenge and sign-off the risk assessment process.

### IBM Recommendation Summary

Expand the scope of the Project Risk Assessment template to consider both delivery risk and the future delivered risk, to also include the transition/migration/cut-over risks.

### ASX Action(s)

1. Include a 'Delivered Risk' sub category in the Technology and Operations category of the PRA
2. Specifically discuss this sub-category at PSGs as the semi-annual PRAs are undertaken
3. Include this as a category in both the Process Risk Assessment and the Implementation Readiness documentation
4. Include a requirement in the Implementation Readiness template that Delivered Risks are signed off for assessment and ownership in ERICA before a go-live decision can be made

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

The inclusion of the 'Delivered Risk' sub-category in the 'Technology and Operations' category of the Project Risk Assessment template, the Process Risk Assessment documentation and Implementation Readiness documentation is designed to put a focus on delivered risk and future delivered risk. ASX's new requirement to discuss it at their PSG (SGG) semi-annually aims to reinforce this requirement. As stated in the previous IBM Recommendation 1.2.3, if go-live is within 6 months, the Implementation Readiness session is used as the formal risk assessment step.

With the introduction of the new requirement in the Implementation Readiness template that delivered risks need to be signed off for assessment and ownership in ASX's GRC tool (ERICA) before a go-live decision can be made, will ensure that transition/migration/cut-over risks are considered.

However, it is unclear whether ASX intends to include "transition/migration/cutover risks" as part of the updates.

For ASX to address this Recommendation, we expect ASX to include transition/migration/cutover risks into the updates to the Project Risk Assessment template, Process Risk Assessment documentation and the Implementation Readiness documentation.

## Recommendation 1.2.6:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 5, #5
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

Despite being under-classified in the earlier stages of the Project [REDACTED], there was no material difference in Project activities or oversight. It was subsequently reclassified [REDACTED].

### IBM Recommendation Summary

Review the categorisation and differences in approach between the various project priority levels to ensure it is suitable against risk appetite and control needs.

### ASX Action(s)

1. Project Risk Specialist to be recruited (New Headcount) to refresh the Enterprise Project Risk Management Framework and associated templates, metrics and controls and manage the framework going forward
2. Review criteria for assessing P1, 2, and 3 projects and management actions that follow
3. Review criteria for assessing high, medium, low risk projects (PRA) and management actions that follow
4. Present this to the PGG

5. Update impacted policies after PGG endorsement

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

In ASX Action 1, ASX have stated they intend to hire a new Project Risk Specialist to define and manage the Enterprise Project Management Framework, templates, practices, controls and metrics. During the Q1 Recommendations Review Workshop 'ASX Remedial Actions - Review of Recommendations 1.2.1, 2.1.1 & 2.1.2' for Recommendation 1.2.1, ASX confirmed they have already hired this new resource for their EPMO space.

ASX has stated in their actions that they intend to review the criteria for assessing P1, 2 and 3 projects, as well as the criteria for assessing high, medium, low risk projects (Project Risk Assessment), and plan to manage actions accordingly following any changes to the criteria. ASX has noted that for any required changes to the criteria and management actions, they intend to present them to their PGG for endorsement so that they can update their impacted policies accordingly. This directly addresses the IBM Recommendation.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX details of their review, any relevant changes to their assessment criteria and approach, evidence of updates policies and supporting PGG endorsement.

### Recommendation 1.3.4:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 5, #18
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The Nasdaq and ASX governance process through the Joint Steering Group (JSG) was documented and effective. However, this governance group did not include any ASX test team representatives between January 2019 - November 2020.

#### IBM Recommendation Summary

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

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

ASX's updates to their Project Governance processes to include a RACI matrix aligned to Scaled PM framework intends to ensure that key roles and responsibilities are clearly defined for various Project Priority and Risk Assessment outcomes - this should act as a guideline for project team members to refer to and understand when certain teams/functions need to be involved at each stage of the project e.g. testing cycle.

As stated in IBM Recommendations 1.1.1 and 1.1.2, ASX is planning to introduce both short term and long-term staff risk awareness education programs to promote a risk awareness culture. The short-term education program has already conducted, as stated in our IE Findings for IBM Recommendation 1.1.1 and covered the required risk topics from IBM. The updates to the 'Guidance for Line 2 reps on project governance' document aims to provide clearer guidelines to L2 representatives on how they should challenge this topic in future PSGs (SGGs).

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX explicit updates to their Project Governance processes (including RACI matrix) and 'Guidance for Line 2 reps on project governance' document to ensure the actions are executed appropriately.

## Recommendation 1.3.6:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
IBM Findings Reference	Chapter 5, #36
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

### IBM Detailed Findings

ERM Line 2 were not invited to the four implementation readiness planning workshops and received the readiness document one day before the go-live readiness meeting. There were gaps in the risk assessment and some risk controls were corrective in nature.

### IBM Recommendation Summary

Project risks should periodically be identified using a Delphi-style technique to reduce risk of group think and normalcy biases. Other risk identification techniques described in ISO 31010 should also be considered at key project milestones. Risk identification should also be tagged against standard categories, to enable reporting of categorisation coverage to control functions.

### ASX Action(s)

1. Project Risk Specialist to be recruited (New Hire) to define and manage the Enterprise Project Management Framework, templates, practices, controls and metrics
2. Update the following policies/documents to include this concept
  - a. Enterprise Risk Management Framework (ERMF)
  - b. Enterprise Project Risk Management Framework (EPRMf)
  - c. Project Risk & Issues Management framework (PRIMf)
  - d. Risk Champions guidance note
3. Update the Expectations of Line 2 on PSGs document to include this concept
4. Include as a topic of discussion in the Risk culture and awareness short and long-term education session in response to 1.1.1-2

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

In ASX Action 1, ASX have stated they intend to hire a new Project Risk Specialist to define and manage the Enterprise Project Management Framework, templates, practices, controls and metrics. During the Q1 Recommendations Review Workshop 'ASX Remedial Actions - Review of Recommendations 1.2.1, 2.1.1 & 2.1.2' for Recommendation 1.2.1, ASX confirmed they have already hired this new resource for their EP MO space.

However, it is unclear in the ASX Actions if ASX will be taking into consideration other risk identification techniques described in ISO 31010 as recommended by IBM, when defining and managing the Enterprise Project Management Framework, templates, practices, controls and metrics. We recommend for ASX to take into consideration other risk identification techniques described in ISO 31010 in order to address this recommendation.

This Recommendation has been submitted for closure by ASX as part of the second quarterly review period (April 2022) and will be assessed in our next quarterly IE report.

### Recommendation 1.3.7:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 5, #36
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

#### IBM Detailed Findings

ERM Line 2 were not invited to the four implementation readiness planning workshops and received the readiness document one day before the go-live readiness meeting. There were gaps in the risk assessment and some risk controls were corrective in nature.



#### IBM Recommendation Summary

Update the implementation readiness templates and supporting guidance, such that the risks in the implementation readiness document clearly highlights whether they are inherent or residual in nature. The likelihood and impact assessment should be noted, to produce the risk rating. Controls/treatments should be tagged clearly as whether having been performed (preventative) or actions to take should an event occur (detective / corrective). In addition, the listed risks should have lineage to the project risk register.

#### ASX Action(s)

1. Introduce the concept of inherent and residual risk and control description into EPRMf and update associated templates including Implementation Readiness template
2. Update the Expectations of Line 2 on PSGs document to include this concept
3. Include as a topic of discussion in the Risk culture and awareness short and long-term education session in response to 1.1.1-2

#### IE Findings

We have assessed the ASX Actions and found that the actions are partially fit for purpose and partially address the IBM Recommendation.

ASX have stated they intend to introduce the concept of inherent and residual risk and controls, and description of controls into the EPRMf and update associated templates, in particular the Implementation Readiness template, which is addressed in the Action 3.

However, they have not indicated whether the listed risks will have lineage to the project risk register and it is unclear how this will be implemented.

For ASX to address this IBM Recommendation, we recommend they incorporate actions to directly address these points in the recommendation, so that all related artefacts (e.g. frameworks and templates) can also be updated accordingly with the new concepts and requirements in Action 2 and Action 3.

## Recommendation 1.4.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 5, #31
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

Participants generally felt the communications leading up to the release were good, including from their Technical Account Managers. However, the following concerns were noted by individual Participants: [REDACTED]

### IBM Recommendation Summary

Ensure that Technical Account Managers formally document risks and issues from customers/participants so such information can be factored into Executive decision making.

### ASX Action(s)

1. Technical Account Managers will be provided education on this requirement
2. ASX Delivery Framework will be updated to include this as a requirement
3. Project Risk Specialist, Project Assurance Specialist and the Line 2 ERM manager will monitor and challenge on this topic

### IE Findings

We have assessed the ASX Actions and found that the actions are fit for purpose and address the IBM Recommendation.

During the Q1 Recommendations Review Workshop 'ASX Remedial Actions - Review of Recommendations 1.2.1, 2.1.1 & 2.1.2' for Recommendation 1.2.1, ASX explained that Technical Account Managers (TAMs) are members of the project team who help act as the liaison between the project and the customers, and they are given the same training and user guides on how to manage risks and issues along with everyone else on the project. The TAMs were specifically called out by IBM as it seemed that they sat outside of the project team.

ASX providing TAMs with education on the requirement to document risks and issues from customers/participants aims to ensure the TAMs are explicitly made aware of this requirement. The updates to the ASX Delivery Framework aims to formalise this requirement as part of their operating procedures and the Project Risk Specialist, Project Assurance Specialist and the Line 2 ERM manager will each play a role to enforce that the process is followed and topic is challenged moving forward.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX explicit updates to their ASX Delivery Framework to incorporate this requirement and evidence they have provided their TAMs with education on it. Additionally, we expect the relevant artefacts for risk representatives, including the 'Guidance for Line 2 reps on project governance' document to be updated with the role and expectations of risk representatives in this space to ensure the actions are executed and appropriate.



### Recommendation 3.1.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #10
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The Business Case was clear, in depth, reasonable and transparent. The key risks were clear and the decision to undertake an early Beta test phase and the option for an extended acceptance process were prescient.

The [REDACTED] software quality risk was noted in the Business Case, with the planned mitigation to receive an early Beta release of the [REDACTED] for issue identification and, the option for an extended acceptance testing phase.



#### IBM Recommendation Summary

At project initiation, formally determine metrics that are carried over, and tracked during project delivery defining the boundaries of operation. Examples include financial variance, product quality, business outcomes, risks, productivity, delivery quality, earned value, customer satisfaction and schedule.

#### ASX Action(s)

1. Project Assurance Specialist (New Hire) to be recruited
2. Define and build (ready for rollout) a Project Assurance Framework that defines project performance metrics and measures (quality)

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

ASX is currently in the process of developing and implementing a Project Assurance Framework as part of its plan to address a number of IBM Recommendations.

The introduction of the Project Assurance Framework is designed to formalise the project performance metrics and quality measures so that it is clearly defined for project teams. It will also assist ASX to have stronger controls in place for project delivery decisions.

The recruitment of the new Project Assurance Specialist is aimed to ensure that the appropriate input has been included in the Project Assurance Framework and that the framework is enforced appropriately.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the Project Assurance Framework, especially the newly defined project performance metrics and quality measures that will be tracked during project delivery.

Additionally, we expect ASX to provide specific details of the newly hired Project Assurance Specialist's role once the Project Assurance Framework is implemented.

### Recommendation 3.2.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #46
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

ASX is aligned to leading industry practices however there were variations in Project execution as it relates to risk & issue management and Project compliance to ASX Practices. Formal quality management and risk-based change paths are opportunities for improvement to ASX Practices going forward.

#### IBM Recommendation Summary

Implement risk-based paths for project delivery, tied to the PRA assessment 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

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 1.2.3, ASX confirmed the PRA is required to be done at the start of the project and then required to be done every 6 months after that - unless go live is within a 6 month period, then the Implementation Readiness session is used as the formal risk assessment step. ASX has also stated they intend to apply the above process for the Project Risk Assessment to the Process Risk Assessment. Through updating the EPRMf, ASX intends to formalise the requirement and ensure that suitable controls are in place.

The introduction of a scaled PM Framework and associated templates is designed to provide project teams with clear guidance on risk-based paths for mandatory deliverables and governance required for projects. The hiring of the EPMO Lead is intended to assist ASX in having additional oversight for this new framework.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the PM Framework and associated templates outlining the mandatory PM Framework deliverables and governance required throughout the Delivery Lifecycle and aligned to the Risk and Complexity of a project.

Additionally, we expect ASX to provide specific details of the newly hired EPMO Lead's role in regard to creating and implementing the PM Framework.

### Recommendation 3.2.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 6, #46
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

#### IBM Detailed Findings

ASX is aligned to leading industry practices however there were variations in Project execution as it relates to risk & issue management and Project compliance to ASX Practices. Formal quality management and risk-based change paths are opportunities for improvement to ASX Practices going forward.

#### IBM Recommendation Summary

Investigate and determine the benefits of formalising upon quality management framework (e.g., ISO 9001 or similar), for embedding into project process and policies

#### ASX Action(s)

1. Project Assurance Specialist to be recruited (New Headcount)
2. Design and build (ready for rollout) a Project Assurance Framework

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 3.1.1, ASX is currently in the process of developing and implementing a Project

Assurance Framework as part of its plan to address a number of IBM Recommendations.

The introduction of the Project Assurance Framework is designed to formalise the project performance metrics and quality measures so that it is clearly defined for project teams

However, ASX has not defined or identified the which industry-practice framework they intend to follow to address this recommendation as detailed in the IBM Recommendation. For ASX to address this recommendation, we recommend ASX to define which industry practice framework they intend to follow.

The recruitment of the new Project Assurance Specialist is intended to ensure that the appropriate input has been included in the Project Assurance Framework and that the framework is enforced appropriately.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the Project Assurance Framework, including specific industry practices to be applied into their practices and newly defined project performance metrics and quality measures that will be tracked during project delivery.

Additionally, we expect ASX to provide specific details of the newly hired Project Assurance Specialist's role in when the Project Assurance Framework is implemented.

### Recommendation 3.2.3:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #15
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The Project broadly followed the ASX project management framework in managing resource contentions, reporting monthly with Project weekly stand-pups and managing the change request process.

The Project had resource contention issues and changes.



#### IBM Recommendation Summary

Update the policies such that for Priority 1 projects the EPMO team is part of the governance functions to ensure compliance to ASX's processes, this is to ensure quality before a Line 3 audit is involved.

#### ASX Action(s)

1. Project Assurance Specialist to be recruited within the EPMO to ensure quality and compliance
2. Metrics and measures will be introduced as part of the Project Assurance Framework (refer to 3.2.2) to monitor compliance

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 3.1.1 and IBM Recommendation 3.2.2, ASX is currently in the process of developing and implementing a Project Assurance Framework as part of its plan to address a number of IBM Recommendations.

The introduction of the Project Assurance Framework is designed to formalise the project performance metrics and quality measures so that it is clearly defined for project teams. It will also assist ASX to have stronger controls in place for project delivery decisions.

The recruitment of the new Project Assurance Specialist and, as stated in Recommendation 3.2.1, the hiring of the EPMO Lead is intended to assist ASX in having additional oversight for this new framework in the EPMO space and help ensure that the framework is enforced to the appropriate quality and compliance.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the Project Assurance Framework, especially the newly defined project performance metrics and quality measures to monitor compliance.

Additionally, we expect to see from ASX explicit updates to any related artefacts (e.g. templates, policies and frameworks) to reflect the requirement for EPMO team to be involved in the governance functions for Priority 1 projects.

### Recommendation 3.2.5:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #20
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

[Redacted]

#### IBM Recommendation Summary

Delivery gaps should be challenged and highlighted by the governance, delivery, and EP MO functions during delivery addressed prior to Line 3 internal or external audit involvement.

#### ASX Action(s)

1. Project Assurance Framework and metrics / measures will identify any compliance gaps (Refer 3.2.2)
2. Project Risk Specialist, Project Assurance Specialist and ERM Line 2 resource will be tasked with challenge

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 3.1.1, IBM Recommendation 3.2.2 and IBM Recommendation 3.2.3, ASX is currently in the process of developing and implementing a Project

Assurance Framework as part of its plan to address a number of IBM Recommendations.

The introduction of the Project Assurance Framework is designed to formalise the project performance metrics and quality measures so that it is clearly defined for project teams. It is also intended to assist ASX to have stronger controls in place for project delivery decisions.

The recruitment of the new Project Assurance Specialist in the EP MO space, in addition to the hiring of the new Project Risk Specialist in IBM Recommendation 1.3.6, and existing and new L2 representatives in the ERM space, aims to ensure that framework is enforced to the appropriate quality and compliance.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the Project Assurance Framework, especially the newly defined project performance metrics and quality measures to monitor compliance with delivery gaps identified.

### Recommendation 5.1.3:

Nasdaq contract surrounding current ways of working, terminology, conditions and schedules.

	ASX Coverage
ASX Action 1	✓
IBM Findings Reference	Chapter 5, #19
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings Summary

The contract between Nasdaq and ASX was established in 2009 and has evolved over time with extensions, amendments, and variations. The NFF agreement was another extension to this complex agreement potentially creating inefficiencies and risks in understanding.

#### IBM Recommendation Summary

At the next major upgrade, ASX should evaluate the need to create a clean contractual baseline with Nasdaq to reflect current ways of working, terminology, conditions, schedules.

#### ASX Action(s)

1. ASX will clean Nasdaq contract at the next major upgrade. This will be noted and diarised by both Vendor Management and Contract Management

#### IE Findings

We have assessed the ASX Action proposed and found that the action addresses the IBM Recommendation.

ASX has stated in their action that they intend to clean the next Nasdaq contract at the next major upgrade which directly addresses IBM's recommendation.

As part of the upcoming quarterly review period this Recommendation will be presented at, we expect to see from ASX the updates to the

## Recommendation 6.1.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
ASX Action 6	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The alignment of ASX's test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

### IBM Recommendation Summary

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)

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

During the meeting 'ASX Remedial Actions | Delivery Excellence Testing Uplift Plan - Run through with EY' on 2 February 2022, ASX provided an overview of their Quality Engineering Transformation Program ("QE Transformation Program"), which had been created to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

As part of the QE Transformation Program, ASX intend to:

- Create awareness of ASX's testing vision through a Communications & Education plan for the QE Transformation audience
- Update ASX's QE Vision and Policy to be aligned with ISO29119 and designed to reach TMMI L4+ maturity
- Update relevant NFR policies, procedures and standards (QE Policy and QE Strategy, including mandatory testing types for major systems and high-risk changes e.g. full ITDR/BCP)

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the identified stakeholders (QE Transformation audience), Communications & Education plan (including materials), plans for ongoing communication and education, and updates to relevant frameworks, policies and standards as mentioned.

## Recommendation 6.1.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The alignment of ASX's test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

### IBM Recommendation Summary

Establish an independent testing quality assurance service for internal projects

### ASX Action(s)

1. Document independent assurance model and processes aligned to risk appetite
2. Select panel of independent assurance providers
3. Update estimation guides to include budget for independent assurance in project planning
4. Roll out with appropriate training and education
5. Ongoing measurement and reporting

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX plans for the independent testing quality assurance process to be defined and launched for new projects as part of their QE Transformation Program. ASX have also stated they intend for metrics, insights and learnings to be captured for 12 months to inform continuous improvement.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the independent assurance model and processes aligned to risk appetite for internal projects, training and education materials and ongoing measurement and reporting, as well as having this model implemented.



### Recommendation 6.1.3:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 7, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The alignment of ASX’s test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

#### IBM Recommendation Summary

Design, document and implement a Continuous Test Process Improvement process.

#### ASX Action(s)

1. Document and certify continuous improvement processes and metrics aligned to ISO29119 CMM level 4 and ASX Risk Appetite Statement
2. Implement, monitor and report on continuous improvement program (at QE authority)
3. Establish roles and funding within QE for continuous improvement within the new practice model

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to update ASX’s QE Vision and Policy to be aligned with ISO29119 and designed to reach TMMI L4+ maturity. This will also apply to the new Continuous Test Process Improvement process. ASX plan to have the process implemented with measurable improvements and outcomes in place.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX this process implemented and the documentation behind the process, including how it was designed and built.

## Recommendation 6.2.1:

	ASX Coverage
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	✓
ASX Action 11	✓
IBM Findings Reference	Chapter 5, #24
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted] Due to the complex nature of trading systems and the extremely large number of combinations possible, exchanges commonly use some form of simulation trading.

### IBM Recommendation Summary

Enhance in-house capabilities for combinatorial testing strategies, methods, tools and datasets to combine functional, negative-functional, non-functional and operational testing at volume with representative data (real or simulated) in an end-to-end environment to create "production-like" testing scenarios targeted at reducing the risk of latent defects causing catastrophic failures in production situations.

### ASX Action(s)

1. Recruit Test Lead (Methods, Processes, Procedures)
2. Recruit Test Data Lead
3. Recruit Non-Functional Test Lead and Non-functional Test Engineer
4. Update ASX QE Policy and procedures to include combinatorial testing aligned to risk-based pathways
5. Establish a combinatorial testing capability including tooling, training, methods, infrastructure, and environment enhancements
6. Review of high-risk in-flight projects to ensure combinatorial testing has been appropriately considered in test strategy and test design
7. Define roles and responsibilities in relation to test data and test environment management
8. Specify standardised test data and test environment requirements aligned to risk-based pathways
9. Enhance test data processes, procedures and associated tooling including relation to production data, synthetic data, data governance and customer testing
10. Integrate planning and estimation processes with ASX delivery framework
11. Maturity roadmap to ISO29119 L4 CMM

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to enhance their QE Policy, QE Strategy, test environments and test data management processes and standards, as well as establish a combinatorial test capability and integrate it into their test policy and processes.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX evidence of the enhancements to their testing capabilities and updates to the relevant artefacts (i.e. policies and frameworks) as mentioned.

## Recommendation 6.2.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The alignment of ASX's test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

### IBM Recommendation Summary

Review and update the central repository for all testing related policies, procedures, methods, tool description, to provide a uniformly accessible source for reference.

### ASX Action(s)

1. Implement a central QE repository for all testing related policies, procedures, methods and tools to provide a uniformly accessible and integrated source for reference for the ASX testing methodology
2. Include demonstration and use of central repository into ASX QE vision, policy, processes and procedures awareness and embedding program
3. Ensure repository is appropriately visible to external parties  
Integrate planning and estimation processes with ASX delivery framework

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

The implementation of the central QE repository for all testing related policies, procedures, methods and tools directly addresses IBM's recommendation.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the evidence of the central QE repository, demonstration on how to access and use it, and updates to the relevant artefacts (i.e., policies and frameworks) as mentioned.

### Recommendation 6.3.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

#### IBM Detailed Findings

The alignment of ASX's test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

#### IBM Recommendation Summary

Describe role-based ASX test training program within the ASX test policy that supports the ASX test policy and guidelines, the ASX test methodology, and their concepts.

#### ASX Action(s)

1. Current state assessment of test training and knowledge using industry-aligned framework (e.g. SFIA tbc)
2. Determine certification & training needs and minimum requirements linked to delivery and operational risk
3. Develop and roll out training and on boarding plan and processes, prioritising higher risk groups

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan and the necessary steps to put together a new training program. However, it is unclear in ASX's actions if the test training program will be 'role based' as described in IBM's recommendation.

In order for ASX to address this Recommendation, we expect to see from ASX that the roles have been considered when implementing the ASX Actions.

## Recommendation 6.3.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The alignment of ASX's test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

### IBM Recommendation Summary

Define and document the risk-based testing approach and techniques in the testing policy.

### ASX Action(s)

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

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program, and their Risk Based Testing methodology approach is included in their scope of work.

ASX has stated that as part of their QE Transformation Program, they intend to update ASX's QE Vision and Policy to be aligned with ISO29119 and designed to reach TMMI L4+ maturity.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX evidence of the enhancements to their Risk based testing methodology and the integration with metrics, including updates to the relevant artefacts (i.e. policies and frameworks) as mentioned.

### Recommendation 6.3.3:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

#### IBM Detailed Findings

The alignment of ASX’s test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

#### IBM Recommendation Summary

Adopt an overarching and detailed ASX Test Methodology which includes templates, methods and processes, job role and guidelines to ensure any compliance to ISO29119 guidelines.

#### ASX Action(s)

1. Create and document a detailed ASX test methodology, aligned to ISO29119 guidelines
2. Prescribe acceptable testing standards (ATS) required for all technology-enabled change aligned to risk appetite and risk-based pathways
3. Update sourcing processes to provide acceptable testing standards to partners and vendors providing engineering, quality engineering or testing services

4. Enhance job roles and responsibilities linked to ASX Testing Career Pathways
5. Publish and roll out the ASX test methodology with appropriate education and communication, linked to training programs

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program, and their Risk Based Testing methodology approach is included in their scope of work.

As part of the QE Transformation Program, ASX intend to:

- Create awareness of ASX’s testing vision through a Communications & Education plan for the QE Transformation audience
- Update ASX’s QE Vision and Policy to be aligned with ISO29119 and designed to reach TMMI L4+ maturity
- Update relevant NFR policies, procedures and standards (QE Policy and QE Strategy, including mandatory testing types for major systems and high-risk changes e.g. full ITDR/BCP)

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the details of the updated sourcing processes, and enhancement of job roles and responsibilities in their Career Pathways.

## Recommendation 6.4.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #9
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

### IBM Detailed Findings

The Design Authority was appropriately involved and, as the software was a customised off the shelf product, was not required to analyse the internals of the Nasdaq software architecture.

The Design Authority was not to consider the internal architecture of vendor platforms.

### IBM Recommendation Summary

As part of the Design Authority checklist, include a solution maturity assessment that covers the market (*external*) and technology maturity dimensions.

### ASX Action(s)

1. Enhance architecture process to embed formal indicators of quality risk to guide testing strategy and plan
2. Include "Solution Quality" as an evaluation criteria (including minimum thresholds) in the architecture evaluation process

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a third-party Testing and Quality Engineering specialist to implement and embed the QE Transformation Program, and their Risk Based Testing methodology approach is included in their scope of work.

ASX has stated that as part of their QE Transformation Program, they intend to enhance their QE Policy and QE Strategy, and establish and enable a risk-based testing approach. ASX also intends to enhance their architecture processes to inform test strategies on quality risk and solution maturity.

However, ASX has not stated the specifics of what they will be including as part of their solution maturity assessment and how it will cover vendor platforms, and whether it will be part of the Design Authority checklist.

We acknowledge that the ASX Actions stated for this IBM Recommendation provide an initial overview of their plan on how they intend to close the recommendation and expect to see the outcomes of the actions during the relevant quarterly review period.

For ASX to address this IBM Recommendation, we expect to see from ASX the specific enhancements to the architecture process and the details of the solution maturity assessment as part of their Design Authority checklist.

This Recommendation has been submitted for closure by ASX as part of the second quarterly review period (April 2022) and will be assessed in our next quarterly IE report.



## Recommendation 6.4.2:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #31
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

Participants generally felt the communications leading up to the release were good, including from their Technical Account Managers. However, the following concerns were noted by individual Participants: [REDACTED]

[REDACTED]

### IBM Recommendation Summary

Engage the market to understand the benefits and demand for the re-introduction of a performance testing environment. Post market engagement, determine the required implementation, if any.

### ASX Action(s)

1. Conduct survey with participants to get input on the different types of testing that customers want to be able to do with ASX Trade, and the benefits and relative priority of that testing for them
2. Using the survey as input, consider what testing environments would be appropriate and propose whether any changes are required

### IE Findings

We have assessed the ASX Actions and found that the actions are fit for purpose and address the IBM Recommendation.

As part of their actions, ASX plans to survey market participants to get input on the different types of testing that customers want to be able to do with ASX trade, in order to determine what testing environments would be appropriate and propose whether any changes are required based the results of the market consultant. This directly addresses IBM's recommendation. Additionally, ASX have noted they intend to take into consideration the ASIC report published in November 2021 titled 'ASIC's expectation for industry in responding to a market outage' (ASIC Report 708) when assessing market consultation requirements around customer testing.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX details around how they conducted their market participant survey, the results of the survey, how the survey results and insights from the ASIC Report 708 were used to inform their testing environment decisions, and the documentation of any changes required.

### Recommendation 6.4.3:

	ASX Coverage
ASX Action 1	✓
IBM Findings Reference	Chapter 5, #31
Comment	ASX Action is partially fit for purpose and partially addresses the IBM Recommendation.

#### IBM Detailed Findings

Participants generally felt the communications leading up to the release were good, including from their Technical Account Managers. However, the following concerns were noted by individual Participants: [REDACTED]

#### IBM Recommendation Summary

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

#### IE Findings

We have assessed the ASX Actions and found that the actions partially address the IBM Recommendation.

ASX has included as part of their actions to update their QE policy and procedures to include guidelines for:

- Which projects should require a final stage of coordinated client testing
- Guidance on types of tests and scenarios which should be included to support that

Whilst we acknowledge that that these are reasonable actions for ASX to take, it does not clearly address the concerns outlined by the IBM Recommendation in relation to participant engagement and coordination. The ASX Action proposed suggest the decisions are on which projects should require a final stage of coordinated client testing and what types of tests and scenarios should be included are independently made by ASX.

For ASX to fully address this IBM recommendation, we recommend that ASX explicitly state in the ASX Action that other market participants are to be involved in coordination and execution activities.

## Recommendation 6.4.4:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #45
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The impact to ASIC was high due to the operational effort needed to recover the required delayed data. In addition, since there was no IT Disaster Recovery or failure test performed in the preparation stage

### IBM Recommendation Summary

Evaluate the need to update the necessary policies to require that a full ITDR/BCP test be conducted as part of the testing program prior to implementing any major system or raise a formal delivered risk.

### ASX Action(s)

1. Enhance QE policy, processes, procedures and acceptable testing standards for non-functional testing, addressing mandatory testing types such as full ITDR/BCP testing of major systems
2. Integrate mandatory non-functional testing types into delivery risk management processes

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to update their QE Policy and QE Strategy, including mandatory testing types for major systems and high-risk changes, such as performing full ITDR/BCP. ASX also intends to enhance and integrate standards for non-functional test types and link to a risk-based test methodology.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the updates to their QE policies, processes and procedures and acceptable testing standards for non-functional testing, in particular that a full ITDR/BCP test is to be conducted as part of the testing program prior to implementing any major system or raise a formal delivered risk.

## Recommendation 6.4.5:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 5, #28
Comment	ASX Action is partially fit for purpose and partially addresses the IBM Recommendation.

### IBM Detailed Findings

There is limited evidence of a sufficient level of depth and breadth in test cases carried out in an integrated system environment to identify defects originating in NFF but manifesting in downstream systems. Neither is there evidence, beyond the limited testing done by ██████ in September 2019, of significant injection of randomisation to simulate market behaviour closer to go-live.

### IBM Recommendation Summary

Create a detailed interface and integration log, and for high importance interfaces ensure that end-to-end test coverage is completed. Where interfaces are not tested, then a clear rationale should be identified, the risk should be logged in the risk register and added to the implementation readiness document. Require that all high-risk feeds and interfaces, internal and external must be included in integration and end-to-end tests using test or live feeds rather than a virtualised or simulated stub.

### ASX Action(s)

1. Design and implement a knowledge base for system interfaces and integrations across architecture, engineering and testing
2. Align integration knowledge base to BA framework and deliverables for maintainability
3. Develop acceptable testing standards for system integration and end-to-end testing with regards to use of stubs vs real interfaces, based on risk
4. Integrate testing with external feeds into project planning and estimation processes
5. Include system integration and end-to-end testing standards into QE procedures, processes and methodology and govern through QE Authority

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to create and implement a knowledge base for system interfaces and integrations across architecture, engineering and testing, as well as include system integration and end-to-end testing standards into their QE procedures, processes and methodology and govern through a QE Authority.

However, ASX have not specifically mentioned in their actions whether for interfaces that are not tested, a clear rationale will be identified, the risk will be logged in the risk register and added to the implementation readiness document.

For ASX to address this IBM Recommendation, we recommend they explicitly state as part their actions how they intend to treat interfaces

that are not tested and the rationale behind it, and if the risk will be logged in the risk register and added to the implementation readiness document.

## Recommendation 6.4.6:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

The alignment of ASX’s test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

### IBM Recommendation Summary

Design, document and implement a test selection and prioritisation process supported by test design optimization methods and/or combinatorial test tools.

### ASX Action(s)

1. Define test selection and prioritisation criteria framework, aligned to ISO29119
2. Define knowledge management requirements for test optimisation and create and implement plan for knowledge base creation
3. Define requirements for test optimisation tool and secure funding
4. Implement test optimisation processes and tools

5. Regular audit/review of test selection and prioritisation framework effectiveness

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to define the test selection and prioritisation criteria framework and align it to ISO29119, implement test optimisation processes and tools, and ensure there are regular audit and reviews in place to measure the effectiveness of the framework.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the implemented test selection and prioritisation criteria framework (aligned to ISO29119), the implemented test optimisation processes and tools, and the plan for regular audit/review to measure the effectiveness of the test selection and prioritisation framework.

## Recommendation 6.4.7:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #13
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

As it relates to the MO37/TMC/Bait incident that caused the outage on the 16<sup>th</sup> November 2020, there was a shared mutual understanding between Nasdaq and ASX of the business requirement that continued from Genium V3 to NFF. An ASX functional test case did find a defect for a top of book scenario however, neither party tested the exact conditions of the scenario that happened on 16<sup>th</sup> November 2020.

### IBM Recommendation Summary

Document a test planning guide that prompts delivery teams to consider a wider coverage of the requirements due to inherent risks and complexities involved. For example, consider dynamic functional scenarios e.g. at start of day, in a slow market, in a very fast market, with many cancels, in a top of book scenario, in a non-top of book scenarios, across partition.

### ASX Action(s)

1. Create an ASX Test Planning guide to provide specific guidance and criteria to plan for wider test coverage to include for example dynamic functional scenarios, schedule-based scenarios (e.g. SOD/EOD), cumulative scenarios, different profiles of market activity and edge cases

2. Integrate ASX Test Planning guide with QE processes, procedures and methodology, Test environments and test data management capability, Continuous improvement program and Risk-based pathways

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to create and integrate an ASX Test Planning guide that includes enablers (e.g. test data and test environments), which directly addresses IBM's recommendation.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the specific details of ASX Test Planning guide, including criteria and wide range of scenarios covered, as well as how they have integrated the new guide with their QE processes, procedures and methodology, Test environments and test data management capability, Continuous improvement program and Risk-based pathways.

## Recommendation 6.4.8:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
IBM Findings Reference	Chapter 5, #27
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

Notwithstanding the continuation of software quality issues throughout the delivery cycle, there is no evidence of any independent review, by either internal or external parties, of the test strategy. [REDACTED], a firm specialising in financial market testing who was engaged by ASX for specific testing assignments, was not engaged to review the testing strategy.

### IBM Recommendation Summary

For complex high-risk projects, consider using an independent specialist party for an independent review of the plan and provide for a wider set of test capabilities in addition to internal testing. For example, for the test strategy and planning, to extend the depth and breadth of risk identification, greater test plan execution coverage.

### ASX Action(s)

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

### IE Findings

We have assessed the ASX Actions proposed and found that the actions address the IBM Recommendation.

ASX has stated as part of their actions that they intend to establish a model and panel for independent specialist review and advice regarding their test strategy and plans, including specialist testing capabilities, which directly addresses IBM's recommendation. Additionally, ASX plans to include this new requirement into their estimation and delivery frameworks.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the established model and panel for independent specialist review of the test strategy and plans, which projects it applies to (i.e. all projects or complex high-risk projects only), and how it is incorporated into estimation and delivery frameworks.



## Recommendation 6.5.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 5, #29
Comment	ASX Actions are partially fit for purpose partially and address the Recommendation.

### IBM Detailed Findings

While regular reports tracking defects were produced by the Project team, ASX relied on the Nasdaq Jira for tracking defects whilst the tracking of defects in the ASX Jira was not maintained in a timely or accurate manner making subsequent analysis difficult.

### IBM Recommendation Summary

Institute on-going defect analysis techniques (including defect prediction and defect modelling). Work with production tracking systems to accurately track Defect Leakage into production. Define and implement a method of linking defects to specific releases, tests and business functions. Begin tracking Defect Removal Efficiency into UAT and Production and Mandate Root Cause recording in defect analysis.

### ASX Action(s)

1. Enhance ongoing defect analysis techniques, including defect leakage, defect modelling and prediction aligned to industry and internal standards and thresholds
2. Link defect, incident and problem management processes to accurately measure defect leakage

3. Mandate root cause analysis recording for higher severity defects and derive metrics and commentary
4. Integrate enhanced defect management processes into QE processes and procedures
5. Integrate all metrics into QE authority and project reporting

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to enhance ongoing defect analysis techniques and link defect, incident and problem management processes to accurately measure defect leakage. Additionally, ASX has stated in their actions they plan to mandate root cause analysis recording for higher severity defects and derive metrics and commentary, as well as integrate all metrics into QE authority and project reporting.

However, ASX have not specifically stated whether they intend to begin tracking 'Defect Removal Efficient into UAT and Production' which is suggested in IBM's recommendation.

For ASX to address this IBM Recommendation, we recommend including in the actions the intent to begin tracking 'Defect Removal Efficient into UAT and Production.

## Recommendation 6.5.2:

	ASX Coverage
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	✓
IBM Findings Reference	Chapter 5, #29
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings

While regular reports tracking defects were produced by the Project team, ASX relied on the Nasdaq Jira for tracking defects whilst the tracking of defects in the ASX Jira was not maintained in a timely or accurate manner making subsequent analysis difficult.

### IBM Recommendation Summary

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

### IE Findings

We have assessed the ASX Actions and conclude that the actions address the IBM Recommendation.

As stated in our IE Findings for IBM Recommendation 6.1.1, ASX has created the Quality Engineering Transformation Program to address a number of the IBM Recommendations related to testing. ASX have partnered with a Testing and Quality Engineering specialist third party to implement and embed the QE Transformation Program.

ASX has stated that as part of their QE Transformation Program, they intend to:

- Define their quality metrics framework
- Establish an Enterprise Quality Engineering governance forum
- Apply and fully integrate quality metrics into governance processes

These deliverables directly address the IBM Recommendation and the recruitment of the Quality Engineering Lead aims to assist ASX in ensuring that the appropriate input around Metrics, Reporting and Assurance is incorporated.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the implemented quality metrics framework and the details of the newly recruited Quality Engineering Lead and their specific role in putting together the Metrics, Reporting and Assurance processes.

### Recommendation 6.5.3:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
IBM Findings Reference	Chapter 6, #48
Comment	ASX Actions are partially fit for purpose and partially address the IBM Recommendation.

#### IBM Detailed Findings

The alignment of ASX’s test documentation and related process implementation is not consistent with that of the expected Test Documentation, Test Techniques and Process Standards based on ISO/IEC 29119.

#### IBM Recommendation Summary

Design, document and implement a test coverage tracking approach to measure coverage of tests to be executed. Apply the tracking to the current base of test cases to ensure proper coverage.

#### ASX Action(s)

1. Design and document a test coverage tracking approach and associated processes
2. Include traceability to requirements and identify other measures of test coverage, for example production data profile coverage, business scenario coverage, levels of test automation, exploratory test coverage, views of prior incidents
3. Develop overall quality dashboard and analytics
4. Implement test coverage tracking and integrate into QE processes and procedures and into reporting

#### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

ASX has included as part of their actions to design and document a test coverage tracking approach and associated processes, which directly addresses the first half of IBM’s recommendation.

However, in IBM’s recommendation, IBM asks for ASX to apply the tracking to the current base of ASX’s test cases to ensure proper coverage, and it is unclear in the ASX Actions as to whether ASX will be applying the coverage to their ‘current base of test cases’, or if they even have a current base of test cases.

In order for ASX to address this IBM Recommendation, we recommend ASX incorporate the test tracking approach to the current base of test cases.

## Recommendation 6.5.4:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
ASX Action 3	✓
ASX Action 4	✓
ASX Action 5	✓
IBM Findings Reference	Chapter 5, #17
Comment	ASX Actions are fit for purpose and address the Recommendation.

### IBM Detailed Findings Summary

Due to [REDACTED] software quality issues the completion of conditional acceptance was delayed by ~6 months. The coverage of the automated regression tests that were undertaken during the first two acceptance test phases was ~45% of the final test case coverage. The acceptance test phases occurred prior to the formal ASX functional and non-functional test case coverage. ASX were right to delay conditional acceptance, however using the full suite of test cases would have identified the scale of the quality issues far sooner.

### IBM Recommendation Summary

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

### IE Findings

We have assessed the ASX Actions and found that the actions are fit for purpose and address the IBM Recommendation.

ASX has included as part of their actions to define the metrics-based criteria and description for the 'Quality Sentiment' indicator, as well as identify actions that should be performed as a result of the risk rating from the 'Quality Sentiment' indicator, which directly addresses the IBM Recommendation.

As part of the relevant quarterly review period this Recommendation is to be presented at, we expect to see from ASX the Quality Sentiment framework, including the defined metrics-based criteria and descriptions for the 'Quality Sentiment' indicator, the updates to related artefacts (e.g. test report templates and regular project reporting templates), and the identified actions that should be taken as a result of the Quality Sentiment rating.

## Recommendation 6.7.1:

	ASX Coverage
ASX Action 1	✓
ASX Action 2	✓
IBM Findings Reference	Chapter 5, #30
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

### IBM Detailed Findings

A Customer Test environment, three Dry Run exercises and four Dress Rehearsals from 20<sup>th</sup> January 2020 to 24<sup>th</sup> October 2020 provided adequate time for Customer and ASX to prepare themselves from go-live. Conformance testing was achieved in advance of go-life. The associated publicly available documentation and instructions was clear.

Dress rehearsals were open invitations for customer to test, offering a capability for participants to log in and perform failovers to observe what happens in those scenarios. There was no requirement on the participants to perform a minimum of functional testing beyond conformance.

Customers that were still testing on the go-live weekend were unable to use the live system for a while post go-live.

### IBM Recommendation Summary

Review the policy to consider whether mixing any form of customer testing with go-live weekend activities is appropriate for critical new system deliveries.

### ASX Action(s)

1. A review of the nature and reason for any customer 'testing' on go-live weekends will be undertaken

2. Any findings from this will be updated in relevant testing and Project Governance policies

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

ASX has included as part of their actions to review the nature and reason for any customer 'testing' on go-live weekends will be undertaken and intends to update relevant testing and Project Governance policies accordingly based on their findings. However, it is unclear as to how ASX intends to conduct the review and whose input will be considered i.e. will it be from ASX's perspective only or will the perspectives from market participants (customers) be considered as well.

In order for ASX to address this Recommendation, we expect to see from ASX the details of their test strategy and test plans based on the feedback gathered from their customers, as well as review their approach to integrate the Customer Testing Strategy with the overall Program Management Governance controls. This includes clear communications, planning and signoffs at the Program Level and implement General Program Management Office (PMO) scope (RAID controls, Change Management, review and approvals processes etc.). Additionally, we would like to see ASX include Change Management principles to fully close identified gaps, including additional Change Impact Assessment for testing related activities to identify internal and external people Impacts.

This Recommendation has been submitted for closure by ASX as part of the second quarterly review period (April 2022) and will be assessed in our next quarterly IE report.

## Recommendation 7.1.1:

	ASX Coverage
ASX Action 1	✓
IBM Findings Reference	Chapter 5, #45
Comment	ASX Actions are partially fit for purpose and partially address the Recommendation.

### IBM Detailed Finding

Whilst keeping the market in Enquire State was within ASX's operating rules, the length of time before making the decision to close the market resulted in uncertainty and the need for Participants to remain on alert for a potential reopening, decision making was based on ASX's Incident Management Framework.

Participants indicated they would have preferred a faster decision to close the market rather than maintain it in Enquire state. They were faced with having to maintain constant readiness for a re-open. ■

### IBM Recommendation

During an outage where the Market is not in a fully open state, identify what length of time would require a default decision of closing the market and performing end of day activities, unless there are other overriding circumstances.

### ASX Action(s)

1. Establish a working group to consider options for managing the market in the event of an extended outage, and bring back a proposal on how to provide additional clarity to market users.

### IE Findings

We have assessed the ASX Actions proposed and found that the actions partially address the IBM Recommendation.

ASX's action to establish a working group does not take into consideration the service levels reviews or updates required in the ASX Incident Management Framework, but rather details the commencement plan they intend to take in order to address the IBM Recommendation.

In order for ASX to address this Recommendation, we expect to see from ASX the details of the outputs produced by the working group decisions, such as service level reviews and updates to relevant artefacts (e.g. frameworks and policies).

This Recommendation has been submitted for closure by ASX as part of the second quarterly review period (April 2022) and will be assessed in our next quarterly IE report.

Appendix A EY Program assurance methodology





## Appendix B Assessment outcome against EY's Cube program assurance methodology

We have assessed the overall program management and established governance of the Delivery Excellence Program against typical project risks following EY program assurance methodology related to Governance and Project Management, and found the following focus areas to be applicable.

EY Cube Methodology			
Domain	Focus area	Topics considered	ASX Coverage
Governance	G1 - Business case integrity		Not Applicable Out of scope - assessment was not retrospective
	G2 - Complexity profile		Covered
	G3 - Capability And maturity		Covered
	G4 - Decision framework		Covered
	G5 - Organisational Change management		Partially Covered
	G6 - Progress management		Covered

EY Cube Methodology			
Domain	Focus area	Topics considered	ASX Coverage
	G7 - Governance effectiveness		Covered
	G8 - Compliance and regulatory		Covered
	G9 - Benefits design and realisation		Not Applicable (Out of scope)
Project Management	P1 - Scope management		Not Applicable (Scope defined by IBM Report)
	P2 - Time management		Covered
	P3 - Cost management		Not Applicable (Out of scope)
	P4 - Human resource management		Covered
	P5 - Procurement management		Covered

EY Cube Methodology			
Domain	Focus area	Topics considered	ASX Coverage
	P6 - Integration management		Covered
	P7 - Quality management		Covered
	P8 - Risk management		Covered
	P9 - Communications management		Covered

## Appendix C Workshop list

#	Date	Meeting Title
<b>Introduction Workshops</b>		
1	17/01/2022	Introduction to ASX: ASX Remedial Actions Review
2	20/01/2022	Delivery Excellence program: ASX Remedial Actions Review
3	21/01/2022	Explanation of recommendation closure pack: ASX Remedial Actions
4	2/02/2022	ASX Remedial Actions   Delivery Excellence Testing uplift plan - run through with EY
<b>Factual Accuracy Check Review Meeting</b>		
5	13/04/2022	ASX Remedial Actions: EY IE Design Adequacy Draft Report Factual Accuracy Check Review
<b>Q1 Recommendations Review Workshops - February 2022</b>		
6	2/02/2022	ASX Actions - Review for Recommendations 3.1.2 & 3.1.3
7	2/02/2022	ASX Actions - Review for Recommendation 4.1.1
8	7/02/2022	ASX Actions - Review for Recommendation 1.2.4, 1.3.1, 1.3.2, 1.3.5 & 1.3.10
9	7/02/2022	ASX Actions - Review for Recommendation 5.1.1 (5.1.2 removed from session, written response provided)
10	8/02/2022	ASX Actions - Review for Recommendation 3.2.7
11	8/02/2022	ASX Actions - Review for Recommendations 3.1.4 & 3.2.6
12	8/02/2022	ASX Actions - Review for Recommendations 2.1.3 & 2.1.4
13	10/02/2022	ASX Actions - Review for Recommendations 1.2.1, 2.1.1 & 2.1.2
14	10/02/2022	ASX Actions - Review for Recommendation 6.6.1
15	10/02/2022	ASX Actions - Review for Recommendations 1.3.3, 1.3.9 & 3.2.4 (Workshop not held, written response provided)
16	24/02/2022	ASX IBM Recommendations: EY IE Draft Report Fact Check Review

## Appendix D Interviewed ASX stakeholders list

Role
Chief Risk Officer
Chief Customer and Operating Officer
Group Executive, Technology and Data and CIO
Group Executive, Markets
General Manager, Business Management and Delivery, Markets
General Manager, Enterprise Risk Management
General Manager, Enterprise Delivery
Head of Change & Delivery Enablement, Enterprise Delivery
Head of Testing, Quality Engineering & Testing
Senior Manager, Enterprise PMO, Enterprise Delivery
Senior Manager, Application Support, Markets Technology
Senior Manager, Enterprise Risk Management
Manager, Business Analysis, Markets
Manager, Vendor and Partner Relationships, Security & Governance
EPMO Lead, Enterprise Delivery
Project Manager, Enterprise Delivery

Appendix E Documents reviewed























## Appendix F First Quarterly IE Final Report (February 2022)

Below is a copy of the first quarterly IE final report (*ASX Independent Assessment of IBM Recommendations Review\_FINAL*) produced on 25 February 2022 covering the 22 IBM Recommendations submitted by ASX on 28 January 2022 during the quarterly period.



# ASX Limited

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

25 February 2022

### REPORT DISCLAIMER

This report has been provided to ASX pursuant to the terms of our engagement letter (Statement of Work, or "SOW") dated 22 December 2021. 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. None of the services or any reports will constitute any legal opinion or advice. We did not conduct a review to detect fraud or illegal acts. We provided specific services only for this engagement and for no other purpose and we disclaim any responsibility for the use of our services for a different purpose or in a different context.

If you plan to use this work product on another transaction or in another context, please let us know and provide us with all material information so that we can provide services tailored to the appropriate circumstances. Other than ASX, ASIC and RBA, our report may not be provided to, used by or relied upon by any other party without our prior written consent. We disclaim all liability to any other party for all costs, loss, damage and liability that the other party may suffer or incur arising from or relating to or in any way connected with the contents of our report, the provision of our report to the other party or the reliance upon our report by the other party. Liability limited by a scheme approved under Professional Standards Legislation.



25 February 2022

Hamish Treleaven  
Chief Risk Officer

ASX Limited  
20 Bridge Street  
Sydney NSW 2000

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

Dear Hamish

Please find attached our assessment of the ASX Actions related to twenty-two (22) of the IBM Recommendations and submitted to ASIC and RBA on 28th January 2022 as part of the ASX Quarterly Report.

Our work has been completed in accordance with our terms and scope of services outlined in our Statement of Work dated 22 December 2021.

We acknowledge and thank ASX for its cooperation in undertaking our independent expert assessment activities to date. If you, the Board, ASIC, or the RBA would like to discuss any matters relevant to this Report, please contact me on +61 408 704 010 or Roberto Fitzgerald on +61 411 549 248.

Yours sincerely,



Mike Orman  
Partner

## Table of contents

1.	Executive Summary .....	2
2.	Introduction .....	4
2.1	Background.....	4
2.2	Scope .....	4
2.3	Approach .....	5
2.4	Limitations.....	5
2.5	Use and disclosure of our reports .....	6
3.	Our Findings.....	7
Appendix A	Recommendation review workshops list .....	44
Appendix B	Interviewed ASX stakeholders list .....	45
Appendix C	Recommendations Questionnaire submitted to ASX post SMR documentation review.....	46
Appendix D	Documents reviewed .....	50
Appendix E	Recommendations to be re-presented by ASX in future quarterly reports .....	59

# 1. Executive Summary

## Introduction

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 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 (“Plan”) which consists of 173 deliverables (“ASX Action”) to address the 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.

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

## Scope

In accordance with Licence Condition 3, 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 IBM review recommendations, and
- If there are any issues in implementing any ASX actions, the reasons for those issues and what remedial 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 is to:

- Review and assess each of the quarterly reports produced by ASX (as required under the relevant Licence), 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.

## 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.

### Summary findings and recommendations

As the appointed IE we have agreed to provide 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." In response we provide you with the following summary findings and the detailed supporting rationale in the remainder of this report.

#### Appropriate progress towards addressing and implementation of the IBM review recommendations

We recognise that ASX have developed a program to address the IBM Recommendations called the Delivery Excellence Program ("the Program"), where they have dedicated resources focused on closing the 59 Recommendations, and we have interviewed these key individuals responsible for the program delivery.

We have found that the Program is 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 reported as closed to date.

We have reviewed the mapping developed by ASX to align its Actions to the closure of IBM Recommendations and confirm that it is comprehensive and appropriate subject to the completion of the ASX Actions.

We have reviewed the overall ASX schedule to close out each of the IBM Recommendations and believe that it is appropriate and reasonable. Twenty-two (22) of these Recommendations are being addressed in the

first quarter of the reporting with nearly all closed completely and 37 of the 59 total Recommendations still requiring action as part of this program of work. In this reporting cycle and evaluated against the 22 Recommendations, twenty-one (21) Recommendations have executed fully and appropriately with four (4) Recommendations requiring follow-up to evaluate the ongoing sustainability of the ASX Action. This demonstrates appropriate progress towards addressing the IBM Review Recommendations. We note that some of the more complex ASX Actions are executed in later quarters and believe this to be a reasonable and appropriate strategy. Further, we have witnessed the Program identifying resource expertise needs in advance and securing talent to maintain its scheduled completion of ASX Actions.

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.

We have found that the ASX Actions are reasonable and appropriate with a limited number of ASX Actions requiring re-evaluation in a future quarterly review.

We acknowledge and thank ASX for its cooperation in undertaking our Independent Expert assessment activities to date.

## 2. Introduction

### 2.1 Background

#### Recommendations Review

To address the 59 IBM Recommendations, ASX subsequently developed a management response plan which consists of 173 deliverables. The Plan is structured around the following seven elements (which are different to the seven domains from the IBM review) that seeks 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 sought 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 3, 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 ASX 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 addressed recommendations and related artefacts (closure packs 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:* The EY team then submitted a set of questions related to the recommendations and subsequent ASX actions one day prior to meeting where ASX prepared responses for the joint recommendation review sessions. A list of questionnaires submitted to ASX can be found in Appendix C.
3. *Recommendation Review Workshops:* We held sessions 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 documentations/evidence and 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. Our Findings

We assessed the ASX Actions taken by ASX as part of their response plan to the IBM recommendations and observed whether ASX have taken the adequate steps to address the recommendations.

Evidence provided for our review was well documented and shows considerable executive support and sponsorship at the outset of the program as well as strong Board oversight.

The following pages outline our review assessment as a summary of all the 22 recommendations submitted by ASX to ASIC and RBA.

## Summary of Review Recommendations Assessment

Below is a summarised view of the outcome of each Recommendation and its related ASX Action(s). For detailed information around recommendation findings please refer to the following pages.

#	Recommendation / ASX Actions	Executed	Appropriate	Sustainable
1.2.1	<b>Recommendation: Ensure Line 2 resource expertise</b>	<b>Recommendation has been partially addressed</b>		
	ASX Action 1: A new Senior Manager, Enterprise Risk Management will be recruited to be the Line 2 representative on P1 and/or high-risk projects (excluding CHES)	✓	✓	✓
	ASX Action 2: Post the PRA, the Sponsor and the CRO will attest that appropriate expertise for Line 2 challenge is available	✓	✓	✓
	ASX Action 3: Review the current Expectations of Line 2 on PSGs documentation	✓	✓	✓
1.2.4	<b>Recommendation: Enhance controls re PRA and Process-RA mapped to risk register</b>	<b>Recommendation has been addressed</b>		
	ASX Action 1: Update EPRM framework and the Project Risk & Issues Management framework to require that risks are transferred to the RAID register	✓	✓	✓
	ASX Action 2: Update the Expectations of Line 2 on PSGs documentation to include this as an advice/challenge topic	✓	✓	✓
1.3.1	<b>Recommendation: Update policy to ensure PRA and Process-RA performed frequently</b>	<b>Recommendation has been addressed</b>		
	ASX Action 1: The EPRM framework will be updated to require that the PRA is done semi-annually through a project's live (note that this decision was taken in Jan 2021)	✓	✓	✓
	ASX Action 2: The EPRM framework will be updated to require that the Process Risk Assessment is considered at multiple times through the project and that is suitable for this risk management task	✓	✓	✓
1.3.2	<b>Recommendation: Ensure risks identified and logged</b>	<b>Recommendation has been addressed</b>		
	ASX Action 1: Update the Project Risk & Issues Management framework to include this as a requirement	✓	✓	✓
	ASX Action 2: Update the Expectations of Line 2 on PSGs documentation to include this as a challenge topic	✓	✓	✓
	ASX Action 3: Create guidance note on RAID management (akin to Risk Champions guidance note)	✓	✓	✓

#	Recommendation / ASX Actions	Executed	Appropriate	Sustainable
1.3.3	<b>Recommendation: Ensure project RAID shared with PSG</b>	<b>Recommendation has been addressed</b>		
	ASX 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	✓	✓	✓
	ASX Action 2: Update the Expectations of Line 2 on PSGs to challenge on this topic	✓	✓	✓
	ASX Action 3: Create guidance note on RAID management (akin to Risk Champions guidance note)	✓	✓	✓
	ASX Action 4: Define standard reporting requirements	✓	✓	✓
	ASX Action 5: Enhance existing RAID dashboards	✓	✓	✓
	ASX Action 6: Create guidance note on risk reporting at PSGs	✓	✓	✓
1.3.5	<b>Recommendation: Ensure ERM Line 2 included in timely manner</b>	<b>Recommendation has been addressed</b>		
	ASX 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	✓	✓	✓
	ASX Action 2: Update the EPRM framework to include this as a requirement	✓	✓	✓
	ASX Action 3: Update the Expectations of Line 2 on PSGs document to make this a requirement that is escalated to the Sponsor and CRO if not met	✓	✓	✓
1.3.9	<b>Recommendation: Ensure RAID reported to PSG and tracked for closure</b>	<b>Recommendation has been addressed</b>		
	ASX 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	✓	✓	✓
	ASX Action 2: Define standard project risk reporting requirements and develop dashboards	✓	✓	✓
	ASX Action 3: Create PSG Sponsor and member guidance note covering reporting requirements	✓	✓	✓
	ASX Action 4: Update the Expectations of Line 2 on PSGs document to challenge on this concept	✓	✓	✓
1.3.10	<b>Recommendation: Quantify risks using ASX standard methods (likelihood/impact)</b>	<b>Recommendation has been addressed</b>		
	ASX Action 1: Review the project risk scalars (these were updated on 5th may and signed off by the CRO)	✓	✓	✓

#	Recommendation / ASX Actions	Executed	Appropriate	Sustainable
3.1.10	ASX Action 2: Include as a topic of discussion in the Risk culture and awareness short and long term education session in response 1.1.1-2	✓	✓	✓
	ASX Action 3: Create Sponsor and PSG member guidance document	✓	✓	✓
	ASX Action 4: Update the Expectations of Line 2 on PSGs document to challenge on this concept	✓	✓	✓
2.1.1	<b>Recommendation: Document PSG roles/responsibilities based on risk &amp; include independence</b>	Recommendation has been addressed		
	ASX Action 1: Review existing Project Governance guidelines and update to ensure clear purpose and roles and responsibilities of governance forum membership	✓	✓	✓
2.1.2	<b>Recommendation: Evaluate if PSG needs member criteria re independence</b>	Recommendation has been addressed		
	ASX Action 1: Line 2 ERM to be allocated to all P1 or high risk project PSGs	✓	✓	✓
	ASX Action 2: Composition of project governance forums will be reviewed as part of Recommendation 2.1.1	✓	✓	✓
2.1.3	<b>Recommendation: Evaluate if P1 and/or High risk projects need dedicated PSG</b>	Recommendation has been addressed		
	ASX Action 1: Update the Project Governance section of the ASX Delivery Framework to reflect this	✓	✓	✓
2.1.4	<b>Recommendation: Update policies to require PSG monitors against defined success metrics</b>	Recommendation has been addressed		
	ASX Action 1: Review and update the Project Governance guidelines to ensure expectations regarding project tracking and reporting are clearly outlined	✓	✓	✓
3.1.2	<b>Recommendation: Checklist to increase scope of lessons learned from PIRs</b>	Recommendation has been addressed		
	ASX Action 1: Complete the Lessons Learnt Framework and Repository Refresh	✓	✓	✓
	ASX Action 2: Introduce Mandatory Requirement to review Lesson Learnt Repository as part of the 'Define & Plan' stage of the Project Lifecycle	✓	✓	✓
3.1.3	<b>Recommendation: Update policy - require PIR lessons learned considered at project initiation</b>	Recommendation has been addressed		
	ASX Action 1: Complete the Lessons Learnt Framework and Repository Refresh	✓	✓	✓

#	Recommendation / ASX Actions	Executed	Appropriate	Sustainable
3.1.3	ASX Action 2: Introduce Mandatory Requirement to review Lesson Learnt Repository as part of the 'Define & Plan' stage of the Project Lifecycle	✓	✓	✓
3.1.4	<b>Recommendation: Update policy - EP MO involved from initiation in P1 projects</b>	Recommendation has been addressed		
	ASX Action 1: A step will be introduced into the Initiation stage of the Delivery Framework that outlines who and how to engage EP MO to ensure standard tooling setup	✓	✓	✓
3.2.4	<b>Recommendation: Consider policy update so that P1 or High risk project PSGs meet fortnightly</b>	Recommendation has been addressed		
	ASX Action 1: Investigate and determine appropriate PSG meeting frequency for P1 or high risk projects	✓	✓	✓
	ASX Action 2: Include this as a requirement in the Governance guidelines of the ASX Project Management Framework	✓	✓	✓
	ASX Action 3: See 1.3.9 point 2 ( <i>Define standard project risk reporting requirements and develop dashboards</i> )	✓	✓	✓
3.2.6	<b>Recommendation: Update policy so that P1 projects run by in-house Project Manager</b>	Recommendation has been addressed		
	ASX Action 1: The Enterprise Project Management framework will be updated to list this as a preference where possible. If this is not possible nor sensible then this will be included in the business case for PGG noting.	✓	✓	✓
	ASX Action 2: The Sponsor with assistance from the Project Assurance Specialist will then be accountable for compliance with project delivery practices.	✓	✓	✓
3.2.7	<b>Recommendation: Ensure that key Go-Live meetings documented</b>	Recommendation has been addressed		
	ASX Action 1: Enterprise Project Risk Management framework to be updated to reflect this requirement.	✓	✓	✓
4.1.1	<b>Recommendation: ASX should maintain detailed requirements log to lessen reliance on single vendor</b>	Recommendation has been addressed		
	ASX Action 1: Review the Enterprise Project Management framework on requirements definition for new projects, updating it to define which projects would require ASX to create/maintain a full requirement register in-house and at what level of detail.	✓	✓	✓
	ASX Action 2: Identify the next project that is likely to apply this issue to. This is likely the next upgrade of NTP.	✓	✓	N/A
	ASX Action 3: Consider whether to apply this retrospectively to ASX Trade or to await the next refresh to this	✓	✓	✓

#	Recommendation / ASX Actions	Executed	Appropriate	Sustainable
5.1.1	<b>Recommendation: Perform contract acceptance at end of project lifecycle</b>	Recommendation has been partially addressed		
	<b>ASX Action 1:</b> Update ASX's Vendor Management framework to require contract acceptance at the end of the project lifecycle once integration and end to end testing have been completed	✓	✓	✓
5.1.2	<b>Recommendation: Create guidelines for supplier contract acceptance testing</b>	Recommendation has been partially addressed		
	<b>ASX Action 1:</b> Guidelines will be created for supplier related contract acceptance testing. These will be referenced in ASX's Testing Policy and ASX's vendor Management framework.	✓	✓	✓
6.6.1	<b>Recommendation: Ensure ASX Trade included in next annual ITDR exercise</b>	Recommendation has been partially addressed		
	<b>ASX Action 1:</b> Ensure ASX Trade included in next annual ITDR exercise	✓	✓	✓

## Recommendation 1.2.1: Ensure Line 2 resource expertise

Recommendation Review Summary	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 the ASX has appropriately identified the need for an additional Line 2 resource and implemented this Recommendation, at the time of writing this report, ASX has not exercised an ongoing process to evaluate Line 2 Risk coverage and capability. As a result, we are marking the sustainability of this item as "Partially Met" until such time that we can confirm that governance around Line 2 Risk coverage and capability has been exercised. EY will include the completion of this "Partially Met" item in its scope for subsequent reviews.</p>		

### Background/Tasks

Ensure that ERM Line 2 resources assigned to projects have sufficient expertise such that they can provide adequate oversight and challenge to the project. Post the Project Risk Assessment (PRA) exercise, a suitable ERM Line 2 expert or set of experts should then be assigned to the project, based upon the detailed understanding of the scope.

### ASX Actions

1. A new Senior Manager, Enterprise Risk Management will be recruited to be the Line 2 representative on P1 and/or high-risk projects (excluding CHES)
2. Post the PRA, the Sponsor and the CRO will attest that appropriate expertise for Line 2 challenge is available
3. Review the current Expectations of Line 2 on PSGs documentation

### Findings

#### ASX Action 1:

Following the recommendation, ASX has recruited a new Senior Manager to join the Enterprise Risk Management space to be the Line 2 representative on P1 and high-risk projects. Additionally, the Enterprise Project Management Office (EPMO) has also hired a new senior risk specialist to be responsible from a project risk perspective (Line 1).

ASX explained the recruitment of the additional resources (Line 1 and Line 2) was to bolster up their resources and mitigate the risk of having any future Line 2 resourcing constraints. With the recruitment of these new resources, ASX advised that they are unable to foresee any resourcing issues in the next 12-24 months for Line 2 representatives on P1 and high-risk projects. The risk resources will have close liaison with the pipeline for what is coming up for P1 and high-risk projects.

#### ASX Action 2:

The Enterprise Project Risk Management framework (EPRMf) on the Confluence site states that all projects must complete a Project Risk Assessment to establish a risk rating. ASX has made an update to the EPRMf under section 1 'Project Risk Assessment' in the first line of point 1, specifically pointing out that the Project Risk Assessment (PRA) is performed during 'Define & Plan' phase and thereafter the PRA is completed every 6 months. Unless the go-live is within the 6 months

period, then the implementation readiness is used as the formal risk assessment step. The second paragraph of the same section highlights the mandatory requirement for P1 and high-risk projects to engage a Line 2 expert and introduces the need to complete an attestation that appropriate expertise for Line 2 challenge is available.

ASX has also added a new section titled 'How to engage the Line 2 Enterprise Risk Management (ERM) team' to explicitly clarify how to invite ERM Line 2 in 'good time' per their requirements.

Under the 'New Project Space Template' page on Confluence, ASX has introduced a 'ERM Attestation Template' child page, to show evidence of having the CRO and Project Sponsor formally reviewing the alignment of skillset and experience whilst considering availability and capacity. New project Confluence templates will come with the standard attestation template, and existing projects with a required assigned Line 2 representative will need to request adding of the attestation from EPMO.

**ASX Action 3:**

The Enterprise Risk Management SharePoint contains resources for Line 2 representatives, including the 'Guidance for Line 2 on Projects Risk Governance', found under the Enterprise Risk Management Framework. This document has been reviewed, formalised, and updated by Line 2 representatives to highlight the expectations of Line 2.

**ASX Action(s) update Communication Log:**

Channel	Description	Date
Project Management Framework Update Meeting	Introduction to Project Management community on attestation of Line 2 expertise and availability	January 2022
Blog Post	Blog post on Delivery Framework homepage to support previous communications	21/01/2022

Outlook Email	Email sent to PM community to communicate/announce the change	24/01/2022
---------------	---	------------



## Recommendation 1.2.4: Enhance controls re PRA and Process-RA mapped to risk register

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
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

Update the necessary policies to ensure that the risks highlighted in the Project Risk Assessment are transferred to the delivery risk register. This is also relevant to the Process Risk Assessment exercise.

### ASX Actions

1. Update EPRM framework and the Project Risk & Issues Management framework to require that risks are transferred to the RAID register
2. Update the Expectations of Line 2 on PSGs documentation to include this as an advice/challenge topic

### Findings

#### Action 1:

Under the EPRM framework, section titled 'It is mandatory for Projects at ASX to complete 3 staged Enterprise Risk Assessments throughout the Project lifecycle' has been updated by ASX to include new content explicitly requiring that risks are transferred to the Jira RAID register

using the standard template, and duplicate reference contradictory of RACI removed.

Under the Project Risk & Issues Management framework, section titled 'Risk and Issue - Roles and Responsibilities' has been updated on direction that Project Owners should be accountable for PRA, Process Risk Assessment, and Implementation Readiness completion. It now explicitly references that it is the project manager's responsibility to transfer project delivery risk content from PRA & Process Risk Assessments and Business Analyst's responsibility to transfer business process risk content from Process Risk Assessments, with the involvement of the Project Manager. This has also been updated on the ASX Delivery Framework on the Confluence site.

Section titled 'Risk and Issue Management - Workflow' has been updated to include Jira RAID requirement to workflow guidance section of the framework.

#### Action 2:

The 'Guidance and Expectations for Line 2 on Project Governance' document stored on the Enterprise Risk Site has been updated by Line 2 representatives to incorporate advice from ASX Action 1.

Under section 1 'Project Risk Assessment', comment 'Are all identified risks appropriately captured in the JIRA RAID register?' has been included.

Under section 2, 'Process Risk Assessment, comment 'Are all identified risks appropriately captured in the JIRA RAID register?' has been included.

Under section 4 'Other Activity', comment 'Make sure all relevant risks from both project risk assessment and process risk assessment exercises are transferred to and managed within a project RAID register. Note, risks identified from other sources such as governance functions meetings and minutes, design authority, delivery team stand-ups, and

*independent teams (including ERM, EC and Internal Audit) should also be recorded in the RAID register' has been included.*

**ASX Action(s) update Communication Log:**

<b>Channel</b>	<b>Description</b>	<b>Date</b>
October Project Delivery Project Managers Monthly Meeting	Message/announcement of the change to PM community	October 2021
Outlook Email	Message/announcement of the change to ERM & Enterprise Compliance community	27/10/2021
Blog Post	Blog post after Project Managers meetings to support the presentation and discussion	1/11/2021
Outlook Email	Email sent to PM community to communicate/announce the change	8/11/2021

### Recommendation 1.3.1: Update policy to ensure PRA and Process-RA performed frequently

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
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

Update the necessary policies to ensure that the Project Risk Assessment and Process Risk Assessment are revisited at key points in the delivery project, as this will provide an additional set of risk identification dimensions that may have been omitted by the delivery team.

#### ASX Action(s)

1. The EPRM framework will be updated to require that the PRA is done semi-annually through a project's life (note that this decision was taken in Jan 2021)
2. The EPRM framework will be updated to require that the Process Risk Assessment is considered at multiple times through the project and that is suitable for this risk management task

#### Findings

##### ASX Action 1:

ASX has updated the EPRM framework on the Confluence site, under section 1 'Project Risk Assessment', to specifically point out that the

Project Risk Assessment (PRA) is performed during the Define & Plan Phase, and then completed again every 6 months after. The requirement was a recommendation at the executive level before the IBM recommendations review, to ensure that the PRA stays relevant as things change in projects. However, if the project's go-live is within the 6 months period, then the implementation readiness is used as the formal risk assessment review.

##### ASX Action 2:

ASX has retitled the 'Process Risk Assessment' to 'Business Process Risk Assessment'.

ASX has updated the EPRM framework on the Confluence site, under section 2 'Business Process Risk Assessment', to specifically point out that the Business Process Risk Assessment is performed during the 'Refine' phase and thereafter, must be reviewed/redone based on certain triggers and their impacts. Subject Matter Experts must be involved in any revisions of the Business Process Risk Assessment.

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Project Delivery Team Meeting Pack	Communication to introduce the change and reinforce the framework intentions	December 2021
ASX Delivery Framework Blog Post	Communication to introduce the change and reinforce the framework intentions	17/12/2021
Outlook Email	Communication to introduce the change and reinforce the framework intentions	23/12/2021

## Recommendation 1.3.2: Ensure risks identified and logged

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
ASX Action 3	✓	✓	✓
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

Ensure that risks are identified and logged from key sources, such as the Project Risk Assessment, Process Risk Assessment, Governance functions meetings and minutes, delivery team stand-ups, independent teams, ERM Line 2, Internal Audit/Line 3.

### ASX Action(s)

1. Update the Project Risk & Issues Management framework to include this as a requirement
2. Update the Expectations of Line 2 on PSGs documentation to include this as a challenge topic
3. Create guidance note on RAID management (akin to Risk Champions guidance note)

### Findings

#### ASX Action 1:

ASX has updated a section of the Project Risk & Issues Management framework (PRIMf) on the Confluence site, titled 'Risk and Issue Management - Roles and Responsibilities', containing a table detailing key responsibilities for each participant.

ASX has updated the Project Manager/Delivery Manager/SCRUM Master role responsibilities to explicitly reference the Project Manager is responsible for transfer risk content from 'key sources'.

Under section titled 'Risk and Issue Management - Workflow', in Process Steps section '2. Identify Risk & Issues and Evaluate', ASX have added an explicit requirement to log risks from 'key sources' as part of Jira RAID workflow guidance in bullet points 2 and 3.

#### ASX Action 2:

ASX has updated 3 sections of the 'Guidance for Line 2 on Project Risk Governance' document to include supporting statements to challenging that risks are identified and logged. The updates made were:

- In row section 1. Project Risk Assessment, 6<sup>th</sup> bullet point under the heading 'Risk/issue identification, assessment and management'
- In row section: Other activity, 1st bullet point under the heading 'Escalation & Reporting'
- In row section: Other activity, 2nd bullet point under the heading 'Alignment to Enterprise Project Risk Management Framework'

#### ASX Action 3:

Guidance for RAID Management is available and accessible from the ASX Delivery Framework on the Confluence site. All guidance related to Project RAID management is available from the Delivery Risk Management Confluence Pages (as opposed to a separate guidance note).

This site already existed and has been updated by ASX to reflect ASX Actions taken as per ASX Action 1 for Recommendation 1.3.2, documented above.

**ASX Action(s) update Communication Log:**

Channel	Description	Date
Monthly PM Meeting	Introduction to Project Management community	October 2021
ASX Delivery Framework Blog Post	Blog post on Delivery Framework homepage to support previous communications	1/11/2021
Outlook Email	Email sent to PM community to communicate/announce the change	8/11/2021

### Recommendation 1.3.3: Ensure project RAID shared with PSG

Recommendation Review Summary	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 evidenced by findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

#### Background/Tasks

Ensure that the full project risk and issue log metrics are shared with the governance functions - e.g., number of open risks, number of risk owners, number of risks in delivery vs risks in change, categorisation of risks (e.g., how many are strategic vs delivery, how many are infrastructure vs personnel, how many are supplier versus in-house) in addition to the key risks that the project team deem material.

#### ASX Actions

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 the Expectations of Line 2 on PSGs to challenge on this topic
3. Create guidance note on RAID management (akin to Risk Champions guidance note)

4. Define standard reporting requirements
5. Enhance existing RAID dashboards
6. Create guidance note on risk reporting at PSGs

#### Findings

##### ASX Action 1:

ASX delivered 3 training sessions in December 2021 to highlight and uplift the visibility and awareness of risk management and its relationship to governance. One session was delivered to ASX board members and the other 2 sessions were delivered to ASX Project Sponsors, Owners and PM's involved in P1 and High-Risk Projects, plus any other identified stakeholders.

As part of their response to recommendation 1.1.1, which is due for the July 2022 review, they have included action ASX Actions to:

- I. Update policies to include special focus on risk culture and awareness in projects
- II. Provide both short term and long-term staff education on topic of Risk Culture

##### ASX Action 2:

ASX updated the 'Guidance for Line 2 on Projects Risk Governance' document under section titled 'Other Activity', sub section 'Escalation and Reporting', to include text highlighting that ERM Line 2 representative will challenge on the topic of risk metrics and transparency of risks to governance forums. on the topic of risk metrics and transparency of risks to governance forums.

##### ASX Action 3:

*This activity has been addressed as part of the ASX action undertaken in Recommendation 1.3.2 - ASX Action 3*

Additionally, in 2 locations of the Confluence site, ASX completed the following:

- I. Drop down section: Risk & Issue Management - Workflow, Process Step 1 - Removed instructions for PMs to create risk dashboards (as there is a risk of incorrect metrics being included in governance forums), replaced with the EP MO taking on the role of creating the standard risk dashboard
- II. Added link at bottom of Confluence page: RAID Setup and Management

**ASX Action 4:**

ASX made updates to the Confluence page titled 'Project / Small Change Health Monitoring & Reporting' to specifically highlight risk reporting for the following:

- Project Level Reporting
- Portfolio Level Reporting
- Enterprise Wide (PGG) Reporting
- Audit & Risk Committee (ARC)
- ASX Group Report

Additionally, Project Governance guidelines were reviewed and updated by ASX as part of ASX Action 1 of Recommendation 2.1.4.

**ASX Action 5:**

The ASX Enterprise Delivery RAID dashboards were standardised and enhanced with additional metrics and guidance on how to interpret the information in the dashboards. New Jira dashboards were also provided as part of a separate ASX action.

