MINUTES OF THE TENTH MEETING OF THE U.S. COMMODITY FUTURES TRADING COMMISSION'S TECHNOLOGY ADVISORY COMMITTEE

October 5, 2018

The Technology Advisory Committee (TAC) convened for a public meeting on Friday, October 5, 2018, at 10:02 a.m., at the U.S. Commodity Futures Trading Commission's (CFTC or Commission) Headquarters Conference Center, located at Three Lafayette Centre, 1155 21st St. NW, Washington, DC. The meeting consisted of four panels. In Panel I, the Virtual Currencies Subcommittee presented on the evolving cryptocurrency landscape, including questions surrounding the appropriate regulatory framework for various crypto assets and trading platforms. In Panel II, the Automated and Modern Trading Markets Subcommittee discussed its planned work over the next year to assess the true risks of the modern trading environment. Panel III discussed the feasibility of regulators issuing machine-readable and executable regulatory rulebooks to facilitate market participants' RegTech compliance solutions. In Panel IV, the Distributed Ledger Technology and Market Infrastructure Subcommittee discussed distributed ledger technologies potential for trade reporting.

<u>TAC Members in Attendance</u>

Erik Barry, Credit Suisse. Head of Client Platform for Prime Derivative Services
Christopher Chattaway, Managing Director, Goldman Sachs
Paul L. Chou, Chief Executive Officer and Co-Founder, LedgerX
Gary DeWaal, Special Counsel, Katten Muchin Rosenman LLP
Bryan Durkin, President, CME Group
Richard Gorelick, Head of Market Structure, DRW Holdings LLC
Christopher Hehmeyer, Managing Member, Hehmeyer Trading and Investments
Bradford Levy, Managing Director and Chief Executive Officer, MarkitServ, Markit
John Lothian, President and Chief Executive Officer, Jonathan J. Lothian Co.
Benjamin Macdonald, Global Head of Product and President, Bloomberg SEF and Bloomberg SDR, Bloomberg
Timothy McHenry, Vice President, Information Systems, NFA
Jennifer Peve, Managing Director Business Development and Co-Head, Office of FinTech Strategy, DTCC
Steven J. Randich, Executive Vice President and Chief Information Officer, FINRA
Alexander Stein, Managing Director, Two Sigma
Larry Tabb, Founder and Chief Executive Officer, TABB Group
Supurna VedBrat, Global Head of Trading, BlackRock

<u>CFTC Commissioners and Staff in Attendance and Speakers</u>

J. Christopher Giancarlo, Chairman, CFTC
Brian D. Quintenz, Commissioner and TAC Sponsor, CFTC
Rostin Benham, Commissioner, CFTC
Dan Berkovitz, Commissioner, CFTC
Dawn D. Stump, Commissioner, CFTC

Daniel Gorfine, TAC Acting Chair/Designated Federal Officer (DFO) and Director, LabCFTC
Brian Trackman, Counsel on FinTech and Innovation, Office of General Counsel, CFTC

Invited Speakers in Attendance
Jo Ann Barefoot, Barefoot Innovation Group
Pierre Lamy, REGnosys
Andre McGregor, TLDR Capital
Brijesh Solanki, Credit Suisse

I. Opening Remarks

Mr. Gorfine, the Designated Federal Officer for the TAC and Director of LabCFTC, called the meeting to order. Commissioner Quintenz, the TAC's sponsor, then gave his opening remarks, welcoming and thanking all committee members for attending. Additionally, he specifically thanked the members of the four subcommittees that were formed after the February TAC meeting. The four subcommittees are: Virtual Currencies; Distributed Ledger Technology (DLT) and Market Infrastructure; Cybersecurity; and Automated and Modern Trading Markets. He then discussed the agenda for the day, including three presentations from the subcommittees on their progress and future plans, and a panel regarding the use of RegTech to facilitate compliance.

Next, Chairman Giancarlo gave his opening remarks. He thanked all for their attendance of the TAC meeting and also noted that it was FinTech week at the Commission and thanked CFTC staff for facilitating and/or organizing the inaugural FinTech Forward Conference. The Chairman then welcomed new Commissioners Stump and Berkovitz and thanked them for taking on sponsorship of their respective committees, the Global Markets Advisory Committee (GMAC) and the Energy and Environmental Markets Committee (EEMAC). The Chairman also thanked Commissioner Behnam for his interim sponsorship of the Agricultural Advisory Committee (AAC) and his work on the Market Risk Advisory Committee (MRAC). He further noted that the Commission just approved the formation of a new MRAC subcommittee to address emerging issues related to the movement away from London Interbank Offered Rate (LIBOR) to Secured Overnight Financing Rate (SOFR), and that he would be serving as the AAC's new Sponsor. The Chairman concluded by highlighting the importance of the TAC meetings and how the meetings help inform the Commission so that the Commission may refine its policy responses to the quickening pace of change in markets.

Following the Chairman, Commissioner Benham gave his remarks. He thanked the Chairman for his remarks and welcomed Commissioners Stump and Berkovitz to the Commission. He also thanked Mr. Gorfine for all his work on the October TAC meeting and Commissioner Quintenz's sponsorship of the meeting.

Following the Chairman's remarks, Commissioner Stump gave her opening remarks. She emphasized her commitment to tackling the challenge of addressing emerging regulatory questions that result from today's evolving technology applications. She thanked Commissioner Quintenz and Mr. Gorfine for their leadership of the TAC and all of her fellow Commissioners for welcoming her to the Commission.

Finally, Commissioner Berkovitz gave his opening remarks. He thanked the Chairman and other Commissioners for welcoming him to the Commission. He emphasized the importance of the Commission being at the cutting edge of technology and regulators being responsive to address the role of these technologies. He concluded by thanking Commissioner Quintenz and Mr. Gorfine for their work on the meeting.

II. TAC Discussion Regarding Committee Goals, Agenda, and Scope

Following the opening remarks, Mr. Gorfine discussed the scope, plans, and approach for the meeting. He stated that the following three subcommittees would present on panels: Virtual Currencies, Automated and Modern Trading Markets, and DLT and Market Infrastructure. At the end of each presentation, the current framing and approach to the subcommittee work would be evaluated to see if it could be improved in any way. Mr. Gorfine also stated there would be a panel on the topic of RegTech and facilitating machine-readable and machine executable rulebooks.

III. Panel I: Virtual Currencies Subcommittee Presentation & Digital Assets Security Discussion

Mr. Gorfine introduced the first panel. