Independent Expert Report

Independent assessment of ASX's Assurance Program for its Implementation of the CHESS Replacement Program

Design Report

28 February 2022

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1.   Executive Summary

Introduction

ASX Operations Pty Ltd ("ASX") is undertaking a project to replace its Clearing House Electronic Subregister System (CHESS) with a new implemented system based on distributed ledger technology (CHESS Replacement Program).

ASX has developed an Assurance Program in connection with the CHESS Replacement Program, with the purpose of providing confidence to internal and external stakeholders and assisting in ensuring that the project meets its objectives. The Assurance Program is part of the critical path of the project and includes a number of reviews focused on important project milestones and key risk areas.

In November 2021 ASIC imposed certain Licence Conditions on ASX Clear and ASX Settlement which included the appointment of an independent expert.

Scope

In accordance with the relevant Licence Conditions, ASX, with ASIC's and the RBA's consent, engaged EY to assess ASX's Assurance Program for its implementation of the CHESS Replacement Program and oversee the implementation of any remedial actions from the trade outage independent expert review recommendations which are relevant to the CHESS Replacement Program.

This is our first independent expert report under the Licence Condition.

The objective of this report is whether the existing Assurance Program is fit for purpose, identifying any topics that require further independent assessment and any remedial actions. Refer to section 2.2 for scope details.

Approach

Our activities included holding workshops to gain an understanding of the project background and the design of the Assurance Program, conducting interviews with key project stakeholders and assessing documentation related to the CHESS Replacement Program and the Assurance Program.

For the purposes of our assessment, we defined fit for purpose as coverage of material CHESS Replacement Program risks and deliverables, the nature and extent of assurance activities, the timing and sequencing of the assurance activities, and governance and change management of the Assurance Program.

We assessed the Assurance Program against EY's Cube program assurance methodology, the CHESS Replacement Program key risks, the CHESS Replacement Program key deliverables, and our understanding of Assurance Programs for major implementation projects of the nature, scale and complexity of the CHESS Replacement Program. Refer to section 2.3 for approach details.

Summary findings and recommendations

The CHESS Replacement Program has been a major project for ASX over the last four years. Over the first years of the program, ASX conducted a number of assurance activities which included internal audit reviews, security design assessments and project governance reviews engaging the subject matter expertise of external third-parties.

In 2021, ASX recognised the need for an end-to-end Assurance Program with the accountability, capability, and systematic approach required to assure a project of the nature, scale and complexity of CHESS Replacement Program.

Based on our findings below, our assessment found that the Assurance Program is fit for purpose, subject to ASX addressing the [three] recommendations.

► Coverage of assurance activities - Our assessment did not identify any significant gaps in relation to the proposed high-level approach and the topics for review. All material risk and delivery aspects of the CHESS Replacement Program will be subject to Assurance Program coverage.

We have no recommendations on the coverage of Assurance Program activities.

► Nature and extent of assurance activities - ASX own and run the overall Assurance Program and use ASX internal independent expertise (Internal Audit) and third-party providers as subject matter experts for the relevant assurance activities.

Our assessment found that for completed assurance activities, and where planning has commenced for upcoming activities, the nature of activities was adequately described. The indicative scope for a number of future assurance activities included in the Assurance Program is limited and does not provide sufficient information to understand or assess the expected level of assurance. For example, the scope is stated as a single objective statement, with no further articulation of areas to testing, the approach to testing, or the effort for the activity.

Our assessment found that while targeted assessments are performed in alignment to project risks which are linked to projects milestones, there are no specific milestone assurance activities planned at the major milestone points of the CHESS Replacement Program. These would aggregate relevant targeted assurance reviews into a 'is the program ready to progress' assurance view.

We recommend that the Assurance Program determines a detailed scope for each remaining review. We would expect these draft

scopes to form the baseline plan. These draft scopes would be adjusted nearer to their start date based on the status of the CHESS Replacement Program at that time and any relevant factors.

We recommend that the Assurance Program consider conducting milestone assurance reviews which, leveraging the outcomes of other targeted reviews, would focus on the objective of providing assurance around the question "is the program ready to progress to the next phase?"

► Timing of assurance activities - Our assessment of proposed timing to review high-level topics against key project milestones did not identify any significant exceptions. We noted that where the CHESS Replacement Program activities had slipped, the assurance activities had been adjusted accordingly. Those underlying delivery activities and their assurance activities are replanned using the program change management processes. We will focus on the timing of assurance activities around ITE2 in our next report.

► Assurance Program governance and change management – The Assurance Program is owned by the Chief Risk Officer. The Assurance Program provides reports and is accountable to the ASX Clear Board, ASX Settlement Board, ASX Audit and Risk Committee, and provide updates to the ASX Business Committee. Third party providers of assurance activities are required to be independent and manage conflicts where parts of their organisation engaged in the delivery of the CHESS Replacement Program.

We recommend strengthening the program management by establishing a formalised framework to provide clear guidance around the expectations of program required inputs and outcomes and the responsibilities assigned in relation to the Assurance Program activities. For example, tracking, assurance and closure management actions, updates to the Assurance Program and planning of upcoming reviews, independence requirements of assurance providers, and reporting of program assurance activities.

Refer to section 3 of the report for detailed findings and recommendations.

Next steps

Our next report under the Licence Condition is due on 30 June 2022.

The scope of that report will cover how ASX has addressed the recommendations in this Design Report, the operational effectiveness of assurance activities in the period to 30 June 2022 and any update on the implementation of any remedial actions from the trade outage independent expert review recommendations which are relevant to the CHESS Replacement Program.

We will thematically focus on areas we currently see as higher risk including customer readiness and ITE2, program change management, organisational capability, and conflicts management and independence.

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

2.   Introduction

2.1   Background

CHESS Replacement Program

ASX commenced a process of evaluating replacement options for its Clearing House Electronic Subregister System (CHESS) in 2015. CHESS is used by ASX as a core system to perform clearing, settlement and other post-trade services for the Australian equity market.

In December 2017, ASX announced the decision to replace CHESS implementing a new system based on Digital Asset's (DA) distributed ledger technology (DLT), project known as the 'CHESS Replacement Program'. There are four key objectives/goals for overall CHESS Replacement project plans to achieve:

► To replace the CHESS system which is based on ageing technology

► To adopt international messaging standards (ISO20022) and enable the retirement of proprietary CHESS messaging

► To comply with regulatory expectations to be capable of implementing settlement services that are multi-CCP compatible

► To develop and enable new business services in relation to clearing and settlement made possible by a flexible and secure system design using contemporary technology providing DLT optionality

Since then, ASX has completed public consultation and opened a Customer Development Environment (CDE) for customers to design, build and test the system. ASX is also scheduled to create an Industry Test Environment (ITE) to support industry wide testing prior to Go-Live.

