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TECHNOLOGY ADVISORY COMMITTEE

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P R O C E E D I N G S

(10:10 a.m.)

COMMISSIONER O'MALIA: Thank you very much. Thank everybody for attending and participating. We have kind of a three-ring circus here today. We have the full TAC committee members sitting around the table. We have the Data Standards Working Group on our left and we have the new High Frequency Trading ATS Subcommittee on my right, and we're going to have a series of three panels here today. So I greatly appreciate everybody coming today and participating and we'll get the fifth Technology Advisory Committee off to a start here.

We've covered a variety of issues thus far, including pre-trade functionality. One of our first groups, Dr. Gorham helped us establish that working group, the first working group we ever had. We've had the SEF Showcase, and now we're going to tackle high frequency trading in addition to the work that the Data Standard Subcommittee has presented us today.

Despite its ubiquitous utilization in our markets, high frequency trading is not only -- is not well understood by the public and the relevant

regulatory bodies, as I believe it should be. So that's one of the reasons we're going to tackle that.

Today's discussion will cover three different topics. Our first panel will discuss the role high frequency trading plays in our markets. Working with our chief economist, Andrei Kirilenko, we have selected 24 individuals to participate in the new subcommittee on automated and high frequency trading, and hopefully over the next several months, depending on their work product and time tables, we can have much better clarity into the practices and the definition into this -- into this area.

The second panel will focus on the final recommendations of the subcommittee on data standardization. As I have said before, data is the foundation of our markets and essential to supporting our transparency requirements. Our ability to capture market data is -- in a universal electronic form is essential to automating our surveillance and oversight programs.

The third panel will explore the deployment of technology solutions in the swaps market with a specific focus on evaluating the costs and technological and scheduling challenge posed by

fully integrating pre-trade credit checks by October 1, 2012, as a technological substitute for documentation. In particular, I'm interested to understand how the industry will develop a seamless interconnection of FCMs, SEFs, DCMs and CCPs to ensure that trade -- trades come off without breakage.

Technology has been the true driver of change in our markets and continues to dictate its evolution. Automated and high frequency trading strategies have narrowed market pricing and provided liquidity. The Commission's challenge, however, is to ensure that as markets evolve, the Commission is able to keep pace and develop oversight and surveillance capacity to ensure markets function in their appropriate manner.

There is little empirical data regarding the impact of HFT strategies on market pricing and overall market behavior and better data and standard definition of these market behaviors must be developed. It seems on a weekly basis there's a new story about automated trading and high frequency trading. In fact, today in The New York Times I read Nathaniel Popper's story quoting Richard Bentley of Progress Software, and many of you know

Progress because John Bates serves on the subcommittee. He could not make it today. And Mr. Bentley said, we've managed over the past several years to equip traders with Ferraris and the regulators are trying to keep up with them on bicycles.

Recent headlines have announced the FIA Principal Traders Group and the FIA European Principal Traders Association developing recommendations on procedures for the development and testing of deployment of trading software. Last week the UN Conference on Trade Development published a report which purports to demonstrate an economic correlation between high frequency trading and distorted commodity prices.

We also witnessed the impact of -- poor computing coding can have on a market with the unfortunate computer glitch associated with the IPO of BATS on its own exchange. And on Tuesday I read that the EU is considering a definition of additional controls on HFT strategies as part of its Method 2 proposal, and they have four to five different proposals, very specific in that paper. And Markus Popper, the lawmaker who -- or Markus Ferber, who is the lawmaker steering that proposal

through, has advocated also a 500-milisecond resting period for ATS orders.

There are definitely strong opinions on both sides of the HFT debate, and on both sides of the Atlantic, for that matter. In an effort to undertake and define this practice, last November I sent out a letter to the subcommittee members, or the full committee members, asking them for their opinion and definition of HFT. And as I noted earlier, I have asked Andrei Kirilenko, the chief economist of the CFTC, to lead a subcommittee to develop an appropriate definition in the -- of HFT within the university ATS, the Automated Trading Systems.

My goal is to have a working description of the attributes of HFT in order to better understand the impact they have on our market. Developing a nomenclature is important, if only as a means to study the trading activity on a consistent basis. Working with Andrei, it is up to the workings groups to establish their own working schedule and meetings and to develop recommendations for the full Technology Advisory Committee to consider within the broad parameters of that subcommittee.

I have also requested that the Securities and Exchange Commission, working with Chairman Schapiro, to send staff to participate in these working groups, as well to ensure full coordination by our two agencies. And we are pleased to have the participation of Dan Grey and Mike Watson from the SEC.

Today we will hear from four witnesses to kick off our debate on the ATS/HFT debate. And I have three goals in mind for today's discussion. One is to establish -- to establish the existing exchange oversight and controls monitoring of HFT activity in the markets today. We have Dean Payton and Mark Wassersug. Dean Payton from CME, I'm sorry, and Mark Wassersug from ICE will identify -- will testify regarding what each exchange is doing to manage trading on their respective exchanges.

Second, we will evaluate and discuss the current state of economic research regarding identifying and analyzing ATS behavior and their economic impact, and we're pleased to have Joel Hasbrouck, who will provide an update on the current economic research as well, from New York University.

And third, identify the attributes of ATS strategies and the firms and to the extent in which

they participate and impact futures markets. Sean Castette from GETCO will provide his perspective on ATS/HFT strategies.

Before I turn to my colleagues for their remarks, I want to let the members of the TAC and the two subcommittees know how much I greatly appreciate your service. I remind my colleagues that everybody here is serving -- has a full-time job and is serving in -- using extra time and taking time away from their families and their jobs to come support our efforts to understand these markets better.

I personally have benefited enormously by your participation and your influence and your ideas and I greatly appreciate that and I know the Commission policy will be better served through your support. I do want to recognize, and I think I said earlier, we're a little early for the data standards guys. I think they're coming in after lunch, but they have put in an enormous amount of work and effort doing calls that have been open to the public, but have worked extremely hard to put together four working group papers that will be presented here today, and we greatly appreciate their service.

Recognize everybody on the HFT, the 24 members who are going to participate in that. We greatly appreciate your time as well. And I want to also thank our staff facilitators, and probably the best time to recognize them, we have -- if you'll just stand up, so we need to make the link between the HFT Working Group and our staff. On Working Group 1, Joan Manley and George Pullen. On Working Group 2, we have Harry Hild and George Herrada. Working Group 3 we have Andrei Kirilenko, Richard Haynes and Jeremy Cusimano. Working Group 4 we have Andrei Kirilenko, Richard Haynes and JonMarc Buffa.

Right after lunch, Andrei, I think, is going to lead a brief meeting to make sure we -- that we're able to get the staff with the working groups so you're familiar, you can exchange contact information, and begin to lay out a strategy for your meetings and time table. So I appreciate everybody's cooperation, willingness to come and participate today.

I'm going to turn it over to the chairman for his comments.

CHAIRMAN GENSLER: Thank you Commissioner O'Malia, or should I say Chairman of the Technology Advisory Committee, for convening this meeting of

the Technology Advisory Committee, and also convening the first meeting of the Subcommittee on Automated and High Frequency Trading of the Technology Advisory Committee, if I got all the words right.

I also want to thank all the members of the full committee and all of the members who are willing to advise us and serve on the High Frequency Trading and Automated --

COMMISSIONER O'MALIA: It's a mouthful. ATS/HFT, whatever you want.

CHAIRMAN GENSLER: Well, being willing to associate yourself with the word "high frequency trading" in itself is a really interesting thing. So we applaud that. But financial reform means the Commission must continue to adapt our oversight to a changing market structure, including emerging trends in electronic trading, and you've been talking about that for some time.

But of course in the markets, one thing we can be quite sure of is that means of communication and technology will continue to advance and affect our markets. This was true in the 19th Century when telegraphs came along. It was -- it led to the introduction of the ticker tapers we all know. It

also is true in the 20th Century when telephones first allowed a central quote system where market participants could get instantaneous bids and offers at that point in time. And I'm sure there was a lot of debate and controversy at that time.

It was further true during the last decade when futures markets went from largely open outcry to now nearly 90 percent traded electronically. So where market makers used to meet on the floor of exchanges, they now often sit at computers miles away or even in another continent. And while market participants used to be involved in each of their trades, they now often rely on algorithms to execute those trades.

So humans are much more frequently relying on the judgment programmed into their machines, which will then initiate and execute their trading strategy. The markets have evolved to where we increasingly find machines competing with each other. So regulators, I believe, cannot assume that the algorithms in the markets are necessarily well designed, tested or supervised. Our regulations have to adapt as the markets increasingly move from man to machine.

Only through adaptive regulation can

hedgers and investors have confidence in the markets and the integrity of those markets. This year the Commission will continue to adapt and work on our oversight of these changing markets, including emerging trends relating to electronic trading. The Commission's already taken a number of steps, and you've already been very helpful in these in that regard.

As it relates to both trading and clearing, the Commission has proposed that there be pre-trade filters to protect the markets and the clearing system and our proposed designated contract market rules and our proposed swap execution facility rules. These trading platforms were required to put in place effective risk controls, including pauses and/or halts to trade in event of extraordinary market events.

We also sought and received many helpful comments on possibly requiring additional risk controls, things like price collars, limits on maximum order sizes, stop loss and kill buttons. And I know later today, I think one of the groups is going to be talking about that, which will be very helpful.

This month we did actually finalize some

rules to strengthen risk management procedures and clearing members. The final rule requires that futures commission merchants and dealers and the like establish risk-based limits on their customers and house accounts. Basically risk filters and procedures would help secure the financial integrity of the clearing system.

In addition, the Commission finalized internal business conduct rules with regard to swap dealers. Doesn't necessarily affect many of you now, but there might be a time that some of you will be electronically trading swaps and this will be helpful because within those rules, maybe not well noticed, but within those rules a risk management procedure requiring swap dealers to have policies and procedures that detect, identify and promptly correct deficiencies and operating and information systems.

Furthermore, the risk management procedures are required to be tested and reviewed. So taken together, these requirements are important enhancements to protect a rapidly changing market, because one day swaps may be in a similar place that our futures markets are now.

Further, I expect the Commission will

consider putting out for comment a concept release concerning testing and supervision of automated market participants, especially those with direct market access. Concepts will be designed to address potential market disruptions at high frequency traders and others who have automated systems and access and costs.

The Commission's also looking to propose a rule when reporting of ownership and control information for trading accounts. That will give us more information as well. These rules would enhance our surveillance capabilities, increase transparency of trading.

So again, I'd like to thank Commissioner O'Malia for his work on this, as well as Chief Economist Andrei Kirilenko. I note that both of them ride to work on a bicycle every day, so I know that this article was probably referring to you. But some of us just run or walk as regulators. I think, Commissioner Wetjen, you ride a bike as well, right?

Yeah, so I think they're referring to the three of you. But the work of this committee and this subcommittee helps inform and infuse good advise and your thoughts in all that we're doing.

That which we've already done I think was better for it. That which we've put into the designated contract market and SEF proposals came right after the FIA and this committee, and I think under your leadership was working about a year ago or 18 months ago into that, and I think it will really help us as we continue to move forward to adapt to changing market structures.

So I thank Scott. I thank all of you, those particularly willing to associate yourself with high frequency trading.

COMMISSIONER O'MALIA: Thank you, Mr. Chairman. Commissioner Sommers?

COMMISSIONER SOMMERS: Thank you. And I just want to echo the gratitude of my colleagues to all of you and to the Commission staff that are willing to put in extra hours on these very important issues. I can't say enough about how important it is for this Commission to be more informed and to have a greater understanding about the types of new market activities and the type -- the ways that these markets are evolving.

The Commission has a long history of regulating actors within the markets for their specific behaviors, floor brokers, CPOs, CTAs, IBs,

with regard to their different activities in the market. But we've never based our regulatory scheme on the type of access that someone has or the different hardware or software that they utilize.

I believe that it's absolutely appropriate for us to understand and recognize different trading activities and to impose different regulatory obligations on those activities. But I believe it would be unprecedented for this Commission to decide that we draw distinctions between market behaviors or methodologies. In my mind, this would be like regulating the guy on the outside of the ring differently than you do in the guy in the inside of a trading pit based on their location difference, based on their different trading style, or maybe even the sound of their voice.

Hopefully with the help of this advisory committee and the ATS/HFT Subcommittee, we can define and develop the appropriate regulatory framework for the specific market activities. I'm confident that this further analysis can prevent us from requiring certain market participants to be registered in categories that do not fit their activity and help us to avoid policy decisions with the potential to cause adverse market implications.

Again, just to echo what the chairman said about Commission O'Malia's work on all of these issues, this particular advisory committee and the subcommittees that he's developed I hope will help us gain a better understanding and help us to improve our oversight regime.

COMMISSIONER O'MALIA: I think we have Commissioner Chilton on the phone?

COMMISSIONER CHILTON: Yeah, I'm here. Good morning.

COMMISSIONER O'MALIA: All yours, Bart.

COMMISSIONER CHILTON: Well, I'll echo what my colleagues have said, but thanking you, Scott. I do so privately a lot of times guys. Commissioner O'Malia has done a great job on this, as has his staff, and I very much appreciate it. You've done more with the advisory committees than I've seen in the time that I've been here, and really to be commended.

I appreciate you doing this over the phone. I won't be long here, and I'm just going to be around for the morning, Scott, and I'll just listen after this. But I came across an interesting statistic a couple of weeks ago and it was in working with DPCC, and then talking with somebody

who's pretty smart on this stuff.

There are over 160 million financial transactions taking place around the world every day, and that's not people, a check clearing their bank. But it's 160 million market-related financial transactions taking place all around the world. And it's just sort of amazing when you think about a normal size and breadth of the markets and how traders are not just up on one market or one exchange, but they're arbitraging all across the world. And these things are -- the HFTs, the cheetahs as I call them, are sort of churning away and burning up the fiber 24/7/365.

It's pretty amazing actually and I commend the exchanges for the work they've done, that we don't see more problems than we do. They do a really good job of trying to keep track of it. But that said, there has been some noticeable trips and falls and I won't get into those. You know what they are.

The argument that I hear a lot, and both Commissioner Sommers and Chairman Gensler referred to it, but I hear this a lot, that while the cheetah -- the FHTs are really just an extrapolation of the day trader. It's just like the pits. You

know, these guys are basing their trades upon intel that they just get. It's as sophisticated as it can be, that they try to execute fast in order to get an advantage. And they try to be essentially flat or have as little exposure as possible at the end of the trading day.

So while I accept that those are similarities with the day traders, you know, there are still -- that's still an argument that some people use to say to regulators, so since they're like the day traders, there's nothing to see here. Move along folks.

Remember that old day tripper song, the Beatles song, it says got a good reason for taking the easy way out. Got a good reason for taking the easy way out. Well, I understand why some people would make that argument. They don't want to be regulated. That's the easy way out. And for us it's naive to think that these things aren't different, that the cheetah traders aren't different than day traders, and dangerous from a regulatory perspective.

And so I really appreciate the fact that we're looking at this. I know you all believe that we need to understand it better. I talked about not

only registration, but of the pre-trade functionality testing essentially before HFT programs go into the production environment, about kill switches in case the programs go sterile. Those are three things that I think make some sort of obvious sense.

But I appreciate the work that everybody's done there. I appreciate all that the TAC and the subcommittee for --subcommittee for your future work. And let's just hope that if we go forward with this in the right way and have a balanced approach, as Commissioner Sommers is talking about, that technology in market isn't simply a one-way ticket. Thank you.

COMMISSIONER O'MALIA: Thank you, Commissioner Chilton. Commissioner Wetjen.

COMMISSIONER WETJEN: Thanks Commissioner O'Malia. I was just going to add my voice to the chorus of praise for Commissioner O'Malia and all his hard work on this issue, and his effective use of the advisory committee has been -- you've been very clever and effective in figuring out how to use us as a useful tool, and not just for the Commission, but I think also for the benefit of market participants.

I also appreciate the fact that today with this meeting there's some targeted issues that hopefully everyone here in the room are going to be able to help us grapple with, and I think focusing the discussion that way is especially good for the Commission.

And then lastly, again just want to pile on, I guess, with what the others have said. I know -- I know how difficult it can be for folks that are here today to make time to do this kind of thing, but again, it's very -- it's very, very useful to us, very, very important to get your input. So appreciate the fact that you trekked to D.C. if you're from out of town and taking yourselves away from your regular day jobs. We really benefit from it and really appreciate it.

So look forward to the discussion today.

COMMISSIONER O'MALIA: Thank you very much. Next we're going to hear from Andrei Kirilenko, our chief economist.

MR. KIRILENKO: Thank you, Commissioner O'Malia. I'd just like to make a few brief remarks to introduce the new Subcommittee on Automated and High Frequency Trading of the Technology Advisory Committee. I think this is going to be a terrific

effort and highly anticipated effort, as you can see by all the commissioners and the chairman.

This subcommittee includes 24 very, very able individuals who have kindly agreed to devote their time to public service. They're extremely well qualified. They represent a diverse set of views. We have exchanges, designated contract markets. We have futures commission merchants. We have a variety of different HFTs. We have traders who are still human traders. We have a variety of experts, experts both on the technology of automated and high frequency trading and experts on the impact of it.

We also have data vendors. Data is an integral part of this ecosystem. So we really look forward to their participation on this. We've split up this 24 very able individuals into four working groups. We've done this before. This is done for -- to make -- to basically make this operational, to make this work in a sort of focus, to have each working group focused on specific tasks.

The first working group is going to work on the definition of HFTs. The second will work on different types and maybe tag HFTs. The third will look at surveillance, regulation, other things. And

the fourth one will look at sort of broader market microstructure issues, as Chairman Gensler said, which has been evolving, and we need to think of adapting our regulation and oversight.

The objective of each working group would be to see -- to produce written recommendations that could be consumed by the public and used by the Commission for consideration and adoption. These recommendations will be then given to the Technology Advisory Committee and you will see how it's done sort of later this afternoon where the other subcommittee that we have on data standardization will be giving their recommendations to the Technology Advisory Committee.

So that's sort of what the endpoint sort of looks like. It doesn't mean that sort of work ends here. We think of this as a catalytic effort. There's an effort where we catalyze with you and with us a sort of broader trends within the industry to move towards an environment where these automated and high frequency trading is better understood, where it's better understood what oversight and regulatory measures need to be in place in light of their presence in the markets.

So I'm very excited that we are starting

this process. As Commissioner O'Malia has said, you and the working groups are going to have a chance to meet very dedicated staff of the Commission and observers from other agencies who will be working with you. They'll be facilitating. I've heard there will be -- they will be there to serve your needs. But you're the advisory subcommittee. You will be the ones advising all of us.

We have -- to get things started for the subcommittee, we've select -- we asked four representatives of the subcommittee to speak on a number of issues related to exchange oversight, academic review and sort of a practitioner's view to get things started. We anticipate to have some additional public meetings of this subcommittee going forward where you'll have a chance to speak in public, where each working group will have a chance to present its views in full public view.

We have curtains drawn so we can be seen by anyone. This is time for these issues to come clearly out in the open by people who know what they're talking about, and they're excited to have this opportunity to start this process today.

Thank you all again.

COMMISSIONER O'MALIA: Great. Thank you,

Andrei. As I noted, I started this creation by sending out a definition of what is ATS/HFT. And I sent that to the Technology Advisory Committee. I think to start it off, I'd like to recognize Richard Gorelick. He has some comments to make about this issue.

If any of the other TAC members haven't -- want to say something, that's fine. We can arrange for that and then we'll go to the panels. So Richard, thank you.

MR. GORELICK: Thank you very much, Chairman. Thank you, members and staff of the Commission, for inviting me to participate in this important discussion. I'm the CEO of RGM Advisors, a principal trading firm based in Austin, Texas.

I have consistently supported regulation that promotes fair competition, enhances transparency, manages systemic risk, lowers costs for investors and hedgers, and gives regulators the tools they need to detect and deter abuse. Most importantly, I believe that any inquiry should be driven by empirical evidence of what's actually going on in these markets.

Right now the Commission, through its own records and through the exchanges, has unique access

to fully attributed audit trail data on every single order and trade in the futures markets.

An essential first step is for the Commission to analyze this information that's available to it. If the Commission does not believe that it has the technology or the expertise to archive or evaluate such data, this group, the Technology Advisory Committee, is well suited to advise the Commission.

Two areas warrant special examination within the data. First, what is the overall quality of the market? Existing research consistently shows lower trading costs, tighter bid-ask spreads, greater liquidity, reduced short-term volatility and approved price discovery over recent years. But don't just take my word for it. It's appropriate for the Commission to look at the data independently to get to the bottom of what it says about market quality.

The second issue is to surveil the audit trail for improper market behavior. Unfortunately, discussions of abusive or disruptive trading practices are largely driven by suspicion, emotion, rumor and anecdote. That's the wrong way to make good policy. Rather, why not look at the data, get

evidence, investigate and take appropriate action?

One of the great virtues of public electronic markets is transparency. I urge the Commission to shine light on what's really going on in the markets before engaging in finger pointing at a particular group.

Where to start? At the December TAC meeting, as Chairman O'Malia indicated, I suggested that the Commission define a group of direct ATS participants, firms that use an automated trading strategy directly connected to an exchange. Instead of starting with a narrow group defined by arbitrary thresholds, by starting with this broad universe and then sorting and filtering based on relevant criteria, regulators would get a complete picture of market activity.

Recall that an automated trade by a mutual fund was an important factor in the Flash Crash. It does not make sense to turn a blind eye to some market activity by defining your way at the outset. Moreover, it would be a shame to have spent such considerable time and effort attempting to study high frequency trading only to realize that we still don't have a full understanding of what's going on in the markets.

That's why we maintain that anyone trading should have proper risk controls and should be subject to appropriate market surveillance, no matter at what frequency they operate.

Mr. Chairman, I'm hopeful that the actions today will help us to move beyond the preoccupation with high frequency trading and to take thoughtful and concrete steps based on real evidence to strengthen our markets. Thank you.

COMMISSIONER O'MALIA: Thank you very much. Anyone else from the TAC want to make a comment? We're going to go to the -- our four panelists, and I'd remind everybody, everybody's got microphones in front of them. You can ask any question. We're going to ask questions. And we're getting microphones for the HFT members as well so you can ask questions. And we'll go down the line and take questions after each panelist -- at the end of the panel. I'm sorry.

Panel 1, we have Mark Wassersug, vice president of Operations of ICE. Mark has been with ICE since 2001, has been vice president of Operations since 2004. He is responsible for overseeing all trading and clearing platform technology operations, including the global network

and infrastructure design and operation. It's my understanding that Mark's job is to cover these markets like stucco.

So we have Mark in the first panel, followed by Dean Payton, managing director and deputy chief regulatory officer of the CME Group, and has been in that position since November of 2009, and responsible for overseeing CME Group's regulatory efforts for CME, CBOT, NYMEX and COMEX.

Following Dean we have -- Joel Hasbrouck has been at the Ken Langone Professor of Business Administration and Professor of Finance at the Stern School of Business at New York University, and his research focuses on the analysis, design and regulation of securities trading and mechanisms, and he's the author of empirical -- of empirical market microstructures study, Oxford 2006, and numerous other articles. We're pleased to have your participation as well.

And Sean Castette is chief information officer at GETCO, a little small firm some of you have heard of, and he is -- joined them in 2001 and currently leads the firm's fixed income commodities and currencies trading groups. In his role, Sean is responsible for overseeing GETCO's global trading

activities in these asset classes, including the identification and development of new and enhanced trading strategies and technologies initiatives. He also serves on the GETCO senior management team, helping guide the firm's overall strategy.

We're very pleased to have all of you here today. We're going to start with Mark and work our way across. So Mark, it's all yours. Thank you.

MR. WASSERSUG: Thank you, Commissioner O'Malia, and the rest of the Commission, for inviting me to speak today. I am vice president of operations for ICE, and as Commissioner O'Malia said, yes, I cover the ICE markets like stucco. But really I would say it's more like the purple skin on an eggplant.

What I would like to talk about today is our oversight of automated trading systems and controls and functions that we have within the exchange to cover those systems. So it's a -- I have a very brief presentation. Happy to take questions throughout the presentation, or at the end of the presentation.

So the first slide I'd like to just discuss how ICE, we at ICE, from an operations perspective and compliance perspective, think about

automated trading systems. To me, the category is very broad. It's with two main focuses, one, automated order submissions, and two, direct market access.

So we have a broad view of clients who automatically submit orders to the ICE exchange. We can be talking about a simple ISV that has a spreadsheet hook to it through to an auto-spreader, or finally to a significant and sophisticated black box algorithm. But all of these customers maintain a direct market access. From the exchange perspective, that's how we would evaluate an ATS, and we really don't look at subcategories beyond that from a monitoring and a compliance perspective.

As many of you have talked about, the benefits of ATS are providing liquidity, market making abilities and tighter bid offer spreads, but unlike with any benefits, there are risks also associated with these same types of activities. Next slide, please.

From a risk perspective, we really look at two broad sides of risk, one, the operational risk, and two, compliance risk. As you can imagine over the last five years, we've seen significant growth in transaction rates and order and message

processing and just with the amount of data that we've had to consume and analyze.

This is -- one of the risks to our exchange obviously is to be able to keep pace with technology, bandwidth, monitoring, et cetera, to match the demands that our clients have for the consumption of that -- of that technology.

These -- the types of processing that we're doing could potentially impact performance, not only from the exchange by slowing down the flow of messages and flow of transactions, but also our users can be impacted as a result of having consumed more and more information and process that information.

The second set of risks that we look about -- look at from an exchange perspective is a compliance risk. So we have to be able to monitor and closely analyze purposeful or accidental market impacts for -- from orders coming into the market at a very high rate on a large scale and have the capacity and the ability and the tools to actually monitor, report on and analyze this data in real time as well as in the past. Next slide.

Over the 11 years that I've been at ICE, we have put in a significant number of controls,

automated and manual, to help alleviate some of the risks that we have within the exchange. And these controls are not -- were not put in place to deal with automated trading to do with HFTs in particular.

Our view is that these controls are systemic and need to be in place for any type of user on the exchange, whether they are a user using a mouse or a computer trading against the exchange. Some of the controls that I want to speak about really fall into two categories, automated order entry validations and then manual validations and controls.

From an automated perspective, what our mandate is from the exchange side is to protect the exchange from errant events, anomalies. So here I have listed five sort of the high-level controls that we put in place. Message throttle limits for one. So we throttle an individual user, an individual market session with a certain number of messages over a certain period of time. So we can control a runaway API. We can control a user potentially floating hundreds or thousands of messages in a given period of time.

This allows -- this allows us to not only

monitor and regulate the amount of messages coming in from a particular user, but it also gives us a good understanding of how a user's trading strategy can be used, and we will work with the user to figure out appropriate message thresholds based upon their activity.

Another automated control we have in place are maximum quantity limits. So you might look at -- you've heard fat finger error, where a user might be looking to bid or offer 10 and they accidentally type in 10,000. Well, we have set quantity limits across the exchange by market, which will eliminate the ability for a user to make a fat finger error such as this. An order that comes in beyond a maximum quantity limit would be rejected and an alert would go into our operation center, as well as to the user that the message was rejected and the reason it was rejected.

I think one of the unique features that we have as commodity exchanges, both CME and ICE, are the price reasonability validations. What we -- what price reasonability means basically is we collar an upper and a lower range of price acceptance based upon the current market price at any given time. And that range is preset by market

and will reject any order that comes in above or below that particular range.

So for example, much like the fat finger error on max quantity, if a user is attempting to float a bid at 10 and it's 10,000, we would -- we would be rejecting that price limit through our reasonability validations and the order, again, would be rejected and the user would be notified.

The fourth point is our position validation, so whereas the first three were more along the lines of floating an order, position validation is actually looking at real time position, long or short position, and rejecting orders for trades once a position limit was -- position limit was met.

That is controlled not by the trader, but more at the risk manager level or at the clearing firm member level, whereas these are credit checks that can be done again in real time based upon active live position from a particular user, or a particular account.

And finally, one of the things from the FIA principles is the order to move upon log-out. All ICE users who are disconnected from the system can -- will have all of their orders removed from

the market upon disconnect. Now we do have the ability for a user to float an order that stays live after disconnect, but by default orders are removed upon log-out. So we don't have orders sitting in a market where a user may have lost connectivity or there might be a problem on their end or on our end.

From a manual validation perspective, one of the key features that we have is a log off user and kill all button, so whereas similar to once users log out, all their orders are pulled, again, risk managers, clearing members have the ability to log in and remove a user from a market, which would kill all of their orders that were live at the market at that time.

We also give clearing members another tool that allows them to suspend, close, deactivate clearing accounts, which again eliminates a user's ability to trade at any given time, thus pulling all of the orders out of the market. Again, these are risks controls that we feel go beyond just the trader's ability or the trading firm's ability, but sit at the heart of mitigating risks at the clearing perspective.

We have a very well documented cleared trade policy, error trade policy, as well as no

cancellation range across all of our markets and across all of our exchanges. So those are -- those are really the controls that we have in place. One of the unique features that we just added to ICE two weeks ago is something called the Interval Price Limit. It's something we've been working on for about a year and a half. And we began this work as a result of the Flash Crash. Next slide, please.

The Interval Price Limit is basically ICE's circuit breaker to prevent or protect against price spikes. What the IPL does is it provides a rolling floor or ceiling price over a given time frame that is configurable to a particular market. This rolling price recalculates on a particular X interval, or Y interval, X interval over time and at a particular interval height up or down, and it eliminates the ability for a user to either offer through the market or bid above the market.

What the -- how the IPL works is if we -- if a market hits a low point along the IPL, let's say the interval price limit is set to $10 and -- the price of the -- sorry, the price of the -- the price of the future is trading at $20 and we have an IPL of -- range of $10, we would have a low limit of 10 and a high limit of 30. If that low limit were

enacted, it traded below or offered below that limit, the market would be put in a hold state. Now hold doesn't mean closing the market. It doesn't mean suspending all transactions. What it means is it holds the ability for any offers to come in below that $10 low limit, but allows bids to come in to be able to stop any gap down that might be taking place. And it also allows the ability for people to trade above that low hold limit.

The hold is configurable. Generally on our system right now it's configured anywhere from five to 30 seconds across different market types, and although it hasn't been triggered, we are going to be looking at what those intervals are and resetting them based upon market activity.

What's important is the notification of that hold goes out to the market in real time, so all users are aware in real time that the market is held, why the market was held, the price information that put the market in a hold state and what the interval will be and when the hold will be lifted. And finally, once the hold ends, a new IPL upper and lower limit are calculated and trading can resume. If we go to the next slide.

I put a diagram together to sort of

represent what that -- what this might look like. So on the first section on the left there, you've got this -- our IPL interval. You can see APs are -- we're calling it the average price, anchor price of the market at any given time. The reasonability limits are what we won't let the price trade above or below at any given time in the market, and our IPL range is the thick upper and lower lines.

As you can see after the first interval, the average price is going down. We recalculate the IPL, but the price now has some precipitous drop and we see a trade below or attempted below the lower IPL limit. This immediately puts the market in a halt state, or hold state, so no trading below that IPL limit can take place. However, trading can take place within that trading allowed range and above the lower IPL limit.

And then our assumption and our hope is that we see market orders come into the market that will add some strength to the lower end and the market will rebound off the low, eliminating or -- eliminating the ability for the market to spike downward where we would see potential stop orders start coming into the market and you would see a

precipitous drop in price. As the -- as a hold is lifted, a new IPL calculated and we continue to move on in a direction of normalcy afterwards. Next slide, please.

The second side of the controls scheme that we look at are really the system monitoring and the system controls. So whereas the first were our functional controls within the system, this is more of our oversight and monitoring of particular markets at any given time.

We have -- I guess one of the key points about having any ATS in your marketplace is being able to validate that ATS performs in a way that you would expect it to perform. We have a rigorous testing and conformance program that is run out of ICE which requires all ATSs to actually conform with particular test cases and a particular program, and until that ATS is certified by the conformance test and meets all the criteria of the performance test, it will not be permitted to trade on the ICE exchange.

One of the -- I think the key features is the recertification as either ICE goes through changes on the trading system that could impact ATSs or ATSs go through significant changes within their

technology or functionality. We do require recertifications as well.

We also, much like our -- the message thresholds we talked about, we have message rate thresholds, whereas the regulator on an individual ID looked at particular IDs. We actually look at message rates across a particular market over any given time period. So we're able to monitor if there's a spike of activity, a flurry activity, not just by an individual user, but again, at the entire market level, and we've got our operations team that is responsible and surveillance team that is responsible for handling any of these types of issues, any of these types of alerts.

We generate system performance reports internally, it seems like within every five minutes of the day, that are responsible for basically looking at the exchange at any given perspective, looking at performance levels, traffic levels, capacity levels, and being able to identify any potential -- any potential issues that might have taken place within the last time interval that we look at.

We also generate, I think, which is unique to the industry, an ATS efficiency report where we

look at particular ATSs on the exchange and we designate what their message efficiency looks like, really looking at the quality of the messages in orders that they are generating compared to the number of transactions and the number of -- and the amount of volume that is being traded.

Two other key pieces that I am going to touch upon briefly are our SMART system, which is our real time compliance surveillance system, and our message policy and WVR reports. So SMARTS, we did the demo this last week to the CFTC. We're not prepared to do a demo today, but it's our real time market surveillance. It's essentially a real time historical graphical representation of an entire market at any given time over any given period of time.

The -- our SMARTS system is used by our surveillance teams in Atlanta, Chicago, New York and London. It's able to reconstruct a full order book and synchronize a playback for a particular market looking at very granular individual orders and time stamps of orders coming into the market based upon user information.

We've been able to -- we've had SMARTS in place for about two years. We've been able to

customize a tremendous number of alerts that allow us to detect anomalies, significant price movements, potential market abuses, and those alerts are then generated into our compliance and our operations teams to allow them to further diagnose and analyze any particular issues that SMARTS may alert us to.

There's also a significant amount of historical information that's presented in SMARTS where we can go back and do multiple analyses based upon anything that happened in the past. The -- next slide, please.

The key -- one of the other key points that we want to talk about, and this is specific to ATS, is our messaging policy. ICE has had a messaging policy really for the last four years, but three of the four years was -- we really looked simplistically at overall messages or orders coming into the market based upon the number or within ratio to the number of lots traded. And what we realized was that really wasn't giving us a good picture of how the markets operated and how our customers particularly operated with regards to the quality of the orders that were being placed in the market.

What we established last January and

implemented last March of 2011 was a new policy where we look to discourage inefficient messaging basically by penalizing messages that were further away from the market at the time of their entry and rewarding the messages that were on the market or close to the market at the time of entry. This -- we coined this the WVR or Weighted Volume Ratio.

WVR is really, the weighting is a multiplier that's based upon the proximity of that order at any given time. Our policy's enforced at the firm level and it's enforced on firms only meeting a particular number of submissions on a given day, so a threshold. And we broke the policy down into multiple tiers, really a minor tier and a major tier, and I'll get into that in a little bit. Next slide, please.

So the weighting that I mentioned earlier looks at the time of submission where that order is in relation to the best bid or offer at the time. So what we realized, that we like market makers, we like ATSs who are submitting prices at the market, best in market, a tick off the market, two ticks off the market, and we wanted to reward that behavior. But we wanted to penalize those users who were three to five or five ticks outside of the market at any

given time. Although we realized there are strategies that implement those procedures, we didn't want -- we wanted to at least force the ATSs to take a look at why and how they were entering orders, the proximity of those orders, so they could better assess whether that strategy could be refined to be improved.

The calculation that we use is simply the multiplier, so where that message is, by its proximity times the number of messages that come in divided by the total sum of the lots, to come up with our weighted volume ratio. And what we found was that with minimal prodding, the ATSs were able to back and refine their strategies where they didn't necessarily reduce the number of messages that they were sending. But they were able to refine those messages and make them tighter into the market, and it ultimately allowed us to have more efficient markets, essentially tighter markets with fewer outliers outside of particular price bands that we felt were not reasonably tradeable. Next slide.

One of the ways we were able to share this information with ATS is from the feedback we were able to give them. What we provide every one of our

ATSs who submits orders onto the exchange, is a report daily that basically gives them a breakdown of where every single order was, the percentage of those orders, the average quantity across a particular market, and where they fell within those buckets that I mentioned, the better, at one tick away, et cetera.

So we were able to provide a report such as this, and this is just a sample from one user from one particular day, back to the ATSs, so they could go back and evaluate their strategies against actual performance data that they had from the previous day. And this was, I think, a significant breakthrough from a lot of the understandings of the ATSs, because really this data was not available to them from a market perspective outside of through the ICE exchange.

So -- and again, we made this available for free on our website. If a user does violate a particular low threshold or upper threshold, they'll receive a similar report to this e-mailed to them directly next business day, but it will actually show them where they violated, what user violated the particular policy. And again, we'll be able to allow them to go and dig into the strategies that

they are using to help refine their approach going forward.

We feel that working with our customers in this way we've had significant advantages improving message efficiency and order -- on order ratios within the exchange, and I think we can show that by the next slide. Overall on ICE we implemented this a year ago. It's been one year of data. We've seen a 33 percent reduction in the WVR ratios over the past calendar -- over the past year, and we've seen some significant reductions in our U.S. futures, in our OTC markets and good reductions in our U.K. markets.

I think what's the largest standout stat here to me is that we've seen a 93 percent reduction in the amount of major violations, so reaching a VR -- WVR threshold of 500 since we implemented this procedure. And again, we haven't necessarily seen a reduction in the number of orders, but what we have seen is much efficient orders that are much tighter to the market.

This concludes my presentation and I'm happy to answer any questions. Thank you.

COMMISSIONER O'MALIA: Thank you very much. I know the chairman's got a couple of

questions already, so we will just go ahead with questions.

CHAIRMAN GENSLER: I'm going to lay out all three of my questions. One of the earlier pages, you had, I'm going to call it message throttle limits. So I was kind of curious whether we're on a country road and your speed limit's 20 miles an hour, you're on a highway, it's 70, or it's the Indy Speedway and it's 210, but it would be really interesting to know what the speed limit is. Some example you could use, I don't know, you're Henry Hubb contractor, you know, just something that we're familiar with.

Second question I had is just overall, if you could give us a sense of what is the ratio of messaging to transactions? I mean, I occasionally use something in a speech that Andrei's given me, but I'm not sure the number's right. I mean, Andrei's always right, but I'm not sure that -- I'd like to know what your -- what's the average that ICE, or if you can give some contract.

And then the third thing is, if I understand this Weighted Volume Ratio approach, is it possible that you could have an inadvertent reaction that you'd have less depth to book, and so

in quickly moving or volatile markets if you're dis-incentivizing people to be five and six ticks away that you might find that you actually have sort of something you didn't want, but then the thing could just blow right through?

So those are my three questions.

MR. WASSERSUG: Sure. Let's take them from the top, Mr. Chairman. Thank you.

The messaging threshold limits, so that is actually set on a -- by a particular individual basis. So the range can be very broad. For example, a particular WebICE user --

CHAIRMAN GENSLER: So different speed limit. Rick's got a different speed limit than maybe each of the 24 members of the new advisory committee.

MR. WASSERSUG: Correct. And that speed limit can vary based upon how that -- based upon how many cars are driving on the highway. So if a particular user is trading just Henry Hubb, that speed limit is going to change if that particular user -- it's going to be different than if that user is trading Henry Hubb and sugar, for example.

So we have to allow for that speed limit to be able to handle both markets at the same time.

The user has the ability to trade multiple markets across the same -- across the same trading session. After a certain period of time though, our recommendation to that user is that they split up the individual sessions, so they put sugar in one car and they put Henry Hubb in another car, and then we can reduce the speed limit overall on the highway.

CHAIRMAN GENSLER: So just because there's probably a lot of questions, a lot to go through, if you could provide the five of us just something that is in plain English, just to understand.

MR. WASSERSUG: Sure.

CHAIRMAN GENSLER: You know, is it like a -- you know, you can put 1,000 messages in six nanoseconds, or is it like 100 messages in three seconds? You know, I'm just trying to understand.

MR. WASSERSUG: From an ATS perspective, messages per second perspective, on a initial put orders into the market, the setting that we go with generally by rule of thumb is 300 orders in one second for an ATS. For single clicker WebICE session it's an order of magnitude less than that.

CHAIRMAN GENSLER: That's helpful. It just gives it perspective. And then on the other,

how many orders per transaction do you -- whether it's Henry Hubb or sugar, on average?

MR. WASSERSUG: Can you back up one slide? So looking at this -- this is our analysis for our Weighted Volume Ratio. This is across the entire exchange here, so our Weighted Volume Ratio, the red line is a 30-day moving average. It's roughly 12.5 orders, messages, per lot traded. That's on the weighting side, 12.5 messages per lot traded across the entire -- all of our exchanges.

CHAIRMAN GENSLER: So Andrei, if I inadvertently included in a speech or two a 80 to 90, what's that number compared to this?

MR. KIRILENKO: I'd like to understand better what I think that the lot came in one -- what's the definition of the lot? One contract?

MR. WASSERSUG: One contract, yeah. And again, we're blending this across our U.S. future, our U.K. futures, our Canadian futures and our OTC contracts.

CHAIRMAN GENSLER: So maybe just, you know, over the next couple weeks you guys, it will be just helpful to understand that.

MR. WASSERSUG: I can provide that.

COMMISSIONER O'MALIA: Can you go back to

maybe on page 12 in your sugar example?

MR. HASBROUCK: Excuse me, Scott. If you don't mind?

COMMISSIONER O'MALIA: Yeah, sure.

MR. HASBROUCK: I think the chairman had one last question I was going to try to respond to. You were asking, I think, does the -- this WVR policy, does it have an adverse effect of potentially reducing liquidity, three, five, seven ticks away from the market? And I think we experimented with a lot of settings, by the way, in looking historically at what would it look like if we had had various weightings in.

And I think the important thing to remember on this is these -- this policy doesn't even kick in until you -- unless you're a user that submits a minimum number of orders per day, which is a very high number. So all of those users that have resting orders in could be hedgers, could be anyone have resting orders in at three, five, 10, 100 ticks away from the market. None of those are affected by this. Those are all -- rest in there. There's no penalty to anybody for that.

So this is -- this is targeted specifically at users who spend a -- send a very

large number of orders.

CHAIRMAN GENSLER: Chuck, your thought is is if you're pretty active in the market, an ATS, if you're a low-latency trader, you can adapt, and a very quickly moving market could then put the next set in.

MR. HASBROUCK: We just saw that there was a -- I think there was a lot of order changing activity far away from the market. There are all kinds of levels of HFTs out there and they've all gotten smarter and better and more proficient, I think, at their algorithms. But some are, you know, in early days may not be terribly elegant.

And so if there are being different markets, they could be frequently changing the prices 30 ticks away from the market and they're changing it every second, and that really doesn't add any value to anybody. So what we were trying to -- we're trying to drive that out.

CHAIRMAN GENSLER: That's helpful. Thanks for that answer.

COMMISSIONER O'MALIA: And I assume your Weighted Volume Ratio is also integrated with your Interval Price Limit, which is your circuit breaker approach?

MR. WASSERSUG: The Weighted Volume Ratio is really a next day analysis, whereas the Interval Price Limit is a real time throttle.

COMMISSIONER O'MALIA: And to address, I think the question the chairman had about the volume, the messages versus lots traded on page 12, I assume that on that top line that messages means the number of messages submitted. Just want to walk us through what we're seeing on that top line?

MR. WASSERSUG: Sure. So we're looking at a particular strip. This is the Sugar 11 contract for U.S. futures for May 2013. So in this particular contract, this particular firm -- this is based on the firm level, submitted 5,477 orders. That's -- that was 13.8 percent of the total orders that they submitted within the Sugar 11 futures contract.

The average quantity that they submitted across all 5,400 of those orders is 4.82, and 91.91 percent of those orders were the best bid or offer at the time that they were submitted. And then as they -- as you go out, 5.2 percent were at the market. So they matched the best bid or offer at the time, and et cetera, et cetera as you go out.

Based upon all 5,477 orders that were

submitted, there were two transactions generated and each transaction was one lot, or a total quantity of two lots were generated. And then as you go down the row, we're looking at again same -- different strips, but the same metrics used throughout.

And again, this is just a -- this was a sample of one user. It's not the entire percentage don't add up to 100 there, as you'll see. So this is just an excerpt from one report.

CHAIRMAN GENSLER: So just whispering to -- Andrei tells me that some numbers that he had looked at were 99 messages to every one transaction in the E-mini that must be what I've been using in some -- so it would be very interesting just to -- because I'm sure each of these markets are a little different and sugar is probably different than Henry Hubb, just to understand message to transaction volumes, which you think is maybe closer to 12 or 15 at least on that other page?

MR. WASSERSUG: Correct.

COMMISSIONER O'MALIA: Any other questions for Mark? Oh, Michael.

MR. COSGROVE: First of all, just a clarification. Is the messaging, that 12 to 1, that's overall market? That's not 12 to 1 for high

frequency traders, right?

MR. WASSERSUG: That's correct. It's overall market.

MR. COSGROVE: So that could be a basis for some discrepancy, if the 80 to 1 is being is being applied to high frequency traders, whereas -- the whole market, okay?

MR. KIRILENKO: There's a whole market, E-mini.

MR. COSGROVE: It's the whole market? Got it.

MR. KIRILENKO: Okay, we have -- we have CME representatives here. They may wish to say something if they feel like.

MR. PAYTON: I think in terms of our messaging policy, with respect to E-Mini, we actually have a ratio of 4 to 1 in the E-Mini. So four messages to every one lot traded is the threshold for our messaging efficiency policy. So it's actually the tightest of any of the products that we have on the exchange.

MR. COSGROVE: Great. I do have two questions. I was curious, how do you adjust price reasonability validation? Is that adjusted automatically in real time, daily?

MR. WASSERSUG: Yes. That's adjusted in real time automatically through our trading system. So for every -- for every price update, the new reasonability is calculated.

MR. COSGROVE: And then my last question, since the speed limit is applied to individual users or individuals companies, is there a sort of standard that -- sort of a standard that applies to anyone, you know, if you do this volume of business you get this, or not volume, but is that standardized or is that somewhat --

MR. WASSERSUG: That's a good question. We have called default settings initially, so that 300 setting, the 30 setting, and then over time we will work with the individuals from the firms to understand their trading patterns. So we don't have any, okay once you've done X amount of transactions, you've fallen into a particular bucket. Everybody can be a little bit different. And as strategies change, so might the speed limits change as well.

