CHESS Replacement: Revised Implementation Timetable

Consultation Paper

June 2020

Contents

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Executive Summary

Overview

ASX and a broad stakeholder community have been working together since 2016 to successfully deliver the system to replace CHESS. This has involved significant collaboration on business requirements, adoption and mapping of ISO 20022 messaging, solution design for new features and connectivity to the new system. At its core, the new system will deliver existing services, new functionality, high availability, reliability and performance, and will underpin Australia's financial markets for the next decade and beyond.

In recent months, the effects of the COVID-19 pandemic have broadly affected the industry. This has impacted CHESS users, who have needed to focus on day to day activities, and it has also slowed software production and integration activities within the CHESS replacement project.

Notwithstanding this, the CHESS replacement application and the distributed ledger continues to be built and tested by ASX in several technology environments across multiple datacentres. We have also deployed the seventh of 10 software drops of the CHESS replacement application into the Customer Development Environment (CDE). This represents 89% of the core clearing settlement functionality used by customers and enables back office software vendors to progress the development of their applications that connect to CHESS.

We are also entering the next important phase of the project. This includes opening the Industry Test Environment (ITE), completing technical readiness, finalising operational readiness, and migration to the new system. As we consult on the revisions to the implementation schedule, we would like to thank all our stakeholders for their ongoing support and commitment.

In developing the revised implementation plan, ASX has carefully considered the stakeholder feedback it has received to date. We have also assessed a number of risks and issues, including the impact of COVID-19 on ASX, its vendors, and the industry more broadly.

Recent market volatility and activity levels have reinforced why CHESS replacement is an important priority to complete on a timely basis. It is also important ASX does so safely. As a result, an additional 12 months have been included for the completion of this important initiative, which moves the target live date from April 2021 to April 2022.

We are now seeking feedback from CHESS users on their ability to meet this timeline.

Background

On 25 March 2020, ASX announced that it was undertaking a replan for the CHESS replacement system and that it would consult on a revised implementation timetable (the replan) in June 2020. The purpose of the replan is to accommodate:

- Impacts of the ongoing industry consultation process on ASX internal development – whereby changes requested by CHESS users have resulted in a greater amount of development work for ASX than anticipated

- CHESS users' feedback on the schedule – which ranged from those whose readiness activities were on track to those requesting additional time

- Additional time for ASX to complete aspects of its own development and readiness activities, including the impact of the COVID-19 pandemic

- Operational impacts of the COVID-19 pandemic – which are requiring CHESS users and ASX to focus on day-to-day operational activities in the short- to medium-term

- Additional effort to cater for significantly increased performance requirements of the replacement system given record volumes experienced in March 2020.

In developing the replan, ASX has been mindful of:

- The importance of replacing CHESS in a safe and timely manner

- Other known target dates for CHESS users involved in non-ASX related ISO standards releases or migration to ISO 20022

- The impact that extending the schedule has on CHESS users in terms of cost and disruption to their local and/or global priorities.

Replan approach

ASX's approach has been to consider all these factors and to develop a viable risk-based plan assuming no unforeseen material impacts, such as pandemic relapse or unexpected project-related issues. This has been subject to a comprehensive replanning process, with an assessment of risks, issues, implications and assumptions, including an estimate of the impact of COVID-19 working arrangements on ASX and CHESS users.

The new target go-live of April 2022 is now subject to consultation, feedback and finalisation by ASX. Once complete, the new plan will require the achievement of important interim milestones involving close collaboration between ASX and CHESS users.

If there is an unforeseen material event, including a second wave of the COVID-19 pandemic, ASX would undertake an impact assessment of the readiness activities of ASX and CHESS users.

Feedback requested

ASX is seeking feedback from CHESS users on their ability to meet the revised implementation schedule. CHESS 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 CHESS 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. In providing feedback, ASX asks that CHESS users take a 'whole of business' view so that, for example, trade execution, risk and compliance matters are considered in their response.

To assist in the replan, this paper sets out key project activities and milestones including system development and testing, user testing, technical accreditation, operational readiness, and operating rule amendments. This is in addition to the detailed information that has already been provided to CHESS users, which is available on the technical documentation portal. Furthermore, ASX will hold a webinar during the consultation period to provide an opportunity for CHESS users to ask any questions they may have about the replan.

In the interests of a safe and timely implementation of CHESS for the whole market, it is important that ASX has an understanding of each CHESS user's current timing constraints. At a minimum, each CHESS user is required to answer question 1 below. In the event that a CHESS user does not do so, they will be contacted by ASX to establish whether they are able to meet the revised implementation schedule outlined in this paper.

1. **Can your organisation meet the revised implementation timetable with a go-live date of April 2022?**

    YES/NO.

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 as set out in section 5.3?**

> **YES/NO/Not applicable.** If you answered no, please provide information supporting your answer.

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 as set out in section 2.3?**

> **Specify the number of months.** Please provide information supporting your answer.

Next steps

The consultation is open for four weeks with responses due by 28 July 2020.

If you would like your response, or any part of it, to be treated as confidential, please indicate this clearly in your submission. All responses, including those marked 'confidential', will be shared with relevant regulatory agencies[1], with whom ASX will continue to engage throughout this process.

ASX appreciates that CHESS users need certainty on the new schedule and will endeavour to provide the new implementation timetable and target go-live date as soon as possible, subject to the feedback received.

Following the consultation, ASX will assess all feedback received and discuss that feedback with the ASX Boards and the regulatory agencies prior to announcing the revised implementation timeline.

Continuation of planned activities by ASX

Notwithstanding the COVID-19 pandemic, a number of planned ASX activities are progressing. Most notably this includes the ongoing development of the CHESS replacement application - the distributed ledger - and the preparation for the Industry Test Environment (ITE).

The opening of ITE is now being planned to a later date as outlined in Section 2. In the meantime, the Customer Development Environment (CDE) will remain open as additional software drops become available.

Initially, access to ITE will be limited to software providers (known as ITE1). This includes third party back office vendors and those users who develop and maintain their own systems in-house. This will allow additional time to optionally test their connectivity and their systems against ASX's production state infrastructure.