**ASX Action 6:**

On the 'ASX Delivery Governance' Confluence page, ASX have a section dedicated to 'Risk & Issue Dashboard Guidance' which provides guidance

on how to prepare and use the dashboard for reporting and governance forums.

The section 'Governance Forums - Purpose & Roles' and its sub-sections (Strategic Governance Group (SGG), Portfolio Working Group (PWG) and Portfolio Governance Group (PGG)) were also updated to include the responsibilities of each forum. This provides guidance on how to access relevant issue and risk data for each forum and linkage to guidance on how to use and interpret. Additionally, specific risk and issue responsibilities were added to Project Sponsor, Delivery Manager and Project Manager roles.

**ASX Action(s) update Communication Log:**

Channel	Description	Date
Outlook Email	Email sent to PM community and project stakeholders to communicate/announce the change	23/12/2021
ASX Delivery Framework Blog Post	Blog post in January on Delivery Framework homepage	21/01/2022
Project Management Framework Update Meeting	Introduction to Project Management community and project stakeholders	January 2022

## Recommendation 1.3.5: Ensure ERM Line 2 included in timely manner

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

### Background/Tasks

Ensure that the ERM Line 2 function (could be more than one person) are invited by the project delivery team in good time, ideally contributing in the preparation workshops, business case production and project risk assessment exercises.

### 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 the EPRM framework to include this as a requirement
3. Update the Expectations of Line 2 on PSGs document to make this a requirement that is escalated to the Sponsor and CRO if not met

### Findings

#### ASX Action 1:

*This activity has been addressed as part of the ASX action undertaken in ASX Action 1, Recommendation 1.3.3*

#### ASX Action 2:

ASX have updated their Enterprise Project Risk Management framework (EPRMf) to include new section titled 'How to engage the Line 2 Enterprise Risk Management team' and a new section titled 'It is mandatory for Projects at ASX to complete 3 staged Enterprise Risk Assessments throughout the Project lifecycle'.

EPMO has introduced a new step in their project initiation activities called the "Project Initiation Workshop (PIW)", which takes place before any project is started to ensure the core project team is aware of the expectations of them in terms of mandatory processes, standards, compliance with reporting etc. A key area covered is "Project Risk Management", and projects that are P1 or high-risk following the outcome of the Project Risk Assessment (PRA), are reminded to involve Line 2 as a mandatory requirement. Non-P1 or high-risk projects are encouraged to engage Line 2 if they require any support in the risk space.

#### ASX Action 3:

ASX have updated the "Guidance for Line 2 on Projects Risk Governance" document to include introduction paragraph, which explicitly states that all P1 and high projects are required to engage Line 2 representation at the Strategic Guidance Group (SGG) and Executive Steering Group (ESG) forums.

In a separate section titled "Other activity", they have updated to include a point that Line 2 are to be invited to relevant forums and failure to do so will require escalation to Project Sponsor and CRO. ASX have shown that they have the processes in place if an escalation were to occur and EY do not believe it is reasonable to assume an escalation will be required or witnessed in the near future to justify holding this in a "Partially Met" state indefinitely.



**ASX Action(s) update Communication Log:**

<b>Channel</b>	<b>Description</b>	<b>Date</b>
Meeting	Monthly PM Meeting - Introduction to Project Management community on when and how to engage Line 2	October 2021
Blog Post	Blog post in November on Delivery Framework homepage accessible as historic blog post	1/11/2021
Outlook Email	Email sent to PM community to communicate/announce the change	8/11/2021

## Recommendation 1.3.9: Ensure RAID reported to PSG and tracked for closure

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

## Findings

Findings have been addressed as part of the ASX action undertaken in Recommendation 1.3.3.

## Background/Tasks

Ensure that project risks, issues and statistics are tracked to completion and reported to governance functions in a timely fashion - e.g., average time to close issues, longest open issue, ownership quantities, number of open risks.

## 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. Define standard project risk reporting requirements and develop dashboards
3. Create PSG Sponsor and member guidance note covering reporting requirements
4. Update the Expectations of Line 2 on PSGs document to challenge on this concept

### Recommendation 1.3.10: Quantify risks using ASX standard methods (likelihood/impact)

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

#### Background/Tasks

Project risks should be quantified in likelihood and impact terms, according to standard definitions of risk assessment.

#### ASX Action(s)

1. Review the project risk scalars (these were updated on 5th may and signed off by the CRO)
2. Include as a topic of discussion in the Risk culture and awareness short and long term education session in response 1.1.1-2
3. Create Sponsor and PSG member guidance document
4. Update the Expectations of Line 2 on PSGs document to challenge on this concept

#### Findings

##### ASX Action 1:

Under the Delivery Risk Management Confluence Pages, drop down section titled 'Risk & Issue Management - Workflow' and sub-section

'Project Risk Scaler', Process Step 6 (Project Risks and Issues) and Process Step 7 (Review and Resolve Escalated Risks and Issues) were reviewed by ASX. Under drop down section 'Risk & Issue Management - Reporting' and sub section 'Meeting and Frequency', 2nd sentence and subsequent bullet points were reviewed.

Project Risk Scalars were reviewed by ASX during 2021, with sign-off received from CRO in May 2021. The risk scalars remain relevant.

##### ASX Action 2:

This activity has been addressed as part of the ASX action undertaken in ASX Action 1, Recommendation 1.3.3

##### ASX Action 3:

This activity has been addressed as part of the ASX action undertaken in ASX Action 6, Recommendation 1.3.3

##### ASX Action 4:

In the 'Guidance for Line 2 on Project Risk Governance' document, ASX has updated wording to highlight that ERM Line 2 representative '*will challenge on the topic of completeness and adequacy of project risk assessment attributes*', impact & likelihood under the first bullet point of section titled '1. Project Risk Assessment' and sub-section 'Risk/Issue Identification, Assessment and Management'.

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Outlook Email	Risk Scaler Email announcements. Supporting message to project management community	8/06/2021
Blog Post	Blog post in June on Delivery Framework homepage	1/06/2021

Meeting	Updates to Project Management Framework Meeting. Restatement of project risk scalars	January 2022
---------	--	--------------

## Recommendation 2.1.1: Document PSG roles/responsibilities based on risk & include independence

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

### Background/Tasks

Document the key roles and functions that must be in attendance of a governance function, based on the risk, complexity, priority and needs of the project. In addition, include roles independent from the project and ideally the organisation

### ASX Action(s)

1. Review existing Project Governance guidelines and update to ensure clear purpose and roles and responsibilities of governance forum membership

*NB: The need for engagement of independent roles will be defined as part of the Project Assurance Framework*

### Findings

#### ASX Action 1:

ASX has reviewed their Project Governance guidelines under sections of the 'ASX Delivery Governance' Confluence page and made updates accordingly.

Amendments were made to Governance Structure of groups, authorities and committees, linkage between those and up to Board. Amendments were also made to the purpose and roles of the governance forums. Standardised Terms of Reference templates for SGGs and PWGs have been provided for all projects to use.

### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	Introduction to Project Managers, Delivery Managers and those participating in project governance	January 2022
Blog Post	Blog post in January on Delivery Framework homepage	21/01/2022
Outlook Email	Email sent to PM community, sponsors, owners, and other key project stakeholders to communicate/announce the change	24/01/2022

## Recommendation 2.1.2: Evaluate if PSG needs member criteria re independence

*This activity has been addressed as part of the ASX action undertaken in ASX Action 1, Recommendation 2.1.1*

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

### Background/Tasks

Evaluate the need to update the necessary policies to require an independent viewpoint, that the delivery team and its reporting line cannot exceed a given percentage of the total governance function membership.

### ASX Action(s)

1. Line 2 ERM to be allocated to all P1 or high-risk project PSGs (Refer Recommendation 1.2.1)
2. Composition of project governance forums will be reviewed as part of Recommendation 2.1.1

### Findings

#### ASX Action 1:

*Findings have been addressed as part of the ASX action 1 undertaken in Recommendation 1.2.1*

#### ASX Action 2:

### Recommendation 2.1.3: Evaluate if P1 and/or High-risk projects need dedicated PSG

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

#### Background/Tasks

Evaluate the need to update the policies to require that for Priority 1 and High-Risk projects key governance functions have dedicated meetings that only cover the project.

#### ASX Action(s)

1. Update the Project Governance section of the ASX Delivery Framework to reflect this

#### Findings

##### ASX Action 1:

The ASX team has updated and distributed to stakeholders document "ASX Delivery Governance" and updated requirement for project dedicated SGG (Strategic Guidance Group) forum for P1 And High-risk Projects session, which positions purpose and Governance. The forum SGG was deemed mandatory for those projects.

For clarification purposes, the acronym "PSG" is an IBM terminology, and the ASX equivalent of the forum is called SGG and outlined in the above ASX Action change.

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	October Project Delivery Project Managers Monthly Meeting. Message/announcement of the change to PM community	October 2021
Blog Post	Blog post in November on Delivery Framework homepage	1/11/2021
Outlook Email	Email sent to PM community to communicate/announce the change	8/11/2021

## Recommendation 2.1.4: Update policies to require PSG monitors against defined success metrics

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

### Background/Tasks

Update the policies such that the governance forums check that the project is tracking and reporting against the metrics defined at project initiation.

### ASX Action(s)

1. Review and update the Project Governance guidelines to ensure expectations regarding project tracking and reporting are clearly outlined

### Findings

#### ASX Action 1:

ASX reviewed and updated the following Project Governance Guidelines:

- Project Initiation Workshop Guidance
- Project Initiation Workshop Template
- Project Domain Health Monitoring & Reporting Guidance
- Standard Project Reporting: How to Guide
- Project Status Report PDF and Project Status Report Setup

Documentation updates included standard project metric reporting requirements, initiation workshop checklists, templates adapted with the ASX Delivery Framework standards and updates/ changes were communicated to Delivery Managers, Project managers, Project sponsors and Project owners, as well as communicated during all inflight P1 Project's SGG Forums (Strategic Guidance Group).

### ASX Action(s) update Communication Log:

Channel	Description	Date
Blog Post	Blog post in December on Delivery Framework homepage	17/12/2021
Meeting	Project Delivery Team Meeting to introduce the change and reinforce the framework intentions	22/12/2021
Outlook Email	Email sent to Delivery Team after team meeting	23/12/2021



### Recommendation 3.1.2: Checklist to increase scope of lessons learned from PIRs

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

#### Background/Tasks

Produce a due diligence checklist to increase scope of coverage and to capture material lessons learned.

#### ASX Actions

1. Complete the Lessons Learnt Framework and Repository Refresh
2. Introduce Mandatory Requirement to review Lesson Learnt Repository as part of the 'Define & Plan' stage of the Project Lifecycle

#### Findings

##### ASX Action 1:

ASX has updated the 'Lessons Learnt & Lesson Actions' section on the Confluence site under the section 'Guidelines to LLR Dashboards'. Updates were made to the process for collating, reviewing, and tracking lessons learnt and lesson actions, to address lessons learned from PIRs (Project Initiation Requirements).

Additionally, ASX has created new Lessons Learnt dashboards in Jira with previous lessons learnt reviewed and updated to the new categories and capabilities.

##### ASX Action 2:

ASX has updated the ASX Delivery Framework with a new Pre-Project Deliverable 'Project Initiation Workshop' in the 'Prioritisation & Selection' phase of ASX's project lifecycle. This is a mandatory step supports the initial set-up process to complete the Concept Approval (for seed funding)/ Business Case for the initiative and involves the review and extract of lessons learnt from the lessons learnt repository to populate in the 'Project Initiation Assessment' form.

The 'Project Initiation Workshop' is triggered independently by the EPMO (Enterprise and Project Management Office) and CaDE (Change and Delivery Enablement) team once a proposal has been selected by the Executive Committee as an initiative that will be funded.

As noted in the 'Project Initiation Assessment' form, the lessons learnt relevant for the project will be captured in the workshop and the PM will prepare a formal lesson learnt overview for SGG (Strategic Guidance Group) review and discussion.

##### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting (July)	Dedicated time within Project Delivery Monthly meeting to delivery and inform on the Lessons Learnt changes	28/07/2021
Meeting (September)	September Project Delivery Project Managers Monthly Meeting - Verbal update and production screen demonstration	22/09/2021

Blog Post	Blog post in October on Delivery Framework homepage	1/10/2021
Meeting (October)	October Project Delivery Managers Monthly Meeting - Formal communication of changes	27/10/2021
Outlook Email	Email sent to PM community to communicate/announce the change	8/11/2021

### Recommendation 3.1.3: Update policy - require PIR lessons learned considered at project initiation

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

#### Background/Tasks

Update the project delivery process and policies to require that prior Post Implementation Reviews\Lessons Learned are considered, especially in the initiation phases of the project.

#### ASX Actions (As per 3.1.2)

1. Complete the Lessons Learnt Framework and Repository Refresh (currently in progress)
2. Introduce Mandatory Requirement to review Lesson Learnt Repository as part of the 'Define & Plan' stage of the Project Lifecycle

#### Findings

*Findings have been addressed as part of Recommendation 3.1.2.*

### Recommendation 3.1.4: Update policy - EP MO involved from initiation in P1 projects

Recommendation Review Summary	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

Update the project delivery process and policies to require that for priority 1 projects the Enterprise Project Management Office (EP MO) team is directly involved from initiation in establishing, for example, the delivery framework, reporting, risk/issues register, financial management systems.

#### ASX Action(s)

1. A step will be introduced into the Initiation stage of the Delivery Framework that outlines who and how to engage EP MO to ensure standard tooling setup

#### Findings

##### ASX Action 1:

At the initiation of all projects (P1, 2, 3), the EP MO team will proactively set up standard project Confluence spaces (and file directories), RAID registers and Financial Budget setup. The EP MO also provides written guidance for standard project Risk, Issue & Assumption Dashboard setup to Project Managers. Associated EP MO processes are documented and there is a checklist to ensure all projects are set up in the same way.

Following the IBM recommendation, the EP MO have now formalised the initial setup process and communicated to the Delivery Team to introduce the change and reinforce the framework intentions as evidenced in the communication log below. Within the ASX Delivery Framework on Confluence under 'Prioritisation & Selection / Deliverables Pre Project', ASX have added a new link on who and how to engage for standard tooling setup.

A new child page from the ASX Delivery Framework has also been added summarising the guidance on when, who and how to engage EP MO for project tooling setup.

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Blog Post	Blog post in October on Delivery Framework homepage	17/12/2021
Meeting	Project Delivery Team Meeting to introduce the change and reinforce the framework intentions	22/12/2021
Outlook Email	Email sent to Delivery Team after team meeting	23/12/2021

### Recommendation 3.2.4: Consider policy update so that P1 or High risk project PSGs meet fortnightly

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

#### Background/Tasks

Consider enhancing the policies such that for Priority 1 and Medium/High Risk projects, governance related reporting frequency is increased to every 2 weeks. In addition, consider the move to a dynamic dashboard-style reporting rather than document-based.

#### ASX Action(s)

1. Investigate and determine appropriate PSG meeting frequency for P1 or high risk projects
2. Include this as a requirement in the Governance guidelines of the ASX Project Management Framework
3. See 1.3.9 point 2 (*Define standard project risk reporting requirements and develop dashboards*)

#### Findings

#### ASX Action 1:

All P1 and high-risk projects must have a SGG and these are required monthly at a minimum. Project Status Reports are required to be completed fortnightly for all projects and there is extended reporting when a project is classified as P1 or high risk. Guidance on potential reasons for why governance forums may need to be increased is found under the 'ASX Delivery Governance' page in the Confluence site.

