

Minutes

Business Committee Meeting

Date	30 November 2017	Time	4.00pm – 5.30pm
Location	ASX Offices – Level 1, 20 Bridge Street, Sydney		

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| 1. Service Performance | 4:00pm - 4:15pm |
| a) Cash Market Clearing and Settlement - Operating Performance | |
| 2. CHES Replacement Project | 4:15pm - 5:15pm |
| a) Business Requirements Working Groups | |
| b) Working Groups' Input on Business Requirements | |
| c) Technology Assessment Process | |
| d) Third-Party Security Assessments | |
| e) ISO 20022 Technical Committee Report and Minutes | |
| 3. Administration | 5:15 – 5:30pm |
| a) Minutes from the 11 October 2017 Business Committee Meeting | |
| b) Forward work program | |
| c) Other matters | |
| 4. Next Meeting - 28 March 2018 | |

Business Committee Members

Company	Name	Job Title	Apologies
ABN AMRO Clearing	Barry Parker	Chief Executive Officer	
AFMA	David Lynch	Chief Executive Officer	
ANZ	Andrew Koudrin (delegate)	Head of Execution Assurance and Middle Office	Peter Mullin
ASX	Peter Hiom	Business Committee Chair, Deputy CEO	
Bank of America Merrill Lynch	Rhys Cahill	Global Markets COO	
Bell Potter Securities	Dean Surkitt	Managing Director Retail	Dean Surkitt
BNP Paribas	David Braga	Head of Securities Services	
Chi-X Australia	Mike Aikins	Chief Operating Officer	
Citi	Miles O'Connor	Director, Direct Custody & Clearing Securities & Funds Services	
CBA	Sheridan Thompson	Head of Strategic Development, CommSec	
Credit Suisse	Winston Loke	Australia Equities COO	
Deutsche Bank AG	Geoffrey Plaisted	Chief Operating Officer, Equities	
Goldman Sachs	Nichole Alexander (delegate)	Executive Director	Jeremy Follett
HSBC	Peter Snodgrass	Head of Direct Custody and Clearing	
J.P. Morgan	Jonathan Evans	Head of Custody and Markets Operations	
Macquarie Group	James Indge	Cash Equities Business Manager	
Morgans	Peter Chisholm	Chief Operating Officer	
Morgan Stanley	Craig McGuire	Head of Operations	
NAB	Greg Bowrey	General Manager, Self-Directed Wealth Products & Markets	
NSX	Ann Bowering	Managing Director	
Pershing Securities	Rob Forbes	Chief Executive Officer	
SAFAA	Andrew Green	Chief Executive Officer	
Sydney Stock Exchange	Geoff Williams (delegate)	Market Operations Manager	Tony Sacre
UBS	Conor Foley	Chief Operating Officer	

ASX Management

Name	Job Title
Tim Hogben	Chief Operating Officer
Hamish Treleaven	Chief Risk Officer
Daniel Moran	Acting General Counsel
Eloise Wett	Executive General Manager, Operations
Cliff Richards	Executive General Manager, Equity Post Trade Services
Diane Lewis	Senior Manager, Regulatory and Public Policy
Gary Hobourn	Senior Economic Analyst, Regulatory and Public Policy
Keith Purdie	Senior Manager, Equity Post Trade Services

INTRODUCTION

The Chair welcomed members and delegates to the sixth meeting of the year. He noted that Dean Surkitt (Bell Potter) was unable to attend and a few members had nominated delegates to attend on their behalf: Andrew Koudrin (ANZ); Nichole Alexander (Goldman Sachs); Daniel Spokes (Morgans); and Geoff Williams (Sydney Stock Exchange).

Two members dialled in to the meeting: Rhys Cahill (Bank of America Merrill Lynch) and Winston Loke (Credit Suisse).

AGENDA ITEM 1: SERVICE PERFORMANCE

1a) Operating Performance Report

The ASX Executive General Manager, Operations spoke to the December quarter performance report (up to 30 October 2017) noting that:

- Availability across CHES and the TAS was 100% for the period.
- Volumes traded and value settled for both ASX and Chi-X are both broadly higher so far in the December quarter. NSX activity is broadly in line with the previous period.
- The daily average value of batch settlement has declined below \$9 billion, the first such occurrence in some time.
- Fail rates remained very low (0.24%) in the September quarter after an uptick in the June quarter. This good performance has continued into October (0.27%).
- The mFund service continues to grow in terms of number of funds and funds under management.

Members had no questions on the performance report.