Participant and other users who rely on a systems vendor solution will be able to access ITE later (in a separate environment known as ITE2) to commence user testing activities. The new timing for this is also outlined in Section 2.

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[1] The regulatory agencies are: the Australian Securities and Investments Commission (ASIC), the Reserve Bank of Australia (RBA), Australian Department of the Treasury (Treasury), and the Australian Competition and Consumer Commission (ACCC).

1. Key Considerations

ASX has taken a risk-based approach to the replan process. In constructing the revised implementation timeline, ASX considered the factors set out in this section.

1.1. Functional changes requested by CHESS users

During the development of detailed business requirements, ASX received feedback from CHESS user focus groups that requires additional time for ASX to complete the development of the CHESS replacement application. These included requests to:

- Re-develop account and holder creation, modification and cancellation events to reduce the number of ISO 20022 messages invoked in each workflow
- Re-develop elements of CHESS to/from issuer sponsored sub-register transfers and conversions as a result of aforementioned account and holder changes
- Retain the settlement of mFund applications and redemptions in batch, as opposed to business requirements previously elicited from the market requesting these be settled gross line by line
- Use of bank account details instead of payment facilities when interfacing to RBA RITS for settlement of CHESS-RTGS ('gross') related payments
- Retain messages for margin settlement advice and change of margin settlement amount
- Increase reporting and retention of funds projection reports
- Provide an additional enquiry workflow in relation to DRPs
- Make changes to the Corporate Actions STP Phase 2 ISO 20022 messages (and its interface to the CHESS replacement system) following industry feedback for that project.

To accommodate these and other changes, ASX has re-planned its development activities under a new release schedule detailed in the next section (2.2).

1.2. Stakeholder feedback provided prior to COVID-19

ASX received feedback from CHESS users leading up to the commencement of the replanning process. This included:

- Additional time sought between completed technical specifications being published and software providers' system testing and accreditation activities
- Shared environment challenges for software providers – testing their code and then deploying their software to clients
- Additional time required to incorporate back office system changes into client-facing systems
- The need for more detailed information in some parts of the project to assist their planning
- Concerns regarding key technical aspects of the project and rule changes not being completed until mid-2020
- Challenges supporting migration dress rehearsals at the same time as undertaking testing, accreditation and operational readiness (as the same resources are often used for these activities).

ASX's response to this feedback is reflected in the revised timeline detailed in the next section. It is also included in the revised rules consultation process detailed in section 5. More detail on how ASX has specifically responded to feedback in this section is included in Appendix I.

1.3. Impact of COVID-19

Over the past four to five months, there has been an impact on project activities due to COVID-19 that has considerably slowed some build and integration activities of ASX and its vendors (which had assumed that teams would be physically co-located during this highly collaborative period). This has affected preparation activities for the opening of ITE and the completion of other development activities.

ASX appreciates that COVID-19 has also impacted CHESS users, particularly in recent busy periods where it has been necessary to focus on day-to-day business operations.

Recognising that uncertainty remains as to the impact of COVID-19 on CHESS users, ASX has made estimated provisions in the replan on the basis that:

- Some software developers and service providers will need some additional time be able to progress their readiness activities
- Some CHESS users are focusing on day to day operations (particularly across reporting season and AGMs in the latter part of this calendar year)
- It is assumed that working conditions for CHESS users will be impacted in the short-term but will 'normalise' later in 2021 such that they will be able to commence their technical accreditation and operational readiness activities
- It is assumed that a significant second wave of COVID-19 will not occur during the project that impacts ASX or CHESS users.

As a result, of all these factors, ASX has determined to delay the opening of ITE and extend the readiness phase in 2021 and this has been reflected in the revised schedule.

1.4. Recent market activity

Since late February, as the market adjusted to the implications of the COVID-19 pandemic, many in the industry have experienced post-trade operational challenges – including ASX, other market operators, market participants and other service providers.

These operational challenges were caused by unprecedented volume increases and volatility, which resulted in records being broken over multiple days. Ultimately, a new record number of daily trades was set across ASX and Chi-X of 7,005,491 on Friday 13 March 2020. Prior to the COVID-19 pandemic, the record was 3,325,770 trades on 6 August 2019. Operational challenges caused by increased activity were exacerbated by the COVID-19 pandemic requiring many organisations to deploy remote working arrangements for their staff.

Throughout this extraordinary period, the whole industry worked together to ensure the market continued to operate with resilience. For its part, ASX took steps to improve the performance of CHESS and will continue to optimise its performance for as long as CHESS remains in production.

However, while volumes and volatility have abated (at least for now) and the CHESS system continues to serve the market extremely well, this period has underscored the reasons why ASX started planning the replacement of CHESS five years ago.

While no-one was predicting the markets would suddenly trade seven million trades in a day, it highlights the need to replace older systems across the industry with flexible, contemporary technology. This requires prioritisation by ASX and CHESS users, but also prudent planning given the impact of COVID-19 to ensure that CHESS is replaced both in a safe and timely manner.

Importantly, as a consequence of the significant uplift in activity during March, ASX has also revised the requirements of the replacement system to ensure ASX continues to provide sufficient capacity headroom and to meet the increased day one needs of the market. This additional effort has been incorporated into the revised implementation schedule.

1.5. Consideration of other activities and initiatives

ASX has taken into consideration other market activities that may impact CHESS replacement project work or cause resource contention for CHESS users – in particular:

- The upgrade of ASX Trade which impacts some users and is currently tracking to an October 2020 go-live

- MT Standards Release 2021 – scheduled for November 2021. Noting this now also includes a number of changes that were postponed from the 22 November 2020 release due to the impact of COVID-19
- SWIFT's global migration of messages used for cross-border payments and reporting from MT message standard to ISO 20022 standard with the co-existence period now planned to commence in November 2022. Noting this commencement date was postponed from November 2021
- Australia's high value payments system's migration from MT message standard to ISO 20022 standard with the co-existence period now planned to commence in November 2022. Noting this commencement date was postponed from November 2021.

1.6. Feedback on the impact of delays on CHESS users

ASX has received representations from several CHESS users about the replan and the impact of delays. These include:

- Several participants who have stated that extended delays will risk loss of momentum in their project team, add costs and negatively impact other resource prioritisations unrelated to CHESS replacement
- Some software vendors who have noted they were tracking to plan prior to COVID-19
- Some CHESS users who have asked for the full scope of the project to be delivered as early as possible
- Other users who have requested an additional 6 – 12 months to enable them to consider rule changes, to ensure their vendor is able to complete development activities, or simply to enable them to review their own business strategies.

While the revised implementation schedule is longer than some CHESS users would ideally want, this feedback is acknowledged and have all been carefully considered by ASX along with all the other factors impacting the revised implementation schedule.

2. Revised Implementation Timetable

2.1. Scope for go-live release version 1.0

The full scope of the CHESS replacement system is published as part of the technical documentation, and is available here. Listed below are the new business requirements, as defined in ASX's Response to Consultation Feedback in September 2018, available in release version 1.0:

Account information:
- Additional investor information
- Centralised data capture and storage
- Standardised registration details

Pre-settlement:
- Settlement lock for CHESS holdings
- Bilateral transaction matching (other than pre-matched status)
- Additional preliminary payment notifications

Settlement:
- Settlement message enhancements (other than opt out for certain messages)
- Linking bilateral settlements

Reporting:
- Electronic provision of holding statements and notifications

2.2. Revised forward release schedule for go-live release 1.0

On 1 April 2020, ASX announced that a number of features would not be delivered by May 2020 in the customer development environment (CDE) and that an updated forward release plan would be published in the Technical Documentation portal.

To date, ASX has published seven application code releases in the CDE (CDE 1-7). To complete the development, ASX is planning to release the outstanding features in three additional code drops beyond CDE7, as outlined below.

Code Drop	Release Date into CDE	Scope	Notes
8	Mid Sep 2020	**Settlement:** - Isolate counterparty - Payment provider authorisation - Change margin settlement amount **Corporate actions:** - Calls - Code change - Class merger - Diary adjustments **Reporting:** - Issuer end of day reporting (AMQP only)	

9	End Nov 2020	**Account management:**	This represents 100% of
		- Investor data and pass-through information (ABN/ACN, TFN, bank accounts)	clearing and settlement scope for Day 1
		- Changes for migration purposes (Holder type, 4 and 5 address lines)	
		Settlement:	
		- Default management related messages	
		Reporting:	
		- Demand reporting	
		- Projected reports	
		- Daily margin settlement advice	
		- Interest earned and collateral statements	
		- Issuer end of day reporting (all applicable connectivity channels)	
10	End Feb 2021	**mFunds:**	mFund-related features only that do not share any consolidated messages with clearing and settlement
		- Applications	
		- Redemptions	
		- Settlement	

2.3. New features availability – release 1.1

2.3.1 Background

The CHESS replacement system will offer the new business requirement features requested by users that were generated through extensive industry consultation in 2017 and 2018. ASX announced in November 2019 that certain new features relating to corporate actions and real time payments, as listed below, would be made available on an 'optional' basis on Day 1, with technical accreditation and operational readiness required to be achieved by 31 December 2021. To assist CHESS users, the timetable has now been simplified such that these features will be made available in a release after the Day 1 go-live.

2.3.2 Revised timetable

The following features will be released into production after the go-live date as 'release version 1.1':

- Non-batch DVP bilateral settlement

- Electronic DRP and BSP elections, DRP enquiry

- Electronic acceptance of entitlement offers

- Electronic payment for entitlement offers.

The DRP election amendment functionality for mFunds, which is currently supported in CHESS, will also be delivered in production post Day 1. This is due to ISO 20022 message consolidation, with DRP elections for all asset classes supported by one message.

For those vendors and software developers that wish to develop for these features prior to Day 1 go-live, they will be made available in a CDE as release version 1.1 from end April 2021. These will form part of a subsequent process for technical accreditation, operational readiness and go-live post Day 1. These features will not be made available in ITE and are not included in software accreditation or customer readiness activities for Day 1 go-live.

Feedback from CHESS users is sought about when they would be ready following Day 1 go-live planned for April 2022, to commence the technical accreditation, operational readiness and go-live activities for the new system features that will be implemented in release version 1.1 (question 5 from the consultation questions included in the Executive Summary of this paper).

2.4. Revised Implementation Timetable

Legend: ◆ INTERIM MILESTONES ◆ KEY MILESTONES

SOFTWARE DEVELOPMENT (CDE) — CUSTOMER DEVELOPMENT ENVIRONMENT (CDE)
- Code Drop 7 (MAY 2020)
- Code Drop 8 (SEP 2020)
- Code Drop 9 (NOV 2020) (Day 1 C&S complete)
- Code Drop 10 (FEB 2021) (Day 1 mFund complete)
- New feature release (APR 2021)

SOFTWARE PROVIDER READINESS (ITE1) — INDUSTRY TEST ENVIRONMENT 1 (Software Providers)
- Code Drop 10 (Day 1 feature complete)
- Technical Accreditation
- Technical Accreditation Complete

CUSTOMER READINESS (ITE2) — INDUSTRY TEST ENVIRONMENT 2 (CHESS User Testing)
- Code Drop 10 (Day 1 feature complete)
- Operational Readiness
- Operational Readiness Complete
- User Testing (inclusive of coordinated testing)

CUTOVER & TRANSITION (Production) — PRODUCTION ENVIRONMENT
- Migration Dress Rehearsals ❶ ❷ ❸
- Go-Live Attestation
- **Go-Live**

OPERATING RULE AMENDMENTS
- Tranche 1 Consultation — Response
- Tranche 2 Consultation — Close — Response
- Tranche 3 and Consolidated Draft Rules Consultation — Open — Close — Response
- Formal lodgement combined rules package

2.5.   Key revisions

The revised timeline lists and sequences a macro-view of key activities and milestones for CHESS users and software providers.   Key features of the revised timetable, compared to the original timetable (see Appendix II) include:

Activity/milestone	Original timetable	Revised timetable
Time between publication of technical specifications and the start of accreditation	3 months	13.5 months
Time between on-boarding of software providers and the on-boarding of their customers in ITE	0 months	4 months
Time between final clearing and settlement code drop and the start of accreditation	1 month	5.5 months
Time from opening of ITE and the start of accreditation	0 months	5.5 months
Time for software providers to complete development of clearing and settlement functionality before deploying code to customers in ITE2	1 month	5 months
Time for user testing in ITE	8 months	11.5 months
Time for user testing before start of operational readiness	2 months	4 months
Overlap of technical accreditation and operational readiness	3 months overlap	No overlap
Overlap of operational readiness and migration dress rehearsals (MDR)	Overlap of MDR 1 and MDR 2	Overlap of MDR 1 only
Time between release of draft consolidated rules package (post consultation on three tranches) and go-live	8 months	9.5 months

Further information on key project milestones is available in sections 3 to 6 of this paper.

3. Software Provider Readiness

3.1. System development

ASX is targeting the opening of a new dedicated Industry Test Environment (ITE1) in December 2020, subject to the successful completion of readiness activities. This environment is being made available to software providers (vendors and those developing in-house solutions that connect directly to CHESS), allowing them to conclude both their functional and non-functional developments.

3.1.1   Characteristics of ITE1

ITE1 builds on the existing CDE and provides a number of additional infrastructure and non-functional features:

-   Single dedicated integrated environment

-   Launch of the CHESS User Interface

-   End of day and demand reporting

-   Production style authentication model

-   Third party certificate signing authority

-   Reduced number of environment re-sets compared to CDE

-   Multi-site/multi-node topology across ASX's data centres

-   Ability to test with other system developers in ITE1.

3.1.2   ITE1 connectivity

All connectivity networks and access methods will be available from the opening of ITE1:

Connectivity Network	Access Methods
ASX Net[2]	- Ledger API (Node Access) - AMQP (ISO 20022 XML Messaging) - CHESS User Interface - FIX (Approved Market Operators)
SWIFTNet	- SWIFT (ISO 20022 XML Messaging)

3.1.3   Code drops

ITE1 will open with code drop 9 (this is the same code drop as CDE 9), with the subsequent code drop 10 (mFund), as outlined in section 2.2, deployed into ITE1 environment at the end of March 2021.

Software providers will be able to transition from CDE to ITE1 from December 2020 but can maintain connectivity to both environments until they have fully migrated to ITE1.

3.1.4   System development in ITE1

Each software provider will be provided their own test kit, much like current production CHESS test kits today. Each kit will contain a list of dedicated UICs that will allow developers to test any CHESS role, along with a unique set of test securities.

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[2] Including IPSec VPN, Switch in Cabinet and Cross Connect.

Test securities will be unique to each kit and generated for the purpose of testing, including a range of security types to facilitate different test scenarios.

ITE1 will also carry forward test tooling from CDE into ITE1, including auto-responders and self-service tooling.

ASX will be standardising the trade ingest tool which gives software providers the ability to upload their own suite of test trades. The initial 'daily canned trades' feature in CDE will not be carried into ITE1. This is because the trade ingest tool will provide software providers more flexibility in relation to the range of trades they test, along with the ability to better manage settlement obligations.

ASX will progressively provide test support for those features that ASX manages in a production environment - for example, un-netting and specific account management activities (such as applying account and holding locks on receipt of court orders).

Software providers will also be able to test non-functional changes, including the security enhancements, for the new system, such as authentication and authorisation for Ledger API access based on mutual TLS and authentication tokens and AMQP (via mutual TLS and ISO 20022 message signing), both of which are mandatory features required to enter ITE1.

ITE1 will provide support for performance testing. ASX will advise of performance thresholds as these are incrementally increased during the course of ITE1.

3.2. System testing

Once software providers have completed their development they can test the end-to-end capabilities of their systems within their own environment before deploying software to their end clients. End-to-end testing should be completed before the start of technical accreditation. Third party vendors may wish to deploy software to their end clients at different phases to help them prepare for their own user testing in ITE2.

From a functional perspective the clearing and settlement functionality available is as follows:

- Account management
- Trade registration
- Netting
- Settlement
- Holding management
- Corporate actions
- Reporting
- mFunds.

For corporate actions, ASX will publish a list of corporate action ex-periods for each test kit, much as exists in CDE today. Holding adjustments can be facilitated through the self-serve tool.

The CHESS UI will be available, and since each test kit provides UICs for different user roles, this may be a useful tool for some to simulate and test specific test cases where bilateral workflow is required.

Software providers will be able to test out non-functional items:

- Testing connectivity and security features
- Performance testing
- Failover and recovery.

3.2.1 Access to ITE1

ITE1 order forms are currently available on ASX's technical documentation website.

3.3. Technical accreditation

3.3.1 Purpose

Technical accreditation is a mandatory requirement for all external systems connecting to the CHESS replacement system in the production environment. It forms part of a broader set of requirements that help ensure the stability of the clearing and settlement facility. Technical accreditation is to be completed by software providers, including both system vendors and CHESS users developing their own in-house system.

There are two components to technical accreditation - connectivity and messaging:

- Connectivity accreditation: ensures systems can provide a secure connection to the CHESS replacement system and maintain critical components of ensuring resiliency

- Messaging accreditation: demonstrating compliance with new message formats. It ensures the system that generates the ISO 20022 message construct can successfully send and receive messages prior to that system being used by CHESS users in the production environment. Messaging accreditation relates to FIX messaging and ISO 20022 messages, as well as DAML commands via the Ledger API.

CHESS users have optionality on how they access the CHESS replacement system. Therefore, connectivity and messaging accreditation depends on both the connectivity channel used and role of the CHESS end user to support required functionality, noting that the connectivity channels are not mutually exclusive.

Demonstration of pre-requisite testing in ITE1 will be required prior to technical accreditation.

Further details on technical accreditation can be found in the technical documentation portal.

3.3.2 Activities to be performed

3.3.2.1 Connectivity accreditation

Connectivity accreditation requires software providers to demonstrate secure connectivity and resilience. Further details on activities to be performed per connectivity channel are set out in the technical documentation portal. Connectivity accreditation scripts to support these activities will also be made available in the technical documentation portal by the end of 2020.

3.3.2.2 Message accreditation

The activities to demonstrate systems can generate the appropriate message constructs and successfully send and receive messages are set out below:

- Software providers to perform messaging accreditation based on the CHESS user type(s) to which their system provides services. CHESS user types are clearing and settlement participant, settlement participant, sponsoring participant, product issuer settlement participant (PISP), specialist settlement participant, issuer (share registry), corporate action payment participant, payment provider and approved market operator (AMO)

- Message accreditation scripts, including mandatory test scenarios, will be provided for each function and supporting feature per CHESS user type. ASX will provide scenarios for each supported function to test all relevant features. For example, the Account function is supported by 12 features, including Account and Holder Creation, Account and Holder Modification, Account and Holder Locking and Unlocking, etc.

- ASX will generate counterparty messages via auto-responder tools and message simulation as required to facilitate full workflow of a test scenario

- Multiple accreditation scripts will be supported at the same time

- ASX will assess accreditation test scenarios to determine a pass or fail status, as determined by acceptance criteria, and confirm results to each software provider.

Sample message accreditation scripts can be located in the technical documentation portal.

3.3.3 Revised timetable

The revised timetable allows for connectivity and messaging accreditation to run from mid May 2021 to end July 2021.

ASX will work with software providers to schedule an appropriate date for their accreditation within this timeframe.

4. Customer Readiness

4.1. User testing

4.1.1 Purpose of user testing

User testing allows CHESS users to perform their own internal tests on newly delivered software from their system providers. It will enable them to become familiar with new or upgraded systems, including any functionality changes, as well as undertake a level of testing that provides confidence that the system is ready for the more formalised operational readiness phase.

Users will also be able to undertake their own testing with new software, which may include integration with their own internal upstream, downstream and reporting systems.

4.1.2 Characteristics of ITE2

All user testing will be undertaken in the ITE2 environment which will be provided on production grade infrastructure.

ITE2 has the following core characteristics:

- Single dedicated integrated environment
- Availability of CHESS User Interface
- Production style authentication model
- Third party certificate signing authority
- Multi-site/multi-node topology across ASX's data centres
- Ability to test with other participants.

4.1.3 ITE2 connectivity

All connectivity networks and access methods will be available from the opening of ITE2, and CHESS users should connect to ITE2 with their intended production connectivity choice:

Connectivity Network	Access Methods
ASX Net[3]	- Ledger API (Node Access) - AMQP (ISO 20022 XML Messaging) - CHESS User Interface - FIX (Approved Market Operators)
SWIFTNet	- SWIFT (ISO 20022 XML Messaging)

4.1.4 Activities to be performed

4.1.4.1 Functional testing

Users will be able to functionally test their systems with CHESS replacement for the functions relevant to their business, examples include:

- Account management
- Trade registration

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[3] Including IPSec VPN, Switch in Cabinet and Cross Connect.

- Netting
- Settlement
- Holding management
- Corporate actions
- Reporting
- mFunds.

4.1.4.2 Non-functional testing

CHESS users will be able to test out non-functional items. Examples include:

- Connectivity testing
- Performance testing
- Failover and recovery.

4.1.4.3 Test support

From a functional perspective, ITE2 will open with all clearing and settlement functionality, and mFund functionality will be available to test from the end of April 2021 (subject to receiving associated software from CHESS users' software providers).

ITE2 will contain some core configuration and provides users the ability to create their own test data for the purpose of testing.

Users will test against their own internal test scripts and testing will primarily be on a self-serve basis during this phase.

Clearing and settlement participants will optionally be able to connect to Approved Market Operators for the purpose of trade flow testing.

4.1.4.4 Coordinated testing activities

ASX will coordinate and support a number of market-wide activities during the user testing window and prior to the commencement of operational readiness. This will include corporate action events, batch settlement, end-of-day reports, unit adjustments for fails, un-netting and delay to settlement. Non-functional scheduled activities, including disaster recovery testing, will also be coordinated.

Auto-responders will be made available (much as CHESS test provides today) and CHESS users will have the ability to test with other CHESS users or their vendors if they wish to do so.

As different CHESS user types (participants, payment providers and share registries) complete their own internal tests during user testing, ASX will work with those organisations that wish to test their own systems with others in the market including:

- Share registries providing end to end corporate action processing through to holding adjustments
- Payment providers actioning authorisation requests on behalf of their participants
- PISPs accepting application and redemption requests on behalf of settlement participants.

4.1.5   Access to ITE2

ITE2 order forms will be available on ASX's technical documentation website from the fourth quarter 2020.

It is a requirement CHESS users enter ITE2 with the expected production connectivity model.

4.1.6   Revised timetable

The revised timeline provides a window of four months for users to test their software prior to operational readiness.

User testing will be available from April 2021 through to attestation in mid-April 2022.

4.2. Operational readiness

4.2.1 Purpose

Operational readiness provides assurance that CHESS users are ready for go-live. This is demonstrated by ensuring that appropriate processes and procedures for each user type are in place prior to go-live. Demonstration that these requirements have been satisfied mitigates risk to the CHESS user and the rest of the market.

CHESS users will need to demonstrate their end-to-end business flows using accredited software. To facilitate this, it is expected CHESS users' surrounding support systems (i.e. back and middle-office applications) will function together with accredited software that connects directly with the CHESS replacement system in the Industry Test Environment (ITE2).

Operational readiness is only applicable to CHESS users. However, software providers, specifically third party vendors, are encouraged to support their clients' operational readiness activities.

4.2.2 Activities to be performed

ASX will coordinate testing of market events to ensure CHESS users have sufficient opportunity to participate in a full range of scenarios to test and develop their own surrounding processes and procedures. This will be done during the operational readiness test window (September to November 2021), with the timing and frequency of most test scenarios following standard market schedules (e.g. participation in batch settlement for relevant CHESS users). This allows CHESS users the opportunity to test against the final criteria for operational readiness processes commencing from 1 September 2021.