#### ASX Action 2:

ASX has updated the section titled 'Governance Forums - Purpose & Roles' on the Confluence site by adding new content under 'Strategic Guidance Group (SGG) - Cadence'. This section sets out minimum requirement and circumstances when increased frequency should be considered.

#### ASX Action 3:

*This activity has been addressed as part of the ASX action undertaken in ASX Action 4 & ASX Action 5, Recommendation 1.3.3, and See Findings section for ASX Action 1, Recommendation 2.1.4*

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	Project Management Framework Update Meeting	January 2022
Blog Post	Blog post in January on Delivery Framework homepage	21/01/2022
Outlook Email	Email sent to PM community and project stakeholders to communicate/announce the change	24/01/2022

### Recommendation 3.2.6: Update policy so that P1 projects run by in-house Project Manager

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	<p>Recommendation has been addressed, as evidenced by the findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.</p> <p>Although the action indicate it is a preference for P1 projects to be run by an internal PM, within the documents we note that there is an exception process for when an external PM is required.</p>		

#### Background/Tasks

Update the policies such that Priority 1 projects are required to be run by in-house project managers who have detailed knowledge of the ASX delivery processes, procedures, and tools. If this is not viable, then an EPMO member should be accountable for compliance to the project delivery processes.

#### ASX Action(s)

1. The Enterprise Project Management framework will be updated to list this as a preference where possible. If this is not possible nor sensible then this will be included in the business case for PGG noting.
2. The Sponsor with assistance from the Project Assurance Specialist will then be accountable for compliance with project delivery practices.

#### Findings

##### ASX Action 1:

ASX has updated the Enterprise Project Management framework to include preference for P1 projects to be run by in-house project managers who have detailed knowledge of the ASX delivery processes, procedures, and tools. In the case where this is not possible, as there are no suitable internal resources, then an 'exception note' for allocating an external project manager is required to be submitted as part of the business case for consideration and approval. This is captured as part of the Business Case template.

##### ASX Action 2:

Under the 'Key Roles & Responsibilities' section of the Enterprise Project Management framework on the Confluence site, ASX has added a 'Project Assurance Specialist' role and described its responsibility under 'Other Project Roles' section in the roles table. ASX states the Project Assurance Specialist will be 'responsible for the definition, development, embedding and execution of the ASX Project Assurance Framework'.

In the same roles table, ASX states that one of the responsibilities of the Project Sponsor is to 'ensure project delivers the intended quality, value and benefits'.

##### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	Project Management Framework Update Meeting - Introduction to PM community on attestation of Line 2 expertise and availability	January 2022

Blog Post	Blog post in January on Delivery Framework homepage	21/01/2022
Outlook Email	Email to PM Community to communicate/ announce changes	24/01/2022

### Recommendation 3.2.7: Ensure that key Go-Live meetings documented

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

#### Background/Tasks

Ensure that key go-live related meetings are minuted and ASX Actions are clearly documented.

#### ASX Action(s)

1. Enterprise Project Risk Management framework to be updated to reflect this requirement.

#### Findings

##### ASX Action 1:

ASX has updated the Enterprise Project Risk Management framework (EPRMf) on the Confluence site under the section titled 'It is mandatory for Projects at ASX to complete 3 staged Enterprise Risk Assessments throughout the Project lifecycle' to include the requirement that all go-live meetings for all projects are documented. The Go-live go/no-go meeting is the key meeting where the formal decision is made and where minutes from the meeting is required to be documented.

These changes were communicated to PM community as noted in the communications log below, and all new projects starting from November

2021 onwards (post this communication) have been set up with the standard project repository in Confluence, which includes the standard minutes template. Additionally, for all in-flight projects which have not reached the 'Embed, Review and Close' phases of the project lifecycle, ASX is currently in the process of retro-fitting the relevant standard project repository and will capture minutes as per requirement when they reach the go-live stage of the project lifecycle.

In the meeting with ASX (ASX Actions - Review of Recommendation 3.2.7), when asked how this process would be governed, ASX explained that the formal sign off of the "go recommendation" needs to be evidenced by the implementation readiness artefacts, which includes the go-live meeting minutes. ASX has provided evidence of go-live minutes being documented for several projects since the November 2021 communications and shown that the minutes have been stored in the appropriate location on the Confluence site.

#### ASX Action(s) update Communication Log:

Channel	Description	Date
Meeting	October Project Delivery Project Managers Monthly Meeting to announce the change to PM Community	27/10/2021
Outlook Email	Email sent to PM community to communicate/ announce change	08/11/2021
Blog Post	Blog post announcement on ASX Delivery Framework page	1/11/2021



## Recommendation 4.1.1: ASX should maintain detailed requirements log to lessen reliance on single vendor

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
ASX Action 2	✓	✓	N/A
ASX Action 3	✓	✓	✓
Recommendation Addressed?	Yes		
Comment	Recommendation has been addressed evidenced by findings outlined below. ASX Actions are deemed appropriate and sustainable at the present time.		

### Background/Tasks

ASX should maintain their own detailed requirements log to mitigate against over reliance upon a single vendor and in case ASX would ever need to change supplier. This log would provide a means to validate the vendors position and would be in addition to the test cases, documenting non-functional, process, integration as well as functional needs.

### ASX Action(s)

1. Review the Enterprise Project Management framework on requirements definition for new projects, updating it to define which projects would require ASX to create/maintain a full requirement register in-house and at what level of detail.
2. Identify the next project that is likely to apply this issue to. [REDACTED]
3. Consider whether to apply this retrospectively to ASX Trade or to await the next refresh to this

### Findings

#### ASX Action 1:

ASX has updated the Enterprise Project Management Framework on the Confluence site, under the Business Analysis (BA) Framework which contains the guidelines on Detailed Business Requirements, Detailed Non-Functional Requirements and High-Level Requirements, and sign off procedures.

High Level Requirements are produced for all projects, regardless of whether the solution is out of the box or customised. At the project initiation, the Project Governance Committee looks at all the projects in the pipeline and determine what the right level of requirements is and what the appropriate level of testing would be.

ASX uplifted the BA Framework in May 2021 to include a new 'Vendor Engaged Delivery (VED)' assessment tool - tool used by Business Analysts (BAs) during the 'Define & Plan' phase to determine core deliverables required on vendor engaged projects depending on the nature of the change. As part of embedding the BA Framework, BAs are required to follow the BA Deliverable Assessment Process and use the Business Analysis Deliverable Assessment Form [REDACTED]

throughout the project lifecycle to ensure that all required deliverables are completed.

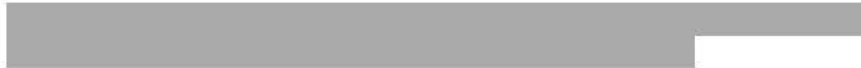
Furthermore, ASX have applied an audit mechanism, where at the end of a project, the BAs do a retrospective to reflect on whether the project was completed in the correct way and all copies of artefacts were collected to ensure autonomy from vendors if changes were required.

#### ASX Action 2:

ASX has assessed their upcoming pipeline of approved projects to commence in FY22 and identified three potential opportunities to apply the new updates in the BA Framework. They are:



At the appropriate time as the projects move through their lifecycle, the BA Framework and specifically applying the Vendor Engaged Delivery assessment, will assist in determining the need for detailed requirements gathering for packaged software/application implementations.



**ASX Action 3:**

ASX held discussions between key executive and senior stakeholders in October 2021 and on 26 November 2021, concluding that the critical releases for ASX Trade were completed and stable, so documentation of full requirements was not required to be done immediately. It was decided they would continue to review this decision and plan for requirements work as part of the planning for ASX Trade releases in the future, in line with the updated Enterprise Business Analysis Framework.



**ASX Action(s) update Communication Log:**

Channel	Description	Date
Meeting	BA monthly team meeting to communicate BA Framework updates with new Vendor Engagement Delivery Process	8/07/2021
Decision Capture	Pipeline assessment	22/11/2021
Decision Capture	Packaged software requirements for ASX Trade, decision to apply retrospectively	01/12/2021

## Recommendation 5.1.1: Perform contract acceptance at end of project lifecycle

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>While the ASX has appropriately identified the need for updating the Vendor Management framework and has shown clear intent and evidence to support this intent to implement their education program by the end of the financial year (FY22), it has not been completed to date. As a result, we are marking the sustainability of this item as "Partially Met" until such time that we can confirm that the training has been completed and embedded into an ongoing plan. EY will include the completion of this "Partially Met" item in its scope for subsequent reviews.</p>		

### Background/Tasks

Perform contract acceptance at the end of the project lifecycle, once integration and end-to-end testing have also been factored in. This would also increase the percentage of test cases and automated test cases available to execute with greater confidence. We note that this is subject to existing contractual terms and obligations, so may not always be possible.

### ASX Action(s)

1. Update ASX's Vendor Management framework to require contract acceptance at the end of the project lifecycle once integration and end to end testing have been completed

### Findings

#### ASX Action 1:

The 'ASX Vendor Management Framework' is documented on the Vendor Relationship Management SharePoint site. ASX has updated the 'ASX Vendor Management Framework' on pages 15 and 16, point a) of section 4.3.2 titled 'Key Contract Management activities include'. The updates are related to 'contract acceptance' and guidelines ensuring appropriate Deliverables, Contract Acceptance, Acceptance Criteria and Acceptance Testing are included in Statements of Work.



As noted in the ASX '5.1.1 Summary Consolidation Page' on Confluence, changes to be communicated to the relevant Tech and Data Contract Owners and Project Managers as part of the Vendor Management education program. In the meeting with ASX 'ASX Actions - Review of Recommendation 5.1.1', ASX explained that they currently have a high-level plan for the education program involving briefing sessions this financial year, however, have yet to confirm stakeholders, content, and dates.

#### ASX Action(s) update Communication Log:

N/A

## Recommendation 5.1.2: Create guidelines for supplier contract acceptance testing

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>While the ASX has appropriately identified the need for updating the guidelines for supplier contract acceptance testing, it has not been fully completed to date as only 14 out of 15 acceptance testing criteria have been completed. ASX will address the final acceptance testing criteria by June 2022. As a result, we are marking the execution of this item as "Partially Met" until such time that we can confirm that the minimum and expected targets (KPI) are included in the Actors testing session, EY will include the completion of this "Partially Met" item in its scope for subsequent reviews.</p>		

### Background/Tasks

Create guidelines for supplier related contract acceptance testing e.g., X% of the final functional and non-functional test cases must be available to start the process, e.g., Y% of functional and non-functional test cases must be automated.

### ASX Action(s)

- Guidelines will be created for supplier related contract acceptance testing. These will be referenced in ASX's Testing Policy and ASX's vendor Management framework.

### Findings

#### ASX Action 1:

Guidelines created for supplier related contract acceptance testing, including standards and controls for vendors providing product releases to ASX and are a supplementary document to the ASX Vendor Management Framework.

ASX has drafted and introduced a new guideline document "ASX Vendor Quality Guideline Standards and Controls"

[Redacted]

[Redacted]

Guidelines have been released and documentation review is within 24 months.

### ASX Action update Communication Log:

Channel	Description	Date
Outlook Email	ASX shared the final version of the document to the Team	17/12/2021
	[Redacted]	

**Recommendation 6.6.1: Ensure the new ASX Trade refresh is included in next annual ITDR exercise**

Recommendation Review Summary	Executed	Appropriate	Sustainable
ASX Action 1	✓	✓	✓
Recommendation Addressed?	Partially		
Comment	<p>This recommendation has been largely closed with the actions conducted to date.</p> <p>While the ASX has appropriately identified the need for ASX Trade to be part of their ITDR and successfully executed a DR test [REDACTED], they have also identified that DR testing is to be done on the ASX Trade platform every 12 months afterwards, with the next annual ITDR scheduled for [REDACTED]. As a result, we are marking the sustainability of this item as “Partially Met” until such time that we can confirm that the ITDR scheduled for [REDACTED] has been executed as part of their ongoing plan. EY will include the completion of this “Partially Met” item in its scope for subsequent reviews.</p>		

**Background/Tasks**

Ensure that the new ASX Trade Refresh project is prioritised for the upcoming annual ITDR (IT Disaster Recovery) exercise to increase confidence and reduce risk.

**ASX Action(s)**

1. Ensure ASX Trade included in next annual ITDR exercise

**Findings**

**ASX Action 1**

In the document labelled ‘Business Continuity Management (BCM) Exercise Summary’ provided by ASX, it shows that ASX successfully executed an ITDR exercise for ASX Trade [REDACTED] and have identified the need to perform a DR test for the ASX Trade platform every 12 months afterwards, with the next IDTR for ASX Trade [REDACTED] [REDACTED] - any changes to this date will require board approval. Additionally, ASX has provided a snapshot of their ‘DR Test Schedule & Summary’ online record from SharePoint, further confirming this.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

The 6.6.1 ASX Action was closed with 2 ‘problem tickets’, and ASX has confirmed that one ticket has been closed and the remaining open ticket has one final ASX Action around strengthening controls around the updated Runsheet, which currently is being manually monitored until ASX Action is closed. ASX confirmed there is no business impact due to outstanding ASX Action and that task is completed.

**ASX Action(s) update Communication Log:**

N/A

## Appendix A Recommendation review workshops list

#	Date	Meeting Title
1	2/02/2022	ASX Actions - Review for Recommendations 3.1.2 & 3.1.3
2	2/02/2022	ASX Actions - Review for Recommendation 4.1.1
3	7/02/2022	ASX Actions - Review for Recommendation 1.2.4, 1.3.1, 1.3.2, 1.3.5 & 1.3.10
4	7/02/2022	ASX Actions - Review for Recommendation 5.1.1 (5.1.2 removed from session, written response provided)
5	8/02/2022	ASX Actions - Review for Recommendation 3.2.7
6	8/02/2022	ASX Actions - Review for Recommendations 3.1.4 & 3.2.6
7	8/02/2022	ASX Actions - Review for Recommendations 2.1.3 & 2.1.4
8	10/02/2022	ASX Actions - Review for Recommendations 1.2.1, 2.1.1 & 2.1.2
9	10/02/2022	ASX Actions - Review for Recommendation 6.6.1
10	10/02/2022	ASX Actions - Review for Recommendations 1.3.3, 1.3.9 & 3.2.4 (Workshop not held, written response provided)
11	24/02/2022	ASX IBM Recommendations: EY IE Draft Report Fact Check Review

## Appendix B Interviewed ASX stakeholders list

Role
Chief Risk Officer
Chief Customer and Operating Officer
Group Executive, Technology and Data and CIO
Group Executive, Markets
General Manager, Business Management and Delivery, Markets
General Manager, Enterprise Risk Management
General Manager, Enterprise Delivery
Head of Change & Delivery Enablement, Enterprise Delivery
Head of Testing, Quality Engineering & Testing
Senior Manager, Enterprise PMO, Enterprise Delivery
Senior Manager, Application Support, Markets Technology
Senior Manager, Enterprise Risk Management
Manager, Business Analysis, Markets
Manager, Vendor and Partner Relationships, Security & Governance
EPMO Lead, Enterprise Delivery
Project Manager, Enterprise Delivery

Appendix C    Recommendations Questionnaire submitted to ASX post SMR documentation review







