



CHES Replacement: Confirmed Implementation Timetable

Response to consultation feedback

October 2020



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Executive summary

Overview

After the onset of the COVID-19 pandemic, ASX announced in March 2020 that it was considering stakeholder feedback and a range of other factors that ultimately led to the publication of a revised implementation schedule. The revised schedule provided for the impact of COVID-19 (as understood at the time) on all stakeholders, accommodated functionality changes requested by CHES users¹, and had a longer period for ASX and CHES users to complete their respective development and readiness activities. The revised implementation schedule with a target go-live of April 2022 was published for consultation on 30 June 2020.

Following a four-week consultation period, ASX carefully considered feedback from 100 organisations. It is clear from this feedback that COVID-19 continues to impact some participants in the industry. This includes the effect on collaboration and productivity, the importance of digitising processes and the desire to further reduce cutover risk for the new system. As a result, CHES users have asked for additional industry testing, more time to prepare, and that scope is delivered as soon as practical to reduce manual processes. Furthermore, subsequent to the conclusion of the consultation process, the industry (including the front office operations of CHES users) has demanded substantially more post-trade processing capacity due to both the extreme increases in trading volumes that occurred during the most volatile period of the pandemic in March 2020, and the possibility of further substantial increases in volume into the future.

This paper summarises ASX's consideration of all these factors and the changes made to the proposed implementation schedule. ASX has adjusted the Day 1 scope and schedule for the replacement system to deliver significantly more throughput capacity and scalability, more functionality, more industry testing, and more time for the industry and ASX to prepare. ASX has also adjusted its implementation approach. Instead of providing CHES users with early access to the Industry Test Environment (ITE) with code drops then being progressively introduced, ITE will be opened later when the system is functionally complete with much higher processing capacity to support industry testing. To enable continued development pre-ITE, an enhanced Customer Development Environment (CDE) will be provided. These changes will provide a better customer experience throughout the implementation process, reduce delivery risk for all stakeholders (including ASX) and provide a significantly enhanced CHES replacement solution on Day 1.

The go-live for the CHES replacement system is confirmed for April 2023, with increased project scope, and a 12-month extension to the proposed date consulted upon in June this year.

In the meantime, ASX maintains a robust maintenance program with the current CHES system, addressing hardware, processing efficiencies and performance tuning. This has successfully improved the transactional throughput of CHES, lifted key capacity constraints, and benefited intra-day and overnight processes. ASX is confident that the current CHES system will continue to support the industry to the extended timeframe.

ASX thanks all stakeholders that provided input and feedback, and looks forward to working collaboratively with the industry to complete the replacement of CHES. In setting this revised date, ASX acknowledges the impact that this has on those CHES users who were on track to meet the April 2022 go-live. Notwithstanding this, in consideration of all the matters raised by other CHES users, the importance of managing delivery risk, as well as the ramifications of the industry demand for significant scalability beyond the extreme volume increases in March this year, ASX has determined that an April 2023 go-live ensures CHES replacement is delivered in a safe and timely manner.

¹ CHES users are defined as those organisations that must undertake technical accreditation and/or formally attest to their operational readiness prior to go-live, in order for ASX to be able to transition all CHES users to the new system. These are clearing and settlement participants, product issuer settlement participants (PISPs), approved market operators (AMOs), back office software developers, payment providers and share registries.

ASX also acknowledges the close supervision of ASIC, RBA, Treasury and the ACCC (“the regulatory agencies”), who have focused on ASX’s governance, stakeholder engagement, functional and technical requirements, and risk management programs. Throughout the project, which commenced in December 2017, ASX has appreciated the strong engagement of the regulatory agencies. This engagement will continue and includes an ongoing and comprehensive independent assurance program.

Background

On 25 March 2020, ASX [announced](#) that it was undertaking a replan of the CHES replacement system to accommodate the impact of the COVID-19 pandemic, the functional changes requested by CHES users, and additional time for ASX and CHES users to complete development and readiness activities. On 30 June 2020, ASX released its [consultation paper](#) on the CHES Replacement Revised Implementation Timetable. The paper set out key project activities and milestones, including system development and testing, user testing, technical accreditation, operational readiness and operating rule amendments.

Feedback from CHES users was sought over a four-week consultation period on their ability to meet a revised implementation timetable, based on a proposed go-live date of April 2022.

The consultation paper posed five questions about the ability of CHES users to meet the revised implementation schedule:

1. Can your organisation meet the revised implementation timetable with a go-live date of April 2022?
2. If you answered NO to question 1, what are the challenges for your organisation in meeting the timeline?
3. If you answered YES to question 1, are there any dependencies that ASX should be aware of, and what would be the impact to your organisation of a delay beyond April 2022?
4. If your organisation chooses to provide feedback on the rule amendments, can your organisation meet the revised timetable for providing feedback on the further rules consultation commencing in early November 2020?
5. How long after the go-live date would your organisation be ready to commence readiness activities (including technical accreditation and operational readiness) for features included in release 1.1?

At a minimum, all CHES users were required to answer question 1.

Submissions received

ASX received feedback from all 96 CHES users and from four industry associations. ASX thanks all respondents for their submissions and helpful insights. All submissions were provided to the regulatory agencies.

Summary of key themes from the consultation process

Key themes from feedback provided by CHES users included:

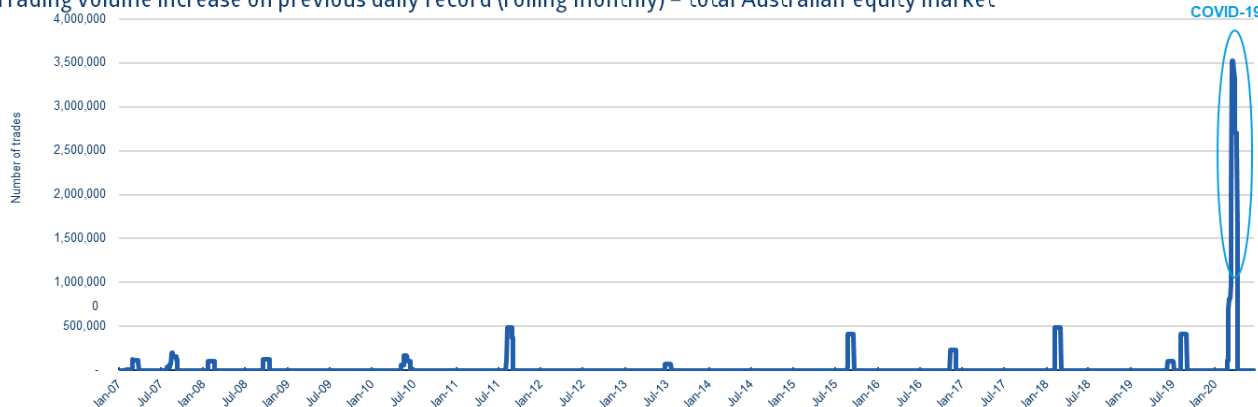
- While the majority said they could meet an April 2022 go-live, many cited a number of dependencies in meeting that date, and some key CHES users indicated a preference for, and a recommendation of, a go-live in Q4 2022. Other users indicated a concern with a go-live in Q4 2022 due to non-ASX industry system upgrades and the AGM season.
- A number of CHES users requested additional types of testing that they would like to undertake as part of their readiness activities. This includes:
 - Industry-wide end-to-end testing

- Performance testing – an industry-wide performance test window, which mirrors peak production volumes
- Data migration testing – an opportunity to undertake functional testing using migrated CHES data.
- In relation to the proposed go-live for additional corporate actions and bilateral DvP features as part of release 1.1 (i.e post-Day 1), a number of CHES users and an industry association noted these features are a key enhancement to deliver efficiencies and reduce risk, and should be made available as early as possible given the learnings from the COVID-19 experience.
- Many CHES users highlighted their readiness to support certain project milestones was dependent on ASX making further information available including:
 - Pricing – further clarity required including a timetable
 - Data governance – provision of a framework on the data governance arrangements
 - Single cutover weekend – further information regarding the approach to the single cutover weekend, including measures to de-risk the cutover
 - Migration dress rehearsals (MDRs) – further detail on the plan and approach
 - Data migration tools – further technical details for the ASX conversion tool for registration details, including timing
 - Connectivity details – timely provision of connectivity details for ITE1 and ITE2 prior to the commencement of testing.
- A small number of CHES users asked for an opportunity to comment on the final rules package (as revised following the consultation on the tranche 3 rules and consolidated rules package) prior to formal lodgement with ASIC for regulatory clearance.

ASX’s consideration of the extreme volume increases in March 2020

Following the extreme increase in trading activity earlier this year, the daily record of 3.3 million trades set in August 2019 more than doubled to 7.0 million trades on 13 March 2020. This volume increase was unprecedented, as shown in the chart below.

Trading volume increase on previous daily record (rolling monthly) – total Australian equity market



In response to this “new normal”, ASX has prioritised resources to deliver further scalability within the existing CHES system. This work is on track, with progressive uplifts in capacity and performance delivered and further CHES capacity uplifts planned in the coming months.

For the CHES replacement system, the trading record on 13 March has caused stakeholders to provide feedback in two important respects:

1. The new record means that the replacement system specification should be enhanced for significant additional capacity on Day 1.
2. More recently, the severity of the increase has also caused the industry to form the view that “possible future increases” should now mean that post-trade processing capacity should not constrain front office trading activity, such that the replacement system is able to scale post-Day 1 to much higher levels than previously envisaged, and to be able to do so quickly.

While this feedback has been outside the scope of the formal consultation, it has been a key consideration of the replan to ensure not only that the new system capacity is adjusted to process significantly higher trading volumes on Day 1, but also that it can scale to significantly higher capacity levels post-Day 1.

The Day 1 throughput capacity requirement has been significantly increased to accommodate ‘bursting’ trade registration activity during the day. Importantly, the system was always designed to be horizontally scalable such that the system architecture is not a constraint to delivering greater capacity.

However, in order to achieve additional capacity uplifts more quickly post-Day 1, the calculation and dissemination of net broker obligations (NBO) will need to be refined in order to complete the necessary overnight processes in a timely manner at high trading volumes. The NBO calculation and dissemination is an overnight batch process unique to the Australian market which replaces all the day’s gross settlement instructions resulting from market trades with a single net settlement instruction per security, per settlement date and per clearing participant. This is a function of the business process that compresses very large amounts of message dissemination (i.e. multiples of the day’s trading volume) into the overnight process.

Refining the NBO process was originally considered as a potential enhancement that could be implemented after go-live of the system. Given the new system was originally specified with significant additional capacity (reflecting the historical trading records at the time), refining the NBO process was not deemed necessary for Day 1, particularly as leaving the NBO process unchanged minimised the changes that customers needed to make to their back office systems in preparation for go-live.

Following the extreme volume increase on 13 March 2020, the refinement of the NBO process is now a Day 1 requirement for the new system. This will deliver the ability to scale much more quickly to even higher throughput capacity post-Day 1. It also removes the need for CHES users to undertake further software development to accommodate changes to the NBO process in an unscheduled release, which in light of recent events would likely be necessary shortly after go-live if left unaddressed.

ASX will consult with CHES users on the redesign of the NBO process in the first quarter 2021, and has made provision in the schedule for software providers to make adjustments prior to the commencement of technical accreditation.

Summary of ASX's response

As a result of the CHES user feedback and the industry demand for additional capacity following the extreme volume increases in March 2020, ASX has identified the following key changes to the scope and revised timetable for implementing the new system that was published for consultation on 30 June 2020:

- Redesigning the current NBO process to **significantly improve the scalability of overnight processing**
- Delivering **significantly more intra-day throughput capacity on Day 1**
- **Adding digitisation functionality** in the Day 1 scope - corporate action dividend reinvestment plan (DRP)/ bonus share plan (BSP) elections and DRP/BSP enquiry, plus non-batch DvP bilateral settlement functionality - that was previously scheduled as part of release 1.1
- Providing for **additional CHES user testing** – greater coordinated testing and market-wide performance and migrated data testing to reduce risks in cutting over to the new system
- Providing **more time for software providers' development, testing and readiness activities** to reduce delivery risk
- Extending the period of operation and **enhancing the CDE** to improve the software provider experience
- Providing more time before opening ITE with a fully functional system with significantly higher throughput capacity, to **reduce delivery risk and improve the customer experience**
- **Avoiding project overlap**, resource contention and the systems impacted by scheduling away from the SWIFT annual standards release in November each year, key milestones for the ISO 20022 cross-border payments, RTGS migrations, and the AGM season.

To accommodate these changes, ASX has conducted a detailed review of all project activities and milestones.

Confirmed implementation timetable

The proposed implementation schedule provided in the June consultation paper (included on page 9 of this document) outlined indicative dates for commencement and completion of certain project activities and key milestones, including system development and testing, user testing, technical accreditation, operational readiness, and operating rule amendments.

ASX has modified the implementation timetable to:

- Move the date for delivering CDE 10 from end-February 2021 to end-June 2021 to incorporate changes to NBO solution design for long-term scalability
- Add an additional software drop (CDE 11) to incorporate corporate action DRP/BSP elections, the DRP/BSP enquiry function and non-batch DvP bilateral settlement functionality
- Move the date for the further operating rule amendments consultation (from November 2020 to August 2021) and formal lodgement of rule amendments with ASIC (from August 2021 to August 2022) to accommodate updates arising from the changes to the NBO solution design
- Enhance CDE before the opening of ITE1 to better support software development activities by software providers²

² Software providers include back office software developers and customers who support their own technology.

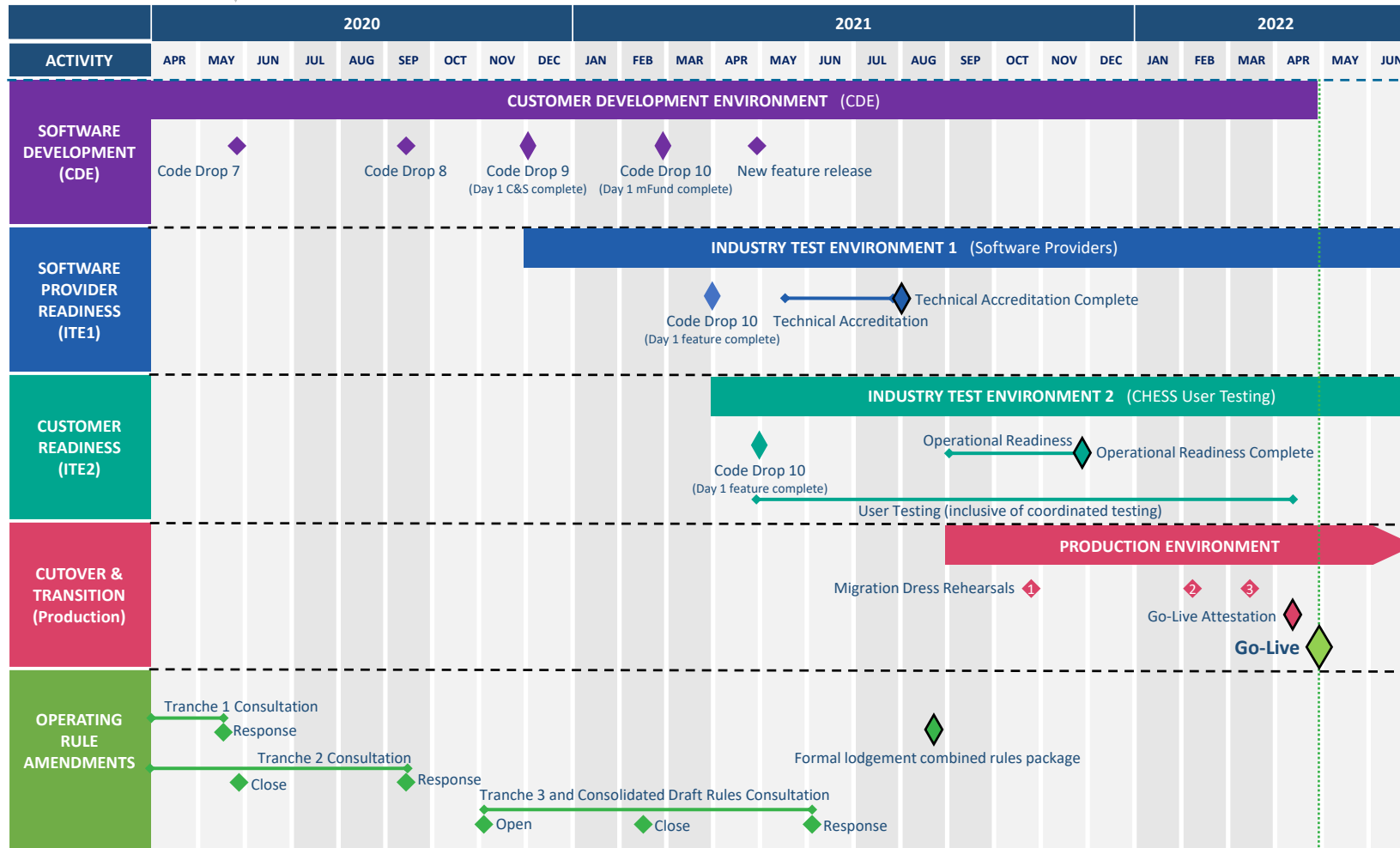
- Adjust the opening of ITE1 from December 2020 to November 2021 to enable the inclusion of CDE 10, CDE 11, and additional throughput capacity
- Adjust the opening of ITE2 from April 2021 to April 2022
- Move the go-live date from April 2022 to April 2023.

The following section of the paper provides the proposed implementation schedule presented in June 2020 and the confirmed implementation schedule accommodating the above changes.

Revised implementation schedule published on 30 June 2020

◆ INTERIM MILESTONES

◆ KEY MILESTONES



1. Feedback received from the consultation process

The following section provides a summary of the feedback received in the consultation process and ASX's response to that feedback.

1.1. Timing for go-live

Feedback received

CHESS users were asked if they were able to meet the revised implementation schedule with a go-live date of April 2022. The question was mandatory to answer, and all CHESS users answered.

The overwhelming majority of CHESS users indicated that they were able to meet the revised implementation schedule. However, a number of responses contained important qualifiers and other points of detail:

- Some noted while they can meet a go-live of April 2022, they recommended a go-live date of Q4 2022 as more realistic, including to allow sufficient time for industry testing and defect rectification
- Some users requested additional market-wide end-to-end system testing, functional testing of data migration and performance testing
- A small number of CHESS users noted an April 2022 go-live did not allow sufficient time for those developing mFund functionality to be ready for Day 1
- Many CHESS users commented on the need for ASX to meet its delivery dates.

One respondent answered that they were unable to meet the revised implementation schedule. Several respondents advocated for no delays beyond the revised go-live date of April 2022. A small number of global investment banks noted they had planned their resourcing and cost projections in accordance with the original timeline and were tracking to plan, albeit dependent upon their vendors also being on track.

In addition, some respondents indicated that they could not provide a yes/no response at that point in time/stage of the project, given the need for additional information such as outstanding technical requirements, operational procedural changes and the implementation strategy.

ASX's response to feedback

ASX has added additional time and activities to the implementation schedule in order to:

- Provide more time for CHESS users to undertake readiness activities (including for mFund). This includes an additional 4.5 months from the last drop of code into CDE and the start of technical accreditation
- Accommodate additional industry end-to-end testing, performance testing, as well as functional testing on migrated data detailed later in this section
- Accommodate the changes to the ASX delivery dates that are necessary to increase throughput capacity and scalability, and include additional functionality.

ASX will continue to progressively update its technical documentation with the ongoing provision of technical and functional specifications approximately three months before the release of related code into CDE. In addition, ASX expects to complete the provision of the new ASX operational procedures and guidelines (commonly referred to as APGs) by end 2020, excluding any proposed changes to NBO and Release 1.1 functionality which ASX will publish after consultation and design finalisation. Section 3 of this paper addresses additional information requests and ASX's response.

1.2. Impact of delay beyond April 2022

Feedback received

A number of CHES users noted there was no material impact of a delay beyond April 2022 as long as current CHES continues to operate.

Some explained that a delay beyond April 2022 could have a positive impact as it would allow CHES users to more effectively accommodate the impacts of COVID 19 and to focus in the near term on business as usual activities. As noted above, other respondents thought that a delay beyond April 2022 would be beneficial in providing more time for user readiness, including providing additional time for developing to mFund workflows.

However, some respondents were concerned about further delays beyond the proposed April 2022 go-live on the basis of additional real and opportunity costs, including the potential impact to other industry initiatives. Systemic risk was also a concern for one CHES user in terms of maintaining in parallel two “stacks” of code over a multi-year period.

Some respondents were concerned that if go-live was delayed to later in 2022, it would present challenges for payment providers if go-live were to coincide with industry-wide ISO 20022 SWIFT and RTGS migrations planned for November 2022.

ASX also received more recent feedback that in the event the timeline is extended, a go-live date in September, October and November would overlap with the peak AGM and dividend season. Custodians and share registries are generally working at full capacity during this period.

ASX's response to feedback

Acknowledging the impact on CHES users of delays beyond April 2022, ASX has had to take into consideration the other factors set out in this paper, including:

- Refining the NBO process and adding significant throughput capacity as a consequence of 13 March 2020 and industry demand for additional capacity
- Adding more Day 1 functionality in response to CHES user demand as set out in section 1.4
- Adding more time, as indicated as preferable by key CHES users
- Adding more industry testing as requested by CHES users
- Avoiding Q4 2022 as a go-live due to other industry-wide activities.

Considering these factors, ASX's confirmed implementation schedule will deliver an enhanced solution with additional capacity, scalability and functionality delivered on a lower risk plan.

1.3. Meeting the schedule is conditional on ASX delivering on published milestones

Feedback received

Many CHES users commented on the need for ASX to meet its delivery dates including, but not limited to, the schedule for software drops into CDE and the opening of ITE.

ASX's response to feedback

ASX understands that CHES users meeting the timeline is contingent on ASX also meeting its milestones. The schedule for delivering code into the CDE will need to be extended as a consequence of refining the NBO process as outlined in section 2 of this paper and extending the scope of Day 1 functionality to include corporate

action DRP/BSP elections, the DRP/BSP enquiry function and non-batch DvP bilateral settlement functionality (the reasons for which are set out in section 1.4).

The delivery of CDE 10 has been deferred from end-February 2021 to end-June 2021. To complete the development, there will now be a final release of code, CDE 11, at the end of September 2021. This release will include the corporate actions functions previously targeted to be part of release 1.1 that have been brought forward into the Day 1 functional scope. To allow software providers to accommodate these changes and complete their development in the CDE, ITE1 will now open in late November 2021.

In the meantime, the delivery of CDE 9 is scheduled for on time delivery into CDE at end-November 2020. CDE 8 was also delivered on time in mid-September 2020.

ASX recognises that the movement of these milestones impacts the ability of CHES users to meet the revised implementation schedule with an April 2022 go-live date.

1.4. Feedback on release 1.1

Feedback received

A number of CHES users and an industry association identified the features in release 1.1 as a key enhancement to the system that should be included as soon as practical. Some respondents noted that they were not keen to accommodate another release and undertake the accreditation process for another release soon after system go-live. This was on the basis that they wanted time to stabilise their systems and that they wanted to shift their focus to other non-CHES related priorities.

A number of CHES users also advocated that release 1.1 be mandatory across share registries to enable the functionality to be fully utilised. Two share registries outlined some concerns and suggested that the functionality contained within release 1.1 be delayed by 12 months.

ASX's response to feedback

Given the industry support and learnings from COVID-19 around the need for more digitalised processes, ASX has decided that the following features will be included as part of the Day 1 scope:

- Non-batch DvP bilateral settlement
- Electronic DRP / BSP elections and enquiry.

Including these features in Day 1 is expected to deliver the processing efficiencies industry stakeholders have sought, while avoiding the need for an additional release and re-accreditation shortly after the CHES replacement go-live.

The other features contained in release 1.1 (electronic acceptance and payment for entitlement offers) will not form part of Day 1, and will be included in a future release.

In reaching this decision, ASX considered earlier feedback about the priority CHES users assigned to all new features as part of the 2017 survey conducted in relation to the new business requirements, where in aggregate CHES users placed greater importance on investors managing their DRP and BSP preferences electronically via their broker.

In addition, the current processing of DRP and BSP elections presents a greater operational risk to the market due to the timeframes in which DRP/BSP elections are submitted, with custodians submitting instructions on behalf of the beneficial holders very close to the cut-off deadline. ASX also notes that the confirmed April 2023 implementation schedule aligns with the feedback from some share registries that the implementation of the

functionality be 12 months beyond April 2022. Furthermore, ASX's response to the tranche 2 rules consultation feedback addresses the concerns raised by the two share registries in relation to the DRP and BSP functionality.

Appendix A identifies optional or mandatory support of (i) non-batch DvP bilateral settlement; and (ii) electronic DRP / BSP elections and enquiry, by CHESS user and applicable rules (included in the tranche 1 and tranche 2 draft rule amendments consultations).