ASX will release minimum testing criteria by December 2020. This will detail the required capabilities applicable for each CHESS user role. In addition, to support CHESS users in updating their own operational procedures, ASX will continue to progressively release the updated ASX Settlement Procedural Guidelines (APG). Completion is also targeted for end of 2020.

As the market will be using new software with new messages, the scope of the testing criteria includes all business flows applicable to each type of CHESS user, as indicated by the ticks in the table on the next page. It should be noted that the test criteria and/or supporting evidence will differ for CHESS user types.

Activity by CHESS User Type	Clearing and Settlement	Settlement-only	Account Settlement	PISP (mFund)	Specialist SP (Offeror)	Issuer (Registry)	Payment Provider	AMO
Account Management: CREATE/MODIFY	✓	✓	✓	n/a	✓	✓	n/a	n/a
Account Management: TRANSFER/LOCK/UNLOCK	✓	✓	✓	n/a	n/a	✓	n/a	n/a
Investor and Pass-Through Information: INITIATE/RECEIVE	✓	✓	✓	n/a	n/a	✓	n/a	n/a
Market Trade and Price: CAPTURE/CANCEL/ACKNOWLEDGEMENT	n/a	n/a	n/a	n/a	n/a	n/a	n/a	✓
Transfers and Conversions – CHESS to/from Issuer: REQUEST/APPROVE/REJECT	✓	✓	✓	n/a	✓	✓	n/a	n/a
Demand Transfers – Unilateral and Bilateral: REQUEST	✓	✓	✓	n/a	n/a	n/a	n/a	n/a
Settlement Transfers – Unilateral and Bilateral (incl. Locks): REQUEST/MATCH	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Settlement Instruction Management*: INITIATE/PROCESS	✓	✓	n/a	n/a	n/a	n/a	n/a	n/a
Collateral Management (ETO and CMM for C&S)**: LODGE/WITHDRAW	✓	✓	✓	n/a	n/a	n/a	n/a	n/a
Corporate Actions: INITIATE/PROCESS	✓	✓	✓	n/a	✓ ***	✓	n/a	n/a
Warrant Transfer by Issuer Agent**: REQUEST/APPROVE/REJECT	✓	✓	✓	n/a	n/a	n/a	n/a	n/a
mFund Activity: APPLICATION/REDEMPTION	✓ *	✓ *	n/a	✓	n/a	n/a	n/a	n/a
Enquiry and Reporting: RECONCILIATION/ENQUIRY	✓	✓	✓	✓	✓	✓	✓	✓
Payment: APPROVE/REJECT	n/a	n/a	n/a	n/a	n/a	n/a	✓	n/a

*Includes settlement instruction rescheduling/suspension/cancellation, isolating counterparty and diary adjustments.
** Optional usage.
***Takeovers and buybacks – Initiate/process.

4.2.3   Revised timetable

ITE2 will plan to open in April 2021 allowing one month of connectivity set-up prior to user testing commencing from May 2021. CHESS users will have four months of user testing in ITE2 prior to the commencement of operational readiness activities, which runs from September to November 2021.

The period for user testing is for CHESS users to commence their operational readiness activities in ITE2, which will be operating on a standard market schedule during this period. This testing can commence on non-accredited software. However, vendors will need to distribute accredited software to their customers ahead of the operational readiness period commencing from 1 September 2021.

5. Operating Rule Amendments

5.1. Rule amendments required to support new system

ASX needs to make amendments to various operating rules to support the operation of the new system replacing CHESS. These are required to reflect the solution design for new or changed functionality in the new system.

5.2. Three tranches of rule amendments for public consultation

ASX has sought to make the rule amendments for the new system available to the market at an early stage (via three tranches[4]), rather than waiting until all rule amendments were available for the new system following completion of the solution design process.

- Tranche 1 rule amendments covered accounts, participants, securities and pre-settlement aspects of the new system, and were released for public consultation on 15 November 2019.

- Tranche 2 rule amendments covered corporate actions, mFund and RTGS payment aspects of the new system, and were released for public consultation on 21 February 2020.

- Public consultation on the tranche 3 rule amendments (planned for release 6 April 2020) was suspended, pending this consultation. Tranche 3 covers batch settlement, reporting and miscellaneous aspects of the new system.

Public consultation on a consolidated rules package across all the rule amendments for the new system (as covered by the three tranches), was also suspended, pending this consultation.

5.3. Revised public consultation process

It is now proposed that the tranche 3 rule amendments and a consolidated rules package across all the rule amendments for the new system be incorporated into a further public consultation ASX intends to undertake commencing early November 2020 (**further rules consultation**). A 15 week consultation period (concluding mid-February 2021) will apply for providing feedback.

The further rules consultation will cover:

- Tranche 1 rule amendments (revised as per previous consultation[5])

- Tranche 2 rule amendments (revised as per previous consultation[6])

- Tranche 3 rule amendments (new).

The miscellaneous aspects covered in the tranche 3 rule amendments will include transitional rules addressing timing for enlivening rules for the new features in section 2.3 that are to be made available in production after Day 1 of the new system, and migration aspects for the cutover to the new system[7].

The tranche 3 rule amendments will be provided both on a stand-alone basis, as well as part of a consolidated rules package, in the further rules consultation.

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[4] Each tranche groups related sets of rules reflecting the logical development of clearing and settlement aspects. For example, tranche 1 covers off: accounts, participants and securities aspects - which are building blocks for other activities in the system; and pre-settlement activities - which are pre-requisite to payments and settlements covered off in tranches 2 and 3.
[5] ASX released its response to consultation feedback received on the tranche 1 draft rule amendments on 22 May 2020.
[6] ASX is planning to release its response to consultation feedback received on the tranche 2 draft rule amendments in mid-September 2020.
[7] For example, the treatment of in-flight transactions/processes in CHESS at the cutover time and the purging of un-actioned messages (where applicable).

This is to assist stakeholders who have engaged with the previous rules consultations to be able to focus their review and feedback on the tranche 3 rule amendments, which have not previously been subject to formal consultation.