So it's more on -- it's a unique setting per user per session.

MR. COSGROVE: Thank you.

MR. HASBROUCK: I think it's just important to -- this is an operational protection.

It's not -- it's not a mechanism for rationing bandwidth or capacity or anything else. It's a really a -- it's really a mutual discovery with the customer and us and trying -- what is it you're doing in this session, this log in? What's the typical type of activity so that we know what to expect, you know what to expect, so if we're -- so we can set a limit so that it doesn't let something beyond what you're expecting to be normal go on.

So it's -- that's what that's for. It's really what Mark's talking about when we say -- when you're doing -- when you're trading four very liquid markets with one session ID, part of the reason we're suggesting you break that out into two or three IDs is so that if you have a problem with one of them, it's only affecting one of the markets you're trading in as opposed to some of the others.

It's all -- that part of it is much more operationally, you know, redundancy oriented as opposed to compliance or level playing field oriented.

MR. KIRILENKO: I have a question about this. I'm sorry, about the calculation. Let's say -- let's say hypothetically you have 100 messages per one transaction and that transaction was for 100

lots. So would your calculation be one message lot traded? So either one of you.

MR. WASSERSUG: Our ratio is based upon messages per quantity of lots traded, not based upon transactions. So in that case, the ratio would be one.

MR. KIRILENKO: One to one?

MR. WASSERSUG: Yes.

MR. KIRILENKO: Right, so if the average transaction size is not one lot, then you will divide by that average transaction size and get to the number of your lots, right?

MR. WASSERSUG: Yes.

MS. DOYLE: It's purely void.

MS. BOULTWOOD: Mark, I was wondering if you could comment, to what extent are these controls that you've implemented that's practiced, and is there a form for comparing across exchanges? You talked about the ordered renewed based on an FIA principle. How much of this is common? How much do you think ICE is just ahead of the pack?

MR. WASSERSUG: Well I think ICE is ahead of the pack. There's actually multiple principles that the FIA comes down with from an exchange perspective on how we should mitigate risks in the

markets, and I think every one of those bullet points was one of FIA's best practices. So I feel like we're well positioned from a risk mitigation standpoint and an FIA best practices recommendation standpoint.

I know that our exchanges in particular, you know, we look at reasonability limits. We look at things like flash crashes. So I think we are -- we, CME and ICE, are both ahead of the game when you look at us compared to the equity exchanges, stock exchanges.

But again, you know, I think from an innovation standpoint, IPL that we just recently released is quite innovative. I don't think anybody in the industry is doing anything like that. We're constantly trying to tweak our technology and tweak the exchange to offer more and more -- you know, more and more risk mitigation and best practices within our systems.

COMMISSIONER O'MALIA: Steve?

MR. JOACHIM: Yeah. I have two questions. One is, do market participants know what the threshold, the dynamic thresholds are for the IPL, and if so, how do you communicate to them on an ongoing basis what those thresholds look like?

And my second question is, and a whole different direction is, is test cases. I'm curious to know how you construct your test cases before participants come onboard. How do you ensure that they have fully and adequately tested those facilities to ensure that there's no damage as a result of the connections?

MR. WASSERSUG: Good question, Steve. Regarding the IPL, we provide a framework for how the IPL is going to operate, so we will provide information on our website to customers that tell them how long the IPL period is, how long the hold period is, and what the range to the upper and lower threshold is.

So if a customer wanted to, they could in real time calculate that based upon average price at a particular time. But it's more important for them to understand the range that an IPL is going to be in as opposed to what the actual number is at any given time. So that's well communicated to our customers.

Again, we rolled this out two weeks ago, so it's a learning process for all of us. And as we make changes to IPL limits, I think we're going to have to continue to work with our customers so they

understand what those limits are going to be.

That answered your first question. Regarding test cases, so I mentioned that we have a pretty significant conformance testing team and program that all ATSs must go through. We have a relatively stringent and very long test program that ATSs must follow, so we give them actual specific test cases throughout all of the scenarios that we envision they will deal with from a trading perspective, and we're actually looking for what the output of that test case is from the ATS.

So they have to fill out a questionnaire, run through a scenario, fill out what the output is, generate that back to our team, and then our team will score the ATS's response to us.

We have separate and dedicated environments, testing environments where an ATS can go and they will schedule time to run through a test program so there's no outside influence, potential anomalies taking place within the -- with that test system. So we know that they can -- that their test cases are going to be accurate and valid.

COMMISSIONER O'MALIA: Anyone else? Okay, Michael.

MR. GORHAM: Quick question. The SMARTS

charts on slide nine, I'm just trying to figure out how to read that. Can you kind of -- I'm not sure what those little balls are on the top between the green and the red.

MR. WASSERSUG: I put this thing small so you couldn't read it. I just wanted to make sure. So what we have is the balls between the green and the red are actual traded -- are actual trades that take place. We have offers and bids, so red is offers, green is bids. And then you can actually drill down into those individual data points and you can look at a particular transaction.

So you can see counter-party information. You can see time stamp information. You can see all that information in there. And then you can zoom in and actually look at what the bid offer spread was at any given point along that curve as well.

MR. GORHAM: And the bars along the bottom?

MR. WASSERSUG: I'm assuming those are just volume bars, total volume that was traded over that particular time band.

MR. GORHAM: Great thanks.

COMMISSIONER O'MALIA: For this HFT Subcommittee, guys, we do have microphones if you

want to grab -- if you have a question. I think there are one on either end. Any other questions? All right, Dean, you're up.

While they're switching over, I think it's useful to point out, we asked both Mark and Dean to come in last week and give a similar presentation of the slides they're showing today to our staff just so we could develop a baseline for what is being undertaken by the exchanges in our markets today, and it was a well-attended event and I think very useful for our staff.

We were in this room and many of the seats were full, so we appreciate their in-house presentation as well.

MR. PAYTON: Hi. Good morning. Thank you, Commissioner O'Malia, for hosting this dialogue today. What I want to do in the time that we have today is talk a little bit about electronic trading at CME Group and hopefully to Richard's point that he made earlier, give people a little bit of competence with respect to how much information that we actually have and the capabilities that we have in the context of oversight for automated trading, electronic trading generally.

So our industry, and obviously the global

financial markets in general, right, have experienced tremendous change and innovation over the course of the last decade. And technology has certainly been a critical -- critical driver in that evolution.

I actually began my regulatory career when we still had IBM Selectrics and white-out in the office, and certainly things have evolved tremendously. We have broader markets, much larger markets, faster markets and more automated markets than we've ever had before, and that's certainly required us to change the way that we think about market oversight and risk management.

That being said, certainly again, just to echo what Richard was saying earlier, automation itself is fundamentally a good thing, and certainly most of these studies that have been done in terms of looking at what we've seen with the electronification of trading is that the market quality metrics have substantially improved over time.

And that said, right, I think everybody in this room certainly agrees that -- that changes have also dictated that we needed to change the types of systems and the types of capabilities that we have

from a risk perspective and a market oversight perspective.

So to give just a quick picture of kind of where we are today, electronic trading volume at CME Group accounts for 88 percent of our total competitively executed volume with open outcry accounting for the other 12 percent. Within that 88 percent that was traded electronically, that really accounts for predominately the overwhelming majority of our futures transactions and probably just under a third of our options transactions.

Within that overall space though, there is certain degrees of automation that really are differentiated by asset class. So the more financial asset classes like FX, interest rates, equity indices, those tend to be more automated than the commodity asset classes, you know, energy, metals and agricultural.

So if you take a quick look at this chart, this tells us a little bit about the evolution of what we've seen over time and the improvements that we've made to our trading infrastructure at CME Group, along with the broader technology changes that you've seen in the marketplace have resulted in much more efficient markets in terms of the

turnaround time that you see from the time that the match engine receives a particular order entry or order request, and the time that we acknowledge that back to the customer.

So that's actually down to just about 3.5 milliseconds in terms of round trip time, and what we see there is not surprising, that as the markets have become more efficient and become faster and become more automated, you also see corresponding growth in the market and growth in the messaging.

With that admittedly cursory backdrop of where we are from an electronic trading perspective, now the question I think is where does that leave us in terms of how market oversight is evolved? I've highlighted four particular topics here and we certainly could spend days, and probably a lot of folks in this room have spent days thinking about and talking about these issues.

But I just want to touch on four of them relatively briefly today. The first has to do with fair access. The second, which we've talked a lot about and Mark spent a fair amount of time talking about ICE's controls, is the risk of market disruption. The third, which I think Richard was pointing to earlier, is the scope of what the

oversight capabilities are. And then fourth, concerns about trading practices and are there things that we need to focus on there?

So starting with fair access -- so starting with full fair access, I mean, there's no question that market participants have different needs and different business models and make different choices in terms of how they want to employ technology in the marketplace. I think what's important for people to take away is that as these markets have evolved, what -- we've created a very level playing field in terms of access and opportunity to access the markets. So today, all participants have non-discriminatory access to the same connectivity options at the same prices. So that's -- creating that, that level playing field that everybody has the same opportunity.

Additionally, a lot of this talk about concerns about high frequency trading actually originated with the press about flash orders that came out of the equity markets a couple years back. And what's important again to understand in our markets is that all the market data is disseminated to every participant at the same time, and it's the identical market data. So again, there's a

fundamental fairness in the way the market operates.

And third, the match engine obviously is unfailingly objective in terms of the way that it matches orders. Those matching algorithms that Globex uses are obviously very transparent to the marketplace. Everybody understands how they work and they work the same way for everybody every time.

You know, we at CME Group, I think many folks know recently launched our co-location facility at the -- at the end of January. Again, there's been a lot of talk about co-location in the context of fair access and that actually continues the drive toward fair access for all participants.

So you have a situation where everybody has access to the co-location facility, again, at the same prices and on the same terms. Today I think we have about 120 firms that are live at the co-location facility, and that includes a diversity of firms. There is proprietary trading firms. There's hedge funds. There's intermediaries and banks. And importantly, there are service providers who take space at the co-location facility and make that available to a broader set of market participants.

And again, within that facility, it is

ensuring that everybody has equidistant -- precisely equidistant connections to the match engine to support that fairness in the process.

So the second issue is how regulators can actually oversee what's happening in these very dynamic markets. Today, we have a very, very granular audit trail that allows us to track every order, every modification, every cancelation, every transaction, every book state change, and we can do all of that at the millisecond level.

So in terms of some of the points that Richard was making, there really isn't any mystery as to what actually is being transacted in the marketplace and how each order and each change to an order is interfacing with the broader market.

So if we take just a quick picture of the scope of some of the audit trail tools and the amount of information that we're taking in from a regulatory perspective, on the order entry side, through our RAPID system, we're taking in somewhere north of 250 million messages a day, and each of those messages has up to 35 data fields. We also have the cleared trade data, which is the process data that's coming through the clearing house. That data is very enriched, includes a lot of additional

attributes, 120 data fields, 7.5 million transactions a day.

And then our market data system, which is giving us all the order book information, price volume, book state changes, and that's another 80 to 100 million messages that we're taking into our regulatory systems every day. So that's a tremendous amount of detailed, very detailed transactional data that is on the desktops of the regulatory team, and we'll talk a little bit more about these tools that we used to actually review that activity.

One other thing to keep in mind is in addition to all the transactional data that we have, we obviously have large trader reporting in our industry and so we not only have the transaction data, but we have the end-of-day position data of participants in our market.

So we know what's happening in the market. The question then is do we know who is acting in our market place? And again, just going to the point of how much detailed information that we have, when an order comes in to us at CME Group, we obviously get the clearing firm that's guaranteeing the trade, the trading firm that's submitting the trade, the

session ID, which basically is the connection that Mark was talking about earlier, that are all identified as part of the order.

We also have an account number --

COMMISSIONER O'MALIA: Hey, Dean, can you pull up your microphone a little closer?

MR. PAYTON: Sure. We also have attributes, including the account number, which for all member and member accounts at the exchange are actually registered. We have the country of origin from which the order originated. We have this ATS order identifier, which was something that we introduced last year which designates whether a particular order is being entered into the system through automated means or manual means.

So those are some attributes on the periphery of what comes in. Importantly, in the center here you have two additional -- two additional pieces of information. First is the operator ID or the Tag 50. This is a unique identifier for the particular individual who's interacting with the system. So essentially it's the person who is entering the order into Globex. We register all member, member firm employee operator IDs. We have their names. We know who

those individuals are.

And in the case of an automated trading system, the way those are registered is that you have a head trader and you also have the team of individuals who support that ATS. So you may have a risk manager. You may have a secondary trader. You may have a monitor. All those folks would be registered with the exchange for those Tag 50s that are required to be registered.

Additionally, something that we do internally at CME Group is identify the market participant ID. And so when we are looking at information on our regulatory systems and there's a transaction for a particular account, we not only know this unique account number at this firm, but we also know who the controller is of that account. So we have a name associated with each of these transactions.

So again, there's very deep visibility in terms of who's participating in the market and exactly what it is that they're doing. And when you think about this in the context of what regulators are able to see in an electronic environment, I mean this is an incredibly precise, rigorous audit trail that has been developed, right? And this has been

evolving over time, things like the country of origin ID and the ATS order identifier or newer tags.

You know, the market participant ID is something that we developed over time because it substantiated the types of surveillance that we were doing in our market. So we've got all this data, very good data, and the question is, well, how does the oversight work within the exchange? And it's really a multifaceted operation that we use in order to effectively oversee trading at CME Group.

So I'll start up in the left with the global command center. So that -- the global command center is really the epicenter of market operations for our electronic trading facility and the staff there has terrific technology that they're using to monitor the markets 24/7. So they run shifts of people who are constantly monitoring what's going on in the market.

This is the group that also works to establish the risk parameters for the risk controls that we'll talk about in a little bit. They are the folks who manage our messaging efficiency program. They have tools that allow them to carefully monitor kind of the guts of what's happening on Globex and

manage messaging efficiency. They're also the group that handles our trade cancelation and price adjustment policy, and they would manage any issues associated with trading halts.

The clearing house risk group is another group that has important functions, the context of how we oversee automated trading. This group is responsible for doing risk management reviews of all of our clearing firms in terms of how they manage risks, credit risks and electronic execution risks for each of the clearing firms.

We'll also talk a little bit about Globex credit controls, but they administer those important controls for us. And we've also developed certain types of alerting capabilities that is on a live basis monitoring what's going on on the Globex platform, keeping track by account of positions in each particular contract.

So the alerts that we have will identify both position alerts and volume alerts, both on an absolute level and based on something that's anomalous for that particular account. And we have staff in clearing risk that are monitoring those, again, on a real time basis throughout the day.

And then Market Regulation is responsible

obviously for conducting trade practice surveillance. We have a wide variety of programs and research efforts that we use to monitor the activity in our markets for potential market abuses and concerns that we might have there, and there's very robust data query and analytical tools that support those efforts, including the tools that -- we have both the position and volume live alerting tools, as well as market alerting tools that identify on a live basis for us when there are anomalies in terms of the amount of volume trading in a particular product or a price move in a particular product.

So we've got a number of different transactional systems. And again, this is kind of what's key to how we evolved in terms of oversight of these markets. What we've done, we anticipated a lot of the changes in the growth in the markets and developed capabilities that really allow us to see deeply in terms of what's happening, who's doing what and when.

So our RAPID system is actually a system that's connected into the Globex infrastructure and we use this on both a live and historical basis. But it's a very powerful tool that allows us to read

and aggregate up to a billion messages per second. So we can immediately pull up any detail that we want about orders or trades that occur on the Globex system. We're able to aggregate that data extremely rapidly, so to the extent that I wanted to identify who the highest messaging Tag 50s or firms were in the E-mini over the last quarter, I mean, literally that's an exercise that takes seconds for us to do with the tools that we have available to us.

It also allows us to reconstruct the order books, both on an individual basis, so we can see an order book and who's behind each of the orders at the price levels in the order book.

Our SMARTS system is the system that we use that is a very highly enriched data set. So we have a tremendous amount of data in the system. We use it on a T+1 basis and it captures information from all the venues that we trade on at the exchange. But the capabilities of the system are very sophisticated. We maintain participant and market profiles for all of our markets and everybody who trades within our markets, and what that allows us to do is to identify anomalies and to also use those anomalies in the context of the pattern detection capabilities that we have.

So we have identified a host of different types of potential market abuses that we use the pattern detection capability to identify and it really allows the analysts in the market regulation group to do a whole host of things that really allow us to protect the integrity of the marketplace.

The volumetric analysis again is something that gives us pictures into what's happening in the market. So for example, if we wanted a picture of what happened during a day or a 10-minute period during the day, it will break out for us on a minute-by-minute basis, a second-by-second basis, you know, how much volume was trading, what the price move was, and show that to us graphically in order to pinpoint places that we may need to focus on.

The Armada system is a third system that is our order data system. It allows us to look at all of the data that is being distributed probably to the marketplace. So we can see the book as any market participant would see the book. And what that allows us to do as well is replay the market. So any time we want to, we can take a particular slice of the market and we can go in and basically do a market replay and we can do that at speeds that

humans can actually understand what's going on. So we can slow it down and actually see message by message what's happening in the market and how that's impacting the marketplace.

Within the market regulation department, there's a host of different types of surveillance and investigations that we conduct and I've highlighted a few of them here. So one type of case that we will work on are cases related to disruptive risk management problems. So as folks have talked about around the table this morning, one of the risks of highly automated marketplaces is that things can go wrong with technology, and that does happen from time to time.

And so when we go in we're looking at the risk controls, the testing, the supervision processes that people have in place to prevent those types of events from occurring. There's also the potential for disruptive trading or messaging practices. There's been significant talk about issues related to spoofing, manipulative conduct in the marketplace. And again, as I think Richard was pointing out earlier, the data, very granular and precise data is there for us to be able to look at how particular participants are interfacing in the

marketplace and to identify whether or not there is something that's problematic around that activity.

There's also a variety of trade practice abuses that we have patterned detection modules to identify and certainly we're focused on various types of anomalies in the marketplace and following through on complaints that we receive from market participants.

So the fourth piece is really the issue around risks. And at CME, again, as the markets have evolved and technology has evolved, we've really worked on building very robust risk management and volatility mitigation tools that allow us to protect the market, and a lot of these tools are similar to those that Mark talked about. And so in the interest of time, I'll focus on a couple of them that are different than those that Mark talked about.

So the protection points for market and stop orders, if somebody enters a market order into a CME Group market, it will automatically assign a limit price to that order. So that market order can only move the market so far and if it's not filled in its full quantity at that level, it becomes a limit order at that point.

So a lot of the issues that we saw in the context of the Flash Crash on the equity side where you have market orders going into the marketplace and trading down to zero or up to exorbitant levels, those types of events can't occur in this market because a market order is going to be stopped before it moves through that far in the book, and the same with stop orders.

We have similar to ICE, dynamic price banding, maximum order size protection and we also have stop logic functionality, which again identifies within the marketplace the potential for stops to be elected and cascade down. And so what we'll do when that condition is identified within the engine, we'll actually pause the market for somewhere between five and 20 seconds, depending on the particular market.

And again, what that does is allow liquidity to come into the marketplace, and assuming that it does, that market will then reopen after that short pause.

COMMISSIONER O'MALIA: Hey Dean?

MR. PAYTON: Yes?

COMMISSIONER O'MALIA: Wrap it up.

MR. PAYTON: Okay. The last two are the

messaging volume controls. And again, similar to those that ICE has, we do that on a rolling time period and then on the Globex credit controls, these are controls that were built, again, something that was quite innovative, because people were reluctant to use controls from the standpoint that it impacted the latency.

So the Globex credit controls were built in a way that it doesn't impact latency in terms of coming to the engine, and it provides firms with the ability to get e-mail notifications when somebody reaches a particular threshold. If they breach a threshold, it allows them to take any number of automated actions in the marketplace.

So I'll leave it there for the moment and open it up to any questions.

COMMISSIONER O'MALIA: Thank you, Dean. I have -- your Tag 50 discussion in 128, Mark, I assume ICE has similar tags?

MR. WASSERSUG: Yes, that's correct. We do. It's not exactly the similar tag numbers and names. We don't tag as many tags as they have on those fixed orders. We rely actually on a few secondary systems that are outside of the order itself for the registration of ATSs and the names

and the countries and all those types of things.

COMMISSIONER O'MALIA: But in the data that we would receive that you provided the Commission, we would know whether it's an ATS or not?

MR. WASSERSUG: Correct. Yes.

COMMISSIONER O'MALIA: Dean, on the market abuse area you identified in this disruptive trading and messaging, have you -- I assume you have, and you've referred it to us, but can you identify a nefarious practice that you've identified that you've kind of worked through and said, you know, this really isn't good for our markets and kicked it off? And if so, what was that?

MR. PAYTON: Sure. You know, there's any number of them, but if we start at the top, we've obviously had situations where somebody had an algorithm that was operating in the market that malfunctioned and didn't operate the way that it was intended to operate.

COMMISSIONER O'MALIA: Can you speak up a little bit? Get a little closer.

MR. PAYTON: Yeah. In those cases, we've actually gone in, investigated what led to the disruption in the marketplace and took appropriate

action with respect to the firms and also ensured that the remedial actions were taken in terms of the risk controls and having appropriate testing and supervision in place.

From a disrupted trading practices standpoint, we've had a lot of discussion with the Commission around those topics and in the context, for example, of spoofing, one type of practice that from an exchange standpoint that we find disruptive and would be a problem, would be a situation where somebody is entering an order without the intent to execute that order for the purpose of misleading other market participants and then exploiting that deception for their own benefit.

And we recently had a case that I think the Commission is aware of where we identified that type of conduct and again, took appropriate disciplinary action.

There's other types of conduct that we've identified in terms of activity during the pre-opening period, so activity that occurs prior to the time that the market is open, but orders are coming into the market. And there was activity that was designed to be manipulative in terms of the kind of conduct that was being transacted. And again,

we're able to identify that conduct, deal with it from a regulatory perspective.

COMMISSIONER O'MALIA: Any questions? Any other questions?

MR. KIRILENKO: I have a question, Dean, about -- I think you mentioned in passing about something about particular methods, a throttling policy that you have for the E-Mini. Could you maybe elaborate more broadly about what your message for the throttle policy is?

MR. PAYTON: There's actually two different issues. One is the messaging efficiency program, which very much like Mark talked about is really an operational program that is designed to work with market participants to ensure that the messaging that they're bringing into our marketplace is responsible and efficient.

So for each of our select product groups, we identify a product benchmark. So again, that is the total number of messages relative to the total volume that's executed. And those benchmarks are different depending on the profile of the particular product, and our global command center team is the team that works with market participants in the event that they breach one of those messaging

thresholds. They'll work with that participant in order to help them fine tune their messaging practices in a way that serves the marketplace in a more effective manner.

The messaging throttles are something different. That's really a risk control that's designed to protect against a market disruption, a runaway algorithm. In those cases, we've got particular standards that we set in terms of the number of messages over a rolling time period and in the event that that's breached, we have the ability to either reject those messages coming in, and at some point they can actually be automatically disconnected.