AGENDA ITEM 2: CHES REPLACEMENT PROJECT

2a) Business Requirements Working Groups

The ASX Senior Manager, Equity Post-Trade Services advised members that the series of CHES Replacement Working Groups, which ran every fortnight for the past six months have concluded their work. There were a total of 13 Working Group meetings covering topics such as account structures and participation models, corporate actions, transfers and conversions, settlement enhancements, data storage and reporting, and non-functional requirements. The working groups identified 40 functional and five non-functional business requirements.

He provided members with an overview of the outcomes of the last three Working Groups:

- 15 settlement enhancement business requirements were identified including:
 - Providing participants with the ability for non-settlement related messages (e.g. corporate actions, transfers and conversions) to continue processing while the daily settlement cycle is running. This would avoid tasks queuing up for processing after the daily settlement cycle and help smooth out operational workload peaks.
 - Streamlining deferred trading and settlement processes by standardising the timeframes where possible.
- 4 data storage and delivery and reporting business requirements were identified including:
 - Providing the capability for a self-service API to enable access to real-time and customised data to improve customer data analytics and their ability to validate the data.
 - Removing duplication in capturing and storing common static data and reducing costs through investigating the feasibility of a centralised depository for end investors' static data and the ability to distribute the data to permissioned users.
 - Providing a real-time notification of holding balance movements to issuers, to help them reconcile their share register in a more timely fashion.

- 5 non-functional business requirements were identified including:
 - Providing customers with global industry standards for message formats and transport options that support best practice authentication and encryption.
 - Providing flexible test environments, including a self-service capability, and a capability to simulate or rehearse production-style scenarios.
 - Providing alternative channels and methods for how to submit transactions during a BCP event. For example, the ability to securely upload and download bulk transactions via a file, or input transactions via a secure browser-based interface.

Subsequent to the conclusion of the Working Groups, members were asked to prioritise the 40 functional business requirements (see Agenda Item 2b).

ASX remains open to bilateral meetings, where appropriate, to obtain a deeper understanding of some of the issues as it works towards issuing a public consultation paper at the end of the first quarter next year.

Members had no questions on the reporting of the Working Groups.

The Chair thanked members for their contributions during the intensive consultative process through the Working Groups. He observed that they had covered a lot of ground and provided significant input into a range of quite complex issues.

2b) Working Groups' Input on Business Requirements

The ASX Executive General Manager Equity Post-Trade Services spoke to process undertaken to gauge the level of demand for each of the 40 functional business requirements identified by the Working Groups. ASX sent out an online survey asking respondents to rank each business requirement, as either a high, medium, or low priority or noting if the requirement was not applicable to their organisation.

The output from the rankings formed one of a number of inputs to assist ASX in determining the 'Day 1' functional scope for the replacement system, which will be subject to a final consultation process next year. ASX's consultation paper will set out the proposed 'Day 1' functional scope of the system that replaces CHES, as well as an implementation plan for the replacement system. This will provide organisations with information to start planning and budgeting their own resourcing for the project.

The ranking process provided a mechanism to broadly group the requirements into high, medium and low priority buckets based on the views from distinct stakeholder cohorts: retail brokers, institutional brokers, custodians, share registries, AMOs and industry associations.

The process identified that six of the top ten business requirements relate to corporate actions, reflecting the widespread support from different groups for removing paper from the process and standardising data that accompanies a corporate action. Other high priority business requirements identified by some stakeholders included:

- Introducing a more flexible account structure hierarchy to enhance the current omnibus/custody model.
- Establishing standardised registration details for the input and maintenance of holder's registration details and providing the ability to quickly and easily access the issuer sponsored SRN.
- Developing API data reporting capabilities to facilitate a more standardised, efficient and easy way to extract information.

In general, there were quite varied responses from AMOs in relation to the 40 identified business requirements, with one AMO marking all of the business requirements as not applicable to their organisation.

A member asked if the order the business requirements were presented in the paper represented their ranking within each classification. The Senior Manager, Equity Post-Trade Services indicated that it was a random grouping of requirements within each category.

The Chair noted that the requirements had been grouped together in different buckets to provide some insight into the overall level of demand. However, it forms only one input into the consideration, over the next three months, of Day 1 business requirements. For example, some business requirements that are particularly important to certain groups, which have not made it into the high priority group overall, could still be included in the Day 1 scope. Similarly some in the high priority group may not make it into Day 1 scope because of other considerations.

In that sense the process is as much an art as a science, applying judgement based on a range of factors including the level of complexity associated with each business requirement and whether there were other preconditions that would need to be taken into account (for example, further industry consultation or regulatory approvals).

