

Cboe Global Markets Technology
Integration Customer Conference Call

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CORPORATE PARTICIPANTS

Gary Compton, *Vice President of Corporate Communications*

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Eric Crampton, *Senior Vice President, Global Head of Software
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Anthony Montesano, *Vice President, Market Structure and Functionality*



PRESENTATION

Operator

Good morning, and welcome to the Cboe Global Markets Technology Integration Customer Conference Call. All participants will be in a listen-only mode. Should you need assistance, please signal a conference specialist by pressing the star key followed by zero. After today's presentation, there will be an opportunity to ask questions. The Q&A is intended for customers only. To ask a question, you may press star, then 1 on your touchtone phone. To withdraw your question, you may press star, then 2. Those listening through the webcast may submit questions throughout the event by typing your question in the Submit Question box on your screen. Questions will be addressed after the prepared remarks have ended. Please note this event is being recorded.

I would now like to turn the call over to Gary Compton, Vice President of Corporate Communications at Cboe Global Markets. Please go ahead.

Gary Compton

Thank you, operator, and thank you all for your time today. Joining us for today's call are Chris Isaacson, Executive Vice President and Chief Information Officer, and Andy Lowenthal, Executive Vice President and Co-Head, Markets Division. Following their prepared remarks, we will hold a Q&A session for customers only. Also joining us for the Q&A will be Eric Crampton, Senior Vice President, Global Head of Software Engineering; Troy Yeazel, Senior Vice President, U.S. Operations; and Anthony Montesano, Vice President, Market Structure and Functionality.

Customers on the phone can queue up for questions by following the operator instructions at the end of today's remarks. If you are online, you may submit a question via the box and Submit Question button on the right-hand side of your screen. If you are a journalist or analyst, please reach out to the Corporate Communications and Investor Relations teams, and they will address any questions you may have separately.

As a preliminary note, you should be aware that this presentation contains forward-looking statements, which involve some risks and uncertainties. Actual results may vary. Please refer to our filings with the SEC for more detailed information about the risks and uncertainties. Also note that references made to the planned migration of the Cboe Options Exchange are subject to regulatory review. All planned dates and timelines are subject to change without notice.

Now, I'd like to turn the call over to Chris Isaacson.

Chris Isaacson

Thank you, Gary. It's been a few months since our last call, so it's nice to join you all again today. Over the last year and a half, we've hosted five calls for the CFE and C2 migrations, and today's call is our first dedicated exclusively to the Cboe Options Exchange, or what we call C1, and its migration to Bats technology. This is our final exchange migration and once completed, we will be able to provide our customers with a single, world-class trading experience across all our equities, options, and futures market globally. As we've previously announced, the C1 migration to Bats technology is planned for October 7, 2019. We will be working alongside you over the next 11 months to ensure you're ready to go on day one.

With the migration of C1, we look forward to providing a better trading experience with proven technology that seamlessly integrates electronic and open outcry trading. As we prepare for the migration over the next year, we'll be making numerous changes to both our electronic and open

outcry trading environments. Leading up to next October, we plan to provide several resources to help you prepare for the migration, including ongoing customer meetings and discussions, a series of conference calls, regular updates to the integration website, and multiple testing opportunities.

As was the case with the CFE and C2 migrations, the Cboe team remains focused on executing a seamless technical and operational integration, and we are committed to ensuring you continue to enjoy the same great trading experience and superior customer service you've always had with Cboe Global Markets.

The migrations of CFE and C2 to Bats technology were a huge success, thanks to the tremendous joint collaboration between the entire Cboe team and you, our valued customers. We are fully aware that the work required for these migrations is a big ask of you, and we recognize the additional work you and your firms will be putting in over the next year to meet our C1 migration date.

As we embark on the migration of C1, which will be the most complex yet, we continue to ask for your support. The feedback you share with us along the way, your participation through the certification and testing phases, and your diligent preparations leading up to the cutover date will once again ensure a smooth and successful migration. So we ask that you continue to provide your feedback and share your opinions, ideas, and questions with the Cboe team as we work through the migration.