1.5. CHESS user readiness is dependent on ASX making further information available

Feedback received

Many CHESS users highlighted their readiness to support certain project milestones was dependent on ASX making further information available including:

- Pricing – further clarity required including a timetable
- Data governance – provision of a framework on the data governance arrangements
- Single cutover weekend – further information regarding the approach to the single cutover weekend, including measures to de-risk the cutover
- Migration dress rehearsals (MDRs) – further detail on the plan and approach
- Data migration tools – further technical details for the ASX conversion tool for registration details, including timing
- Connectivity details – timely provision of connectivity details for ITE1 and ITE2 prior to the commencement of testing.

ASX's response to feedback

Section 3 of this paper provides the details on how ASX will respond to these requests for more information.

1.6. Timeline does not support some mFund providers to be ready on time

Feedback received

One CHESS user noted that their software provider has indicated they will be unable to develop and deliver mFund functionality by April 2022. While the CHESS User Interface (UI) may be used as an alternative solution for mFund, the CHESS user providing this feedback determined that the UI is not sufficiently scalable as it does not offer automated processing of applications and redemptions.

ASX's response to feedback

ASX notes that the extension of the implementation schedule to April 2023 allows additional time for software providers to develop to mFund. CDE 10, which completes the functionality for mFund, will be made available at the end of June 2021 with technical accreditation commencing late April 2022. This provides an additional 7.5 months prior to the commencement of technical accreditation.

1.7. Industry-wide end-to-end testing

Feedback received

A number of CHESS users asked for an industry-wide end-to-end test phase to facilitate the execution of operational scenarios that rely upon multiple CHESS users to complete together.

ASX's response to feedback

ASX will facilitate a coordinated industry-wide end-to-end test phase for the execution of operational scenarios that rely upon multiple CHES users to complete together. ASX will provide two windows for CHES users who have completed their operational readiness activities to perform this level of testing. The first window will be in December 2022, and the second window will be in February 2023. This will provide CHES users the opportunity to simulate bilateral and market-wide operational processes across a range of scenarios ahead of production implementation. ASX will work with CHES users to agree on the scope and coordination of the industry-wide end-to-end testing phase.

This new test phase is in addition to user testing with auto-responding software supporting test scenarios, and ASX coordinating and supporting a number of market-wide activities, including corporate action events. Both of these testing activities occur during the user testing window and prior to the commencement of operational readiness. The new test phase, industry-wide end-to-end testing, will occur post-operational readiness activities.

1.8. Industry-wide performance testing

Feedback received

A number of CHES users requested that the revised plan should accommodate an industry-wide performance test, mirroring peak volumes, which they see as critical to build market confidence in the new system prior to go-live.

ASX's response to feedback

ASX will give software providers and CHES users the opportunity to performance-test their systems directly with the CHES replacement system.

ASX will facilitate performance testing to allow organisations to test the throughput of their interfaces - Ledger API, AMQP or FIX Gateway as appropriate to the users' method of access. SWIFTNet performance testing is a matter between SWIFT and its clients.

The performance of a users' host system, both in terms of the creation of messages sent to CHES and the processing of the messages received from CHES, is not in scope for this phase of testing.

Where applicable, ASX is planning to develop test tooling to help facilitate performance testing that cannot be initiated by the end CHES user, for example, with the creation of high volume trade registration messages for a clearing participant.

Software providers will also be able to conduct relevant performance testing of their systems' interfaces prior to the accreditation phase.

Technical accreditation does require a software provider to performance-accredit their system.

As part of the industry-wide end-to-end test phase, ASX is planning to incorporate a level of performance testing to help all CHES users operate under simulated volume scenarios. Further detail on the performance testing that will be facilitated will be provided by ASX prior to the opening of ITE1 and ITE2 respectively.

1.9. Functional testing on migrated data

Feedback received

Some CHES users provided feedback that software providers and CHES users require the opportunity to perform functional testing on migrated CHES data. It was suggested this may include ASX providing a test environment containing converted CHES accounts to support functional testing, including sub-register movements to reduce readiness risk. Industry testing facilitated by ASX using post-migrated data and with CHES users playing their production roles, was considered important by these respondents to provide market confidence in relation to data migration ahead of go-live.

ASX's response to feedback

ASX acknowledges that both software providers and other CHES users require the opportunity to perform functional testing on a migrated data set.

Functional use cases that require a migrated dataset are:

- Functionality related to holders and accounts once migrated, for example the ability to amend, lock and cancel accounts
- Validation of registration details lines 4 and 5 with external host systems
- Workflow for scheduled settlement instructions, including full and partial fails post-migration
- Adjustments to migrated holdings and sub-positions.

There are a number of considerations in supporting these functional use cases, for both pre-migration and post-migration. ASX will work through the options of how this will be facilitated alongside the existing CHES test environment. ASX will provide further details once this analysis has been completed.

1.10. No changes to functions already delivered in CDE

Feedback received

Some software vendors noted their ability to meet a revised timeline was contingent on there not being any changes to functions already delivered to ASX's CDE that would require rework. Any change to Day 1 scope would have an impact on CHES users' readiness to meet the revised timeline.

ASX's response to feedback

CDE 9 is scheduled for delivery at the end of November 2020. However, CDE 10 will be modified and moved to end June 2021 to accommodate changes to the solution design for the redesign of the NBO process (as outlined in section 2 of this paper). There will also be one further code release (CDE 11) at the end of September 2021. CDE 11 will be the final functional release and it will include the corporate actions functionality from release 1.1 that has been brought forward into the Day 1 functional scope.

As a consequence of these changes, CDE has been extended to run for longer and ITE1 has been delayed to allow all Day 1 functionality to be available from its opening.

1.11. Additional migration dress rehearsals

Feedback received

A CHES user commented that the period between the first migration dress rehearsal (MDR1) in October and the second migration dress rehearsal in February (MDR2) was too long and asked ASX to give consideration to facilitating additional migration dress rehearsals between MDR1 and MDR2 on an optional basis, in addition to the three mandatory MDRs.

ASX's response to feedback

ASX will schedule a contingency MDR if the results from MDR1 and other factors indicate that it will be required.

1.12. Improved ASX support levels and customer experience

Feedback received

Some CHES users commented generally on the support levels in CDE and indicated that ASX support needed to be enhanced going forward at the level to accommodate additional activity for users' timely development, testing and migration dress rehearsals. This feedback included the need for improvement to the turnaround time on CDE defects and queries to provide a better user experience, both in CDE and ITE, as well as the to-be production environment that will be used for migration dress rehearsals.