The Executive General Manager Equity Post-Trade Services noted that broadly the 40 business requirements will be placed into one of three work streams to be progressed as part of:

- Day 1 CHES replacement or subsequent enhancements;
- the Corporate Action STP Phase 2 work stream; or
- normal ASX business-as-usual processes separate to, and possibly in advance of, CHES replacement.

Members asked if ASX had been surprised that optional shorter settlement cycles had ended up a 'low' priority and if there had been different views expressed by retail and institutional participants on the issue.

The Executive General Manager Equity Post-Trade Services indicated that it was not a surprise given the mixed feedback received in response to the original consultation paper which had included limited explanation of how this would work in practice. He explained that while some more detail was provided during the working group process, views have remained mixed. However, ASX believes that more work to clearly articulate the potential benefits could affect demand for settlement optionality. He noted that there is some precedent for settlement optionality in other markets with around 40% of transactions in Europe processed in real-time through T2S.

The Chair drew a distinction between settlement optionality and settlement optimisation. It may be possible to optimise settlement without necessarily fragmenting liquidity. This could be achieved through creating an environment where participants with an inventory of securities could facilitate earlier settlement, and create efficiency within the market

The Chief Operating Officer also pointed out that there was mid-level support for facilitating bilateral DVP settlement outside of the batch. For example, allowing stock and cash movement on a DVP basis on a more real-time basis in the afternoon.

A member asked if ASX would be publishing a more detailed report on the results of the survey, beyond that contained in the Business Committee papers. It was confirmed that there would not be any more detailed report on the survey results but that the consultation launched towards the end of March 2018 would provide transparency around if, and how, the business requirements identified by the Working Group would be taken forward and the reasons for these decisions.

A member complimented the way the Working Groups were run, and expressed his view that they were rewarding for the people who participated in them, providing a deeper understanding of the diverse perspectives and priorities of different stakeholder groups.

The Chair indicated that ASX would look to continue similar customer engagement processes in 2018 and beyond as the project continued, including to assist in determining a range of implementation and transition issues.

A member asked how ASX would resolve the conflicting views and priorities of different groups, such as retail versus institutional brokers. The Chair indicated that ASX would seek to address as many of the business requirements as practicable. Where trade-offs have to be made ASX will make a call and explain why a particular choice was made.

An AMO member noted that the Working Group outcomes and survey did not cover issues of interest to them as they were focused on the services and functionalities used by the other customer groups. He expressed concern that there has not been detailed consultation around the precise detail and nature of the CHES services AMOs currently use and

what new services might be developed. He asked when and how that engagement would occur prior to ASX settling on the final set of requirements.

It was noted that the AMO Working Group was the appropriate forum for eliciting AMO specific business requirements and that AMOs have been, and continue to be, provided with the opportunity to raise their requirements for the replacement system prior to the March decision. The ASX Chief Operating Officer noted that the AMO Working Group had been halted at their request pending a request for ASX to provide further analysis into the current and future potential services that would be provided to AMOs. He also confirmed that ASX remains available to continue with the AMO Working Group discussions about the AMOs' business requirements.

2c) Technology Assessment Process

The Executive General Manager Equity Post-Trade Services outlined to the selection process for the technology to underpin the replacement of CHES. He reminded members that the key elements of the process had been underway for around two years and were outlined at the last Business Committee meeting.

This process included assessing the ability of the software vendor to deliver the necessary software on time and consistent with specification as well as testing the functional and non-functional performance of the software.

He noted that while distributed ledger technology architecture is new, much of the technology that would go into a CHES replacement system is mature and widely used. For example, public-private key infrastructures, cryptography to protect password details, digital certificates, and application programming interfaces (APIs), etc.

A significant element of the assessment process over the last couple of years has involved stepping through and understanding the risk profiles of bringing a new technology to the market.

To test functional performance, a subset of requirements were built to reflect the core clearing and settlement functions that CHES performs each day, this represents about 20% of the functions but around 70% to 80% of message traffic.

Non-functional testing included an assessment of throughput capacity, latency, resiliency, redundancy and security. This testing was conducted based on the real workflows that occur in the market and at market loads many times larger than those processed by CHES today.

The functional testing has been completed and everything has passed the acceptance criteria. This means, in practice, that Digital Asset has the capability to model real world business workflows. The non-functional testing has almost been completed.

It needs to be recognised, however, that the system Digital Asset has built to date is not complete as it does not include all current CHES functionality or any changes to be implemented as a part of the Day 1 business requirements.

A member asked at what point following the December technology and March business requirement decisions would participants and their vendors be in a position to model what the technical specifications will mean for their organisations.