On today's call, I'll provide an overview of the planned timeline and rollout schedule, the technical specifications being released later this week, including the first of our Feature Packs, and how and where you can find information related to the C1 migration. But before I dive into all the migration details, let me hand it over to Andy to share a brief Cboe Global Markets business update.

Andy Lowenthal

Thank you, Chris, and welcome to everybody on the call today. It's nice to speak with all of you again.

I'd like to take this opportunity to talk about the current trading environment and the surge in volume we saw in October.

Higher volatility returned to the market in October, and that was reflected in record volumes through the month. VIX futures total volume of 9.66 million contracts in October set a new record, surpassing the previous highs of 9.16 million contracts set in August 2017 and 9.04 million contracts in February 2018.

SPX options set a total volume record in October with 41.4 million contracts, up from February's 34.6 million. Further, trading in SPX options is up roughly 25 percent year-to-date from the same period last year.

We've also seen strong volumes for SPX Weekly, with a record ADV of 1.12 million contracts in October, up from February's 1.03 million contracts. Our SPX Weeklys product has experienced amazing growth this year, with four of our top five record ADV months occurring in 2018.

In addition, CFE, our futures exchange, and our C2 and EDGX Options exchanges each set new all-time highs for total monthly volumes during October.

Amidst this heightened volatility environment, with increased trading activity, I'm pleased to note that our Bats technology performed exceptionally well in both regular and global trading hours sessions, making us even more excited to complete the C1 migration.

Regardless of market conditions, we continue to remain focused on our three commitments: Product innovation, seamless trading solutions, and of course, leading-edge technology.

This fall, we leveraged our product innovation expertise to tap into the growing corporate bond marketplace with the creation of Cboe corporate bond index futures. CFE began listing for trading Cboe iBoxx iShares \$ High Yield Corporate Bond Index (IBHY) futures on September 10 and then CBOE iBoxx iShares \$ Investment Grade Corporate Bond Index (IBIG) futures on October 8.

These corporate bond futures allow users to hedge and mitigate corporate bond credit risk, to efficiently allocate to the corporate bond market and implement fixed-income trading strategies. We are enthusiastic about our prospects to steadily increase use of these products and look forward to further expanding our presence in this space with additional products going forward.

We also hosted our first Cboe RMC, or Risk Management Conference, in Tel Aviv, a new one-day format located in a downtown environment. The event was a great success, with approximately 150 attendees. We look forward to Cboe RMC in Asia next month and our full schedule of RMCs in 2019, which will include additional one-day events similar to our Tel Aviv event.

As we work through the migration process, we encourage your continued engagement with our team. Chris will touch on the feature packs in more detail in a moment, but I wanted to highlight that one of these feature packs -- a new quoting interface -- has been developed as a direct result of our conversations with you. This is functionality you asked for, and we are pleased to deliver it.

So I ask that you keep sharing your feedback with us. Don't hesitate to reach out to Anthony Montesano, Bryan Harkins, Chris, or me at any time. You may also contact your business development or operations liaisons or simply email batsintegration@cboe.com.

As always, we will continue to look for ways to better serve your needs through cutting-edge trading technology, dedicated customer service, advanced trading solutions, and innovative products. Our entire team is hard at work delivering on this mission each and every day.

I'll be happy to take any questions at the conclusion of our prepared remarks, but for now, I'll hand it back to Chris.

Chris Isaacson

Thanks, Andy. Now let's turn to the C1 migration.

As highlighted on our previous calls, in preparation for the migration, we planned two technology enhancements to the C1 marketplace in 2018: first, the migration of SPX to Hybrid, which was completed successfully in April, and second, the introduction of new floor terminals which began a few weeks ago.

Though the Hybrid market model is being built into Bats technology, the market model for the AM-settled SPX Options, referred to as Hybrid 3.0, was not replicated as part of this effort. We retired Hybrid 3.0 and transitioned the AM-settled SPX Options onto Command system's Hybrid platform.