ASX's response to feedback

As functionality continues to be delivered to the market, ASX will build-out additional support tools and enhanced performance levels to assist development activities and provide an improved customer experience. For example, this will include additional tools for share registries to play the role of settlement participant. Software providers have requested fewer scheduled resets of CDE to help with longer running test cycles (e.g. corporate actions) and ASX is working to reduce the frequency of CDE resets.

ASX has a dedicated team in place to support software providers using CDE for their own system development and to respond to functional queries that arise. The dedicated team will continue to support the market through new functional releases in CDE, and evolve to accommodate additional milestone activities in ITE1 and ITE2. The support model includes dedicated email and phone details and case tracking in a consistent manner to production-support for CHES queries today.

1.13. Sufficient time to be allowed for bug (defect) fixes

Feedback received

Some respondents commented that the revised timeline did not make provision for bug fixes and defect resolution, both for system testing in ITE1 or user testing in ITE2.

ASX's response to feedback

ASX will provide a longer lead time from the last drop of functional code to the start of technical accreditation, to accommodate the provision for defect fixes, if required, in a future code release.

In addition, ITE1 will open with code complete and with production-level performance. If any issues are identified, ASX will prioritise and release fixes, where appropriate, in ITE1 and ITE2.

1.14. Rules consultation

Feedback received

A number of respondents provided feedback on their ability to meet ASX's proposed rule amendment timetable, with the vast majority indicating that they could meet ASX's proposed timetable.

A small number of CHES users also requested an additional round of consultation on the 'final' rules package (i.e. the consolidated rules package across the three tranches as revised in ASX's response to consultation feedback) prior to formal lodgment of the rules with ASIC for regulatory clearance. One respondent also suggested that the rules for release 1.1 (transitional) be removed from the tranche 3 consultation and be consulted on separately on the basis that it was proposed that release 1.1 would be implemented after Day 1 go-live.

ASX's response to feedback

ASX has considered the request for a further round of consultation on the rules prior to formal lodgement and has formed the view that a comprehensive consultation process on the rule amendments providing stakeholders a number of opportunities to provide feedback is already provided in the project plan. However, if a new material issue is raised by stakeholders with respect to changes made through the final round of consultation, ASX will engage with the relevant stakeholders, other impacted stakeholders and the regulatory agencies prior to formal lodgement of the rules.

Two earlier rounds of consultation on the draft tranche 1³ and the draft tranche 2⁴ rule amendments have now been completed. The consultation process also provides for a further and final round of consultation covering both the draft tranche 3 rule amendments and a consolidated rules package across all the rule amendments for the new system (as covered by the three tranches⁵).

In line with feedback received, ASX will retain a 15-week consultation period for the further rules consultation, which will now commence in early August 2021⁶ and conclude in mid-November 2021.⁷ This revised timing for consultation on the rules is to accommodate the changes connected with the redesign of the NBO process (as set out in section 2 of this paper) and associated rules changes.

Across the three rounds of consultation, stakeholders are being provided 38 weeks in total to provide feedback on the proposed rule changes.

Each round of consultation incorporates significant explanatory material to stakeholders to assist with their understanding of the changes and assess any impacts on them. ASX also publicly releases a comprehensive response to consultation feedback for each round of consultation.

Given the changes to release 1.1 functionality (with some functionality to now be delivered as part of Day 1 go-live), the tranche 3 rule amendments will no longer include the relevant parts of the transitional rules that

³ The tranche 1 rule amendments were released for [public consultation](#) on 15 November 2019, with ASX releasing its [response to consultation feedback](#) received on the tranche 1 draft rule amendments on 22 May 2020.

⁴ The tranche 2 rule amendments were released for [public consultation](#) on 21 February 2020, with ASX releasing its [response to consultation feedback](#) received on the tranche 2 draft rule amendments on 24 September 2020.

⁵ As revised through the earlier rounds of consultation on the tranche 1 and tranche 2 draft rule amendments.

⁶ Rather than the early November 2020 timing contemplated in the June consultation.

⁷ Rather than the mid February 2021 timing contemplated in the June consultation.

were to address the timing for enlivening rules for new functionality which was to become effective after Day 1 of the new system⁸.

Instead, the rules supporting:

- Electronic DRP and BSP elections, DRP and BSP enquiry and non-batch DvP bilateral settlement are to be retained in the rules package to be consulted on in the third quarter of 2021. It is proposed that these rules will become effective at the time of Day 1 go-live of the new system, in the same way as for other functionality being delivered on Day 1
- Electronic acceptance and payment for entitlement offers are to be removed from the rules package and revised timing for these rules will be considered following Day 1.

The rule changes supporting electronic DRP and BSP elections, DRP and BSP enquiry and non-batch DvP bilateral settlement have already been the subject of the earlier rounds of consultation on the draft tranche 1 rule amendments and the draft tranche 2 rule amendments. They will also be subject to a further round of consultation on the consolidated rules package for Day 1 of the new system.

Separately, under the draft tranche 2 rule amendments an express framework to support the processing of certain “non-takeover offer events” was proposed to be included in the ASX Settlement Operating Rules. This included providing for the processing of investor acceptances under buyback offers or reinvestment offers as well as elections under schemes of arrangement relating to alternate forms of consideration. Following further feedback on the tranche 2 rule consultation process, ASX has decided not to progress functionality in the new system supporting the processing of elections as to alternate forms of consideration under a scheme of arrangement having regard to the complexities of these events including structure, transaction timeframe and uncertainty of the outcome. As a result, the draft rule amendments associated with these elections will be removed from the rules package.

1.15. Ongoing impact of COVID-19

Feedback received

Some respondents commented on the uncertainty relating to the ongoing impact of COVID-19 on CHESS users. A number of CHESS users have indicated that they have adjusted to the new working arrangements and that these adequately support their ongoing commitment to CHESS replacement. However, some CHESS users commented that their readiness activities would be impacted if working arrangements do not normalise in 2021. Some CHESS users also commented on the difficulty assessing the impact of COVID-19 with any certainty at this stage (noting the consultation period closed prior to the stage 4 lock-down in Melbourne).

More recent feedback from CHESS users indicates that working from home arrangements could potentially hamper user acceptance testing activities for software providers and their customers.

ASX's response to feedback

ASX notes the ongoing impact of COVID-19 on CHESS users in the time since consultation responses were submitted.

The revised schedule provides additional time for ASX and CHESS users to accommodate COVID-19 impacts. Under the revised schedule, user testing activities will now not commence until mid-April 2022. ASX will continue to monitor the ongoing impacts of COVID-19.