So it really goes through three stages of warning, reject, disconnect.

COMMISSIONER O'MALIA: When we -- when Dr. Gorham put together a pre-trade functionality, we spent a lot of talk -- we spent a lot of time talking about the wash sale issue and what checks exchanges can do to prevent excessive amounts of wash sales. It never made it in to the trade practice -- abuse pre-trade functionality to ban it. Has there been any evolution as a technology with a lot of trading across market? People are invariably

hitting themselves in terms of trades. How are you minimizing that?

MR. PAYTON: Yeah. Well, there's two ways. So first, the technology is out there for front-end systems to implement wash blocker functionality. So basically what wash blocker functionality does is if I have an offer at 10 sitting in the market and I decide that I want to buy 10s, when I enter my order to pay 10 for 100, what that will do is automatically cancel my offer before my buy order goes in.

So that functionality is widely available and widely used. So that's probably the primary way that market participants avoid trading with themselves. From our standpoint, in terms of the way that we police issues related to wash trading, to the extent that there are inadvertent washes, again, that's a situation where we will identify the conduct through our surveillance programs and then we will work with those market participants to identify what are the circumstances that are leading them to trade with themselves.

In some cases, market participants don't have -- again, their algorithms aligned or tuned in the most optimal way and we'll work with them to

address that.

CHAIRMAN GENSLER: I'm glad Commissioner O'Malia has raised this, because this is one that's -- we've all talked about on a number of occasions. I'll leave it at that.

You say wash blocking software is available for market participants, widely available you said.

MR. PAYTON: Correct.

CHAIRMAN GENSLER: Do you think it's widely used?

MR. PAYTON: I do think it's fairly widely used. It's not -- it's not all market participants. And again, there may be situations when that wash blocker functionality doesn't quite work, because you have the cancel and the order entry, which are two messages that are going in, and sometimes they'll miss each other and the transactions will occur anyway. But --

CHAIRMAN GENSLER: So if I can ask you in a hypothetical.

MR. PAYTON: Sure.

CHAIRMAN GENSLER: If it's widely available and widely used, do you think that we should see in our surveillance data that firms are

meeting themselves on a regular basis or on a very rare basis?

MR. PAYTON: I think that you will see that it's rare in the context of the overall activity. So --

CHAIRMAN GENSLER: And if we're seeing one firm hypothetically that is not rare, what would that mean?

MR. PAYTON: Well, I think that you'd have to look at it and understand what's happening in that particular situation.

CHAIRMAN GENSLER: Do you consider -- I'll pick on Rich, because he's sitting there. But if Rich's firm meets Rich's firm on some regular and repetitive basis, that's a bunch of wash sales? I'm just -- but there wasn't a -- it could have been --

MR. PAYTON: Yeah, it really depends on the circumstance. So Rich may have 20 different traders working for him. Each of those traders is a separate operator and separate individual in the market running separate algorithms. In that case, if there's no intent for those two algorithms or two traders to meet each other, that doesn't fundamentally constitute a wash sale. Those are two traders in a broker place.

CHAIRMAN GENSLER: I don't know. That was your view. I don't know if it's the Commission's view. I don't know --

MR. PAYTON: Okay, well, from our standpoint, a wash sale requires intent. So if you have two independent traders that are inadvertently meeting in the marketplace --

CHAIRMAN GENSLER: So my last question, do you think people are using wash blockers to ensure that two of their traders don't meet, or that one trader doesn't meet themselves?

MR. PAYTON: Yeah. It's predominately for one trader not meeting themself.

CHAIRMAN GENSLER: Okay. Thank you. You want to respond?

MR. GORELICK: Since the chairman picked on me, I just wanted to chime in a little bit. One point is generally speaking, firms don't want to have wash sales because they're expensive. If we could match a trade internally, we don't pay for that. If we purchase that service from an exchange, it's quite expensive. So we do have a lot of motivation to use the tools to prevent those washes where they are available.

CHAIRMAN GENSLER: So you're saying that

if you had 20 independent traders, you would prefer that if one is buying and one is selling that you did that internally and you didn't go through and pay the whatever fees?

MR. GORELICK: Exactly.

CHAIRMAN GENSLER: And do you use this wash blocker software?

MR. GORELICK: You know, I'm not -- I'm not sure if we use the specific feature that he's mentioning at the CME, but I know we use that type of technology on a variety of exchanges wherever it's offered.

CHAIRMAN GENSLER: Oh, I'm sorry, so it's an exchange software, or is it something they have had?

MR. PAYTON: No. This is front-end software as opposed to an exchange software.

MR. GORELICK: But many --

MR. PAYTON: There are exchanges that have that.

CHAIRMAN GENSLER: I'd be interested, as these subcommittees work, to learn more about this whole area that Commissioner O'Malia raised, and certainly been one that a number of us have been talking about is how to in this rapid environment,

stay with the spirit and the letter of the law against wash sales.

MR. VICE: If I may just comment there. I think from an exchange standpoint, we would -- if Rich's firm accounted for let's say 5 percent of the volume in a given market, then -- and we knew that he had traders running independent strategies in that market and our strategy and some other type of strategy, then we wouldn't expect him to run into his own traders more than 5 percent of the time.

So I think there are some kind of rough metrics there that we look at, probability analysis type of thing, that would -- if it's much higher currency that, then you have to ask yourself is there some intent here and something else going on as opposed to independent strategies being executed independently.

And I think it's important that they -- that those independent strategies be able to rely on the bid offer in that market, even if it's an affiliated strategy. Otherwise, you're essentially saying a fund can only run one strategy in a market at one time, and I don't think that's going to be good for the markets or liquidity.

So I think -- and I don't like using the

term "wash trading" so loosely either. It does -- intent is a key element of that. We refer to it as paired trading for lack of a better term. Paired trading. And then we look at paired trade occurrences to see if this is a possible evidence of wash trading, of actual wash trading where there is some intent that we can see.

CHAIRMAN GENSLER: But I take it from what Rich was saying, they would like to take the paired trades and match them in their own world because then they logically wouldn't be transferring some of their economic returns to you as an exchange operator. You might want them to take their paired trades to the exchange. There might be --

MR. VICE: I mean, clearly they're motivated to not do that, as Rich said. We don't -- I mean, we've got the priorities of the day, a lot of priorities above a consideration like that.

COMMISSIONER O'MALIA: I do think this issue is probably right in the wheelhouse of probably the working group four, kind of a microstructure issue. So hopefully they'll address it. Steven?

MR. JOACHIM: This will be a question for both Mark and Dean. Do you do any cross-market

surveillance? Do you cooperate in terms of regulatory activity, so if you have a few pieces in one market, do you share information across the other market?

And then a corollary to that is do you also look at the underlying cash markets that -- where there are cash markets, and for arbitrage abuses across those markets?

MR. PAYTON: Yeah. I think that broadly speaking the cross-market surveillance primarily occurs outside of the particular exchange venue. That being said, to the extent that we have information in our markets that creates concerns for us, we're members of, for example, the Intermarket Surveillance Group.

So we have had occasion where we may be looking at something in our E-Mini contract and in order to conduct the kind of analysis that we want to conduct, we require information from one of these securities exchanges, and the cooperate and provide that information, as we would to them.

So I think that some of the cross-market surveillance issues, I think, are an area where the federal regulators need to have a significant impact on that.

MR. WASSERSUG: Just to add to what Dean was saying. From a cross-market perspective, we actually look at, since we have some complimentary markets, to SEMI markets as well. We are actually looking at SEMI data feeds as we do our analysis. So as I showed you that SMARTS analytical tool, we'll actually pull in SEMI data feed prices so we can look at alerts not only on our market, but also at the SEMI market for complimentary markets, to determine if there might be an anomaly in one market and how that might impact our market as well.

MS. BOULTWOOD: A related question on cross-market kind of opportunities, because the reality is you compete as exchanges on specific locations, contracts. And how do you look at business practices that one thing might be encouraging volume, like co-location facilities, which you both have, or volume rebates to participants, or the initial margin rates that you charge on contracts that might be very similar in cases where you do compete? Is there an exchange of information on those types of items, or do you just let the market work so to speak?

MR. PAYTON: I think broadly speaking we do what we think is right for our market and market

participants. So when you talk about something like margin, that's not a competitive issue for us. That's a risk issue for us. So we're setting our margin levels at those levels that we think are appropriate for our marketplace in order to manage the risk that we have to manage at the clearing house.

So something like that isn't a competitive issue for us. From the standpoint of something like co-location, certainly the efficiency of your market infrastructure is a competitive issue, and from CME Group's perspective, we're always going to be looking to innovate and be able to provide our customers with the kinds of services and products that will attract them to our exchange.

MR. WASSERSUG: We do compete with the CME. We make publicly available information that is deemed to be publicly available and necessary for our participants to be able to determine where they want to do their business.

I think for some of the inside baseball pieces, that we keep that very close at heart. And we don't really look to share information outside of our company that is -- that we deem to be valuable to us.

CHAIRMAN GENSLER: Do you keep it like stucco?

MR. WASSERSUG: A little bit, yeah.

COMMISSIONER O'MALIA: Any other questions? Then we'll get on to our next panelist, Joel Hasbrouck.

MR. HASBROUCK: First, thank you, Commissioners, for the opportunity to discuss these issues. I'm going to talk a little bit about some of the broad-brushed stuff that is going on in the academic research.

First, in the studies I'm going to be discussing, most of them are based on what's going on in the equities markets. This is important for two reasons. First, equities are in futures, and second, the market structure is different. The equity markets are very fragmented. When we see something, we ask ourselves, is this an attempt to somehow, or an artifact of somebody trying to tie these disparate markets together?

When people discuss high frequency traders, there's no precise definition, but as it gets implemented in practice, they tend to be large. They cover multiple markets, not just one. I should say, not just one exchange. They co-locate. They

account for a lot of the message traffic, and they react very quickly.

The trading styles, the studies will be able to generalize. There are high rates of order cancelation. There's high turnover, as very tight position management, meaning not only do you go home flat, you go to lunch flat. You end every five minutes flat. It's very, by and large, very disciplined and very controlled.

And for that reason, we often compare them to market makers. And in fact, many of them do trade passively like market makers, putting out a bid or an ask and waiting for somebody to come in and hit it, but not all the time. They also trade very actively as necessary when they need to lay off the position or when they need to simply take advantage of market timing.

Now most of the studies are equity market studies. The first one I'm going to discuss is not. This is a study that Andrei did with people in the CFTC and outside.

One aspect of it certainly was looking at the May 6th crash, and the main conclusion there was that the high frequency traders didn't trigger it certainly, but they weren't complete bystanders

either. But for today's purposes, the more important thing is how do the high frequency traders behave in normal times, and the answer, according to the study, is that they behave like market makers, low inventories, high turnover. But by comparison with our traditional market makers, they do tend to trade more actively.

Another recent study, this one is from European equities, and it's interesting, because it shows the effect of the entry of high frequency trading. It's a study by Albert Menkveld on the Chi-X system, which is an alternative market to the Euronext Equities Markets. The Chi-X is dominated by one high frequency trader.

What Albert found is that when this trader entered spreads at all the markets, that is, the Euronext markets, the so-called primary markets, dropped as well. The high frequency trader, to nobody's surprise, is profitable. Most of these profits occur in positions that are held five seconds or less. So very quick, rapid profit realization and 80 percent of its trades are passive.

Gideon Saar, Cornell and I have looked at about 500 stocks on NASDAQ's Inet system and when we

look at our strategies of cancel and replaces and seen their effect on what's going on in the book -- and generally when this kind of thing takes off, you see lower posted spreads, lower effective spreads, short-term volatility drops, and there's increased depth.

Now the reason causes here is in quotes is that in econometric analysis, we use that as a statistical causality, not a mechanical or deep relationship causality. NASDAQ made a contribution last year putting together a collection of trades from members that it identified as high frequency traders by the usual criteria, co-location, high turnover and so forth, and their data, which they've made publicly and generally available to all academics, records all the trades and all the prevailing quotes.

And here there have been a couple of studies using this data. One, high frequency traders are very active. They're involved in about 68 percent of the volume, sometimes demanding liquidity, often supplying it. Their strategies tend to be correlated. That is, they're not independent. They tend to move in the same direction. They tend to herd.

There's also some evidence that they can predict future order flow, and that's an important point I'll come back to, because it alludes to their -- the source of high frequency trading profits. What do they do to volatility? Well, it depends. Does volatility draw in high frequency trading? It depends whether you're talking about the broad market or stock specific. If it's broad market volatility, high frequency trading in the individual issues tends to increase.

But if stock specific volatility goes up, HF activity tends to drop. Going in the other direction, if high frequency trading increases, that tends to be followed by reduced volatility. Again, that's an association, not necessarily a causal mechanism.

Terry is also participating, and Ryan Riordan have also looked at these data and find that the high frequency traders, when they're trading actively, they tend to anticipate subsequent price movements. In other words, they seem to have better information.

The conclusion this study draws is that high frequency activity enhances what's called price discovery, price formation, and also market

efficiency, that is, information gets into the price more quickly.

So if we can summarize these studies, and this is just some of the key ones, the effect of high frequency trading seems to be beneficial or benign. Now having drawn that reassuring conclusion, I'd like to point out some of the limitations. First of all, we're not quite sure what information is driving high frequency trading activity and how it makes markets more efficient.

The other qualification is that these studies characterize average or routine or ordinary market behavior, not sort of the extremes. These are important points, so let me elaborate. Efficiency, we say a market is more efficient when it reflects information more quickly. This idea is a holdover from the idea of fundamental information. If there are fundamental economic developments, we want them to be in the price as soon as possible.

For example, we have regulation, FD in the equities markets. Company makes an announcement. Everybody has to get the same info at the same time. The value of informational efficiency is less clear when one player is trading on advance knowledge of another trader's order, or an advanced guess.

And a paper by Jarrow and Protter have looked at that and concluded -- and I might point out this is an empirical paper, a theoretical paper, not an empirical one -- they point out this is obviously dysfunctional.

Now I'd like to talk about some of the extreme behaviors. Although volatility and high frequency trading seems to not exacerbate each other in normal times, when you look at the data, you see some rather strange cases that are difficult to explain. Now these are from the equity markets, so nobody in this room has to feel threatened. You didn't regulate it. You didn't run the market which it arose.

But the question is, can it -- can it occur in the futures markets? So here -- and I also don't mean to imply that these are -- that there was manipulative intent here. But I'm going to show you two cases. This is the National Best Bid and Offer for ticker symbol AEPI. And there are -- this is not a singular case. There are many cases like this. The National Best Bid is in blue. The National Best Offer is in red, from a typical day about a year ago.

Now there's not a lot of fundamental

information hitting the market here. And yet, in the hours shortly before noon, we have incredible volatility in the bid. If you stepped into the market to trade during this time, if you'd been using a market order, the price you would have received would have depended on whether your order came in on an even millisecond or an odd millisecond. This is difficult for us to reconcile with a well-functioning market, particularly when there's no fundamental information arriving.

Here's another example. This one is from the Inet system going back about three years on a nice day in June. Here this is a 10-minute window. The message traffic is clicking along at about five to 10 messages per second, and then all of a sudden shortly after 12:18 somebody throws the switch and the message traffic jumps up to over 200. Stays that way for a little over a minute, then they hit the off switch and it drops back down to five to 10.

Again, this is very difficult. Did it cause a meltdown? No. Did it cause a crash? No. And yet it imposed certainly a burden on the systems. Prices were changing during this time and I would say it introduced noise into the market process that other participants had to react to. So

again, not one of your markets, anybody in the room, but the question is, could it happen?

Thank you.

COMMISSIONER O'MALIA: Any questions? Joe, in the back. There's a microphone down here. Probably have to turn it on. You can just -- it's remote, so just grab it.

MR. SALUZZI: Hi. I just had a quick question for the professor. Would you agree, in the equity markets, of course, that there are two different sets of quotes, one that you can create yourself if you had all the technology, being that we're in a fragmented market, 13 stock exchanges and so on, and one that the SIP, or the Security Information Process, provides to the general public? And if these two quotes are different, is one faster or slower than the other?

MR. HASBROUCK: Okay, it's common knowledge that the consolidated feed is slower than the subscriber feeds that the exchanges make available to their subscribers. If you want to call that two different sets of quotes, I'd agree with you. As far as that being sort of a deliberate technique of sort of a two-tier information and two-tier pricing, that I can't address.

I believe that they -- the exchanges claim, and I see no reason to doubt this, that they make the information available to their subscribers and to the SIP at the same time.

MS. BOULTWOOD: Joel, have there been any academic studies looking at product rates of high frequency trading? You talked about equities, but then you looked at sugar or you looked at oil.

And then kind of a related question. If you put global contracts aside, like a WTI contract, are we studying at geographic differences in high frequency trading?

MR. HASBROUCK: All right, I can give you a partial answer to that, which is that we observed what we think of now as high frequency trading first in U.S. equities markets, not initially at least in European equities markets. And the reason was at the time they had cancellation fees and throttling.

They have since decided to compete on latency and as a result, what you have over there is starting to resemble a lot more closely what we have here. But that I would say -- oh, and I should also -- another anecdote from the Foreign Exchange Market. The people at Intercap tell me that when they introduced an automated feed, an application

program interface to their foreign exchange trading systems, the traffic just exploded.

So you certainly need the means. You certainly need a low-cost structure, and then it seems to be why not?

MR. GORHAM: The second to the last chart on AEPI, so this is -- looks like an incredible illiquid stock. You go for an hour, it looks like without even a single trade. So what's your interpretation of this activity? Is it a few orders come in and then there's a lot of --

MR. HASBROUCK: The trades are not indicated on this graph. As it happens, there was trading activity near the market open and near the market close, but not during the period of time when I -- when I referred to the high frequency activity.

Now you can conclude that because there were no trades, no harm, no foul. But we see similar instances where there do seem to be trades, and even if there aren't trades, I view the bids and asks as important price signals that other participants are relying on, and any noise in them at all is cause for concern.

That said, when I look in greater detail at these episodes, I can tell a story about what's

going on. On the bid side, I see a series of attempts to sequentially ramp up the price and then cancel it, almost as if somebody were trying to run an auction. But that's speculation.

And if they were trying to run an auction, it did not ultimately end up with a success.

MR. GORELICK: First of all, I wanted to applaud the professor's work today. I think this is the kind of empirical work that I was talking about both in terms of the overall market quality side and in terms of the anomalous trading side.

A couple things I did want to point out, these last couple of slides, which clearly are unusual graphs and does lead people asking questions about what's going on here. I think as Commissioner Chilton said early on in his presentation today that there are 160 million daily transactions every day around the world in the financial markets, and with that volume of transactions, it's not surprising to me that you'll be able to find anomalous behavior in particular markets.

And as Professor Gorham pointed out, this may be a relatively illiquid security where you're probably more likely to see that kind of thing. But that said, it's exactly the type of unusual behavior

that we should surveil for, that the exchanges, if they see something unusual, they should get to the bottom of it. They should call up whoever sent these orders and ask them why they did it, especially if it's the kind of thing that happens on a regular basis.

And it's exactly the type of unusual behavior that should be pretty easy to surveil for.

MR. HASBROUCK: I want to be clear. I don't -- I have no evidence, or actually any suspicions that there was any kind of nefarious intent here.

COMMISSIONER O'MALIA: The old adage about shooting the messenger. Is there anything we can do as a Commission to improve the data, to improve your research, to help things along?

MR. HASBROUCK: We are always helped by better, more timely data, whether it comes from the Commission or whether from the exchanges themselves. Andrei in particular has been very helpful at engaging academics and making opportunities available, and we urge the Commission to continue in that vein.

CHAIRMAN GENSLER: One thing that I think I've said this publicly somewhere, but though we've

been strained on funding as an agency, we have gotten a little bit more funding on technology. And so earlier this year, we initiated a project where we'd start downloading order data as well on a regular basis.

We've been blessed for years -- whomever did it it was before we were at the Commission -- that we daily get open positions and transaction data from the exchanges, and that's worked pretty well. The SEC does not get that data as a contrast. So like 9:00 in the morning May 7, we already had the download of everything, as we do every day.

But we don't normally get the order data unless we go out and ask the exchanges for it, but we're initiating now because data storage costs have come down a lot to actually download the order data into the CFTC. It's going to take a while. It's not going to happen in a couple months. But it's just sort of a 18-month to two-year project that we'll be working with, and I think the exchanges already know this. If you didn't, I'm telling you this, so that we can in our surveillance and enforcement have that in the futures world as well.

MR. TABB: Is this on? Now it's on. When you look at HFT basically being a more efficient way

to make markets, I guess, or creating efficiencies in the market, are you looking, and are the symbols that you looked at, are they more large cap names or are they across the capital spectrum?

So are we, you know, having a selection bias because we're only looking at the more liquid stocks because that tends to be where they play? Are we looking across the broad spectrum of capitalization?

MR. HASBROUCK: Initially they were playing in the high cap stocks, but now I believe it is much more broad. And my impression also is that the strategies are shifting from being single market to multiple market strategies, and I'm basing that observation on the increased premium that technology providers seem to be stressing on long distance latency delays, building high-speed networks for example, to span the Atlantic.

That suggests to me that multiple market strategies are becoming more important.

COMMISSIONER O'MALIA: Sure, Chuck.

MR. VICE: I guess I'm struggling to understand the significance a little bit. I mean, we put the charts up with squiggly lines and everybody kind of, what's going on here? As an

exchange operator, I'm trying to read, what should I be doing about this type of activity on one hand? I think both CME and ICE have talked today about a lot of steps we take to discourage extraneous messaging.

So to the extent that these orders are far away from the market, and if no interest to anyone, I think we got effective policies in place to try to deter that. To the extent someone's running an auction, and I take that to mean, and you correct me if I'm wrong, an HFT potentially, or any other traders improving their bid gradually to see if there's interest, I call that trading and helpful to anyone who's looking to sell stock on the other side of that.

So I'd like to hear a little more color from this very -- you know, this expert group in the room of what we're to make of this, because I'm struggling a little.

MR. HASBROUCK: First, if I could just make one point. This is not deep in the book. This is the national best bid. And also though, I can assure you, I am puzzled myself about how to look at it. It imposes a cost on participants, yet it also makes opportunities available.

CHAIRMAN GENSLER: I find myself somewhat

thinking the same question Chuck just raised. This is $29.30 to 29.70, and somebody's probing, as you say, maybe creating opportunities. If there was no transaction in that time frame, then of course there may have been, as you said, some costs. But if somebody actually had executed at one of those prices, they would have done so willingly, I assume.

MR. HASBROUCK: On the equities markets, there would be special concerns because the MBBOs are being used as reference prices for other trades. So in a futures market, this would not be a concern. On an equities market, it would be -- it might be.

COMMISSIONER O'MALIA: I think Chuck has given us a good opportunity. We'll let the panel think a little bit about it. We're going to go to Sean to keep things moving, and then we can come back and maybe you all can reflect on that point.

MR. CASTETTE: I think we have the technology here figured out. It's often times harder than it seems like it should be, which I think is a theme for us.

Thank you, Commissioner O'Malia, for the invitation to speak today and the invitation to be on the subcommittee to define high frequency trading. As you mentioned at the opening, I've been

with GETCO now a little over -- right around 11 years, and in that time I've had a variety of roles, including chief technology officer, and I'm currently head of fixed income commodities and currencies globally for the firm.