What this has meant is that SPX market-makers have been able to stream their own electronically accessible quotes, and the book is now open to all market participants.

Initial results during the months since the SPX conversion to Hybrid have been very encouraging. We're seeing the vast majority of our market-makers stream quotes electronically, quote widths have narrowed by over 60 percent, and displayed size has more than doubled.

The second technology enhancement to the C1 market in advance of the full C1 migration is the introduction of the redesigned PAR workstations, or PAR 2.0, as we are calling the new floor terminals. PAR 2.0 will initially interface with the legacy Command system and is the first of two updates to prepare the PAR interface for connecting to Bats technology once the full C1 migration is completed next year.

PAR functionality allows floor brokers to trade in open outcry with other in-crowd participants, with simultaneous access to bids and offers contained in the electronic matching engine. As part of the migration effort, Bats technology is being modified to incorporate the concepts of a Hybrid market model, with floor brokers interfacing via PAR and several new integrated and modernized features that will be available to our floor brokers.

The new PAR is being rolled out in two phases. Phase one, which is PAR 2.0, began last month and is on target to be completed by year-end. This phase incorporates a new user experience and functionality to interact with the C1 Command platform. Legacy PAR and PAR 2.0 will run in parallel until legacy PAR is decommissioned at the end of 2018.

The Cboe Floor Support Team is working with users as we migrate from legacy PAR to PAR 2.0. Product demonstrations and opportunities to interact with PAR 2.0 are available at the Reporting Desk at Post 10 throughout the rollout period as new functionality is added.

Phase two, PAR 3.0, will interact with Bats technology and will incorporate exchange platform changes to enhance order handling and market data delivery to PAR. The expected completion date of this phase will be the ultimate C1 migration date of October 7, 2019.

If you have any questions related to PAR 2.0, please reach out to the Cboe Trading Floor Operations Team at 312-786-8580 or floorops@cboe.com, the Market Structure and Functionality Team at msfmgt@cboe.com, or the Operations Support Center at 866-728-2263 or helpdesk@cboe.com. They stand ready to help.

With our target migration date of October 7, 2019, as our finish line, here is an overview of our planned timeline and key mile markers along the way. We've mapped out an aggressive rollout schedule.

This Friday, November 16, we plan to release the completed technical specifications for the C1 migration. The specs will include the connectivity manual; FIX and binary order entry (BOE) specifications; our various market data specifications, including Multicast PITCH and TOP specifications; a platform change matrix; and all other related materials.

In preparation for the C1 migration, and in an effort to unify our options functionality as much as possible across our four options platforms, we plan to introduce a total of nine feature packs across our BZX Options, C2 Options, and/or EDGX Options exchanges, all subject to regulatory review and approval by the SEC. Rollout of the feature packs has begun and will continue through the third quarter of 2019.

The nine feature packs are related to:

- #1 - Entitlements and reserve orders
- #2 - Quoting interface, as Andy mentioned
- #3 - Electronic Secure Web API for post-trade edits
- #4 - Market data feed changes
- #5 - Simple order auctions
- #6 - All-or-None (AON) orders
- #7 - Global trading hours and harmonization of an opening process
- #8 - Complex crossing
- #9 - Complex orders with stock legs.

The certification environment for the first two feature packs is already available, with production rollouts for the feature packs one and two planned for November 29 and January 17, respectively. I'll have more on these in a bit.

Beginning February 1, the new physical connections to the new C1 platform will be accepted at either 1G or 10G. C1 will have dedicated network infrastructure and customer connections, separate from our other U.S. equity, options and future exchanges.

We expect to kick off TPH connectivity and testing on March 4. All C1 TPHs and vendors or ISVs must certify to the new platform, so we encourage all participants to connect as early as possible. This will ensure your readiness for migration, as well as ensure you're allowed to participate in weekend production testing and/or production testing with test symbols, which will be offered Monday through Friday starting May 6, 2019.

Please be advised that logical order entry sessions, in other words, FIX, BOE, or BOE Bulk or Quoting, will be created for each participant in the new production environment based on the number of logins in use on the legacy C1 platform as of April 1, 2019.