⁸ Transitional rules addressing migration aspects (e.g. in-flight transactions/processes) for the cutover to the new system will continue to be part of the tranche 3 rule amendments.

2. Other considerations outside the consultation process

2.1. Extreme volume increases in March 2020

2.1.1 Significantly increased scalability of the overnight process

Prior to COVID-19, the record number of daily trades was 3.3 million on 6 August 2019. A new record was set on 13 March 2020 with 7.0 million trades, surpassing the previous high by more than 100%. This required ASX to significantly increase the Day 1 throughput capacity and ensure that the system can scale to much higher volumes post-Day 1.

In order to achieve additional capacity uplifts more quickly post-Day 1, the calculation and dissemination of net broker obligations (NBO) will need to be redesigned in order to complete the necessary overnight processes in a timely manner at high trading volumes. This is as a function of the business process that compresses very large amounts of message dissemination (i.e. three times the day's trading volume) into the overnight process.

The new system is designed to be horizontally scalable, however in order for the CHES replacement solution to scale to the levels the industry has now requested after 13 March 2020, ASX is proposing a refinement to the messaging flow inefficiencies of the NBO process. This does not mean removing the efficiencies that netting provides but instead managing the message flows associated with settlement, and in turn increasing system scalability while maintaining DvP Model 3 and its associated market efficiencies.

The operating rules supporting the new system, including rules addressed in earlier tranches and rules to be addressed in tranche 3, will also need to be revised to reflect the new solution design.

2.1.2 Consultation on NBO refinement

ASX will consult with all impacted CHES users (software providers and clearing and settlement participants) from late January 2021. This will include Focus Groups on the solution design and reconvening the ISO 20022 Technical Committee on the impact to messaging. There will also be a review period for impacted stakeholders to provide formal/written feedback to ASX. Prior to the commencement of consultation, ASX is available to engage with impacted CHES users for preliminary discussions.

Documentation on the changes, including the functional specifications and messaging requirements, will be published after consultation and design finalisation.

2.1.3 Significantly increased intra-day throughput capacity

In addition to increasing the scalability of the platform, ASX is also increasing throughput capacity requirements for Day 1 and beyond. The increased requirement will mean the system will be able to maintain an acceptable trade registration response latency given significantly greater trade volume experienced on 13 March 2020. The increase in throughput capacity will mean the new system can manage plausible growth in capacity.

2.1.4 Impact to the timeline

The changes required to provide for increased system scalability and intra-day throughput capacity have led to a revised cadence of CDE releases and an additional code drop. To allow sufficient time for consultation with impacted CHES users, the changes to the NBO will now be delivered to CDE in June 2021, and the additional throughput capacity will be included in Day 1. Software providers and CHES users developing in-house systems will be provided more time to re-design, re-write and re-test these changes prior to the opening of ITE1, now planned for late November 2021.

2.1.5 Existing CHES improvements

Given the need to support existing CHES for a longer period, ASX continues to focus on its operational performance. Active CHES system remediation addressing hardware, processing efficiencies and performance tuning has successfully improved the transactional throughput of CHES and reduced key capacity constraints. These improvements include:

- CHES trade registration – message queues significantly reduced with minimal backlogs
- CHES daily settlement process – reduced from approximately 60 minutes to 30 minutes
- CHES end-of-day (EOD) overnight netting process – average processing time reduced by two hours.

ASX has also completed upgrades of the storage arrays used for the CHES system. This allows faster disk read and writes, and benefits intraday and overnight processes that utilise high input and output throughput for the disks.

Benchmarking has demonstrated that the intraday trade capacity for CHES has now been increased to 7 million trades per day, with the ability to manage this volume over multiple consecutive days, and further uplifts in system capacity and performance will be undertaken progressively during the balance of 2020 and in to 2021.

It is important to note that intra-day processing capacity of CHES registering trades must be accompanied with improvements to overnight batch processes. These include generating corporate action cum entitlement balances, customer reporting, and the requirement to generate net broker obligations (NBOs). As outlined earlier, the creation of NBOs is particularly challenging as volumes increase. This is because the daily overnight NBO process must complete within a short window to allow other overnight batch processes to complete in a timely manner. Further investigation of options to address these batch processing constraints is currently being undertaken.

ASX has also assessed the business and operational controls that could be implemented to manage operational effectiveness, and the approach that ASX could take in the event of an exceptionally large trade count day, which might impact on the capacity and integrity of CHES processing, as experienced on 13 March 2020. These potential actions have been reviewed with market operators and the regulatory agencies, and were communicated to the market on [22 September 2020](#).

3. Additional information required by CHES users

3.1. Overview

In their submissions, many CHES users noted that their readiness to support certain project milestones was dependent on ASX making further information available.

This section of the paper sets out further information that ASX will be providing to the market as a result of CHES user feedback. Consistent with the approach to date, ASX will be releasing this information through the documentation portal.

3.2. Pricing

ASX provides the following roadmap for announcement of key elements of pricing ASX services prior to CHES replacement go-live.

3.2.1 Day 1 clearing, settlement and other services

ASX has previously committed that it will not increase fees to participants for like-for-like clearing and settlement services.

Before finalising and publishing its detailed pricing for clearing, settlement and other services, ASX is required to satisfy the regulatory agencies that the pricing is consistent with CFR's Regulatory Expectations⁹. ASX has commenced engagement with the regulatory agencies for this purpose.

As a next step, ASX will conduct informal soundings with ASX Clear and ASX Settlement participants to obtain their feedback on its pricing proposals. ASX intends to engage with the regulatory agencies regarding feedback from the informal customer soundings. Subject to completion of the regulatory engagement process, ASX intends to finalise and publish the pricing by early Q3 2021.

Key target date	Activity
Q4 2020 – Q1 2021	Engagement with ASX Clear and ASX Settlement participants
Q2 2021	Engagement with regulatory agencies
Early Q3 2021	Announcement of Day 1 pricing for clearing, settlement and other services

3.2.2 CHES access

Indicative pricing for access to CHES for ASX Clear and ASX Settlement participants was announced on 3 September 2019 (see [letter](#) and also referenced in our [Participant Fact Sheet](#)). In summary, ASX's new ISO 20022 messaging service, AMQP 1.0, will cost \$495 per session per month. Pricing for ISO 20022 messaging via SWIFTNet will be subject to fee agreements between SWIFT and their clients. Participants can also access CHES via the Ledger API, also charged at \$495 per API connection per month, with this fee waived for the first three years from CHES replacement go-live.