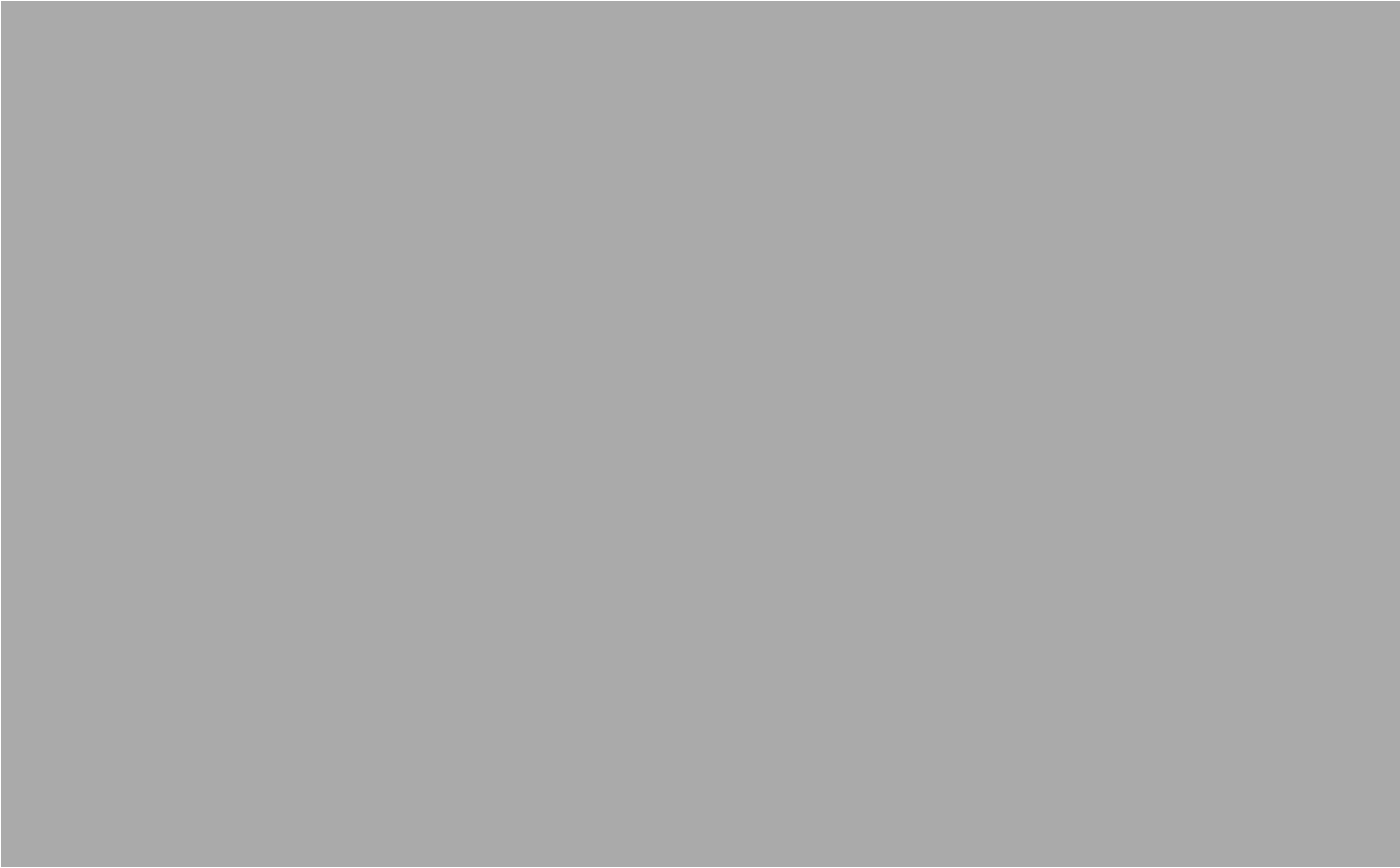




Appendix D Documents reviewed



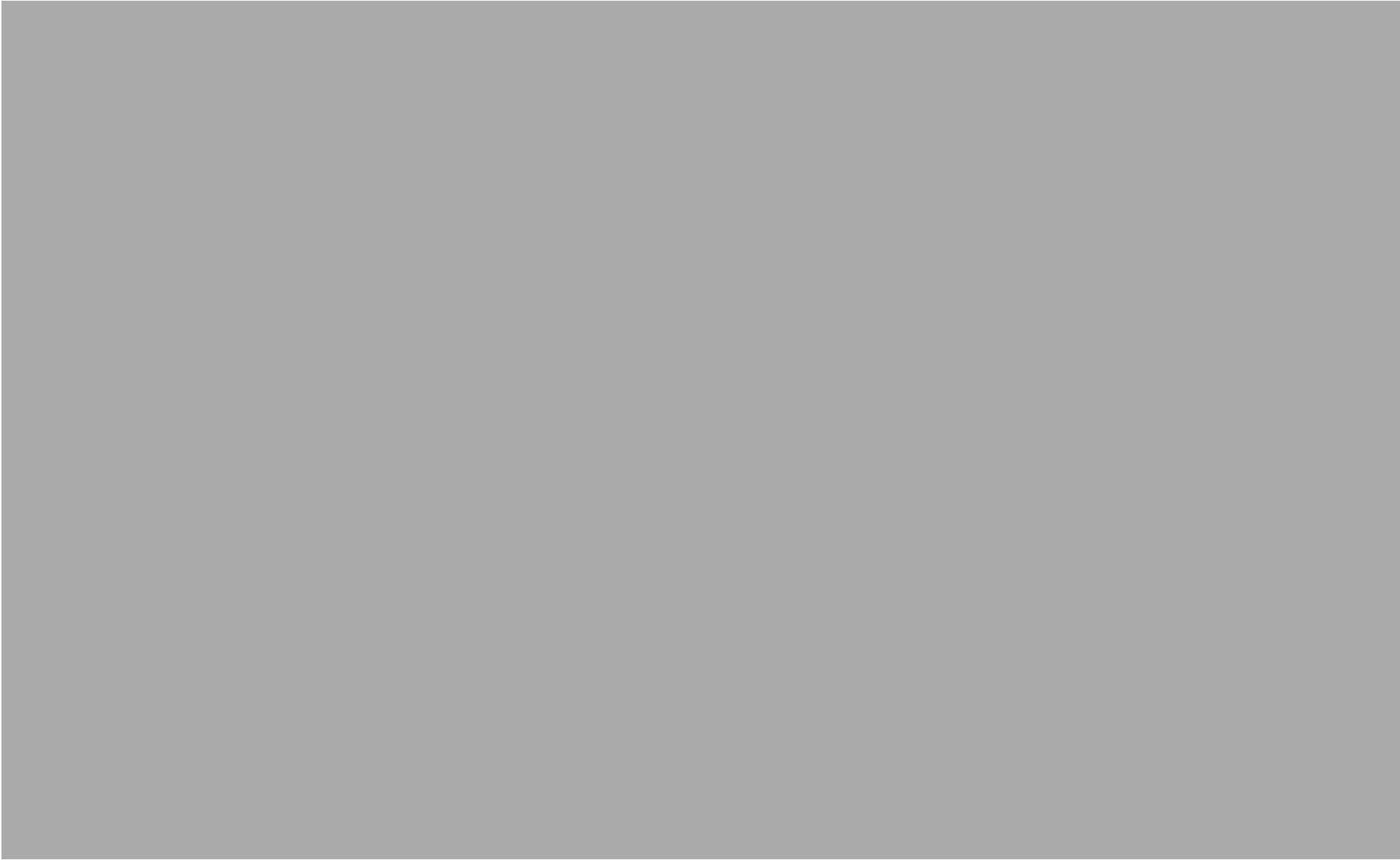


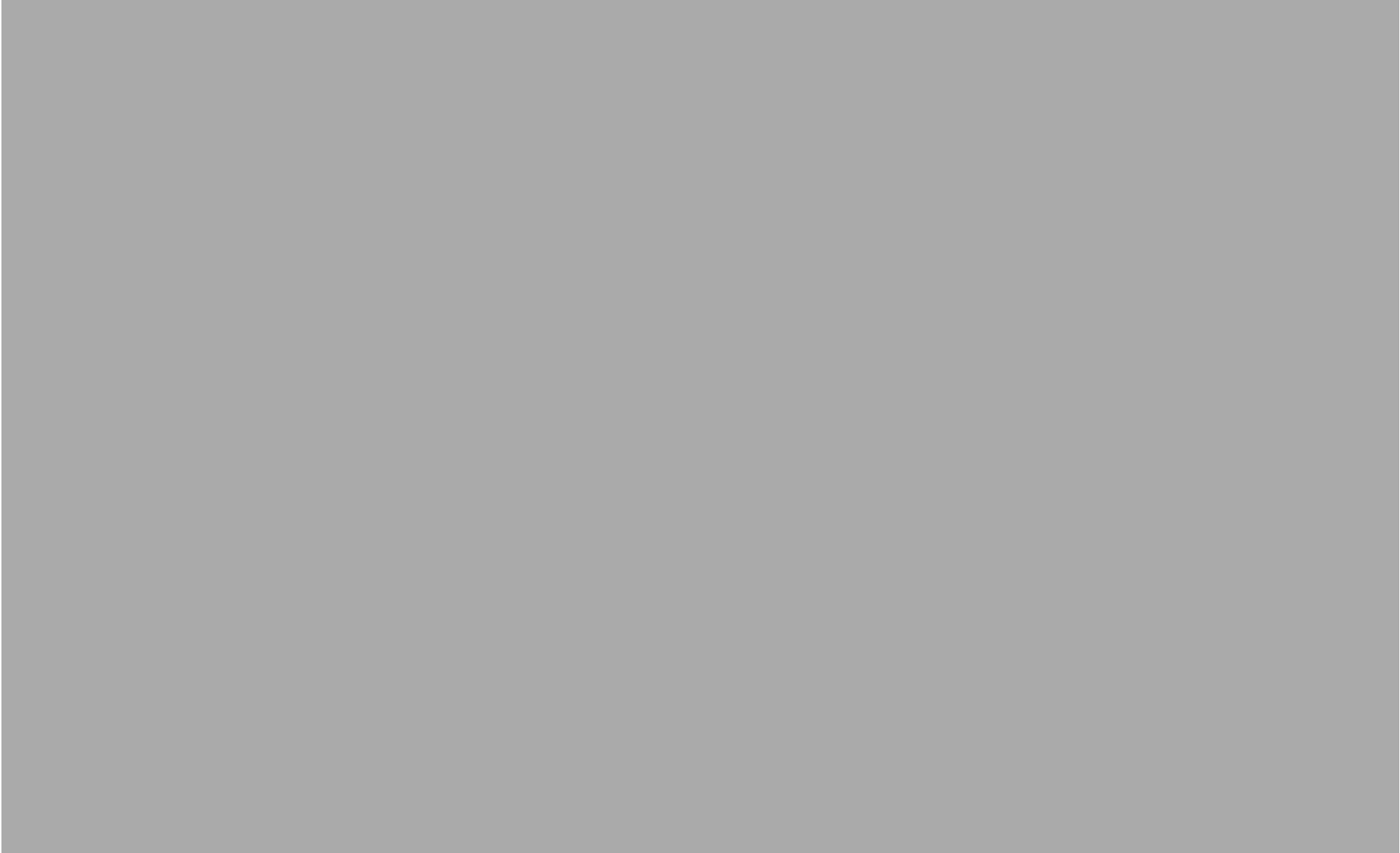
















## Appendix E Recommendations to be re-presented by ASX in future quarterly reports

#	Recommendation Reference	Quarterly Report to be Re-presented	Outstanding Actions - To deem recommendation fully addressed
1	1.2.1 - Ensure Line 2 resource expertise	March 2022	Review of future PGG (Project Governance Group) packs to confirm that L2 resourcing requirements are outlined and evidently included during monthly PGG Forums.
2	5.1.1 - Perform contract acceptance at end of project lifecycle	June 2022	Sustainability question to be addressed by June with delivery of training.
3	5.1.2 - Create guidelines for supplier contract acceptance testing	June 2022	Full execution of this recommendation to be addressed by June quarterly report.
4	6.6.1 - Ensure ASX Trade included in next annual ITDR exercise	█ 2022	Outstanding action to be closed once ITDR is carried out in █

## Appendix G 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 Response Plan to address the IBM Review 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 27 April 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.

Unless otherwise agreed in writing with EY, access to the Report is made only on the following basis and in either accessing the Report or obtaining a copy of the Report the recipient agrees to the following terms.

1. Subject to the provisions of this notice, the Report has been prepared for ASX and ASX's regulators ASIC and the RBA, and may not be disclosed to any other party or used by any other party or relied upon by any other party without the prior written consent of EY.
2. EY disclaims all liability in relation to any other party who seeks to rely upon the Report or any of its contents.
3. EY has acted in accordance with the instructions of ASX, in conducting its work and preparing the Report, and, in doing so, has prepared the Report for the benefit of the ASX and ASX's regulators ASIC and the RBA, and has considered only the interests of ASX and ASX's regulators ASIC and the RBA. EY has not been engaged to act, and has not acted, as advisor to any other party. Accordingly, EY makes no representations as to the appropriateness, accuracy or completeness of the Report for any other party's purposes.
4. No reliance may be placed upon the Report or any of its contents by any party other than ASX and ASX's regulators ASIC and the RBA. Any party receiving a copy of the Report must make and rely on their own enquiries in relation to the issues to which the Report relates, the contents of the Report and all matters arising from or relating to or in any way connected with the Report or its contents.
5. Subject to clause 6 below, the Report is confidential and must be maintained in the strictest confidence and must not be disclosed to any party for any purpose without the prior written consent of EY.
6. All tax advice, tax opinions, tax returns or advice relating to the tax treatment or tax structure of any transaction to which EY's services relate ("Tax Advice") is provided solely for the information and internal use of the ASX and ASX's regulators ASIC and the RBA, and may not be relied upon by anyone else (other than tax authorities who may rely on the information provided to them) for any purpose without EY's prior written consent. If the recipient wishes to disclose Tax Advice (or a portion or summary thereof) to any other third party, they shall first obtain the written consent of ASX and ASX's regulators ASIC and the RBA, before making such disclosure. The recipient must also inform the third party that it cannot rely on the Tax Advice (or a portion or summary thereof) for any purpose whatsoever without EY's prior written consent.
7. No duty of care is owed by EY to any recipient of the Report in respect of any use that the recipient may make of the Report.

8. EY disclaims all liability, and takes no responsibility, for any document issued by any other party in connection with the Project.
9. A recipient must not name EY in any report or document which will be publicly available or lodged or filed with any regulator without EY's prior written consent, which may be granted at EY's absolute discretion.
10. A recipient of the Report:
  - (a) may not make any claim or demand or bring any action or proceedings against EY or any of its partners, principals, directors, officers or employees or any other Ernst & Young firm which is a member of the global network of Ernst Young firms or any of their partners, principals, directors, officers or employees ("EY Parties") arising from or connected with the contents of the Report or the provision of the Report to the recipient; and
  - (b) must release and forever discharge the EY Parties from any such claim, demand, action or proceedings.
11. In the event that a recipient discloses the Report to a third party in breach of this notice, it will be liable for all claims, demands, actions, proceedings, costs, expenses, loss, damage and liability made or brought against or incurred by the EY Parties, arising from or connected with such disclosure.
12. In the event that a recipient wishes to rely upon the Report that party must inform EY and, if EY agrees, sign and return to EY a standard form of EY's reliance letter. A copy of the reliance letter can be obtained from EY. The recipient's reliance upon the Report will be governed by the terms of that reliance letter.

## **EY | Building a better working world**

**EY exists to build a better working world, helping to create long-term value for clients, people and society and build trust in the capital markets.**

**Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.**

**Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.**

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via [ey.com/privacy](https://ey.com/privacy). EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit [ey.com](https://ey.com).

© 2022 Ernst & Young, Australia  
All Rights Reserved.

Liability limited by a scheme approved under Professional Standards Legislation.

ED 1121



Ernst & Young is a registered trademark.

[ey.com](https://ey.com)