Additionally, a single DROP session will be created for each TPH. Fees will be assessed for all order entry and DROP logical ports automatically created for users on the new trading platform unless they are removed prior to October 7, 2019.

As such, firms are expected to review logical ports existing on the new platform any time after April 2 to ensure the number of ports is appropriate and default settings are acceptable. Firms should also be sure to work with the Cboe Trade Desk to ensure their DROP lines are set up to DROP the expected data.

We plan to conduct a series of five weekend tests in the new C1 production environment, with the first scheduled for June 15 and the remainder running approximately monthly up until the migration in October. The dates for the five customer weekend tests will be June 15, July 27, August 24, September 14, and October 5, which is the final Saturday before the migration. Please make sure to get these testing dates on your calendar for 2019.

To facilitate effective testing, OPRA will participate in each weekend test, and OCC intends to participate in weekend testing as well. Customers should plan to participate in as many of these weekend tests as possible.

I want to reiterate that we anticipate enabling the new C1 production environment for testing with test symbols on, May 6, 2019.

And, of course, all of this testing leads up to our target C1 migration date of October 7, 2019. As was the case with CFE and C2, there will be no parallel period. The planned migration date is a hard cut-over, and the legacy platform will be shut off.

I just alluded to the nine feature packs, but I want to take a moment to highlight the first couple that will roll out.

Feature pack one bundles enhancements related to DPM entitlements and reserve orders, specifically:

- DPM small order entitlement allocation
- Implementation of reserve orders and complex reserve orders, subject to SEC approval
- Implementation of new EFID group risk controls
- OCC customer ID and clearing member optional data field mapping
- New sell market orders in no-bid series behavior.

Testing for feature pack one in the BZX, C2 and EDGX Options certification environments is already available and will be launched to production on November 29, dependent upon regulatory approval.

Feature pack two bundles enhancements related to the coding interface. Specifically, a new BOE Quote Update message will be introduced allowing firms to submit up to 20 updates via a single message on BZX, C2 and EDGX Option Exchanges. This will ultimately replace the current BOE Bulk Update message, which sends individual messages to the Matching Engine from the order gateway.

The BOE quoting messages will be available on EDGX starting January 17, and on BZX and C2 on January 25. The existing Bulk Order message will be deprecated, effective March 29, in favor of the new Quote Updates. Feature pack two will also include new risk reset functionality.

Testing for feature pack two is also already available in the BZX, C2 and EDGX option certification environments. Both Anthony's and Troy's team will be working closely with you as we implement this new functionality.

Feature pack three will introduce an electronic Secure Web API for post-trade edits, while feature pack four will include all material market data feed changes. We'll announce the certification and production dates for these feature packs very soon via Trade Desk notice.

We'll have more information on each of the feature packs as they roll out. In the meantime, for all the latest information, refer to the Integration Website.

I'd like to remind you the integration website is at batsintegration.cboe.com/c1, where you can find all the resources related to the C1 migration.

As I mentioned earlier, this Friday we'll post all the technical specifications to the website, which will include the connectivity manual, market data specs, FIX and BOE specs, and other related materials. Additionally, we plan to publish a comprehensive FAQ that will cover a host of issues related to technology, certification, market data, billing and other items.

On the integration site, you'll also be able to find the planned migration timeline, the platform change matrix, new platform features and downloadable implementation guides. The website will be the source to find complete information on our series of customer calls -- dates, times and call-in or webcast details for upcoming calls, along with archived materials from previous calls.

We will be regularly adding to and refining the resources on the integration site, so I encourage you to look there regularly.

We've covered a lot today, so while the operator prepares for questions, I'd like to recap some of the key points we've touched on.

It will be an exciting 11 months as we prepare for the planned C1 migration to Bats technology on October 7, 2019. Between now and then, the foundation is being laid with enhancements to the C1 marketplace, including new PAR 2.0 terminals and the rollout of nine feature packs across our other three options exchanges, BZX, C2 and EDGX.