All stakeholders will also be able to provide feedback across the entire package of rule amendments for the new system as a consolidated rules package across the three tranches[8].

A response to consultation feedback received on the further rules consultation is planned for release in June 2021.

5.4.   Regulatory clearance process

The rule amendments, including any changes made through the public consultation process, will be subject to the usual regulatory clearance processes.

ASX plans to formally lodge the combined rules package (covering the rule amendments referred to in section 5.3 above) with ASIC in August 2021. Following the regulatory clearance process, a final set of rule changes will be released. This is anticipated to be by the end of September 2021.

ASX is planning to release the final rule changes at least six months prior to go-live of the new system.

The final form of the amendments will become effective at the time of go-live of the new system.

5.5.   Rule development timeline

The consultation and regulatory clearance processes referred to in this section 5 are shown in the below draft rule development timeline:

Day 1 CHESS Replacement: Detailed Rule Development Timeline (2019-22)

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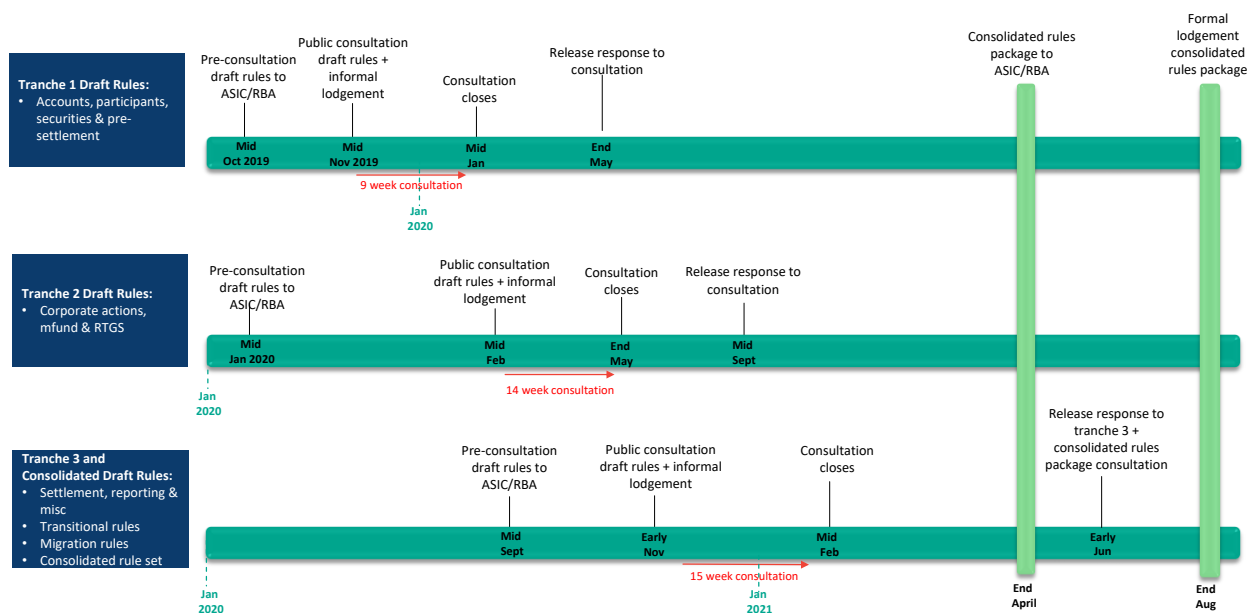
[8] As updated through the prior consultations on the tranche 1 and tranche 2 rule amendments.

6.   Cutover and Transition

6.1.   Purpose

Cutover and transition form part of the activities that help ensure all required activities can be completed within the required timeframe for a successful cutover to the new system over a single weekend. To facilitate a successful go-live, the single cutover event will be preceded by a series of migration dress rehearsals. These are the final steps before CHESS users can provide their attestation.

6.1.   Activities to be performed

6.1.1   Migration dress rehearsals

ASX will coordinate three migration dress rehearsals (MDRs) prior to go-live. The specific dates are pending the outcome of this consultation, with mandatory participation from all CHESS users, to run through the full end-to-end activities that will be undertaken by CHESS users and ASX over the go-live weekend.

This is the only CHESS user activity that happens in the new production environment prior to go-live.

The objective of migration dress rehearsals is to allow all CHESS users to:

-    Prove, test and refine their cutover approach

-    Confirm the sequence of activities are correct

-    Allow for adjustments to be made to the run-sheet, as necessary, to ensure all activities can be completed within the actual migration window

-    Test the communication channels with the ASX command room

-    Test incident management procedures to provide:

    >   useful input and detail for the cutover weekend run-sheet

    >   for the rehearsal of incident management and assist with the refinement of those processes for cutover.

ASX will publish a run-sheet detailing the required activities that need to be completed over the rehearsal weekend. The run-sheet will be shared in advance with all relevant task timing and support contacts listed.

ASX will schedule information workshops to run through all weekend cutover activities, along with specific sessions on changes, such as new registration details and account migration.

6.1.1.1   Dress rehearsal environment (DRE - new production environment)

DRE is the target production environment with all of the infrastructure and non-functional features of production. This will not contain the support tools that are present in ITE. The purpose of this environment is to enable the execution of dress rehearsals in preparation for go-live. This will become the production environment.

DRE testing will be conducted as per the migration dress rehearsal dates and detailed schedules to be provided.

Once migration dress rehearsals have been completed the system will be configured for production access in preparation for the actual go-live weekend.

6.1.2   Single cutover

ASX has assessed that a single cutover weekend approach as the least operationally complex and lowest risk option.

This contrasts to phased approaches that would require CHESS users to run and support **two separate settlement batches** on **two separate systems** in **two different message formats** across **two different post trade processes**. This would also require ASX to maintain the legacy sub-register or duplicate the CHESS sub-register across systems.

These alternative approaches were assessed to introduce significantly more risk and reduce settlement netting efficiency.

Furthermore, transitioning from CHESS proprietary messaging to ISO 20022 creates additional complexity and development as it would require a solution to be put in place where **both messaging standards could co-exist**. This is because CHESS has many more messages with a rich information set, whereas the ISO message format is more structured and involves different business processes for stakeholders.