In my roles at GETCO, one of the things that I've been able to do is to see a lot of the tremendous change in electronification of the markets that we've seen over the last 10 years in a very first-hand manner.

I'm going to share some of that perspective with you today because I feel it's going to be beneficial to some of the work that we're going to do in our subcommittees. I'm going to do it by giving you some aspects of the history of GETCO, and along the way providing some perspective on some of the changes.

We were founded in 1999 with the express goal of facilitating the transfer of markets from the analog model of pit and phone trading to the electronic digital age. As we've quoted a couple of times today, that transition has been highly successful, and we believe that we were a part of making that happen.

Our early years were dedication to moving

the liquidity of the pits in Chicago to the electronic platforms being developed by the CME and CBOT. Our first trades involved traders in the pits, communicating with traders using click-based trading screens to keep the markets synchronized. It was a highly competitive endeavor, and in the largest products, we and others were able to achieve our goals of moving price discovery from the pits to the screens where the true market could be seen by everyone at the same time, not just the select few at the pits in Chicago.

Following our successes in moving liquidity to the screens, we began market making these products. Essentially, we moved our traders in the pits who were making two-sided quotes upstairs and into an electronic venue. The traders used technology to calculate the prices of their markets and manually manage their orders.

At this point, we had helped to achieve our fundamental goal of improving transparency and competition in the markets. However, we still believed that spreads could be tightened and liquidity improved. This feeling pushed us toward the world of automated trading.

Before talking about our experiences and

automated market maker, I want you to know a few key beliefs that drive GETCO. The core of our beliefs come from our founder's view that strong financial markets are the lifeblood of the economy. They believe that the best markets are the ones that combine a relentless push for efficiency with the lowest friction as necessary to ensure the safety of the market itself. You can see these beliefs in our constant push for increased competition, transparency and smart regulation.

What our founders did not set out to create in GETCO is another trading firm that's inwardly focused on profits. They set out from the beginning to build a 100-year business that they knew that in order to do that, we had to offer a service to the market that was well received. That service had to be competitive and priced well so that customers would want to continue to use it.

This has focused GETCO on what we believe is best for the market, and we believe that as long as we align our business with what's best for the markets, we will continue to be successful. These beliefs drive the firm as we look toward the -- to adapt to the constant change that occurs in our markets.

For most of our last 10 years, we've spent our energy focused on development and improvement of our automated trading -- our automated market making capabilities. The core of the service that we offer to the markets is a continuous two-sided market at good prices. Providing a service to more than 50 markets around the world has taken a constant focus on both the technology that we use to make the markets and the operational excellence required to successfully manage the many forms of risk associated with large-scale participation in the markets.

Our technology has changed, along with the level of efficiency in the market. The changes have come across the whole spectrum of our trading process from risk management evaluation to order management. And the biggest and most visible aspect of our innovations and those in many of the other participants, have come in the area of speed. Speed, as we generally view it, is an important part of being able to provide the tightest, best quotes in the market. The faster we're able to react, the tighter and larger we can quote. The slower we can react, the wider or smaller we can quote.

Our goal has always been to tighten

spreads and so it's imperative that we are among the fastest participants. The reason that speed matters so much to market makers like us is that we're providing firm quotations to the market for a large number of products. The transition from the floor model to the electronic world has been accompanied with a transition to firm quotes that come with the obligation to trade. That means that a market maker who is showing a competitive two-sided marketing, every Euro/dollar expiration is taking substantially more risk today than they did in a pit model. That risk is mitigated if the market maker can adjust or change its quotes very fast in response to changes in the market.

Failure to react fast enough means the market maker's quotes will be acted on by other participants, most likely to the detriment of the market maker. Ten years ago, acceptable reaction times for market making systems were measured in seconds or hundreds of milliseconds. Today they are measured in single digit microseconds, single digit milliseconds, and sometimes even microseconds.

Another area where we have invested a lot of time and energy is in operational excellence. For us this means that we take very seriously our

responsibility to participate in the markets on a continuous basis. We focus on building the protections and safeguards into our systems that allow them to trade -- allow them to provide markets in some of the most extreme conditions, like those experienced on May 6th.

The protections and safeguards in our systems are an ever evolving set of checks and monitors both pre- and post-order entry. These checks protect the markets by limiting what our traders can do in areas like the frequency that orders can be entered or modified, the size of the orders, the prices that can be traded, and we work diligently to improve our protections in the system every day.

We believe that most automated market makers hold -- build similar checks into their systems with similar goals and similar results.

In recent years there has also been a significant increase in the risk management and monitoring capabilities produced by the exchanges, as we've heard from both ICE and CME today. These protections augment our internal protections and the protections that other participants build into their systems.

This combination of protections very much decreases the likelihood of one of these events occurring. The better the combination of our checks and monitors with the exchanges, the more confidence I have in our ability to provide competitive markets.

On May 6th, we were one of the few market makers who actively provided liquidity during a period of highest uncertainty. We believe that we were able to do this in part because of our trust that our systems and everything around them worked properly in the face of highly uncertain conditions. And we believe that that trust comes from our experience and our focus on these risk management and operational concerns.

While the markets have changed significantly over the past few years, a few things haven't. We believe that the fundamental traders, like investors and hedgers, continue to provide the core price direction in the markets. Intermediaries continue to provide the service as necessary for the market to find equilibrium. What's changed for these participants is the technologies and practices that are necessary for them to be successful.

We believe that the percentage of the

market that's done using automated or algorithmic trading is increasing and in our estimation this will continue as end users gain more trust in the new breed of technology enabled intermediaries. As users adopt those -- these technologies in their trading, end users will look more and more like their currently automated counterparts. They will also present similar operational risks to the market.

Another key aspect of the market that is unchanged is the uncertainty around future prices of products. This seems like a trial point, but I state it because intermediaries can be criticized for not accumulating large positions in the face of real and balances of demand, like those seen on May 6th. An event like this -- in events like this, intermediaries absorb the risk that they are prepared to manage. When that limit is exceeded, the intermediaries -- or experience something outside of norm -- their normal expectations, and when this occurs, they need to assume that the market knows more than they do.

We do not believe that the risks that intermediaries are willing to take is fundamentally any different now than it was in the days of pit

trading. Intermediaries have long had the responsibility to understand the ebbs and flows of their markets and to be in tune with their natural rhythms. We believe that technology has allowed intermediaries to automate this feeling and to be more precise in managing it, but that there are capital and risk management responsibilities that limit the maximum positions of any intermediaries at any given moment.

So much has changed in the last 10 years, it's hard to list it all, but there are two items I feel are worth highlighting. Both of these topics represent aspects of the overall improved efficiency of today's market relative to 10 years ago. Costs for individual transactions have come down. This means that it costs a lot less for investors and hedgers to execute the fundamental business of the markets. That's a good thing.

And these costs include explicit costs like clearing cost and exchange fees, as well as implicit costs like slippage or spread widths. In some markets that we participate in, the cost of an estimate, to be down approximately 60 percent over the last 10 years. We received feedback from participants like Vanguard that these savings are

being passed directly on to investors in the form of higher returns and lower fees.

While transaction costs are down on average, operating costs for liquidity providers has increased dramatically over the last 10 years. The investments and technology that are necessary to be successful -- a successful liquidity provider in today's markets require a much higher level of expense on both the technology itself and the talent necessary to bring it to life.

These investments by automated participants continue to rise as the bar for competing at the highest levels continues to raise. While these costs are high, they are not exclusive. As the CME pointed out earlier, the fair access rules of the exchanges level the playing field for all participants and allow new entrants to enter the market freely. The markets remain highly competitive because new entrants are taking advantage of this and are able to raise the capital and investment in these capabilities. There are few, if any, barriers to entry in the modern markets in our opinion.

Another major improvement in the markets over the last 10 years has been the tremendous

change in transparency. The area where we are most excited about is the ability of regulators and academics to do the in-depth analysis on the behavior of the markets like the ones we've seen today and the ones we've read about on May 6th.

This ability did not -- sorry. This ability did not exist 10 years ago, and while there is certainly more data to sift through today, the availability of the data for analysis opens up a tremendous capability for our regulators to ensure the fair and orderly behavior of the market.

My view as a participant in the markets is that there have always been people who abuse the system. They were there when the markets were primarily in the pits, and they're there in our electronic markets of today. But I believe that many of the behaviors that have been attributed to high frequency trading have always been characteristic of intermediaries in the markets. What's changed is our ability of regulators to leverage the unprecedented access to market information and that that provides me with the confidence that they can monitor and catch undesirable behaviors in a way that was not possible years ago.

Overall, there's been a tremendous change in the market over the last 10 years, and we believe that the changes have made the markets significantly more efficient. These efficiencies have come with changes in technologies necessary to be an intermediary exchange or regulator, but changes will continue in the future as more parts of the market become automated.

That automation will continue to affect the behaviors of all participants. In the equities markets, we have seen customer orders become increasingly executed by smart algorithms, and doing this has allowed customers to execute their orders in even lower overall net costs.

We also believe that the fundamental stability of the markets is a concern that everyone must take seriously. Events like May 6th undermine the confidence of people in the markets themselves, and we believe that regulators, exchanges and market participants have all worked steadily to improve the reliability of the markets and the protections built within it, but there is much additional work ahead of us.

An open dialogue and discussion like the one we planned for the subcommittee, is the best

tool for bringing awareness to potential problems and stopping them before they occur. I believe the subcommittee is going to produce very positive change in the safety and stability of the markets.

I want to thank you for the opportunity to present these views and to participate in this subcommittee.

COMMISSIONER O'MALIA: Sean, I don't know if you're aware, FI Principal Traders Group, which I understand GETCO's a member of, put out in November 2010, recommendations for risk controls for trading firms, kind of a baseline for best practices. I guess in March of 2010, about a week ago, FI European Principal Traders Association put out software development change management.

Now this is only a month old. This is a year and a half old, or something. What is the status of deployment of PTG members abiding by the standards listed in here; are you aware?

MR. CASTETTE: I am not aware of the status of the deployment of those risk protections across all the members of the PTG.

COMMISSIONER O'MALIA: I would assume that if you signed up for it, you're doing all of these things.

MR. CASTETTE: We have put considerable effort over the last 11 years in implementing those and other measures into our systems.

COMMISSIONER O'MALIA: Yeah. A lot of the things that were raised by the exchange, change management and testing, conformance testing, error controls, pre-trade risk management price collars, volatility, fat finger, et cetera. The interesting thing about this -- the European version, or European software development, it talks about maintaining source codes, source code review and audit-ability, and all of this will be maintained, who is -- I assume it means maintained at the firm. Would that be available to the Commission, for example?

MR. CASTETTE: I'm not -- I don't think I'm qualified to comment on whether or not it would be available immediately. I do know that we have had our codes subpoenaed by the SEC and we have provided and worked with them to make sure that they understand the particular parts of anything that they've asked for.

I assume there are some firms that are both members of the U.S. If anybody wants to comment on this. This is an interesting piece and

I'm just kind of wondering what -- what's intended by it. Anybody?

MR. GORELICK: My firm participated in the drafting of both of those with a lot of other firms. I know GETCO had representatives on both as well. I think they're just good demonstrations of the fact that the industry participants have been thinking about these issues for a long time. It's not like we woke up in 2008 and started trading with computers and you never thought about risk or software controls or any of the types of risks that we deal with daily.

As Sean mentioned, this has been sort of an important skill for our business since they were founded. The purpose of these efforts is to really benefit not only from the learning that's come from individual firms within the walls of those firms, but to broaden out and talk as an industry and make sure that we're thinking about the types of risks that not only have we experienced personally or thought of personally, but that our peers and competitors have as well.

COMMISSIONER O'MALIA: Maybe we could get an update as to where firms are in applying these things and maybe that's the FIA needs to provide

some sort of update on that. I know this is a new document, but it raises a number of questions about --

MR. CASTETTE: Even though they're new documents, by the time most of these practices -- these are best practices that are documented by the FIA. Most of those practices have been in place at firms like ours or Richard's for a number of years. What we're doing is codifying them so that other participants can learn from the practices that we've developed.

And many of them are taken from other industries as well. The software development practices of code control and things like that, and testing, are commonplace.

COMMISSIONER O'MALIA: I think everyone heard the chairman. He kind of laid out that we're also looking at new initiatives, and if you're already doing these things, maybe you can help us understand what -- if there's any gaps or we're missing anything, et cetera, that you aren't already doing or the exchanges aren't already doing. I mean, that's what kind of this meeting was about, is to establish that baseline for where we are today.

Anyone else have a question?

MR. VICE: Scott?

COMMISSIONER O'MALIA: Yes.

MR. VICE: In that regard, ICE, about a month or two ago, sent a survey out to our -- a group of high frequency traders, defined with direct market access, automated trading, asking them if they've adopted those by best practices, and point by point. At this point, it's just a survey. I think it's certainly sent out with an expectation that they do, and we've asked them where they don't, to just explain why they don't.

We'll be happy to share the high-level survey results, not individual results obviously, but high-level results of that when we finish that activity.

COMMISSIONER O'MALIA: Great. That's very helpful. Thank you.

Any other thoughts, questions? Yeah, Dr. Gorham.

MR. GORHAM: You probably know also that the Chicago Federal Reserve Bank has been doing over the last year or so a survey of firms and exchanges, firms and vendors, and they've come out with two reports so far that I know of, one on exchanges, one on vendors. I don't know if the one on firms has

come out, but you might be able to -- you can get their raw data. That might be useful to the Commission.

COMMISSIONER O'MALIA: I wasn't aware of that. Thank you. In my packet of kind of research material, I also had this interesting, provocative study that came out last week, I think, David Bicchetti and Nicolas Maystre, synchronized and long-lasting structural change on commodity markets and evidence from high frequency trading.

This is a provocative study, to say the least, about the role HFT has had in commodity markets. And if you think you had a problem with any of the slides that Mr. Hasbrouck put up there, you should read this study.

But we will leave that for another day. We are over our time. And I do want to thank the panelists here, thank the HFT. We're going to excuse everybody but the HFT Subcommittee because we want to have a brief organizational meeting. So I appreciate everybody's participation. If the subcommittee would stay around, I'd appreciate it.

Thank you very much to our panelists. We'll be back at 2:00.

(Whereupon, at 1:02 p.m., a luncheon

recess was taken.)

A F T E R N O O N S E S S I O N

(2:18 p.m.)

COMMISSIONER O'MALIA: Before we begin, we have our legal disclaimer that we have to deal with. In order to -- Nancy will explain the process for receiving the documents and the recommendations. Nancy Doyle is our assistant general counsel.

MS. DOYLE: Good afternoon. This is pretty much for the record and I apologize for those that worked on the Data Standardization Subcommittee, because it may be repetitive of what you already know.

As we explained at the outset of the Data Standardization Subcommittee process, the charter -- this is a federal advisory group, charter for it -- provides that it renders advice, proposals and recommendations to the full Technology Advisory Committee. We have met with representatives of the TAC to vet and process these proposals. Done a great job. And they're here today to present the Data Standardization's Subcommittee's four working group proposals to the full TAC. It's presented to you today.

And let me explain what the TAC's role on this is just in terms of FACA, advisory committees

and charters. The FACA -- this is being passed through the main committee up to the Commission. The FACA receives these and recommends that they be submitted to the Commission for its deliberations. When you receive these, and generally recommend, you are not having to formally vote. You won't have to formally vote, although we have a quorum here today.

What you will be doing by a voice approval when Commissioner O'Malia calls you to the end -- you may want to know this -- is agreeing that these are worthy of being relayed to the Commission for its consideration. So please do not feel -- and I'm stating this publicly with a court reporter here -- that you are signing on to every footnote in every one of these working group reports you've been viewing for the last three months. You'll be happy to know that.

So just like a good lawyer, just to repeat again, here's the written words. The purposes of today, for these materials, which have already been previewed to this committee in its previous meetings, is to be formally received by the full TAC for recommending for delivery to the Commission with your general endorsement.

TAC subcommittee members are free to

discuss, comment on or disseminate the recommendations as they see fit, but of course, neither the Subcommittee on Data Standardization or the TAC should say that the Commission now at this stage endorses the recommendations.

The Commission itself isn't taking action today, of course. What actions, proposals, endorsements or deliberations the Commission undertakes with respect to any or all of these four working group reports will be at the Commission's future election and discretion.

So if anyone has any questions on this, I'll be available to help you, but it's important to just clarify what it is and what it isn't, and I thought it would be of some comfort to the TAC members in particular to know about.

COMMISSIONER O'MALIA: Thank you, Nancy. We're going to proceed right away to Doug Harris, full TAC Committee member, to present the recommendations on working groups two and four. Doug.

MR. HARRIS: Thank you, Commissioner O'Malia, and good afternoon. I'm pleased that you asked me to vet the recommendations of the subcommittee two and four. I realize that this is

an important step in --

COMMISSIONER O'MALIA: Doug, can you pull that microphone closer?

MR. HARRIS: -- an important step in bringing additional clarity to the obligations of swap entities, DCOs, DCMs, SDRs under Title VII of Dodd-Frank Act and the Commission's expectations with respect to the reporting, maintenance and retrieval of swap data.

I'd like to take just a moment to thank my boss, Gene Ludwig, for making the firm -- CEO of Promontory Financial Group, for making the firm's resources available to me and to engage in this vetting. And I want to particularly thank Evelyn Fuhrer, who's sitting here with me. She's the head of Promontory's Financial Services Technology Group, and I relied upon her quite a bit in doing this vetting.

I also want to say that Promontory doesn't have any particular proprietary interest in any of these working group recommendations, nor did we approach the review of these recommendations from any one client's perspective. Our clients have included the CFTC, existing DCOs, DCMs and other entities or registered swap dealers. So our concern

here was on the integrity of the reporting process and the accuracy of the reporting process.

In conducting the vetting, we determined that there were five considerations that we should assess each of these recommendations against, consistency with Dodd-Frank Act, the statutory provisions and rule-makings, cost and ease of implementation, time to market, consistency with current industry initiatives, and action-ability.

First the recommendations of working group two. The first recommendation is adopt the generic product representation for reporting of complex and BISPO (ph) products to equip regulators with an appropriate level of information while preserving the ability of the marketplace to innovate.

We support this recommendation, but we're aware that the generic product representation would not fully comply with the existing CFTC reporting rules under Part 43 and Part 45. So currently there is a process for 180 -- 180-day exemption from the reporting requirement for complex and BISPO products. We think that this exemption is going to need to be extended over time. In fact, what we think is that there will need to be a long-term exemption for complex and BISPO products. As new

products are developed and evolve, it will always be the case that the generic product representation will not fully capture all of the primary economic turns.

So we would suggest that the TAC suggest to the CFTC that they consider a long-term exemption for BISPO and complex products and possibly consider a process whereby over time, as new products are developed, that the CFT -- the CFTC assess whether certain complex and BISPO products are now adequately captured by the generic product representation and no longer need an exemption.

Recommendation two, leverage the ISDA standard credit support annex initiative to create a highly standardized data representation of the ISDA SCSA and explore possibility and options for electronic execution. Again, we support this recommendation and we think that the TAC should recommend to the -- that the CFTC continue outside of the formal rule-making process to encourage the develop of the SCSA, and thereafter a machine-readable representation of the SCSA.

And we note that this effort would be consistent with current industry initiatives of ISDA to create the SCSA and at -- FpML has also put

together a working group to develop an electronic representation of the SCSA. So that was one of the factors strongly in favor of our support of this recommendation.

Recommendation three, regarding legacy portfolio legal agreements finalized and industry wide survey to identify legal agreement information relevant to systemic risk. The survey will confirm scope, feasibility and collate information relevant to a cost benefit analysis.

On this recommendation, we actually suggest that the CFT -- that the TAC suggest to the CFTC that it delay taking action on this recommendation, though we think that gathering this information from legacy portfolio document agreement is going to be very important for the CFTC in order to better assess systemic risk in the swap market.

We also think that -- that the obligations imposed by Title VII have already put a strain on the resources of many firms and especially the technology resources. And we would recommend that the CFTC consider delaying the survey until after industry participants have completed some of their initial compliance efforts under Title VII.

We're going to switch now. You're going

to have to switch documents to the recommendations of working number four. The first recommendation, 1a, concerns data format. The recommendation is the first step to standardized trade reporting across market sectors should be develop -- to develop a set of common XML elements and then work towards establishing a unified set of XML tags over time.

Further, setting up a process to manage and evolve standards over time using the expertise of industry groups is the best way to achieve success in standardization projects. We agree with the direction of this recommendation, but if in fact the recommendation is intended to mean that the CFTC should undertake that effort, we don't think that that is the best use of CFTC resources. We think that the TAC should recommend to the CFTC that the CFTC provide guidance on the initiative and support to the industry in further developing the common XML elements and a unified set of XML tags.

Recommendation 1b, data format. The CFTC should not dictate the input format to the SDR as long as the SDR can produce output to the CFTC in a format that the CFTC finds acceptable. We agree with this recommendation and in fact, we don't think any further action really needs to be taken here

because the CFTC has already effectively implemented this recommendation in 17 C.F.R. Part 45 by not dictating the input format to the SDR. However, we also believe that implicit in this recommendation is an obligation on the part of the CFTC to define acceptable data transmission output formats for recording to the CFTC and disseminating these requirements in a timely manner to SDRs so that they have sufficient time to comply.

Recommendation 2a deals with storage. The recommendation is it is likely that there will need to be a way to reformat or transfer old records into newer media from time to time. SDRs will need procedures to do this in a way that still maintains the integrity of the original data by maintaining the readability over time. In this area it would be helpful to have further guidance to clarify first, to clarify best practices for developing and implementing such procedures.

We note that this is absolutely consistent with the existing regulatory requirements. Part 49 requires SDRs to establish sufficient procedures and policies and procedures to prevent a valid swap from being invalidated. We agree with this recommendation and we think it would be extremely

helpful for the CFTC to provide guidance on sufficient policies and procedures. And further, we have some ideas as to what those policies and procedures should be, and they would include robust change management policy -- policies and procedures that address periodically updating storage media, databases and associated application systems.

We think the TAC should also suggest to the CFTC that the CFTC consider providing SDRs with further guidance on establishing a control framework that is reasonably designed to ensure that the data continues to be credible and useful over time.

Recommendation 2b also deals with storage. The long duration of some swaps may require that original data be maintained in its native format for extended periods. The term "data file format" appears to need further definition, as it is unclear whether this means the format created by a sender of data, the format that might exist in transmission, or the format that a receiver of data uses to state the data.

The working group believes that for a cleared swap trade, the native format of the transaction record is that used and maintained by the DCO for a privately-negotiated trade reported to

the SDR. The native format would be that used and maintained by the SDR.

This one we actually have some issues with. We think that possibly the focus on the native format may be too restrictive, and what's actually more important is the integrity and credibility and accuracy of the data over time. So we think the TAC should recommend that the CFTC consider providing guidance on developing appropriate controls and audit trails to ensure that stored data remains credible.

Now the one issue we -- that possibly goes against our conclusion, is the fact that native data, native file format may be necessary in certain enforcement proceedings. We haven't made that determination and so I think what would be appropriate, is to first have some kind of legal opinion or analysis as to whether the data native file format will be required for the CFTC to pursue enforcement actions. But aside from that issue, we think the real issue is the ongoing credibility and integrity of the data.