The key milestones established in the project plan are the following:

► ITE1 (Industry Test Environment 1) is the first of two staged releases of the new DLT platform and CHESS application to industry ahead of the Go-Live. ITE1 enables software providers to perform functional and non-functional testing and to complete any developments they have been implementing. ITE1 commenced on 1st December 2021 and runs until mid-September 2022. In the second half of ITE1, there is a period of accreditation, where software providers need to demonstrate that their software can successfully connect and interact with the new system.

► ITE2 (Industry Test Environment 2) is the second staged release to open the new DLT platform and application for CHESS users to complete user testing and develop their operational readiness, following the ITE1 milestone and which is due to commence per the current plan on 18th April 2022. At the end of ITE2, there is a period of user readiness attestation, where users will confirm that they can successfully operate with the new system.

► Go-Live: expected Go-Live date of the CHESS Replacement project is April 2023.

CHESS Replacement Program Assurance Program

ASX has developed an Assurance Program with two key purposes:

► Assist in ensuring the project meets its objective of the successful replacement of CHESS with a system based on DLT that meets ASX's functional & non-functional requirements (secure, reliable, available, performant, etc)

► Provide confidence to internal and external stakeholders relating to functional and non-functional aspects of the replacement system and decision-making for key milestones including readiness for go-live.

The Assurance Program has been designed taking a top-down approach with a focus on important project milestones and key risk areas.

The Assurance Program is 'owned' by ASX's Chief Risk Officer as sponsor. The delivery of the Assurance Program is distributed across a number of assurance providers, depending on the subject matter of each topic, including independent experts and ASX Internal Audit.

The outcomes of individual reviews planned in the Assurance Program and their findings are tracked by the Assurance Program workstream within the CHESS Replacement Program and reported periodically to the Executive Steering Group (ESG), the ASX Audit and Risk Committee and the Clearing and Settlement (CS) Board.

ASX Clear and ASX Settlement Licence conditions

As a related matter, in November 2020 an outage occurred following a major upgrade to ASX's 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. The independent expert made recommendations in seven key categories from this review: risk, governance, delivery, requirements, vendor management, testing and incident management (trade outage independent expert review recommendations).

The combination of the trade outage and the criticality of the CHESS Replacement program has led ASIC (as delegate for the Minister) to impose certain Licence Conditions on ASX Clear and ASX Settlement. Australian CS Facility Licence (ASX Clear Pty Limited) Additional Conditions Notice 2021 (No.1) dated 24 November 2021 and Australian CS Facility Licence (ASX Settlement Pty Limited) Additional Conditions Notice 2021 (No.1) dated 24 November 2021, condition 2 on Schedule 1 "Appointment of an independent expert" required ASX to engage an independent third party (independent expert) to conduct an assessment of its existing Assurance Program on its CHESS Replacement Program prior to Go-Live and oversee the implementation of any remedial actions from the trade outage independent expert review recommendations which are relevant to the CHESS Replacement Program.

2.2   Scope

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

1. In accordance with the relevant Licence Conditions, EY will assess ASX's Assurance Program for its implementation of the CHESS Replacement Program and oversee the implementation of any remedial actions from the trade outage independent expert review recommendations which are relevant to the CHESS Replacement Program.

2. In addition to the Licence Conditions, ASIC has required a Pre Go-Live Confirmation from EY as to our opinion with respect to:

  a.   The Assurance Program meeting its objectives of:

   i.   The successful replacement of CHESS with a system that meets ASX's functional and non-functional requirements, and

   ii.   Promoting confidence to internal and external stakeholders

b. The adequacy of ASX's governance framework for testing, and

c. The design adequacy of the CHESS Replacement Program's 'Go-Live' decision framework (which incorporates both the business decision to implement the new system and implementation activity decision check-points over the cut-over weekend) and whether the decision framework has been followed.

Our engagement will deliver the following reports as required by the Licence Conditions and the Pre Go-Live Confirmation:

► Design Report, which will set out whether the existing Assurance Program is fit for purpose, identifying any topics that require further independent assessment and any remedial actions.

► Six Monthly Progress Reports, which will set out an update to the Design Report, providing a status update of existing remedial actions and identifying any further remedial actions, and updating on implementation of any remedial actions from the trade outage independent expert review.

► Pre Go-Live report, which will set out the status of any remedial actions and whether they are necessary to be undertaken prior to Go-Live and an update on findings of the totality of the Assurance Program reviews indicating whether the remedial actions identified in the Design Report and Six Monthly Progress Reports and the relevant trade outage independent expert review recommendations have been appropriately implemented by ASX.

► Pre Go-Live Confirmation requested by ASIC in addition to the Licence Condition

► Two Post-Implementation Reviews (PIR)

This document refers to the Design Report as the initial deliverable of our agreed scope of work.

The objective of the Design Report is to assess CHESS Replacement Program Assurance Program developed by ASX to evaluate whether it is adequately designed to mitigate the risks associated with the nature, scale and complexity of the CHESS Replacement Program. Achieving that objective, i.e., if the CHESS Replacement Program is fit for purpose, includes the consideration of the following aspects:

a. Coverage of assurance activities. Assessing how the Assurance Program was built and reviewing its design and content to determine whether the scope breadth is appropriate and if there is any key topic missing in the proposed list of reviews that integrate the plan.

b. Nature and extent of assurance activities. Assessing individual reviews proposed scope to determine whether they have been planned with the appropriate depth to achieve the expectations and objectives of the Assurance Program.

c. Timing of assurance activities. Assessing proposed timing for the reviews in the Assurance Program to determine whether they have been scheduled at the right time in alignment to when the associated project risks are more relevant.

d. Assurance Program governance and change management. Assessing the established governance of the Assurance Program including change management and ongoing maintenance.

2.3 Approach

In undertaking our assessment for the delivery of this report, the following activities were performed:

1. *Documentation review:* A detailed review and analysis of ASX's Assurance Program and related relevant artefacts included those associated to the CHESS Replacement Program. All documentation was provided to EY by ASX based on a documentation request. A list of documentation reviewed can be found in Appendix H.

2. *Understanding workshops*: A number of workshops have been conducted to gain an understanding of CHESS Replacement Program objectives, milestones and status, including the ongoing governance of project risks and issues, and the approach taken to build the Assurance Program. A list of workshops conducted with ASX can be found in Appendix F.

3. *Interviews with key stakeholders:* The review also involved stakeholder interviews to capture additional input to complement the analysis of the documentation provided and enhance our understanding. Key business stakeholders identified by ASX were asked about their role with respect to the project and the Assurance Program and their perspectives around the design of the Assurance Program including the coverage of key project risks and the expected levels of assurance to be provided. A list of interviews conducted with business stakeholders can be found in Appendix G.

4. *Assurance Program design assessment:* Our evaluation of the breadth and depth of the Assurance Program has included the following assessments:

► Comparison against typical project risks following EY program assurance methodology, including those related to program governance, project management, and technical solution (refer to Appendix D for the outcome of the analysis). Additional details on the EY program assurance methodology utilised to complete our design assessment of the Assurance Program are set out in Appendix B.

► Assessment of the areas in scope for review against the detailed list of key risks included in the project RAID (refer to Appendix C for the outcome of the analysis).

► Assessment of the areas in scope for review against the list of key business and enabler capabilities as defined by the CHESS Replacement project (refer to Appendix E for the outcome of the analysis).

► Assessment of the Assurance Program versus our understanding of assurance programs for major implementation projects of the nature, scale and complexity of the CHESS Replacement Program. We recognise that the CHESS Replacement Program is arguably unique in its nature, scale, and complexity. While ASX has been progressively modernising its core systems over recent years, this is the largest and most material project for ASX. It is replacing a systemically important piece of national infrastructure, impacting and dependent on many external stakeholders, and using relatively leading edge blockchain distributed ledger technology at its core. Arguably, this means there are no directly comparable programs locally or globally to assess the assurance activities against. So, we have considered our experience of programs which contain elements of the CHESS Replacement Program and the assurance programs over those. For example, core banking replacements and other transformation and implementation programs across financial services and government entities.

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 responsible for any defect or problem arising out of or

related to data processing in any Systems in relation to the CHESS Replacement Program and its Assurance Program.

► Our review of ASX's Assurance Program detailed scope 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. That fact limits our ability to perform a more granular analysis on the depth of the Assurance Program.

► Our review was limited to documents requested by EY and 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 governance arrangements and executive accountability needs.

► Our scope under the licence conditions requires us to oversee the implementation of any remedial actions from the trade outage Independent Expert review recommendations which are relevant to the CHESS Replacement Program. For the purpose of our engagement, we define oversee as to observe, inspect and test that ASX has implemented the remedial actions. ASX are 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 so 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, and ASX may issue a media release and/or a public report referring to or publishing the content of our Reports , and may make or issue our Reports or a summary of the content of our Reports. We will prepare a summary of our Reports (EY Summary Reports). We consent to ASIC and the RBA, and ASX publishing our Reports, EY Summary Reports and/or summaries 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.   Findings and Recommendations

Detailed below are the findings and recommendations in relation to our review of the CHESS Replacement Program Assurance Program developed by ASX to evaluate whether it is adequately designed to mitigate the risks associated with the nature, scale and complexity of the CHESS Replacement Program.

3.1   Coverage of assurance activities

The objective of this area is to assess how the Assurance Program was built and designed and to assess the breadth of the program to determine whether there is any key topic missing in the proposed list of reviews that integrate the plan.

Context

ASX has developed an Assurance Program to assist with ensuring the project meets its objective of the successful replacement of CHESS with a system based on DLT that meets ASX's functional & non-functional requirements and to provide confidence to internal and external stakeholders, supporting decision-making for key project milestones including go-live readiness.

Our review has considered as input the Assurance Program formalised by ASX   .

Prior to the development of the Assurance Program in its current shape, ASX conducted a number of assurance activities which included internal audit reviews, security design assessments and project governance reviews engaging the subject matter expertise of external third-parties.

In 2021, ASX recognised the need to obtain assurance across all key aspects of the project whereby independent reviews were sought led to the development and formalisation of the Assurance Program (refer to Appendix A) as the project milestones were reached.

The Assurance Program has been designed taking a top-down approach with a focus on:

► Important project milestones, where topics for independent review have been considered in the context of the objectives for each upcoming phase of the project and associated risks:

  ► ITE1 (1st December 2021)

  ► ITE2 (18th April 2022)

  ► Go-Live (April 2023)

► Four key areas to ensure comprehensive review coverage of the project and change management:

  ► Project governance: includes the assessment of roles and responsibilities, reporting framework, RAID management, cost management, stakeholder engagement, schedule management and the assessment of project approach against the recommendations from the trade outage independent expert review

  ► Technical solution & design: includes the assessment of testing strategy and approach, performance, scalability and security design

- ► Operational processes and controls: includes the assessment of identity and access management, relevant technology controls and operational controls for both market-facing and internal ASX operational processes

- ► Industry readiness and implementation: includes data migration controls and readiness considerations for ASX, vendors and customers

Discussions with the regulators have been held along the way to discuss the proposed approach and the involvement of external parties to help provide the adequate level of independent assurance, opting for selecting different providers depending on the topic rather than commissioning a single firm to conduct the end-to-end program assurance activities.

Findings

Our assessment did not identify any significant gaps with regards to the proposed high-level approach to determine the design of the Assurance Program.

The consideration of a top-down risk approach and the key areas identified in combination with key project milestones is materially consistent with our EY's Cube program assurance methodology (Appendix B) utilised as a benchmark and industry practices to develop program assurance activities in relation to major implementation projects.

In some cases we have assessed the coverage as partial. This is where we found the assurance topics and objectives mapped against the expected assurance at a high-level but without the detail required to meet a full coverage assessment outcome. (See Finding 3.2 Nature and extent of assurance activities).

The Assurance Program was formalised in August 2021 and by design was forward looking. Two governance elements in the EY Cube methodology relating to pre-project assurance are therefore not applicable and not in the scope of our work.

We have no recommendations on the coverage of Assurance Program activities.

3.2   Nature and extent of assurance activities

The objective of this area is to assess the individual reviews proposed in the Assurance Program scope to determine if they have been planned with the appropriate depth in regard to key areas in scope to achieve the Assurance Program objectives and expectations.

Context

The Assurance Program developed by ASX contains indicative scope and timetable for each of the planned reviews per the topics described on section 3.1 of this report.

The Assurance Program includes a high-level view on the topic, identified accountable parties for each review and the selected assurance provider.

Closer to the commencement of the planned assurance reviews, the detailed scope will be defined. This is conducted through collaborative effort between ASX's CRO, accountable parties, i.e., business stakeholders acting as stream owners who apply their knowledge on the topic and subject matter expertise of assurance providers, both external providers acting as independent experts and ASX Internal Audit, where appropriate.

The selection of the assurance provider is proposed by the accountable parties alongside the proposed detailed scope, which is reviewed and approved by ASX's CRO as Program Assurance owner.

Findings

We have assessed the details of indicative scope included in the Assurance Program against our methodology, project risks, project business enablers and capabilities, and common industry practices. Where available for reviews already completed, we have assessed the detailed Statements of Work or ASX Internal Audit planning memos to understand the proposed detailed scope for each review. We noted the following improvement opportunities to be considered by ASX management in future updates of the Assurance Program:

► Indicative scope details. We acknowledge that the inputs provided but the assurance providers and the accountable parties identified for each review help determining the detailed scope for each of the planned reviews which is formalised in the corresponding engagement letters with external providers or planning memos with ASX internal Audit.

We found that the indicative scope included in the plan for most future assurance activities is limited and does not expand on the description of the topic to enable an independent reviewer to assess the key areas of focus, the expected key risk areas to be covered in the scope or the indicative controls framework to be considered as the baseline to provide the level of assurance expected.

Without a more detailed and clear view on key scope aspects in close alignment to the expected deliverables by the project and a clear set of minimum requirements around risk coverage for each of the planned reviews, there is a risk associated to the ongoing management and execution of the Assurance Program in relation to the appropriate set of activities (scope and effort) associated to each review (i.e. if each program review is doing too much or too little) and the mechanisms that the Assurance Program owner has in place to challenge any proposed scope by independent experts and establish baseline requirements for the reviews to be conducted.

While we acknowledge that future reviews scope and areas of focus will be highly dependent on project progress and might be altered by future decisions depending on project progress, is industry common practice around building Assurance Programs for major system implementations to be able to provide a more detailed view on key scope areas for review for the upcoming planned reviews on the following 6-12 months.

For example, we noted that ASX Assurance Program includes a "Customer review" planned later in 2022 before final go-live which is one of the most critical aspects. From the indicative scope, is not clear what are the expectations around the areas to be covered considering technology, processes, and people implications. In relation to customers and vendors, where the project is establishing attestation and accreditation processes it is also not clear the level of assurance expected to be obtained around those processes to assist in identifying any potential issues at the right time. The current approach seems to evaluate readiness at the end of the project to validate that project outcomes have been achieved to a level that would suggest readiness to go-live. However, it is not clear if the review will consider assessing at an earlier stage the strategy, approach and requirements as established by the project that define readiness (considering people, process, and technology aspects).

Given the limited information provided on the indicative scope, the Assurance Program cannot demonstrate – beyond the high level objective - how key risk areas are getting the right level of attention within the planned reviews. That level of detail is expected in the agreed Statement of Work (SOW) from the third party assurance provider. For example, on the technical solution and design area, performance and scalability seem to be key areas of focus but is difficult to determine from an independent reviewer perspective where other key aspects related to the platform as availability and broader operational resilience are covered to ascertain if they are receiving the right level of attention. Similarly, would compliance and regulatory requirements including all obligations within licence conditions be considered?

From our review of existing SOWs, we have also noted instances, such as the one related to Identity and Access Management, where the agreement in place seems to contain a generic agreement on deployment support services for technical consultation or assistance. Pending our review of the assessment performed and the report, the combination of the indicative scope and the SOW do not provide an independent reviewer enough information to determine the- key areas in scope to be reviewed and the expectations around the level of assurance that will be provided.

We recommend expanding as appropriate the indicative scope details included in the Assurance Program utilising as input the expected key project deliverables and the associated risks, and utilising inputs from assurance providers and business area leads acting as accountable parties, to provide as a minimum an understanding of the expected baseline requirements to be covered in each review.

► Milestone readiness. The Assurance Program has established a number of targeted assessments across the key areas identified, including the topic of readiness to assess ASX, vendors and customers readiness before go-live. Those targeted reviews have been scheduled (refer to 3.3 Timing of assurance activities) in consideration of key project milestones and are focused on identified key areas of risk. However, and linked with the concept of program readiness, we have not identified that the plan includes specific milestone reviews, which will bring together the outcomes of the various deep dives and targeted assessments to provide a holistic view on program readiness to transition to next project phase.

In relation to lessons learnt from ITE1 as assessed by ASX, delays in the implementation activities of the elements to be delivered as part of ITE1 milestone limited the ability for the assurance provider, in this case ASX Internal Audit, to execute testing of processes and controls on the environment as planned.

The review was therefore limited to a desktop review on documentation to perform a high-level design assessment which provides a reduced level of assurance compared to the execution of process walkthroughs and control testing on the environment to confirm that key functionalities were working as expected.

ASX is considering a similar review planned for ITE2 to be performed after go-live but prior to the start of operational readiness testing to ensure the platform is available to complete the required tests in alignment with the planned scope depth. Considering the criticality of the ITE2 milestone where the environment will be open to industry participants to complete user testing, when compared to our methodology and common industry practice, is usual to split program assurance reviews around project milestones between pre and post go-live activities where it is not feasible or practical to complete the full scope review before going live.

Key aspects that the project needs to deliver as part of that milestone as defined in project acceptance criteria should be subject to some level of assurance review before the environment goes live. This would mitigate a risk that potential gaps of minimum control requirements are not identified before opening the platform to industry participants, which could impact their user testing processes.

We acknowledge that ASX had planned discussions to determine the detailed approach for ITE2 in consideration of the above, which however had not been finalised at the time of our review.

We recommend combining the targeted assessments included in the plan and the ongoing project governance health-checks with milestone reviews for key project milestones (i.e. ITE2, Go-Live) which will provide enhanced assurance over the go/no-go decision for the transition to the next phase and will be focused on provide confidence around the following aspects:

► Review of Program readiness to transition between key project milestones based on the project plan

► Definition of go/no-go criteria to transition each phase and business endorsement of those criteria

► Tracking and satisfaction of go/no-go criteria to exit phases

► Considering the inputs of the applicable targeted assessments, provide a view on business and technical readiness to transition to the next phase comparing to expected criteria defined by the project in relation to the go/no-go decision i.e. stability of platforms, baseline functionalities implemented, data quality criteria met, etc.

► Organisational change management aspects in relation to the people domain such as training activities completed, program communications distributed, etc should be a key area of focus.

► Endorsement of the go/no-go decision by relevant governance forums

We recommend ASX to apply lessons learnt from ITE1 in the planning and scoping exercises for upcoming milestones ITE2 and Go-Live. While ASX current thinking for ITE2 intends to plan the review on key technology and operational controls once the platform is ready and available after opening to industry participants, we also recommend revisiting key criteria in relation to technology and operation controls to transition between phases per the project plan to determine any control requirements and system functionalities that from a program assurance perspective should be reviewed before opening the ITE2 environment.

3.3   Timing of assurance activities

The objective of this area is to assess the proposed timing for the reviews in the Assurance Program to determine whether they have been scheduled at the right time in alignment to when the associated project risks are more relevant, so the reviews are executed at the right time to provide the assurance inputs expected.

Context

The Assurance Program developed by ASX contains indicative timetable for each of the planned reviews. Per discussion with key stakeholders, we noted that the Assurance Program activities are considered part of the critical path of the project. The reviews have been scheduled in relation to key project milestones as it is shown on the project plan (Appendix I).

Findings

We have assessed the timetable proposed in the Assurance Program against key project milestones to determine whether they have been scheduled at the right time in alignment to when the associated project risks are more relevant. Although there are some limitations associated with the lack details of indicative scope as noted in the section 3.2 "Nature and extent of assurance activities", we did not identify significant findings in relation to the timing proposed for the topics to review in the Assurance Program.

We acknowledge that looking forward the Assurance Program will need to actively adapt to align to project future potential planning changes which is covered under 3.4 Assurance Program governance and change management activities below. Those updates will be considered in our next report due on 30 June 2022.

3.4 Assurance Program governance and change management

The objective of this area it to assess the established governance of the Assurance Program including change management and ongoing maintenance to determine whether adequate mechanisms have been established in place for a rigorous governance around the Assurance Program activities.

Context

The Assurance Program is owned by the Chief Risk Officer (CRO). The accountable party, generally ASX business unit lead (for example, security reviews within the Assurance Program are owned by ASX CTO), owns the assessment, helping to design the statement of work and select the assurance provider for each of the Assurance Program reviews, which is then approved by the CRO. The PMO is mainly responsible for the execution of the required activities to support the program. The outcome of the assurance activities and related project progress are presented to

different governance forums such as ESG, Clearing and Settlements (CS) Board, Business Committee, and Audit and Risk Committee (ARC).

Changes to the assurance activities are dependent on the outcome of the various stages of the project. For example, timing of assurance activities can change if there are delays in the progress or desired outcome of a project phase was not achieved.

In relation to the assurance providers, ASX Internal Audit and external experts are conducting those reviews depending on the subject matter expertise on the topic. There were instances of past reviews completed by external experts which were also embedded in project activities, approach that has progressively changed ▮▮▮▮▮▮▮▮▮▮ ▮▮▮▮▮▮▮▮▮▮▮▮▮▮ towards ensuring independence in the execution of the assessments. Where an assurance provider is selected prioritising technical expertise on the area under review which is part of the project at the same time, ASX is ensuring that a separate team within that provider different to the team embedded in the project conducts the review.

Monthly meetings are held between the CRO, Project Sponsor, End-to-End Delivery Lead, Program Owner, and General Manager (GM), Head of Regulatory Affairs to discuss progress of the assurance activities and adjustments to the Assurance Program.

The completion and outcome of the assurance activities are considered in the critical path of the project and the findings and proposed remediation activities are logged and tracked for closure in the project risk and issue register. For the specific findings raised by ASX Internal Audit, those are also tracked in ASX enterprise risk management system.

Project risk and issues are periodically extracted and presented through ESG, monthly Board and quarterly ARC papers.

Findings

Our assessment identified the following areas to strengthen the current processes in place for the governance and change management of the Assurance Program.

We recommend:

- Formalising the framework to govern and maintain the Assurance Program. The PMO is currently responsible for maintaining the assurance plan based on progress of the reviews and monthly meetings with the CRO and Project Sponsor, Program Owner, and GM, Head of Regulatory Affairs. An Assurance Program, especially for large and complex implementation projects with high expectations around the program assurance requirements, involve the execution of a broad range of activities which require clear guidelines. While ASX has processes in place to run those activities, we have observed instances where the absence of a formalised framework with a clear guidance leads to a lack of clarity around the course of action. For example:

  - Validating management actions. PMO is responsible for the overall monitoring of the status of the remediation actions coming from all assurance activities conducted within the Assurance Program. Internal Audit is responsible for the validation of the closure of the remediation actions, limited to those linked to the reviews completed by Internal Audit. The process and roles and responsibilities to validate the closure of the remediation actions from the assurance reviews has been further refined recently, whereby PMO will validate closure of remediation activities coming out of Assurance Program reports different to those executed by Internal Audit.

- Updating the Assurance Program and planning of upcoming reviews. We observed that during our assessment the plan was not fully up to date; for example, Internal Audit was still assigned to be the accountable party for a number of reviews which has since changed. We also observed that the necessary activities to discuss detailed scopes and lock-in required SOWs for upcoming reviews before ITE2 milestone (18/04/2022 per current project plan on Appendix I) had not been conducted at the time of our review.

- Ensuring independence of assurance providers. The Assurance Program is changing the resourcing of reviews executed by third parties from using teams embedded in the program delivery to using separate teams within the third party. ASX should formally articulate its expectations for service provider independence and conflict management (for example, segregation of delivery and assurance resources), and require that to be addressed in their engagement agreements.

- Reporting of program assurance activities. From the sample of ESG papers reviewed for this report it does not seem to exist a clear standard in relation to the expected inputs to be provided by the Assurance Program. In addition, while a formal input of the Assurance Program activities and the assurance approach to ITE1 was provided for the ARC in August 2021, no specific input in relation to the proposed approach for ITE2 has been prepared for the ARC schedule this quarter ahead of the next project milestone.

We recommend that the program establish a formalised framework, approved and owned by the Assurance Program owner, to provide clear guidelines and expectations around the following key aspects surrounding the governance and maintenance of the Assurance Program:

- Roles and responsibilities defined in relation to all Assurance Program related activities including expectations across the 3LOD

- How the Assurance Program is maintained, including frequency and approvals required for changes, meetings established and expected outcomes

- Timelines to trigger the planning activities of the reviews

- Expectations around reporting and escalation of progress and outcomes, including reporting to ESG, CS Board and quarterly ARC.

- Expectations around issue closure, including that adequate monitoring of remediation actions is performed and periodic reporting of status be established.

- Requirements established to assess the independence of the assurance providers. Where appropriate, those requirements should include a review of the concluded assurance activities where the assurance providers were embedded in the project team to determine whether additional complementary reviews should be performed.

Appendix A ASX Assurance Program summary

Review*	Accountable Party / Review Coordinator*	Indicative Scope & Timetable*	Assurance Provider	Status / Progress Update*
Project Governance				
Project Health Check		Roles and responsibilities, reporting framework, RAID management, cost management, stakeholder engagement, schedule management [Nov 2019]	3rd-party A	COMPLETE
Project Replan		Process Review, Assumption Review, Challenge Process, Contingency Planning [Sept 2020]	3rd-party A	COMPLETE
Project Health Check		Roles and responsibilities, reporting framework, RAID management, cost management, stakeholder engagement, schedule management [May 2021]	3rd-party A	COMPLETE
[NEW] Trade outage independent expert review Recommendations Self Assessment		Assess the program against the 59 recommendations from the trade outage independent expert Review [Oct 2021]	Project Team	COMPLETE
[NEW] Trade outage independent expert Review Recommendations – Independent Assessment		Assess the program against the 59 recommendations from the trade outage independent expert Review [Dec 2021]	3rd-party A	COMPLETE
Project Health Check		Roles and responsibilities, reporting framework, RAID management, cost management, stakeholder engagement, schedule management [Mar 2022]	3rd-party A	Work planned
Post Implementation Review		Lessons Learnt [Jun 2023]	Project Delivery	Not Started
Assurance Program Design / New Licence Conditions				
[NEW] Assurance Program Design		Report on the design of the Assurance Program [Feb 2022]	3rd-party A	Work underway
[NEW] Assurance Program Design Update		Update on design of Assurance Program; remedial action update (including trade outage independent expert review recommendation actions) [Jun 2022]	3rd-party A	Not Started
[NEW] Assurance Program Design Update		Update on design of Assurance Program; remedial action update (including trade outage independent expert review recommendation actions) [Dec 2022]	3rd-party A	Not Started

Review*	Accountable Party / Review Coordinator*	Indicative Scope & Timetable*	Assurance Provider	Status / Progress Update*
[NEW] Go Live Governance Readiness		Assess that the Assurance Program has met it's objectives; adequacy of Testing Framework; adequacy of Go Live Decision Framework [Mar 2023]	3rd-party A	Not Started
[NEW] Post Implementation Review Report		Assess that the Assurance Program has met it's objectives; adequacy of testing framework; adequacy of Go Live Decision Framework [6 + 12 months post go live]	3rd-party A	Not Started
Technical Solution and Design				
Testing Approach Review		Adequacy of test approach [Apr 2021]	3rd-party B (embedded)	COMPLETE
Performance Review		Review of CHESS+ platform performance status against target by trade per second and latency, at each point in workflow [Mar 2022]	3rd-party B	Work planned
Scalability Review		Assessment of time taken for scalability to increased targets by either horizontal or vertical means against regulatory guidance [Mar 2022]	3rd-party B	Work planned
[NEW] Test Approach / Strategy Review		Adequacy of Test Strategy [Dec 2021]	3rd-party B	Not Started
Technical Solution and Design – Security Design				
Security Design Review		Security review of the DLT platform and CHESS+ application covering security design and threat risk assessment, ongoing component testing as security functionality is delivered, environment reviews pre go live for ITE and Prod environments and penetration testing pre go live (and potentially at ITE). Pre ITE1 – Interim Report - Findings from a design review (gaps). Security design and architecture, security NFR testing [May 2021]	3rd-party C (embedded)	COMPLETE
Security Assurance Review		Ongoing component testing as security functionality is delivered, environment reviews pre go live for ITE1 and penetration testing pre go live for ITE1 Pre ITE1 Security NFR testing [Oct 2021]	3rd-party C (embedded)	Draft report distributed for review
Security Design & Assurance Review		Pre ITE2 - Security design and architecture, security NFR testing (initial review - defects will be raised due to partial entry criteria) [Mar 2022]	3rd-party C (embedded testing but with additional resources outside of the project team)	Not Started

Review*	Accountable Party / Review Coordinator*	Indicative Scope & Timetable*	Assurance Provider	Status / Progress Update*
Security Assurance Review		Pre GO-LIVE Penetration testing (cyber adversary simulation) + Testing/ retest of full set of security controls [Jan 2023]	3rd-party C (embedded testing but with additional resources outside of the project team)	Not Started
Operational Process and Control Design and Implementation				
Identity and Access Management		Identity and Access Management system (3rd-party D) configuration and setup health check [Sep 2021]	3rd-party D	Draft report distributed for review
Identity and Access Management		Penetration Test [Sep 2022]	3rd-party D	Not Started
Technology Controls Review		All Technology controls relevant to the CHESS Replacement system and operational processes – ITE1 [Sep 2021]	Internal Audit	COMPLETED
Technology Controls Review		ITE2 - Technology controls review [Mar 2022]	Internal Audit	Not Started
Technology Controls Review		Pre GO-LIVE - Technology controls readiness review [Mar 2023]	Internal Audit	Not Started
Technology Controls Review		Post GO-LIVE - Technology controls review [Jun 2023]	Internal Audit	Not Started
Operational Controls Review		All Operations controls relevant to the CHESS Replacement system and operational processes – ITE1 [Sep 2021]	Internal Audit	COMPLETED
Operational Controls Review		ITE2 - Operational controls review [Mar 2022]	Internal Audit	Not Started
Operational Controls Review		Pre GO-LIVE - Operational controls readiness review [Mar 2023]	Internal Audit	Not Started
Operational Controls Review		Post GO-LIVE - Operational controls review [Jun 2023]	Internal Audit	Not Started

Review*	Accountable Party / Review Coordinator*	Indicative Scope & Timetable*	Assurance Provider	Status / Progress Update*
Operational Controls Review – Clearing Risk / Billing / Participant Compliance		ITE2 - Operational controls review [Mar 2022]	Internal Audit	Not Started
Operational Controls Review – Clearing Risk / Billing / Participant Compliance		Pre GO-LIVE - Operational controls readiness review [Mar 2023]	Internal Audit	Not Started
Operational Controls Review – Clearing Risk / Billing / Participant Compliance		Post GO-LIVE - Operational controls review [Jun 2023]	Internal Audit	Not Started
Technology and Operations Controls Review		Technology and Operations controls included in the ASAE 3402 report on controls. Other controls relevant to the financial statements audit Higher risk areas, e.g. substantially new/different processes – to be identified throughout L1 work – ITE2 [Mar 2022]	Internal Audit/3rd-party E	Not Started
Technology and Operations Controls Review		Pre GO-LIVE Technology and Operations controls review [Mar 2023]	Internal Audit/3rd-party E	Not Started
Technology and Operations Controls Review		Post GO-LIVE Controls Operating Effectiveness report on controls [Jun 2023]	Internal Audit/3rd-party E	Not Started
Industry Readiness and Implementation				
Data Migration Review		Independent assessment of the accuracy and completeness of the data migration from old to new CHESS. Assessment of outcomes of various dress	3rd-party A	ASX collating management responses / actions

Review*	Accountable Party / Review Coordinator*	Indicative Scope & Timetable*	Assurance Provider	Status / Progress Update*
		rehearsals ahead of go-live and migrated data post go live. Review Strategy [Dec 2021]		
Data Migration Review		Review Dress Rehearsal [Sep 2022]	3rd-party A	Not Started
Customer Readiness Review		Assurance that * ASX is ready for the cutover * Customers and vendors are ready for the cutover – setup, accreditation and attestation [Dec 2022]	TBC	Not Started

Appendix B   EY Program assurance methodology

Appendix C   Assessment outcome against project risks

We have compared the key focus areas included in the CHESS Replacement Assurance Program against key project risks performing the following procedures:

a. Obtained the RAID log as of 22/01/22 ▮▮▮▮▮▮▮▮▮▮▮▮

b. Filter the RAID log to identify the project risks defined.

c. For each of the high-risk exposure areas identified by the project ▮▮▮▮▮▮▮ inspected the Assurance Program ▮▮▮▮▮▮▮▮▮▮▮▮ to determine whether the identified project risk is covered by any assurance activities per the CHESS Replacement Assurance Program.

Risk aggregation by Impact Category	# of High Risk Exposures identified in each impact category	Assurance Program Coverage – assessment outcome*
Schedule	▮	Covered
Objectives/Benefits	▮	Partially Covered (refer to Findings in 3.2)
Budget	▮	Covered
Customer	▮	Partially Covered (refer to Findings in 3.2)
Regulator	▮	Partially Covered (refer to Findings in 3.2)
People	▮	Partially Covered (refer to Findings in 3.2)
Supplier	▮	Partially Covered (refer to Findings in 3.2)

The assessment outcome is limited to the information available at the time of our review, which include some limitations on the granularity provided on the indicative scope for the program assurance reviews as describes in the findings of section 3.2.

Appendix D   Assessment outcome against EY's Cube program assurance methodology

We have compared the key focus areas included in the CHESS Replacement Assurance Program against typical project risks following EY program assurance methodology, including those related to program governance, project management and technical solution.

EY Methodology – EY Cube			ASX coverage	
Domain	Focus area	Topics considered	ASX program assurance coverage	Areas included in trade outage Independent Expert recommendations report
Project Governance	G1 - Business case integrity		Not Applicable (the ASX Assurance Program was by design forward looking)	
	G2 - Complexity profile		Covered (Project Governance reviews)	✓
	G3 - Capability And maturity		Covered (Project Governance reviews)	✓
	G4 - Decision framework		Covered (Project Governance reviews)	✓
	G5 - Organisational Change management		Partially covered (refer to Findings in 3.2)	
	G6 - Progress management		Covered (Project Governance reviews)	✓

EY Methodology – EY Cube			ASX coverage	
Domain	Focus area	Topics considered	ASX program assurance coverage	Areas included in trade outage Independent Expert recommendations report
	G7 - Governance effectiveness		Covered (Project Governance reviews)	✓
	G8 - Compliance and regulatory		Partially covered (refer to Findings in 3.2)	
	G9 - Benefits design and realisation		Not Applicable (the ASX Assurance Program was by design forward looking)	
Project Management	P1 - Scope management		Covered (Project Governance reviews)	✓
	P2 - Time management		Covered (Project Governance reviews)	✓
	P3 - Cost management		Covered (Project Governance reviews)	✓
	P4 - Human resource management		Partially covered (refer to Findings in 3.2)	✓

EY Methodology – EY Cube			ASX coverage	
Domain	Focus area	Topics considered	ASX program assurance coverage	Areas included in trade outage Independent Expert recommendations report
	P5 - Procurement management		Partially covered (refer to Findings in 3.2)	✓
	P6 - Integration management		Partially covered (refer to Findings in 3.2)	
	P7 - Quality management		Covered (Project Governance reviews)	✓
	P8 - Risk management		Covered (Project Governance reviews)	✓
	P9 - Communications management		Partially covered (refer to Findings in 3.2)	✓
Proposed technical solution	T1 -Requirements engineering and design		Covered (Technical Solution and Design reviews)	✓
	T2 - Methodology and development		Covered (Project Governance and Technical Solution and Design reviews)	✓
	T3 - Technical infrastructure		Covered (Technical Solution and Design reviews)	✓

EY Methodology – EY Cube			ASX coverage	
Domain	Focus area	Topics considered	ASX program assurance coverage	Areas included in trade outage Independent Expert recommendations report
	T4 - Data management		Covered (Data Migration reviews and Technical Solution and Design reviews)	
	T5 - Security and controls		Covered (Security Design, Identify and Access Management, Technology and Operational controls reviews)	✓
	T6 - Business continuity and recovery		Partially covered (refer to Findings in 3.2)	✓
	T7 - Testing and validation		Covered (Technical Solution and Design reviews)	✓
	T8 - Cutover and support		Partially covered (refer to Findings in 3.2)	
	T9 - Sustainability model		Partially covered (refer to Findings in 3.2)	

Appendix E   Assessment outcome against project business enablers and capabilities

We have compared the key focus areas included in the CHESS Replacement Assurance Program against key business enablers and capabilities defined as key deliverables of the project:

a. Obtained the CHESS product business and enabler capabilities document which defines the key functionalities and underlying process of the CHESS replacement system

b. For each of the business and enabler capabilities, identify whether related assurance activity has been defined in the CHESS Replacement Assurance Program.

Business and enabler capability	Assurance Program connected review	Assurance Program Coverage – assessment outcome
User onboarding and management	Identity and Access Management	Indicative scope and SOW provide limited information in relation to scope coverage (refer to Findings in 3.2)
Trade registration & novation	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Settlement Instructions	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Holding management	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Settlement	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
mFunds	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Asset servicing	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Accounts	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
CMM & Collateral	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Reference data & system integration	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Customer reporting (msg)	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Customer reporting (other)	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Internal Reporting	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Billing	Operational Controls Review – Clearing Risk / Billing / Participant Compliance	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Scheduling	Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Data Migration	Data Migration Review	Covered

Business and enabler capability	Assurance Program connected review	Assurance Program Coverage – assessment outcome
Data Quality	Data Migration Review	Covered
Migration Reconciliation	Data Migration Review	Covered
Security	Security Design & Assurance Review	Covered
Channel enablement	Security Design & Assurance Review Identity and Access Management Customer Readiness Technology Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Test data	Test Approach / Strategy Review	Covered
Performance and Scalability	Performance Review Scalability Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Resilience	Technology and Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Maintainability	Technology and Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Connectivity & Queriability	Technology and Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Infrastructure & Environments	Performance Review Scalability Review Security Design & Assurance Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Operational verification	Technology and Operational Controls Review	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Technical Handover	Industry readiness and implementation reviews	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Business Readiness	Industry readiness and implementation reviews	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Internal Ops readiness	Industry readiness and implementation reviews	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Customer & vendor readiness	Industry readiness and implementation reviews	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Release and support	Industry readiness and implementation reviews	Indicative scope provides limited information in relation to scope coverage (refer to Findings in 3.2)
Cutover	Data Migration review	Covered

Business and enabler capability	Assurance Program connected review	Assurance Program Coverage – assessment outcome
Program Delivery	Project Governance reviews	Covered

* The assessment outcome is limited to the information available at the time of our review, which include some limitations on the granularity provided on the indicative scope for the program assurance reviews as describes in the findings of section 3.2

Appendix F   Workshop list

The below table outline the workshops conducted with ASX stakeholders:

Workshop list		
Workshop topic	**Attendees**	**Date of workshop**
Introduction to CHESS Replacement	End to End Delivery Manager Head of Product, Equity Post Trade Project Management Office	19 January 2022
Risk, Assumption, Issues, and Decisions (RAID) Management	End to End Delivery Manager Project Management Office	20 January 2022
Assurance Plan and Roles and Responsibilities	End to End Delivery Manager Project Management Office	24 January 2022

Appendix G   Interview list

The below table outline the interviews conducted with ASX stakeholders:

Interview list	
Role	**Date of interview**
Chief Risk Officer	19 January 2022
End to End Delivery Manager	20 January 2022
General Manager, Head of Regulatory Affairs	24 January 2022
General Manager, Equity Post Trade	24 January 2022
General Manager, Internal Audit	25 January 2022
Group Executive, Securities and Payments	1 February 2022

Appendix H   Documents reviewed

Appendix I   CHESS Replacement Program timeline

Latest available CHESS Replacement Program timeline as published in the ASX CHESS Replacement Documentation Portal (public access):
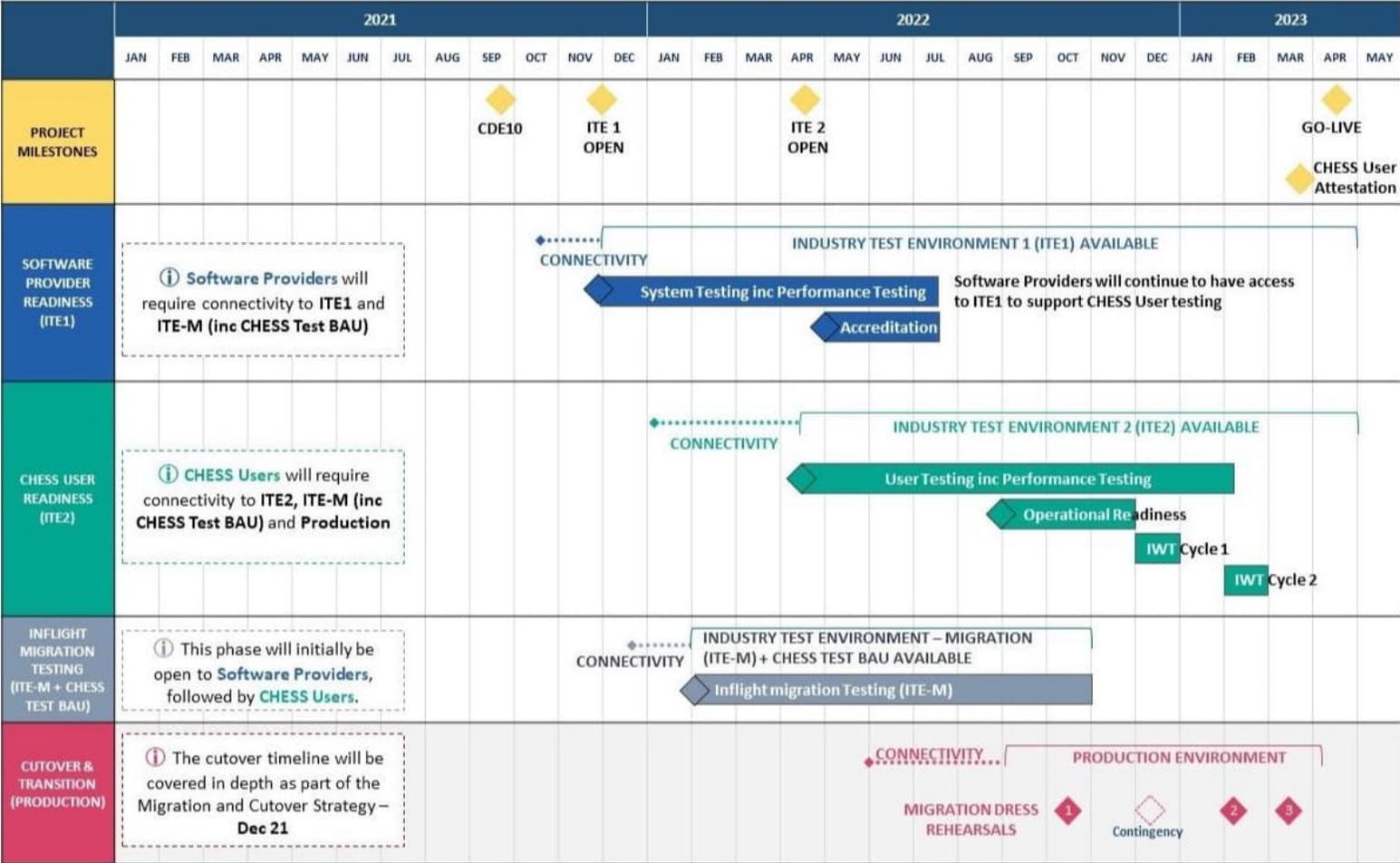
Appendix J   Release Notice

Ernst & Young ("EY") was engaged on the instructions of ASX Operations Pty Ltd ("ASX", "Client" or "you") to conduct an Independent Assessment of the CHESS Replacement Assurance Program ("Project"), in accordance with the engagement agreement dated 21 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 28 February 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.

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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.

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