The Executive General Manager Equity Post-Trade Services advised that the March consultation paper will include a plan of the delivery profile. The final scope should be released by mid-year and would include more detail to assist organisations to plan and budget. This would include the first suite of information on technical connectivity options, and sufficient information to allow firms to begin considering their preferred connection method.

A member asked if ASX was considering a single vendor (Digital Asset) solution or was open to a multi-vendor solution with ASX as a systems integrator. The Chair indicated that when an announcement is made in December it should be clear how ASX will be moving forward.

A member commended the rigorous process that ASX had undertaken to capture industry input. He considered it sensible to use the most contemporary technology available when undertaking a major system change. He thought the careful and considered process had worked well, particularly by ensuring that the consideration of business

requirements remained central to the process and the technology choice did not distract from this important aspect of CHES replacement.

The Chair replied that ASX wants to continue with a similar customer engagement process as the project moves into 2018, and that we will continue to examine ways to make it is effective as possible.

2d) Third-Party Security Assessments

The Executive General Manager Equity Post-Trade Services explained that given the importance of the post-trade infrastructure, ASX commissioned two third-parties, the NCC Group and KPMG to test specific aspects of Digital Asset's DLT-based system.

These reviews supplemented ASX's own assessment of the information security characteristics of the technology by drawing on the specialist personnel and assessment tools of these businesses to examine the way the technology was architected and implemented.

The two parties conducted their assessments independently of each other, both in Digital Asset's headquarters in New York and locally in Sydney. The KPMG team also included some expert personnel from Data61, CSIRO's data division.

While both reports are commercial in confidence, they have been provided to the relevant regulatory agencies.

ASX has not identified any threshold issues of concern based on those reports and our own assessments.

In response to a member's question the Chair noted that the scope of the review was confined to assessing around 50 claims made by Digital Asset about the security of the technology. There will be further assessments that will examine the final deployment of the platform prior to implementation.

A member asked if there had been any feedback from the regulators on the third-party reviews. The Senior Manager, Regulatory and Public Policy explained that ASX, has been engaging with the regulators for about two years on DLT given ASX Clear and ASX Settlement's licence obligations. For example, ASX has conducted a self-assessment against that ASIC DLT Assessment Tool and has provided that to the regulators. ASX has also undertaken a preliminary assessment against key PFMI/FSS requirements in relation to the implications of the DLT-based system. More recently, ASX's engagement with regulators has included providing briefing on the technical and security aspects of the system, including the two third-party security reviews and ASX management's conclusions from those reviews.

She noted that ASX expects this engagement will continue through the life of the project. There will be a particular focus in Q1 next year on the regulatory implications of system and other changes required to implement the 'Day 1' functional scope of system that replaces CHES.

2e) ISO 20022 Technical Committee Report and Minutes

The ASX Chief Operating Officer noted that the Technical Committee has mapped 382 of the 478 CHES messages into around 88 individual base ISO 20022 messages.

There are around 20 non-standard ISO messages that may be submitted to the relevant registration authority for global registration. It was noted that a number of new messages have been submitted recently as part of TS2 in Europe. Some of these settlement and payment messages appear relevant to the Australian market and there may be scope to leverage off consideration of these.

The Committee continues the process of identifying redundant messages that could be eliminated as part of the process as well as considering the upstream and downstream impacts of the new global message structure.

ASX has fielded questions around the process and timing for software developers to begin working with the new ISO-based message structure. It was noted that until the Day 1 business requirements are finalised the final suite of ISO messages could be subject to changes. As such, it is advisable for developers to hold back until the middle of next year before devoting significant resources to developing code.

It is proposed to accelerate training around the new message structure in 2018 to allow participant firms to examine the potential opportunities presented by the change.

An upcoming survey of Technical Committee members will collect views on the effectiveness of the process to date and if there are ways this can be enhanced.

Members had no questions on the Technical Committee report.

AGENDA ITEM 3: Administration

3a) Forward work program updated

The Chair noted that 2018 will be another busy year and a more developed forward work program for the Committee is dependent on the upcoming decisions around the technology choice and Day 1 business requirements for CHES replacement. By the Committee's first meeting of 2018 it should be possible to have a better fleshed-out work program which would include both CHES replacement and Corporate Action STP Phase 2.

3b) Minutes from the 11 October 2017 meeting

The minutes of the 11 October meeting were approved without change.

3c) Other matters

There were no other matter raised by members.

The Chair expressed his thanks to members and their organisations for their participation and input through the Business Committee, Technical Committee, and CHES Replacement Working Groups during the year.

Next meeting

The next meeting is scheduled to be held on 28 March 2018.

The meeting closed at 5.15pm.

Signed as a correct record of the meeting.



Chairman

28. 03. 2018

Date