Recommendation 3 deals with versions. Rather than allow every minor change to a product definition to result in a new and distinct product

ID, keep product IDs stable by associating a version with product IDs. It would be important to match the product ID and the version, particularly when contract lifetimes are long compared to the duration of a given version.

We agree with this recommendation primarily because it is consistent with current industry initiatives. Currently identifiers are used. Versions are used for CDS and we know that to use to a UPI initiative will involve versioning of the UPI and product taxonomy for all asset classes.

Recommendation 4a. In order to make it efficient for interested parties to retrieve data, every SDR should provide the same standardized API. Access to different parts of the data would be configurable so that all parties could use the same API. We also agree with this recommendation and we think that it would assist the industry and the SDRs to comply with the reporting requirements and facilitate retrieval and analysis of data.

Recommendation 4b also deals with storage. Swap participants should be given the ability to view all data reported to SDRs on swaps that they are party to over the life of such transactions. The reporting entity will need to be able to

directly amend data, although this ability should be limited to reported data only.

The counter-parties should have the ability to report errors in data so that they may be corrected by the original reporting party, or subject to some form of dispute resolution. We agree with this recommendation, but we don't believe that the CFTC should necessarily prescribe the process by which SDRs accomplish these tasks. Different SDRs may have different methods for correcting data and providing access to data, and we questioned -- we questioned whether a reporting entity needs to be able to actually directly amend the data.

That would imply that the reporting entity actually has -- can go into the system and report the data. That presents, in our minds, certain security issues. And so therefore, we think that it's probably best that the TAC recommend to the CFTC that the CFTC allow SDRs to follow through on this recommendation and to allow access -- to allow data to be corrected in the form that it sees fit.

Recommendation 4c, access, the CFTC should establish more detailed requirements for the analysis of data by SDRs on a regular basis, as well

as for ad hoc requests by the CFTC, until the CFTC establishes more detailed requirements, including the expected types and urgency of requests. It is unknown what future functionality SDRs will need to support, which has important implications from a software perspective.

This information will also help SDRs determine the need -- the needed computing horsepower for their middle offices. We note that SDRs are expected to routinely monitor data for the purposes of any ongoing swap surveillance and objectives of the CFTC, as well as for ad hoc requests.

We support this recommendation because we once again believe that the more lead time and direction that the SDRs have as to what the future surveillance objectives of the CFTC will be, the better equipped they will be to respond to requests. And we note that there is going to always be a cost associated with complying with these requests. So the earlier that the CFTC provides us guidance to the SDRs, the more efficiently they can carry out their responsibilities to respond.

Finally, recommendation 5 goes to timing. The initial data loaded into SDRs should be OTC swap

data, as the primary goal of the relevant portion of the Dodd-Frank Act is to bring transparency to this sector of the market. With this in mind, the subcommittee recommends the following sequence for required reporting into SDRs.

Phase 1, ensure SDR requirements are international and applied consistently. Phase 2, begin reporting of non-cleared trades. Phase 3, begin dissemination of public data on a real time basis. Phase 4, require the reporting of cleared trades into SDRs. Phase 5, provide query functionality to regulators. And Phase 6, provide more complex portfolio analytics to the regulators.

It's pretty clear that the working group in this case phased in these various requirements based on information that they thought was going to be most important to the CFTC's surveillance and monitoring activities. We would approach it slightly differently. We would suggest that the TAC recommend to the CFTC the CFTC go after the low-hanging fruit first, and that would be reporting cleared trades and non-cleared trades, then disseminating public data, then providing query functionality, and then providing more complex portfolio analytics.

What we disagree with is that Phase 1, which would seem to have to occur before these other phases occur, is the proper first thing to try to tackle. We think international consistency is going to be hard to achieve, and in our view, it should be an ongoing process doing these other phases rather than the first phase that has to be accomplished before these other requirement -- reporting requirements are put into place.

As we see at the end, we think the reporting of cleared trades can be achieved fairly easily and it would be considered to be a big win for the Commission.

And that's it.

COMMISSIONER O'MALIA: Thank you very much. It goes without saying, but I will say, I can't thank both Doug and R.J. and their respective teams for all the hard work they did to take all the work of the data group, and I greatly appreciate the data group's work to assemble all this and to make your recommendations on a very short time.

I know our staff appreciates your assistance. I do. And I know I speak for the Commission on that. So thank you very much --

MR. HARRIS: You're welcome.

COMMISSIONER O'MALIA: -- for all the work you did to distill this and give thoughtful reflection on the rules -- or on the reports. R.J., you ready?

MR. CUMMINGS: Yeah.

COMMISSIONER O'MALIA: Fire away.

MR. CUMMINGS: Okay, I'm going to move through mine pretty quickly. We had to do recommendations on the group one and group three, product and entity identification, specifically UPI and LEI, and then group three was the use of semantic descriptions for financial instruments.

We went through the TAC's recommendations that were provided in December. And what we have is that we recommend the use of an asset class accepted product taxonomy for Part 43 reporting, real time reporting, and move the fields listed in the Part 43's table A1. We feel that those -- that table's a little bit restrictive.

As the use of UPI for Part 43 is optional, ISDA has taken on the sort of optional responsibility to complete taxonomy definitions for all asset classes that would ensure that required fields are covered for reporting purposes. We also recommend that UPIs will only be provided for Part

45 reporting where appropriate, and to continue to work with the CFTC in order to get detailed guidance for granularity of UPIs. This specifically relates to standardized products versus exotic or bespoke products on each of the asset classes.

This will further categorize products for systemic risk management until such time that the taxonomy provides sufficient minimum classification. The existing rules of operations documents are available. The government changed process for OTC taxonomies at ISDA. It's a working framework right now. And at this point, for a July 16th implementation date for credit and interest rates, the industry should adopt the ISDA proposed taxonomy to allow for timely implementation.

We also recognize that the taxonomy approach that ISDA has put forward can change over time. UPIs have a unique appeal for product classification, but the difference in definition and use of a common UPI in Parts 43 and 45 to some degree limits the value that UPI would represent for SDR reporting.

An absence of clear guidance on UPI granularity should allow the industry infrastructure providers to leverage proxy UPIs until such time as

the CFTC can prescribe a more universal approach to product classification.

So the taxonomy approach serves to categorize OTC asset classes in a meaningful way in the immediate term. We believe the CFTC should continue a dialogue with other regulators to ensure consistent application of the OTC taxonomy recommendations.

The governments of the steering groups or authors of taxonomy and UPI categorization materials need additional analysis. Primarily, industry groups have not formally recognized, and I stress formally, DCO, DCM, SDR and SEF participation in current classification activities.

As these entities will have to adopt and support data transmission activities to one another, a mechanism for dispute resolution will be required. Current steering committee guidelines have not previously had to formally acknowledge -- I stress formally again -- confidentially -- confidentiality or non-disclosure practices with a wide range of commercially competitive entities now tasked with participating in a product classification process. New product innovations and timing considerations will have a larger role to play.

LEI, we recommend the support for Part 45 LEI initiative being coordinated by FSB that leverages the ISO 17442 LE standard for CFTC reporting. SWIFT, DTCC and ANNA are developing an industry solution to address the roles of the registration authority, facilities manager and third-party provisioning capabilities for LEIs. That process is well underway today.

We recommend the immediate notification and distribution of existing LEI records industry wide where available. We understand that there are roughly 50,000 cleansed LEIs and there are probably about 9,000 that are ready to go today.

We recommend the use of proxy LEIs until such time as the industry can fully adopt and support ISO 17442 for designated swap dealers where LEIs don't yet exist. We recommend an appropriate industry integration and testing period in advance of required reporting compliance data.

Integration and testing should allow for a beta phase of no less than nine months, in our opinion, and a live implementation period with a definitive compliance date. LEIs are consistent with and highly correlated to several other Dodd-Frank initiatives, including LSOC and position

limits. In some cases, the stated compliance dates of related Dodd-Frank reporting requirements could preempt adoption of standardized LEIs in favor of proxy LEIs in order to meet parallel reporting objectives. So we have a little bit of a race condition here.

The actual implementation cost associated with the initial development and distribution of the industry solution for LEIs does remain unclear, and it's not entirely clear if there is uniform international support or agreement for the CFTC's LEI approach, as foreign sovereign regulator -- regulatory mandates similar in nature to Dodd-Frank are either in draft form, still under discussion or have yet to begin in earnest. The CFTC should continue to actively push for an international solution while endorsing a proxy LEI approach for markets under its jurisdiction to allow for sufficient integration and testing time.

Group three, semantic representation of financial instruments. We recommend the continued use of XML-based reporting schemas, FpML and FIXML in order to capitalize on the existing technology and framework investment of the industry for regulatory reporting. The standards available to

the industry infrastructure providers, clearing members and trading entities today are capable of addressing the needs of the industry and regulators with little, if any technical modification.

We recommend that any additional parallel analysis on the implementation impacts of ontological or semantic technology should be deferred until existing Dodd-Frank initiatives can mature and be reviewed for additional efficiencies and capabilities.

The proposed benefits and opportunities of semantic representation of data appear encouraging with regard to the enhanced classification and analysis of data. However, a proper cost benefit analysis should be done before further investing in this area. A good starting point could be a gap analysis of the reporting infrastructure once it's fully developed by the industry, in line with regulatory requirements. We believe that any attempt to force the use of semantic representation would only serve to complicate existing reporting requirements.

COMMISSIONER O'MALIA: Thank you very much. You want to say anything about it, Chuck, as a full TAC member?

MR. VICE: Other than I guess as a full TAC member I'll recommend R.J.'s -- the working group's recommendations on those two topics. And would also just like to add one point of concern for the CFTC to consider going forward on the proposed solution for -- recommended solution for LEI determination and the entities mentioned there to provide that.

We do support it. However, we do recognize that that's essentially going to be -- this was not put out for an RFP, and so this is essentially a monopoly service and we just -- we want to make sure that the concerns are addressed in terms of how this is paid for and the costs are determined and fees are determined and so forth.

MS. BOULTWOOD: Can I just clarify that?

COMMISSIONER O'MALIA: Yeah.

MS. BOULTWOOD: I mean, it wasn't clear to me in reading the recommendations who's responsible, what are the roles and responsibilities in terms of the UPIs, the LEIs, you know, creation and assignments, I guess. And then also, didn't we also discuss transaction identifiers?

MR. VICE: I'll tell you my high-level understanding and R.J. can correct me where I get it

wrong. The LEIs, I believe it's SWIFT, DTCC and ANNA, there's three organizations there that have been more or less recognized globally. There is some global momentum behind that solution and I think it makes the most sense.

And so they will -- determining an LEI will be a fairly straight forward thing, a corporate entity or hedge fund or swaps dealer, whoever it may be that doesn't have one. I equate it to some extent to the old Dunn and Bradstreet codes that every company had. So I think it's a pretty straight forward thing. You just need to have a code so everybody knows that when they see that code that that's you.

The UPI, I think what they're recommending there is more of a process of determining a UPI code as opposed to the codes themselves, so that it has the flexibility as new products come along, variations of products are developed, anyone can use the taxonomy to derive the same product code as anyone else.

And then I believe the USI, I'm not sure that was a topic of one of the working groups.

MR. GORELICK: No, that wasn't. That wasn't a topic. Well said.

MS. BOULTWOOD: Transaction identifiers are something to be addressed in the future or --

MR. VICE: There -- in some of the rule-making, I mean, I think in terms of SEF establishes those. I think if the SEF traded -- I mean, there are some guidelines emerging. Maybe they're even in the rule-making; I can't recall.

COMMISSIONER O'MALIA: Well, a lot of this data is -- you know, hopefully we can adopt, consider it as part of our decision making going forward and how we're going to implement it and what the challenges are from a technology cost, et cetera.

Global coordination on the LEI is critical and I believe it's this week that meetings in Basal are occurring to kind of harmonize, make sure everybody's on the same page. There is some issues to Chuck's point regarding the governance that I think are still being considered, but by and large, the standardization of how they're going to be -- you know, what's going to be implemented and how soon they can be implemented using this proxy proposal, is moving forward. But there are a couple of items still left open and we will have to use the proxy to move forward.

The four working group papers are on our website and both R.J. and Doug here have kind of provided their review through Chuck as well, to make recommendations or recommendations on those working groups to be kind of forwarded to the Commission for consideration.

So what I'll ask you to do here is to basically approve both of them, to make sure that the Commission's aware of both of them. Since this is an open meeting and a public record, we will allow for other comments to come in on both the papers and the recommendations themselves. So if you have any further thoughts, we're -- we'll include all of that and provide that as a recommendation to the Commission.

A lot of their -- the LEI's a good example of something that is very near term and immediate. And there are some other concepts that both -- some of the other working groups considered that are farther range and will be valuable to us in considering how we tackle these issues. Even there was in one working group no specific single consensus, so on the taxonomy, that's a challenge for all of us to figure out what the next steps are on that.

But it really will provide us a good range of ideas and concepts that we need to think about, not only for immediate rules, but longer range rules, and how we're going to integrate further automating and creating a universal record for all of this trading, and to automate all of it.

Because as we heard this morning, the volumes and the speed in which all of this occurs really dictates kind of a computer-aided strategy here. So I can't thank enough the working groups -- I see them sprinkled about here -- who have participated, and I greatly appreciate your input and efforts on that. It was extremely valuable.

These are very thorough recommendations and reports. They're on our website. I encourage you to take a look at them and download them, review them, et cetera. Provide comment. We're going to allow for that.

But if you would, I will just ask if there's kind of a unanimous consent, or if there's any objection to forwarding all of this on to the Commission. Does anybody have any objection on the TAC from forwarding all of these documents and recommendations to the Commission? Well thank you very much and I thank the Data Standards Working

Group for their service to provide this information as well.

We are going -- anything else from a legal standpoint?

MS. DOYLE: No. Just to clarify what's happening, for the record. I think it's clear, but in case I misheard it, it's not just the four working group reports. Also the work product. Mr. R.J. Cummings and Mr. Douglass Harris and their organizations, which again, this is an educational process for staff too, this whole working group has been really grateful. It's great working with you.

That will also be forwarded on to the Commission for reading too. And I already said it, but I'll repeat it again. In agreeing to do this, you're not agreeing to any footnote in anything, of binding any of your organizations. The entire point of FACA is that people come from their own industry perspective and they share it with the government, and we consider it for further action, if any, we might take with respect to one or not.

COMMISSIONER O'MALIA: All right. We'll move to panel three. Thank you very much, R.J. and Doug, Chuck, thank you.

(Pause)

COMMISSIONER O'MALIA: We're get -- somebody's getting your name tents. If you'll just have a seat. We won't let that hold us up. This is the third panel for the day. This is an idea. We had a rule-making a couple weeks ago that talked about documentation and how we're going to solve for a trade breakage and issues going forward. We want to make sure that through documentation that there wouldn't be any anti-competitive behaviors.

We imposed some rules on that, but what fascinated me the most about this is what are we for? What will the Commission be for? What is the industry for in integrating the swaps market from a transaction to clearing perspective, keeping in mind that this is different than the futures markets? We are going to have more SEFs. We had ICE and CME, two prominent players in the futures markets.

And in the swaps market, we're lucky to see many more transactions or transaction venues, swap execution facilities. We have to integrate the FCMs. We have to make through multiple clearing houses. It all has to happen in less than a blink of an eye.

And so our challenge is obviously to make sure that from a technology standpoint that this

functions effectively, efficiently and a time frame that we have -- we have created our rule-making and that you can all transact without any problem.

So this is the panel, what are we for? What is possible? And it's clear to me that it's an industry solution and we're going to rely heavily on the industry. The good news is when we first put our proposal of rule-making on the documentation, document -- that's when the documentation lifespan ended and the next concepts began.

The four gentlemen we have here today have taken a very active role, buy side, sell side. We've got execution. We've got confirmation to try to give you a representation of all elements in a very short panel of how we're thinking, how the industry is thinking about it and how we can expect the transac going forward to make sure that we have credit checks on all of our trades.

We have the ringleader, Randall Costa, managing director of Citadel. He is responsible for a range of strategic initiatives for Citadel, including OTC derivatives. Prior to joining Citadel in 2007, he was a CAO of fixed income in Citi-group.

We also have Paul Hamill with UBS, and who did not send in a bio. He's managing director of

UBS and has spent a lot more time in Washington, because we've seen him a lot more.

Then we have Jeffrey Maron, managing director of MarkitSERV. Jeff served -- joined MarkitSERV in 2000 -- in January of this year as managing director and a member of the management committee. Prior to this he was head of client technology and the head of administration of E-Commerce at GFI with over 20 years of experience in the financial markets.

And then finally we have Jim Rucker, head of Credit and Risk, MarketAxess. Jim served as chief operations and credit and risk officer at MarketAxess Holdings from 2010 to February of 2011, and previously served as the CFO, June 2004 to 2010. Also served as head of finance as well, vice president of international fixed income operations at Chase Manhattan before that.

So gentlemen, I don't know if you have a specific order. I don't. But you're free to start. With Paul Hamill. And if you want to give us any of your background, I apologize. I just didn't have a document for you.

MR. HAMILL: (Off microphone).

COMMISSIONER O'MALIA: Okay. Hit the

button. Light it up and --

MR. HAMILL: Okay. Thanks. I guess what we thought we would do by way of introduction is just give some history to sort of the working group and the business problem, just so people have the context of kind of what we're going to talk about today.

From a business standpoint, the problem here is one of certainty of execution and I think as a group of market participants, industry participants, we started to talk about that in various forms throughout the course of mostly last year, and really that is as we move to an environment where the products we trade are subject to some sort of mandatory clearing requirement, then the kind of trade is not done until the trade is cleared, and that's obviously different to the world we live in today and was a problem that we would have to solve for.

So that kind of certainty of execution problem started to manifest itself more quickly as we started to talk about some of the sort of standardized documentation structures that we were looking to put in place as an industry, especially last year.

A small working group formed around about June last year and started to look at how other markets solved this problem and what are the technologies and other solutions might be out there to achieve some of the things that were being discussed in the documentation so we have the trilateral documentation structure. But it was also a view that we should think about how technology might solve some of those problems, and start to examine how other markets worked.

So we did that, and that small group worked closely with CCPs, SEFs, buy side, sell side, you know, pretty much anyone who was interested from a market standpoint, and sort of tried to establish some principles, and then ultimately that folded into what became the FIA as the working group, which was then used to kind of more broadly socialize some of the issues and the concepts to try to get more of a consensus view across the market and what the outcomes kind of might be.

So I would say -- and currently the FIA as the working group is probably best described as being in the process of sort of finalizing the consensus around what those principles are, and I think we'll talk about a few of those today.

With that, I'll probably hand over to Randall.

MR. COSTA: And further just to set the stage, there was a slide, I don't know -- there's one. Oh, it might be on here. Well, I'll start and then if we can get the slide. The purpose is to really set the stage for -- this is a really interesting problem set, because it's at the intersection of risk, legal, plumbing and market structure, so where the money flows, and how markets evolve or -- and at what pace?

As Paul set up, once a swap is accepted for clearing, bilateral counter-party credit risks or performance risk, is eliminated through the interposition of the clearing house. Then the clearing house becomes the buyer. We know. So the question is, how do we get from the point of execution to the point of clearing acceptance or make them the same?

Looking at the illustration, if alpha fund executes a swap with swap dealer Y with the intention to clear it, and were any time to elapse between the point when the parties say done and the point the clearing house accepts it, there is risk, however small, that the trade is not accepted,

mostly likely because one party exceeded its credit limit for clearing.

If the trade is not accepted and time has passed, the replacement price for the non-breaking party may be different than the price for the trade originally executed, the difference in price we refer to as breakage.

The discussion topic here is how to deal with this risk. This is not a new challenge. It's been solved in a range of existing cleared derivatives markets, as Paul alluded to, such as futures, listed equity derivatives, and energy swaps. And in part based on those existing frameworks, solutions are built or under construction for cleared OTC derivatives.

We hope -- I don't know what the protocol is typically for this panel, but while we represent buy side, sell side, trading venue and middleware -- and confirmation, there are clearing houses represented on the panel that are very much a part of our solution process here, our industry. So we hope they can speak freely as we go along.

When we look big picture at those existing markets -- and what we're looking at today already with cleared OTC derivatives, there are two

operational models -- there's host execution clearing acceptance and pre-execution clearing guarantees. If we were to walk quickly through -- I can try to refer to the diagram -- I know these are very familiar to most people in the room -- in post-execution acceptance, the trade is executed, so it would be alpha fund and swap dealer Y. They would execute it through whatever modality, voice, SEF. They would execute it and the trade would be submitted to the CCP for clearing.

Before the CCP can accept it, it has to run through some fundamental checks. If we look at this diagram, it's first of all, of course, is the product one that they accept for clearing. And the SEF or the trade capturing utility may already have filtered for that.

Two, is the swap dealer. Let's imagine the swap dealer was self-clearing. Are they within their limits at the clearing house? Three, is alpha fund within its limit set by its clearing member such that the clearing member will say, I accept this? I stand for this trade? And four, is clearing member X also within its limits at the clearing house?

If the CCP runs through all those checks

and those are affirmative, it sends a message back to the participants, trade accepted. What I just described is all known to you as ClearPort. Happens in seconds, breaks very rarely, if -- very, very, very rarely. That's the post-execution acceptance model.

In the pre-execution guarantee model, the counter-parties to the trade are not able to trade. They're not permitted to trade unless they first pass a filter that assures that they have already sufficient clearing limit, and the focus in all of these industry discussions for the bulk of this time has been around the client, presumably the greater risk.

So the filter, as we're going to discuss a lot here, can be held at the SEF, or the limit could be in principle reserved on a trade-by-trade basis, and we'll talk through some of those different options that would overcomplicate the diagram if we had put it here.

But the point is that if alpha fund goes to trade with swap dealer Y, if there's already a facility in it in place where swap dealer Y can rely on clearing member X on behalf of alpha fund, having vouched for that trade, in other words, through

automation, alpha fund goes to input the trade, and it passes a filter, the effect of which is to say that clearing member X is going to stand for its client in that trade, then swap dealer Y doesn't have to worry about even the hypothetical possibility that the trade would break in a post-execution context.

And what I just described is all very well known to you from, for example, and there are many examples, like Globex. In effect, I think even this morning it seemed there was some discussion about those kinds of filters, those pre-execution filters that ensure that the parties through the trade know that the trade is going to get cleared.

The CME rules say basically, if we see a match trade done in Globex, it's accepted. In principle, that's because the CME -- the clearing house can rely on those checks having been done. And of course, CME is watching its clearing members as you go along, so it knows that that trade is stood for, especially when we're talking about an indirect clearing participant or alpha fund, the client. We know that the clearing member is going to stand for that trade.

The -- if post-execution acceptance

operates in real time, that is, if the parties to the trade know immediately whether the trade is accepted, even in the post-model, then if the trade is not accepted, there is no trade and there is no breakage. Again, we're talking something familiar to all of you in the ClearPort model.

However, if time were to pass in the post-execution approach between execution and clearing acceptance or rejection, there would be the risk of breakage. The pre-execution guarantee model prevents parties from even entering into the trade unless there is sufficient clearing limits set aside to ensure that it will be accepted.