The replacement system also includes new functionality that does not map to existing message sets and processes, and some existing CHESS functionality has been redesigned that will involve different business processes.

A phased approach would require the development of a solution where both CHESS EIS messaging and ISO messaging co-exist, which would introduce significant risk.

The preferred approach avoids the need for ASX and CHESS users to run parallel production systems and separate settlement processes. It also reduces the complexity of synchronising and reconciling data across multiple systems.

A single cutover weekend is predicated on getting the timing and sequencing of the migration activities right through at least three migration dress rehearsal events, which will test and prove industry readiness to de-risk a single cutover event.

6.1.3   Attestation

CHESS users will provide their attestation after the final migration dress rehearsal. This is ASX's final readiness requirement where CHESS users attest to their readiness for Day 1 go-live of the CHESS replacement system. This will include:

- Connectivity accreditation of production software
- Message accreditation of production software
- Evidence of participation in prescribed operational testing performed on accredited software
- Demonstrate participation in migration dress rehearsals.

6.2.   Revised timetable

To reduce the proportion of overlap between the operational readiness and migration dress rehearsal tasks, the revised timetable allows for the second migration dress rehearsal to happen after operational readiness activities have been completed.

The three migration dress rehearsals will be scheduled for a weekend to mimic the actual go-live weekend.

Attestation is scheduled 13 months later than originally planned.

Appendix I – Stakeholder feedback received to date on the original implementation timeline

| Stakeholder feedback	ASX response
Additional time sought from completed technical specifications to vendor systems UAT and accreditation activities	> More time has been provided between the publication of complete technical specifications and the commencement of user testing in ITE2 and accreditation activities > A delay to the commencement of technical accreditation activities > A longer period has also been provided from the start of user testing in ITE2 to go-live
Shared environment challenges for vendors testing their code and then deploying their software to clients for UAT prior to start of IWT	> Established two distinct environments for industry wide testing with software developers now having exclusive access to the industry test environment (ITE) for a period prior to admitting CHESS users, affording more time to vendors to test code (ITE1) prior to the start of user testing (ITE2)
Additional time required to incorporate back office system changes into client-facing systems	> Vendors now have more time to release software to their end customers prior to the opening of ITE2
The need for more detailed information to assist stakeholder planning	> Updates to APG (ASX Procedure Guides) documentation have commenced from April 2020, and targeting completion by end 2020, which is more than 12 months prior to go-live > All technical specifications have now been published, two years prior to go-live

Concerns regarding key technical aspects of the project and rule changes not being completed until mid-2020	> ITE1 implements the end state architecture of the CHESS replacement solution, including integration to ASX's new identity and access management system
	> Proposed that the tranche 3 rule amendments be incorporated into a further public consultation ASX intends to undertake across all of the rule amendments for the new system in November 2020, with a 15 week consultation period to be provided (an additional nine weeks)
	> All technical documentation now available in relation to proposed rule changes, providing a longer lead time
Challenges in supporting migration dress rehearsals at the same time as undertaking testing, accreditation and operational readiness (same resources used for these activities)	> Eliminated parallel technical and operational readiness activities, and minimised the overlap between migration dress rehearsals and operational readiness activities

Appendix II – Original timeline
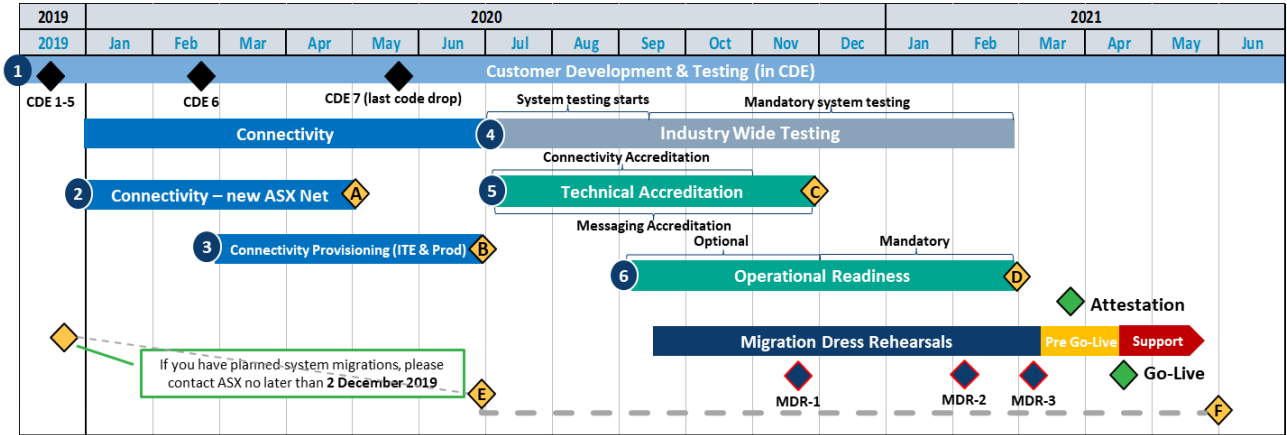
1. Iterative customer development and testing for software vendors and in-house systems connected to CHESS in a dedicated customer development environment

2. Submit order forms and install new ASX Net connections (if required)

A. All new ASX Net installs to be completed

3. Provisioning of ASX Net SWIFTNet connectivity to the test and target production environments

B. All ASX Net and SWIFTNet connectivity in place for testing and migration dress rehearsals

4. Conduct Industry Wide Testing (IWT) in the Industry Test Environment (ITE). IWT allows for functional and non-functional testing

5. Commence Technical Accreditation in ITE - mandatory for all systems connected to CHESS

C. All systems successfully Accredited prior to 2nd dress rehearsal

6. Commence Operational Readiness in ITE - mandatory for all CHESS users.

D. Operational Readiness to be completed prior to Attestation

MDR. Conduct three separate mandatory industry migration rehearsals

E. ASX Change Control Period commences

F. ASX Change Control Period ends (indicative)