PAR 2.0 rollout is on track to be completed by year-end, while the nine feature packs are rolling out now through the third quarter of 2019.

While the migration date is less than a year away, and may seem like a long way off, this is actually an aggressive timeline, with numerous milestones along the way that will require your attention.

Feedback from market participants has been and remains critical as we will continue to work closely with you to ensure we deliver a robust trading platform that meets your evolving needs.

This Friday we'll release the technical specs, while the certification environments for the first two feature packs are already available now.

On February 1, new physical connections to the new C1 platform will be accepted.

On March 4, the certification environment will be available for TPH connectivity and testing.

June 15 will mark the first of five weekend testing opportunities, while May 6 will commence the new production environment for testing with test symbols.

October 7, as I've mentioned, of 2019, is our target date for C1 migration to Bats technology. This will be a hard cut-over and there will be no parallel period.

Lastly, you can find complete information and resources related to the C1 migration at our dedicated microsite, batsintegration.cboe.com/c1.

Our team is very excited about this migration and remains focused on executing a seamless technical and operational integration. We remain committed to ensuring you continue to enjoy the same great trading experience and superior customer service you've always enjoyed working with Cboe Global Markets.

Please do not hesitate to contact our Business Development or Operations teams with any questions you may have on the integration or on any of these key initiatives.

With that, I'll hand the call over to our operator to begin the Q&A session.

QUESTIONS AND ANSWERS

Operator

And at this time, if you would like to ask a question, you may press star, then 1 on your touchtone phone. If you are using a speakerphone, please pick up your handset before pressing the keys. To withdraw your question, please press star, then 2. You can also submit questions through the webcast by typing your question in the Submit Question box on your screen. At this time, we will pause momentarily to assemble our roster.

Our first question from the phones will come from Dan Heffernan with Bank of America. Please go ahead.

Dan Heffernan

Hey, I see in package three, you mentioned that the API will be released. Will that also be released for the C2 exchange once it's available on the C1 exchange?

Chris Isaacson

Yes, so, Eric Crampton, do you want to handle that question?

Eric Crampton

Sure. Yes, when feature pack 3 is released, that will be available on all three of the Bats technology exchanges, including C2, at that time, and then once — with the C1 migration, it will be available on the C1 migration date as well, (with the) same interface across all four exchanges.

Dan Heffernan

Thank you.

Chris Isaacson

Thanks for the question, Dan.

Operator

And again, if you would like to ask a question, please press star, then. 1.

And we do have one more question from the phone from Alex Shleimovich with Barclays. Please go ahead.

Alex Shleimovich

Yes, the question is that you just mentioned that there will be a TPH-centric DROP copy. That means [unintelligible] from there will be a single DROP copy? How will you currently have with C1 implementation?

Chris Isaacson

Yes, Alex, so this is Chris. There will be — the DROP copy setup will be very similar to the way that BZX, C2 and EDGX work today, and on that DROP copy, a firm can DROP from multiple order-entry sessions onto a single DROP session as well as multiple EFIDs. They just need to work — each firm needs to work with the Trade Desk to ensure that their DROP copy is set up to drop the right data.

Operator

And I am currently showing no further questions from the phones. Mr. Isaacson, would you like to take any online questions at this time?

Chris Isaacson

Yes, at this time, we just have one call — or one question online, which is, “Will the new Cboe exchange be CAT compliant from the get-go?” And the answer is yes, pursuant to any guidelines or any requirements of the CAT, we will be compliant both before and after this migration.

Operator, do we have any more questions on the phone?

Operator

At this time, I am showing no further questions from the phones.

CONCLUSION

Chris Isaacson

Well, I think if there are no further questions, I just want to thank all those who’ve taken the time to dial in today, and with everything we do your continued input and feedback are critical, and we appreciate the opportunity to work with you through this very critical integration for us and for you. And, with that, have a wonderful afternoon.

Operator

The conference is now concluded. Thank you for attending today’s presentation. You may now disconnect.