However, a pre-execution model, as we're bound to talk about here, creates more processing steps and credit limit management complexity. The -- just one big picture, market structure point, if through post-trade real time acceptance or through especially pre-execution guarantees, the risk of breakage is eliminated, then each party is free to trade with any other party and secure best available pricing. Real time or guaranteed acceptance is fundamental therefore, to anonymous central and mid-order book trading since each participant in the club doesn't know who it's trading with and needs to

rely on the framework to ensure that its trade gets done. Also for the club, because execution prices are displayed to the market in real time, they need to be definitive.

Finally, real time acceptance or pre-execution guarantee by eliminating the risk of breakage eliminates the need for any documentation between executing counter-parties that would seek to allocate the risk of breakage. If there's no breakage, there's no need to have documentation that allocates that risk. And that in turn eliminates, from our perspective, on the buy side, a huge barrier to getting up and running with clearing.

So we have to, before we trade, exchange perspectives. In terms of the big picture principles that we're moving forward with in the FIA, is the working group, which is a working group that works by consensus. It's a bunch of folks coming together with the spur, the incentive, the framework of regulation, the incentive, economic incentives of collectively maintaining a healthy market, and also avoiding building infrastructure that people won't use.

So there's a sort of a collective need, even if we have different perspectives, to try to

arrange where we can around standardized solutions where we don't see competitive advantage. So in that context, there's a broad consensus that while the post works and is working and, you know, if there was an economic crisis and I as a buy side firm had a choice between not clearing or clearing, we could live with that just fine. There's a broad -- I'd say a broad consensus to move to pre, because it will enable all forms of trade execution, all the different modalities that we just touched on.

And how we build that requires clarification on where we put the limits, where we particularly house -- and we have to break it into two discussions. One is where we put the customer credit limits established by the clearing member, and then separately, how we treat -- how we treat the clearing members or self-clearing or direct clearing participants.

Again, we're solving for something that's been solved for in many other markets, so we have the benefit of transposing technology and workflow that exists in those with the difference, as Commissioner O'Malia, you pointed out, that we're -- here we have a market where -- well, in some markets we have multiple clearing houses, so we solve for

that. We now may have a larger group of execution platforms and modalities going at the same time.

I don't know if you want to speak to -- I mean, there has been some movement toward consensus. I don't know, Paul, if you want to speak to it, in the group, but then we can each offer perspectives from our stakeholder positions.

MR. HAMILL: That summarizes it well. I mean, I think you could debate this question of need for pre or post all day long, and you could sort of debate the idea that technology is going to get you to that place where posts can happen quick enough.

I think however long you debate it, there's a feeling from a risk standpoint by the majority, as Randall pointed out, of the market participants that when executing these kind of trades, such as like a credit default swap, that the risk of the product requires that you know you have a trade at the point of execution.

It's just simply too much concern out there that people have around doing trades and finding out later that they don't exist. It's just not a deep liquid market where you're perhaps just going online to trade or break it or whatever. You know, the market could have moved materially. A

series of events likely to occur along the lines of someone having a trade rejected and a very volatile market could result in big losses.

And I think most people involved in the group are just concerned generally that the market is illiquid enough. A lot of the changes that are going to occur already create some risks that people will leave the product or not understand how the product now works. And so what we certainly don't want to do is introduce sort of another layer of risk which is a lack of certainty around execution as an unintended consequence of the way in which we choose to clear the trades.

So that's really been -- it may seem a small point, but it's been very, very relevant to a lot of the participants. And I think even if over time it's fantastic if we do get to a place where things happen post, I think in the initial stages it's essential that we have pre -- pre-trade credit checks to get people comfortable.

So I think we talked through a range of different options. We obviously have this -- a world where you could do something like a trilateral where everyone would communicate a limit to each other via document. That's quite complicated.

Along that spectrum you have a world where everyone -- you could communicate limits to all the different execution venues, such as SEFs and other people, which is even more fragmented and complicated, or you could have -- where you communicate limits through CCPs or lastly, some kind of uber (ph) single central hub type model.

I think where the industry sort of came out was on the set of CCP solution, largely because people are focused on using -- you know, focused on costs. They're focused on using infrastructure and pipes and plumbing that exists today, focused on time to market and obviously concerned with well the idea of this kind of hub thing is a nice idea. It only works if you only have one hub. What if you have five? Suddenly you're then back to the same problem where you kind of wish you were just using the three CCPs, or however many it is that we have.

So I think there's recognition that each of the solutions has pros and cons and some flaws. Generally I think we've sort of gotten to a place where it's a pre-trade -- pre-trade credit check by and large residing with limits at the CCP, which the SEFs and other sort of execution venues will be able to tap into for credit checking at the point of

execution.

MR. COSTA: And if I can just set up a few vocabulary words that I know we're going to keep talking about. It's the -- we talked about -- it's the three Ps. We talked about post. We're going to talk about ping and we're going to talk about push.

So the ping is the higher latency. The notion would be that wherever the credit limits are housed -- let's take Paul's example. Let's say those limits, as with ClearPort with -- let's say they're up at the CCP. An alpha fund is going to trade with swap dealer Y, let's say on an RFQ. Before alpha fund -- it says I'm going to introduce my RFQ and I want it to go through the SEF and be displayed to five dealers.

The way to secure this pre-trade workflow in a ping model would be that the SEF would -- before allowing my RFQ to go through to those five dealers, would ping the credit limit housing facility at the CCP where it would say, hey, alpha fund wants to do a trade of 10 in X, is there a limit for that, yes or no?

And the limit housing facility having stored and the limits set by clearing member X dynamically changed through the course of the day

and dynamically changed automatically as automation gets -- you know, is built around it -- would say yes, limit lock, limit reserved. And that would -- and the message would go back and then the SEF would allow the RFQ to go out to the five dealers and the dealers would know that because it was allowed through by the SEF it has that clearing member sponsorship behind it.

The push by -- so that's fine in a higher latency environment. And that means that you have one little -- one pot, let's say in my example of CME, CDS, credit for alpha fund established by clearing member X. So you draw from that pot. It goes and it reserves 10. If the trade gets done, it consumes that 10. If the trade doesn't get done, it's unlocked, and you could proceed all day like that.

And that limit again, that pot could change dynamically, depending on clearing member X's view at any given point of alpha funds credit. If instead we weren't particularly motivated by a need for a lower latency, let's say we want a limit order book and we don't want to be held up even for those -- that round trip of the ping, then we have a push, which is alpha fund says to clearing member X, look,

you can keep my single pot up there at the clearing house. That's good. You gave me a hundred in limit. But I want you to put 40 at SEF X, Y, Z. That's a cloud. So that the filter is held right at the SEF.

And every trade as I go to enter into that order, or aggress an order is -- either passes the filter, or as I said before, it doesn't happen if it doesn't reach it. So the counter-party on the other side isn't exposed to the risks of breakage. So that's the push.

COMMISSIONER O'MALIA: Jim, I think we'll go to you and then Jeffrey.

MR. RUCKER: Thanks, Commissioner O'Malia. Let me just preface what I'm about to say by saying that MarketAxess is an electronic trading platform in the credit space. So the class of swaps are traded on the platform as CDS. So the solutions that we build are specifically for CDS. I would imagine that they're not dissimilar for other types of swaps, but that's not what -- the only swaps that trade on the platform of CDS.

We took a bold step a little while ago building in pre-execution credit limit checks on our platform based on what we were hearing from the

industry. We currently have two ways for those pre-execution credit limit checks to take place. The first of those is we allow FCMs to upload to us at the beginning of the day their credit limits for their clients.

As trades are done over the platform then, when the inquiry or the order is created, we check against those limits of the FCMs as they're provided to us. If it passes the credit check, then the inquiry can progress and the trade can be completed. If it doesn't pass the credit limit checks, the trade is held up at that point and it can't progress any further.

We collect trades during the day so we're monitoring the gross notional trades executed against the limit and we would expect that every morning we would receive new limits updated from the FCM against which we would check the trades of the coming day.

So that's method number one. The second way we have of doing this is when an inquiry or order is created on a platform, we have the ability to message out to an FCM, or the ping method that Randall spoke about that allows the FCM then to confirm back to us whether the inquiry or order is

within the limits that the FCM has for their clients.

Now obviously that second method also opens itself up. Instead of limits being managed by each individual FCM at the central credit limit hub, it's pretty easy for us to have messaging out to a central limit hub rather than messaging out to each individual FCM. The reason that we built it that way is to give us the flexibility, depending on which solution the industry chooses to do it both ways.

But that's essentially what we've built so far. In terms of the cost of doing that, we spent something in the range of $200,000 to date in programming those solutions into the platform. At this point, we halted development of this stage, waiting to hear more about the industry feedback and the work of the FIA as a group.

To really round out the credit limit checking, we need to do some additional work. If it remains along the current lines of the SEF monitoring limits and reaching out to either the FCMs or central hub, we estimate there's probably another hundred thousand dollars of development spending we need to make to really complete the

credit limit checking on the platform. So we estimate the solution, when completed, will cost us in the region of $300,000.

So that basically is what we have. The one thing I would add is I think we would be supportive of some industry solution that created some central method after checking credit limits. Now obviously there would be substantial work to do if we had to create the connectivity and the messaging with all of the FCMs that would have clients participating on a platform. That itself would create some additional work.

So as I say, we would be in favor of finding some sort of central solution.

MR. COSTA: Directly responsive to that, I should mention that a key work product for the FIA, as to working group, is -- so the first is what Paul said, which is a defined set of consensus principles to the extent possible so that there is guidance there. Separately though, there is a technology group that is being formed literally this week whose charge is to establish a messaging protocol to be standardized across the industry. That's to that point that -- you know, nobody, I think, sees competitive tritiation in messaging protocols.

And what messaging protocol means is at one level highly technical, so that all of the stakeholders in that diagram can communicate according to the same -- using the same language. But more specifically, in alignment with the principles as you work through the use cases, some of which we've just described in general here, there would be agreed messaging, little sequences so the protocol for a ping sequence coming from a SEF to the credit limit housing facility and back again, would be fully standardized, so that we're eliminating barriers to entry across all the different SEFs, and minimizing the extent of access investment around standardization that's good for everyone.

MR. RUCKER: A standard messaging protocol would clearly be a significant benefit to us in ensuring that the work in connecting to all of the individual FCMs was minimal.

CHAIRMAN GENSLER: Just one question. Your hub, the document that I'm looking at, which I assume is MarketSERV's. So it's Jeffrey's hub, but I apologize, because Jim talked about hubs.

MR. MARON: We're all in this together.

CHAIRMAN GENSLER: What's that?

MR. MARON: We're all in this together.

CHAIRMAN GENSLER: That's right. To bring -- to bring transparency to America. I'll wait for Jeffrey, but the question that I'll have for both of you is just how your respective hub or hubs relate to the rules that we just finalized a week or so ago.

MR. MARON: We can talk through that. That would be great. Thank you.

So Randall did a very nice job of walking us through and describing a lot of the issues. My grandmother always said, a picture's worth a thousand words. So I'll talk you through some of the diagrams as well.

Just by explanation, MarkitSERV currently is involved in the infrastructure in the industry. We're the messaging system that people use today from execution to clearing houses to the DTCC, which is one of our parents, in terms of warehouse, all the way through.

So we already have a good understanding of what the structures are. We currently house a lot of the static data that would be required to make this operate properly. And we already communicate with the clearing houses.

So let's just quickly through some of the potential models as Randall described them. So the first one is the CCP holds the limit, and in which case, each FCM provides a CCP, but they provide each CCP with a limit, which means if we have several CCPs -- we do around the room today. We've got ICE. We've got CME. We've got IDCG.

Each FCM would have to everyday decide how much to give to each CCP. They can dynamically move intraday, but they're always deciding ahead of time how much line to leave each one of their clients at each one of the CCPs. And as we have Eurex and others that are looking to enter the market, that's going to continue to fracture out the liquidity that's available for clients to execute and move liquidity around intraday.

The second is for the SEF to hold the limit as allocated by the FCM, and we all know -- God knows how many SEFS we're going to have. There seems to be more every day. We're going to settle down to fewer than we have today, but even still, that results in fracturing the lines that are available out there, each FCM to have to manage now across all the different SEFs, how much limit to make available.

Going clockwise, the FCM can hold the limit and do it per trade query, in which case, they hold it centrally. They know in real time what's available. They can view it against the futures and options positions. They can do it against cash and do basis, but that means that every SEF needs to contact out to every FCM. And although that's been done to some degree thus far for asset class, we would need to have a proliferation of those.

The fourth choice in the lower left-hand corner is the hub holds the limit, in which case there's one central location for all the FCMs to get together and put the limits in place for all the SEFs to go to to look for those limits, and for all the CCPs to come in as well.

So how would this actually work? What are the risk measures and what are the different choices? Well, the FCM could continue to calculate the risk every time a trade came in. They'd have the benefit of knowing the portfolio and could look at this across a wide variety of options.

However, that adds latency in its time and again has to go back to the FCM. The hub could calculate it as well, and we've come up with some methodologies for optimizing how this could be done

and in reducing latency. One of the things that Markit -- our other parent does very well is pricing of derivatives. So we have the benefit of using their models, which are ready industry standard. Also, the SEF could calculate it, but again, each one's highly autonomous and there are quite a number of SEFs that are out there.

So when would we reserve the line? As was mentioned early, the best thing is to do it pre-trade. So every time the bid or an offer would be entered into a SEF, they could reach out to the hub and check at that point in time. And as that order moved around the market, it would already have pre-trade certainty. You would know that that order was good, that bid or that offer was available to be executed against. And therefore, when people looked at the market and looked at the SEFs for price transparency to get an estimate of liquidity, they would know what they could do and they would know what couldn't be done. And this would work both from a central order book as well as on an RFQ basis.

Well, how would limit be calculated? There are a couple different models that are out there. We could do notional, but as people started

to get into spreads, got very difficult. We could do it the simple basis, or what we decided to do was just do a simple DV01 with a matrix. That took everything down to a pretty common methodology for most of the FCMs to work with.

What's acceptable latency? The answer is almost none. So folks that were looking for it to build this platform currently build and operate exchange trading platforms. We're looking for a few milliseconds, which means that when a bid or an offer goes into the market and joins the bottom of the stack, by the time it iterates up through, you already know whether that trade can be done or not.

How do we take care of the individual fund, which is a significant issue? And you guys have solved that fairly recently by saying that we're going to operate almost like an IB basis where it will be done at the block pre-allocation level and then allocation will take place later on.

Confidentiality? People were concerned, if the FCM needs to give the line out to each one of their individual clients every SEF or every CCP that's out there, more knowledge is available about what those lines are than some folks felt comfortable with.

By keeping it in the SEF -- sorry, by keeping it in the hub, that enabled only one location to know what their true line was. And because today we already know all the trades that have been executed and no one seems to have an issue with how well we're keeping confidentiality, we believe that was a reasonable solution to that problem.

In terms of failure models, as was discussed earlier today by ICE and CME, people already have issues with how to do this and people already have come up with solutions as to how to handle disconnects and other issues. We don't expect this to happen very often, if at all, but we need to assume that there's going to be fell over, there's going to be two live systems, there's going to be disaster recovery, that everything be mirrored, and they all operate in real time, and that's all built into the solution.

So in summary, what are the pros and cons of a central credit hub? First, standard messaging protocol. Randall's 100 percent correct, and the FIA as the working group is 100 percent correct. We all need to have a standard methodology for communicating with each other. But if everybody had

a right to everybody else, in subtly different ways, or over and over again, that sort of takes away from having the standard for messaging protocol. It's easier to write once -- write to one central place.

The cost of building the hub is less than the total cost of every FCM writing to every CCP and every SEF that's out there. It also enables a new entrant to come into the market. So IDCG entered the market. If someone else was a creative as they were and entered later on, would every FCM and every SEF want to be willing to write to them?

In the case of a hub, they would only write once and everybody would have equal access to them. Standard security, standard monitoring. So all of the risk measures that were spoken about, and in the documentation and last week's rule-making, are available in there as well. There's a global kill switch, so an FCM would have access to turn off a particular client across all SEFs, the same way a CCP would have access to turn off an FCM across those trading failures.

Real time updates, the availability for every FCM to update all their credit lines in real time if they chose, or discreet points in time if they chose to do that. And it's totally

independent. It's not owned by any CCP, any execution venue or anybody else.

Cons, there's a little bit of latency. It's a couple milliseconds. I'm sure some other folks will come up with some other issues as well, but that's the one that we hear the most and we believe the trade off of having a couple milliseconds of latency by getting that pre-trade certainty out of the way benefits the market overall.

CHAIRMAN GENSLER: So it's free. It's low cost. It's a profit center for -- can I just ask? How does it fit into the rules we just passed? You're -- I'm familiar with the rules, but I'm not familiar with your architecture here.

MR. MARON: In terms of the rules of making sure that every FCM has a series of limits for all of their clients, they can put the limit at the hub and do it once rather than fracturing that limit out. Therefore, they have greater certainty that the limits that they establish and the risk measures they established are all contained in one place.

We can have the hub, and we plan to have the hub send notification out to the FCM as a level

of orders builds up to a certain point. So if someone were to hit orders of 50 percent of their credit line, we would send a message, then 60, then 65 percent. And by the same token, the FCM could take a look around and see how many orders are outstanding by going to one place and seeing what those risk managers are on a per trade basis.

CHAIRMAN GENSLER: I think what I'm hearing is your perspective is you're trying to market to the FCMs -- you didn't use that word -- but market to the FCMs that you could fulfill their requirements that we just passed, that risk management filter. They would be hiring you. They'd still have the legal obligation, but you'd be their survey?

MR. MARON: Right.

CHAIRMAN GENSLER: You'd be their third-party vendor, but what you would be trying to appeal to them is that you could do it for the whole market, or at least a portion of the market, and then folks who actually trade in the market would have to decide, because some FCMs probably wouldn't use the hubs, some would and --

MR. MARON: It would achieve critical mass?

CHAIRMAN GENSLER: What's that?

MR. MARON: Hopefully it would achieve critical mass.

CHAIRMAN GENSLER: From a business perspective that's what you're -- I see.

MR. MARON: And then for their own, from an eligibility perspective, people -- the SEFs would be able to go directly to the hub and know that this client can trade this instrument through that FCM out to this clearing house. Because we know of multiple clearing houses clearing similar products, as well as a kind of equivalent products, whether it's ears and swaps.

MR. COSTA: What the rule requires is that there be either immediate post or pre-execution certainty, and the pre-condition for that, going back to the earlier models, is that either immediately after or in advance, the trade has to pass a credit filter. In respect of a customer trade, the clearing member has to vouch for it.

So what's at discussion here is that a hub is one way to try to solve for that. We do face a challenge with the different role players about where to put those credit limits. And it's a balance between getting to market sooner,

competitive advantage, latency certainly, and who has to do what.

So maybe to sharpen the debate and start to form a little bit of a debate here with regard to the hub, ultimately you've got risk, so the FCM is the risk taker. The FCM's going to take risk on my behalf. They're going to determine at any given point in the course of a day how much limit they're willing to extend to me.

An important distinction, and I take up with you, is that there's a difference between limit and liquidity. So they may decide the liquidity that I have is the amount they're willing to take. So JP Morgan's my clearing member. They say I have 100 in limit. The challenge for me across different clearing houses, let's say -- let's go to the ICE -- the energy example today. I clear in two clearing houses. My clearing member has to manage that unitary 100 limit across those two clearing houses.

Now the liquidity I have with my clearing member is 100. The limits they may prescribe for me, which are held today at the clearing houses, may be more, because they know how I trade. They know me. They know that when I go into a given market I score on one out of 50.

And they get to know you over time and they determine a limit that will always keep me from blowing my actual 100 limit, but will allow me to trade within that. And they certainly are prepared, as they do today, to dynamically manage between those two clearing houses.

We should add that any such system -- and this ties to other aspects of the rules and was alluded to here -- has to have certain safeguards, that if there are larger limits than the actual liquidity that my clearing member wants to give me, there need to be safeguards at the SEF level. So this is part of the build for the SEFs, and I think they're all attentive to this, but it does need to be finalized as we go forward.

Fat finger, a lot of this stuff you saw for the very high velocity markets this morning need to be built in for our lower velocity today. Fat finger checks, maybe size limits. The kill switch is critical. If we've got a kill switch that's a critical safeguard for FCMs, and also for clearing houses in the event one of their FCMs starts to wobble, then there need to be heartbeat monitors that ensure that from SEF to clearing house, there's never a lost connection, because if they hit the

kill switch, they know it has to work.

So those are all aspects actually of the messaging protocol. But what the industry would decide as the most efficient place to put the credit limits is very much an open question now in going forward how we do that.

COMMISSIONER O'MALIA: Jeffrey?

MR. MARON: If I could. I think you raise a very good point, and I think the world as it exists today has certain mechanisms for trading, because you go to the voice broker, you might go to three or four voice brokers and put an offer into each of them. And as soon as the first one takes that offer you'll call yourself off the others, and you're only exposed really -- you're exposed in three different voice brokers, but only realistically you're going to get it done in one.

However, the new ecosystem for swaps, we're executing through SEFs and electronic platforms. People are building arrogation platforms to then take the liquidity from all of those SEFs and arrogate it together. So the likelihood of someone getting swept and having all of their orders getting executed immediately is now much higher than it was in the voice broker world.

A number of FCMs have mentioned to us the concern about assuming that some of the trades will get done and some won't. They are very much concerned until we actually see how the ecosystem works and how things shape themselves out, that in the beginning they may end up having to allocate more credit line than they expected to because people do get swept, and all of their orders were executed rather than just the first one at the first voice broker. Now all three can get done instantly, and they won't have the opportunity to cancel the other two.

MR. COSTA: But let's be clear. We're not in a high frequency central limit order book world today. It's a fair point. We need to plan for it. That was this morning. I mean, we'll get there, I hope. I was actually thinking it would be great if in a year we have this morning's presentation for these markets, but we're not there yet.

And the -- there's an important thing to realize. We don't even have any functioning central limit order books for the buy side today. When we get there, there may be one or two, but the whole rest of the market is likely to move step by step through block trading, voice trading and RFQ.

MR. HAMILL: If I can make a point. I think that a lot of these points are really good points. I do think though the market will change. I mean, today if you think about maybe the investment index market, we make like 250 up markets, right? I don't see a world where we're making 10, 250 up markets across 10 SEFs and 10 live order books. It just won't happen.

So I think a lot of people have speculated that available trade sizes on platforms will go down. I would say that's one consequence we would expect to see. So I think it's a valid concern, but I think there's ways people can react to -- I mean, no one is going to hang themselves out there to get lifted on 2.5 billion -- you know, if someone finds some way of doing that. It's just people will protect themselves.

So I think that's a concern, but I think there's a way in which people adapt to the electronification of the market and won't try to trade exactly the same way as they do today to protect themselves.

COMMISSIONER O'MALIA: Can I ask you a question? To Jeffrey's point, whether it's 2.5 billion or 5 million, I mean, nobody's going to want

get lifted on multiple.

MR. HAMILL: I think it will depend -- I mean, I don't know the answer to that question, because we've never lived in a world where there are 10 SEFs, or whatever it might be. But we're probably going to want to have our markets out on multiple venues, that's for sure.

And if some of those venues operate any live environment, which some of them will, because some of the products kind of already do, like the indices, then I don't think we'll have a choice. So I think it is definitely a concern. We haven't yet really begun to sort of think about, or I don't know if something that the industry themselves can answer. I don't know if it's more of a regulatory question.

But we foresee a world where we will have live markets on multiple venues and in theory could get lifted at the same time and the same product in multiple venues. And I don't know how we -- one way in which we sort of protect ourselves from that. It's just the size that we show up.

But that's a natural -- I'm not saying that's a bad thing that you show a smaller size. I think some of the SEFs will likely create -- well,

two things will happen. Some of the SEFs will likely create sort of iceberg workup type trading functions, is my guess, so that people can show smaller size.

COMMISSIONER O'MALIA: Is this another ICE product?

MR. HAMILL: No. Sorry, just a coincidence, although I think they have one. But no. What I mean by iceberg is you show a smaller size than what you're -- than what you really want to trade. So there's the opportunity to do more, and somehow that is only discovered at the point of execution.

Equally we're all spending time and money building technology so that when we do get hit or lifted on a particular platform we can pull our liquidity off of other platforms. And again, I think that's -- that's not a new feature that we deal with.

COMMISSIONER O'MALIA: Chuck, an ICE product that is being offered that was announced down at Boca, I think, is your Plus One solution. Do you want to mention that? I would like to get industry input on this one. I've got a couple other questions, but I'd really be interested to hear kind

of the industry comment on this debate.

MR. VICE: Sure. Sure. We -- and we had to give it a name, because otherwise it was this thing we're trying to refer to. But this Plus One, ICE is a active participant and the FIA is the group that Randall was referring to, and so we're -- as is CME and other CCPs, and we've all been struggling with this ping versus push versus hub versus very complicated solutions, kind of gold-plated solutions with a lot of moving parts, and I think from our point of view, operational risk.

We've gone into it with the same priorities as everyone else, trade -- everyone wants to have as much execution certainty as possible. The FCMs want to be as fully protected as possible. We all want as low latency as possible. But I think for us, we also want -- we have two other requirements. There's little operational risk introduced as possible. And we also have some tight deadlines to meet. We can't be -- we don't have three years to build this.

We're big fans of phase one, phase two, phase three type of approaches to things. So for us, what we -- what Plus One was all about, and I can get into the details of that, if you want. But

we've put out a lot of information about it. But I think in a nutshell, we've said as a CCP, regardless of whatever else SEFs and hubs and the industry does, they're certainly free to do and expect them to do.

But as a CCP, we're going to have customer level limits that FCMs will set for their customers that we will maintain, and as executed trades come to us from SEFs or other sources, we will check both sides of that trade against that limit, accept it, do all the messaging you would expect, let them know that we accepted it.

And each FCM would set a threshold on each account and the first trade that puts them over that threshold will take that trade, so there's certainty of that trade. But we send a message out to all the SEFs that that account is essentially disabled until further notice or further trading.

So what we've tried to do is minimize as many moving parts. And this is not rocket science. I think as someone said earlier, there's variations of these things out there. And then going forward we as a CCP may enhance that solution to have more pre-trade capabilities than that initial version, or it may be that the FCMs, working with third parties,

or FCMs working directly with SEFs, adopt one or more of those models you saw up there to achieve whatever last narrow remaining piece of pre-trade certainty that they want to have.

I think part of our view is formed by the fact that we have operated OTC execution platforms, central limit order books in fact, very -- with high frequency traders in them, with pre-trade limit checks in --

CHAIRMAN GENSLER: It does work, doesn't it?

MR. VICE: -- for 10 years. It does work, which is good. I know that's where these guys want to get to, and we do as well. But we also know that the experience behind that is it's rarely -- very, very rare. I mean, far less than .1 percent less than that, that an order is actually rejected because it hit a limit.

So I think in terms of the 80/20 rule and tight deadlines, we take that experience and say, let's not build this complicated system to deal with the .001 percent of the time. Let's get something out that allows the 99 percent to happen efficiently, and it gives us more time as an industry to work on more complicated solutions to

better handle higher frequency trading and interest rates, credit and some of these other markets.

That's what Plus One was all about.

MR. O'CONNOR: I think it's important to remember that the markets that we were talking about this morning exist in a vertically, integrated, exclusive arrangement, and I think that's not what we're talking about with a swap market and that creates a lot of complication.

I think with regard to this debate, and I know that the groups working on it have concentrated on this issue, and that is, the cost of going from instantaneous or near instantaneous post-trade acceptance to pre-trade certainty, the cost of making that very small leap is significant, and I think it's important that we think about what benefit are we getting from taking that extra step, because the costs are -- the costs are substantial.

And I think we heard a little bit about where those costs come in, and they come in in two different ways. Number one, we're having to build a whole new set of infrastructure that's going to have to be funded, and it's not trivial infrastructure. It's a complex machine. And number two, any time that you ask either a clearing house or an FCM to

extend its resources, its limits beyond its own four walls, that they get hair cut. There's just no way around it.

We heard about various limit monitoring systems. We heard gross notional and we heard of DV01 matrix. Now I can see how they work from a latency perspective, but there is no operational OTC clearing house who monitors their risk in that way. They use far more complex ways of monitoring their risk, which are higher latency.

So in order to expose ourselves, expose our resources to that type of environment, we have to hair cut them. There's no way around it. So you reduce the limit resources available in the system and you increase the cost of transactions by making a very small leap in terms of instantaneous post-trade certainty to pre-trade certainty.

MR. HAMILL: Maybe -- I mean, looking at it from perhaps an execution side of looking at the product, I mean, I don't -- I don't think anyone -- we talked about this in the industry group at length. I'm not sure anyone really thinks there is a question around that.

I think the tradeoff of some kind of operational cost versus introducing meaningful risk

to the product that could damage the product isn't really a tradeoff. I mean, today you have a product that when you trade it, it is done. If you move into a world where you don't have pre-trade checks, you have a product that you trade it and then you wait and see.

I'm not saying it couldn't be very fast, but you've changed the way the product works and you need to change what people think about managing risk around it. So from a risk standpoint, I don't know anyone who thinks that that's a simple question of just operational latency and cost. I think everyone sees it as a risk question.

MR. O'CONNOR: I disagree entirely. I think -- I don't --

MR. HAMILL: Then you disagree with everyone who's in that group basically.

MR. O'CONNOR: No.

MR. COSTA: I'll try to speak the middle. I think the bulk of the buy side actually aligned with more what Garry said. But looking forward and wanting to support efficient electronic trading, we are very supportive of, well, first of all, the ICE model, because that gives that increment of reassurance. Or ultimately pre-trade, because

that's what will enable central limit order books, very simplistic.

Now, it seems to me as we walk before we run, the bulk of trading that's going to be done in the next six months or nine months, will be much higher latency. We could manage with a slower process, including a slower pre-trade, if we start to move to central limit order books. Whatever was said before as a customer, I'm happy to be fragmented.

So if there's a SEF that's a true central limit order book and latency matters, then take a piece of my single pot, even my post-pot, and go ahead and push it up, haircut me so that I can take the latency. And then I don't want any intermediate steps. I don't want to wait even a little bit to go check somebody else, but only when we get there.

MR. O'CONNOR: But it's only required if you get there.

MR. COSTA: Yeah.

MR. O'CONNOR: Let me finish my point before I upset everybody in the industry. And that is that the way that it works today, I think is what happens is at the time of transaction, there's a contemporaneous process of credit check. Now from

the outside looking in, that may feel like pre-trade certainty, but it's not necessarily pre-trade certainty. A trade may -- a trade may not be executed because a limit is not available.

Now is that -- you know, in the brave new world, is that instantaneous post-trade approval or is that pre-trade certainty? It's not clear to me that it's one or the other.

MR. DURKIN: I just wanted to echo some of the comments that Chuck said earlier. I mean, we should not dismiss the models that have been in place for sometime that deal with both, I think effectively post- and pre-trade credit checks. And so when we talk about going down maybe a slightly different path, you also have to look at what has been put on this industry in general in terms of operational readiness and the timelines to be able to get all of this accomplished.

And so while we're all very sensitive to trying to get to that ultimate end, I do think we shouldn't dismiss what's out there today and what is working very well as we move towards that direction.

MR. HAMILL: I feel like I'm the only one arguing though for the pre-trade check, but maybe I'll just reiterate. I don't think because it's

easier to have a post-trade check that you do that and give away safety. Like that just doesn't seem to me like a sensible trade that anyone would make.

And I think whatever anyone would say about what that group concluded, there was a large majority of that working group, including buy and sell side, who would rather have a pre-trade check. That's not to say people don't recognize there's hair in getting it done and it's complicated and it's hard. But if you ask someone, pretty much anyone who trades credit default swaps, for example, at the point of execution, would you rather know then your trade is done or would you rather wait a little bit of time? The answer is, I'd rather know my trade is done.

But the question is, how do we achieve that? And no one's saying that's easy, but it's not a simple question of -- there's no value in it, so let's just look at what we have today.

CHAIRMAN GENSLER: Can I ask this? How do you read the rule that we just finalized if we said futures commission, everybody's sort of entering into a cleared trade has to have a futures commission merchant guaranteeing them? Isn't that in essence saying it's -- I mean, at least the FCMs

on the hook? Whether the FCM is checking pre or post, the FCM is on the hook so that you can have anonymous trading and let's hope that the FCM is managing it in a way -- not more than hope, but that they really are managing in a way that works.

MR. HAMILL: Go ahead.

MR. COSTA: I would say -- I was actually -- and this is part of the -- let's call it the dialectical synthesis in the sense that on -- the greater risk in theory is on the customer side. So I think we would agree that if -- and it's a less of a lift for the FCMs to stand for their customer trades, including through even a ping. We're hearing that from the SEFs. We're hearing that from the FCMs.

Where it gets -- where we really would be trying to revise the world would be to ask CCPs to put pre-execution limits out against their FCMs.

MR. MARON: And I think this is an evolutionary process. We're not looking to go whole hog and get to the end stage immediately. We would like to get to pre-trade certainty and have that pre-trade credit check, and it's going to take for us all to get there. But the FCM has to know about that order that was put in in order for them to

stand behind it. And they can either do that by having each of the SEFs tell them about it, or a hub or somebody else tell them about it.

But otherwise, how do you get them to stand behind a trade that they're not aware of until after it's gone through the clearing house?

CHAIRMAN GENSLER: But I'm gathering that you do interpret the rule that we just finalized, that everybody's got to have an FCM standing. So thus, if you enter a market anonymously, and you don't know who's on the other side, but you know by force of some law that the party on the other side has to be guaranteed by an FCM.

MR. MARON: Yes.

CHAIRMAN GENSLER: I mean, that helps the clearing houses.

MR. HAMILL: I think we're just talking here about the practical implementation of that, right? For an FCM to get comfortable with that, they have to put that limit somewhere and be sure that trade is being read against that limit. I think that's what we're effectively -- I think everyone agrees that's the best -- that's how the central limit order book needs to work.

MR. COSTA: I think the one section of the

rule would certainly accommodate ClearPort, in the sense that it's real time automated acceptance that would potentially be post.

CHAIRMAN GENSLER: But the FCM still has to stand behind it?

MR. COSTA: Yes.

CHAIRMAN GENSLER: I was talking about the FCMs. I recognize you're talking about the clearing houses, but I was talking about the FCMs.

MR. RUCKER: I just wanted to add a point on the practical implication of this, in my view is that way or another, the industry does need to reach a consensus on the way this is happening, because from a trading venue standpoint, and as hopefully a SEF, what would be hardest is if we end up with all these different models we've talked about operating in different circumstances. That, I think, would be very costly and very inefficient to the industry.

My personal view is that all of the solutions we've talked about could work to ensure that we get a clearing certainty, a point of execution. But what we do need to decide as an industry, what is the method we're going to follow? Otherwise, we really will create a lot of additional cost.

MR. HAMILL: To that point, I would say, I think, from a UBS standpoint, being both an FCM and execute, there may be -- there may be people who try to set up different models. I think the market will find its own equilibrium. I would not envisage we will trade on a SEF without a pre-trade credit check. Just couldn't see that working. I wouldn't envisage that as an FCM we would just waive trades in not based on some sort of limit that we have for these kind of products.

So it will sort of self-police itself, because if someone goes out there and says yeah, hey, I'm setting up this SEF, it's a essential on the order book, there is no pre-trade limit check, we're going to check after the fact, and then someone else says, I'm going to set up a central order book, I'm going to require that somehow you post your limit to me and ICE is going to give me a venue to do that and I'm going to push it out there, and I know -- and they know what the point of execution that trade is done, and I can immediately read as an FCM how much of my limit is being used, that's how the market's supposed to work.

So I think we will go to the venues that operate the way -- that make the most sense from a

risk standpoint for our firms. That's how I think that stuff polices -- I don't think we'll get to a single standard. I think that's obvious from some of the discussions we're having today actually.

CHAIRMAN GENSLER: Randall, can I ask you a question about your earlier chart? You happen to have in the box trade execution central and mid-order RFQ, voice, and I was just curious, does anything on this chart differ between those three or are you sort of neutral? Because you put all three in the box.

MR. COSTA: Does it differ in the sense of how we address the limit?

CHAIRMAN GENSLER: Or all of this sort of the financial integrity of trades.

MR. COSTA: In terms of pulling, a little bit potentially in the sense that -- I'm sorry, I'm still struggling a little bit about your earlier question that the rule-making. I think would still allow a ClearPort like structure even in the sense that it doesn't -- the trade does not have to pass to be within the rules. An FCM pre-existing limit filter, it could be done first and then within real time accepted. It's a fine point, but it becomes relevant to the voice trade context.

Am I being clear?

CHAIRMAN GENSLER: That's all right. It's the plumbing and the plumbing, so I'll try to catch up later.

MR. COSTA: The issue with voice is this. In the world -- there will always be -- like block trades, right? There will be voice trades, like on Globex today, we have a huge liquid trade.

CHAIRMAN GENSLER: Actually, I'll say -- as I've said over and over again, block trades, absolutely.

MR. COSTA: Yeah, they will happen. So the thing is, we say done -- Paul and I say done off an RFQ. So there's no way as we're doing -- we're talking this through on the phone normally, that we -- we'll get there, but normally we would do this on the phone, and then we would input it into a trade capture facility.

And the way it would be processed, as I understand it even today, I'm looking over at Bryan at CME, it's like ClearPort. It's immediate post acceptance. It would hit the filters, both my FCM filter and my CCP checking, that it's within the FCM's limit. And from my perspective, that will work fine forever. It worked for futures for a long

time.

If you are -- if you want perfection and you want pre-execution certainty even on the voice trade, we can give that to you too, by leveraging the same infrastructure that we're talking about here. In principle market access, could -- let's say there's a trade that -- you know, I could do a trade and I could do an RFQ. It's going to pass through our ping filter or the push, and it's going to go to file. But I've got a blocked trade. And I agree with Paul; we could in theory leverage the same infrastructure and run it through.

We could put in the trade to one, because it was blocked. It didn't have to go to five. It goes to one. But before it goes to Paul via MarketAxess, it passes the credit filter. So he really wants that thousand percent certainty that there's no risk, that he breaks between the time we say done and the two seconds that the clearing house delivers the message back; you could have it that way.

And it isn't -- I don't think anyone built it, but it's not hard since everyone is busy building what MarketAxess set up. And we have certainly talked about that in the FIA as to form.

That's the only difference I see.

CHAIRMAN GENSLER: So you're saying in voice, or at least the voice you're identifying, which is a block, it's for a few seconds bilateral. Because it's not anonymous. You know it's Paul. Paul knows it's you.

MR. COSTA: Yes. It's not anonymous. It's between the counter-parties. We would say done, but we're intending to do a clear trade. If we're in a mandatory cleared world, there's no bilateral trade that gets converted to a cleared trade. We're doing a cleared trade, but it hasn't -- it's subject to acceptance and it hasn't been accepted for the time it takes for the two of us -- if we were using a trade capture utility like MarkitSERV or ICE Link or VCON, he'd type in the trade and I'd type in the trade at the same time.

The trades would match immediately, just like with ClearPort, and as long as they align, there weren't an exception kickback, we'd fly to the clearing house, run through the ClearPort checks and pop back. And by the time basically we got done typing and took a breath, we'd have an accepted or rejected message back.

The buy side view generally is that if

somehow it was in that .0001 percent of being sort of rejected because I was stupid enough to blow my limit and not watching my fuel gauge, Paul knows who I am. He can say, oh, it was you. I know you're okay, or I'm walking, you know, I'm just walking from this trade. And I think that's the way the energy markets have worked and the way futures block trades work.

We don't sue each other. We don't need execution documentation to get this done. But there are other -- there are folks who are very concerned even about that instance. And we have a technological solution to it. It's MarketAxess leveraging or MarkitSERV, as a middleware or trade capturing utility could in theory plug into credit limit pots as well and deliver the same functionality, or the CCPs could offer it.

ICE, I think we've talked to ICE about it, or CME. They could similarly offer just like they have ClearPort today, or ICE Link today. I could just go to ICE Link and there could be a screen that would function as if it were ICE Link supporting credit techs or supporting a SEF.

MR. HAMILL: I think it's actually quite simple. You have one risk limit and you kind of

have three ways of trading. You're either trading on a limit order book or you're trading on a screen using a request for call or you're trading by voice. It doesn't really matter which one of those you're doing.

You're sort of doing the same thing and it just -- it's just more like a slow motion version of it as you -- on the central limit order book. It's already there and it's done. On the RFQ, it can be done. The limit could be checked as the RFQ is launched. And the voice is very similar to an RFQ trade. Sort of by voice trade, someone's calling you. There's a period of time. You give a price.

I think what's more complicated about the voice trade is where is it that you're going to look for the limit? Where is that limit exposed to? Does the clearing house do it through a front end, or do we check in on a SEF, or whatever it is?

But again, that's not hard. It's just a decision and it's also a competitive one that I think people will be continuing to try to build the best mousetraps for. I mean, it's my view that the -- you know, the risk managers will set up the clearing house and/or the MarkitSERV hub and if they want to be successful, they will offer a feature

that does something like this, so that people can get pre-trade certainty on voice trades as well.

I don't know that it's all that different.

COMMISSIONER O'MALIA: How long is it going to take to get to the ideal world of having it all plumbed and wired? I think our rule says October 1 of this year.

MR. COSTA: I just want to -- I don't think -- I think you've heard a number of us say we don't need to get to the ideal world. You've heard some real full ideals expressed here. What we need to get to by October 1 is a standardized messaging protocol. We need to, ideally, if we can, align around risk measures for asset class. That would certainly make the FCM's task easier and the CCP's task easier. But if we didn't, it wouldn't be the end of the world.

We need the SEFs, if they're active, to build the ping, or if elected, the push. And to be prepared to activate or handle the safeguards that we talked about that are intrinsic to the system, and also required in the rule-making.

We need the FCMs to finish the limit automation that they've already undertaken with respect to their individual customers. And then we

need the CCPs to build their Plus Ones effectively, or their equivalents. I've heard all of those stakeholders in my discussions with them say -- you've got a bunch of them around the table, that they're prepared to do that for us to get up and running.

When we go more high velocity, then we want to intensify the robust -- the strength of the infrastructure to handle that lower latency.

MR. MARON: And there are interim steps that as was just mentioned, already in place. We won't be able to achieve that by October for the hub. We'll have it shortly thereafter, the next generation credit.

CHAIRMAN GENSLER: Bryan, did that sound like the -- right roughly?

MR. DURKIN: Yes.

CHAIRMAN GENSLER: Paul, just because earlier you peaked my interest on something. How many SEFs do you think there might be, you know, assuming we do our thing and actually finalize the rule this summer?

MR. COSTA: Per asset class.

CHAIRMAN GENSLER: No, no, no. Our bet's a little broader.

MR. HAMILL: Twenty-five. That's a real number. I'd say about that.

MR. COSTA: You mean worldwide or U.S.?

MR. HAMILL: SEFs are global then?

MR. COSTA: Because I count 14 now that I -- on my list.

COMMISSIONER O'MALIA: I just want -- Cosgrove said there's -- he was a buyer at 100.

MR. COSGROVE: That was until I saw the SEF registration form.

COMMISSIONER O'MALIA: We're just trying to help.

MR. COSGROVE: You are helping.

MR. HARRIS: Thirteen SEFs have already signed up with NFA for -- 13 institutions have already signed up with NFA for regulatory services and I think it's going to be upwards of that.

MR. COSTA: But I think -- if I can contextualize, if not all of those are all asset classes, and very few of them are central limit order book. I think that's important to appreciate as we look at this discussion and decide what milestones we need to hit when.

MR. MARON: I thought most of the newer SEFs that were out there are all central limit order

book and all the IBs that are offering their platforms are all central limit order book. I think there are a few people today who do dealer client very well, like MarketAxess, that will offer RFQ potentially, a central order book as well, if we're not -- as they choose as the rules go through.

But I would be a betting person on the side of more central order book rather than less.

CHAIRMAN GENSLER: It somewhat depends on how we finalize. How we propose is everybody has to at least facilitate live, actionable ammo. So executable quotes, bids and offers with full market access, or impartial access, as Congress said.

I understand that Commissioner O'Malia is about to wrap up, so I just wanted to thank everybody. I think this is just really a terrific set of advice, advisors. I haven't seen what the smaller groups are doing with Andrei, but I think our Commission all benefits and the public benefits.

We have a lot of work in front of us and as these markets move and change, the technology component is critical. So I thank you.

COMMISSIONER O'MALIA: Any other final thoughts of TAC members, panelists? Let me thank you all very much. I want to thank our teams that

help set this up. Margie Yates and her team. We have the AV team that makes all of this work. Cornelius Sessions, Michael Jones, Gene Robinson, Joshua Griffin.

I want to thank my staff, Laura Gardy, Carl Kennedy, and Nancy Schnabel for their help. Obviously all of the people with the General Counsel's Office that -- and all of our staff assistants that will be helping out on the working groups.

I also want to -- just kind of a housekeeping matter. All good things must come to an end. The TAC Committee is no different. But it's only version 1.0. TAC 2.0 will be -- we have to renew the charter. The charter expires in June and I will renew it. I will renew -- obviously there will be seemless transition for the ATS and HFT.

I'm interested in what more work the Data Committee is interested in doing, and I'm certainly interested in the full committee's -- and we will renew it and if you're interested in participating again on the next one, 2.0, let me know. Those who you think would be good candidates, let them know. I'd also like to know about different topics, as

well, what do you think would be useful for us to attack and address going forward?

So this is a useful process. I've benefitted a lot in the brief two years that we've done it. We've got a lot of work out of you all and I greatly appreciate it. And so we'll renew this again, chairman willing, of course.

CHAIRMAN GENSLER: Commission willing. It's a Commission, General Services Administration, things like that. But it's been highly beneficial.

COMMISSIONER O'MALIA: Good. So to that end, we will keep going. Let me know if you're interested in serving again and we'll move from there.

Again, let me thank everybody for their time, their effort to participate and to support these groups and to support the Commission. It's very beneficial. So thank you very much for coming today and thanks for your participation. Thanks.

(Whereupon, at 4:14 p.m., the meeting was adjourned.)