⁹ Regulatory Expectations for Conduct in Operating Cash Equity Clearing and Settlement Services in Australia

ASX intends to release access pricing for other users by Q2 2021.

Key target date	Activity
Q2 2021	Access pricing for other users

3.2.3 Electronic CHESS holding statements

Prior to the replacement of CHESS, ASX will be providing a digital delivery option for investors who wish to receive their CHESS holding statements in electronic form. The target go-live is Q1 2021. In order to receive statements electronically, investors must elect for electronic delivery via their broker. This will deliver cost savings to issuers.

A number of participants, issuers and share registries have already been briefed on the proposed solution. A detailed information paper on the system design and solution for investors, participants and issuers will be provided by early 2021.

ASX intends to provide new pricing for delivery of CHESS holding statements in accordance with the following timetable:

Key target date	Activity
Q1 2021	Pricing model released
Q1 2021	Target go-live

3.3. Data governance

ASX will publicly release an information paper in November 2020. The paper outlines ASX's data governance arrangements for the existing CHESS system which will continue to apply for the CHESS replacement system and the services provided by the ASX Clearing and Settlement facilities.

Topics of the information paper include:

- Key features of ASX's group-wide data governance framework which applies to all data held across ASX, including accountability and oversight arrangements and group-wide policies and procedures for data management
- Data governance arrangements in place for data received, including arrangements for confidentiality, security and integrity of data, access to data and compliance with applicable data protection laws such as the *Privacy Act 1988* (Cth)
- As part of ASX's ongoing focus on privacy and data protection across its organisation, further enhancements to the already robust arrangements in place for privacy and protection of data received by CHESS
- An outline of the limited changes to the data that will be received by the CHESS replacement system.

As the paper will explain, the data governance arrangements in place for CHESSE are shaped by the legal and regulatory framework within which ASX Settlement operates. This includes the ASX Settlement Operating Rules which ASX Settlement has made in accordance with its obligations as a licensed clearing and settlement facility operator. The operating rules govern the collection, use and disclosure of data received by CHESSE. The rules specify what data needs to be provided and the purposes for which it is provided. ASX Settlement uses and discloses data received by CHESSE in accordance with the operating rule framework to perform its functions and provide its services.

In terms of data access, the operating rules provide the framework for access to data, including the parties that can access data and restrictions on disclosure. Under the new system, the operating rule arrangements dealing with access to data will remain unchanged unless specified in the rule amendment consultation papers (such as the rule amendments associated with the DRP/BSP election functionality). Under both current CHESSE and the new system, security and access controls ensure that access to data is limited to entitled facility users performing a function in relation to that information.

3.4. Migration approach (single cutover)

ASX will publish a separate information paper to explain ASX's risk assessment supporting a single cutover weekend migration strategy. ASX is planning to publish further information on the approach by Q4 2021. ASX will cover this topic in more detail in a future market webinar as part of the Implementation and Transition Working Group.

3.5. Migration dress rehearsals

ASX is planning to release a paper to the market by the end of Q2 2022 setting out the plan and details on the migration dress rehearsals. This will provide an outline of the objectives, scope, entry criteria, expected outcomes, run-sheets and success criteria. It will also provide further details on the environment that will be used for executing the rehearsals.

3.6. Data migration tools

ASX has responded to requests by CHESSE users for more information on conversion tools by holding an Implementation and Transition Working Group webinar on data migration tools on 26 August 2020. In that webinar, further information was provided on the:

- ASX conversion tool for registration details, which will help facilitate converting registration details to the new format so that CHESSE users can use the output files to load into their host systems. The tool will also identify non-compliant registration details
- Functional and non-functional requirements for the registration details tool, the format of input and output files, and a list of warnings and errors where registration details do not meet the validation rules.

ASX is planning to publicly release further technical details on the conversion tool through the documentation portal for the project by end-November 2020. The ASX conversion tool for registration details is planned to be made available to CHESSE users from March 2021.

3.7. Connectivity details

ASX is planning to provide the connectivity details required for users three months in advance of the respective opening for ITE1, ITE2 and the "to be" production environment.

4. Ongoing independent project assurance

4.1. Overview

The CHES replacement project is accompanied by a formal assurance program.

The objective of the assurance program is to ensure the CHES replacement project meets its key objectives.

The assurance program involves distinct reviews performed by either external independent assurance providers, specialist consultants, or internal ASX resources that are independent of the CHES replacement project. Key areas that are reviewed include:

- Project governance – performing regular project health checks at key milestone dates. Review areas include project progress against milestone dates, scope management, risk management and reporting processes
- Performance including scalability, stability and persistence – assessing volumetrics including throughput capacity and latency with processing high volumes
- Design effectiveness of controls within the CHES replacement operating environment – reviewing technology and business process controls
- Data migration strategy, plan and execution – providing assurance over the completeness and accuracy of data being migrated to the new system
- Security – reviewing key security controls at the application and infrastructure level.

Review results are formally presented to ASX management, the ASX Board, ASX Clear and ASX Settlement (CS) Boards and the regulatory agencies. Any actions arising from the reviews are tracked centrally by the CHES Replacement Project Office, led by the Project Director. The ASX CHES Replacement Executive Steering Group ensures the resolutions of the action items are complete and appropriate.

The assurance program also provides status updates on the progress of any action items to the ASX Audit and Risk Committee, ASX Board, CS Boards and the regulatory agencies.

Appendix A

The table below identifies optional or mandatory support of a feature by CHESS user and applicable rules (included in the tranche 1 and tranche 2 draft rule amendments consultations).

Product	Feature	CHESS user	Optional / Mandatory	Rules
DRP/BSP elections	Submit DRP/BSP election, cancellation, enquiry	Participant	Optional for participants to use	No rules-based obligations to use ASXSOR 5.19A
	Acknowledge receipt of election and/or cancellation, notify issuer instituted cancellation, respond to enquiry	Issuer	Mandatory for issuers to support	Rules-based obligations to support ASXSOR 5.19A
Non-batch DvP bilateral settlement	Instruction creation, modification and cancellation	Participant	Optional for participants to use	No rules-based obligations to use ASXSOR 9.5A, Section 11
	Payment facilities and payments via RITS-RTGS	Payment provider	Optional for payment providers to support, noting demand from payment providers' customers to support this (commercial driver)	No rules-based obligations to support Payment providers that choose to support RTGS become bound by ASXSOR Section 11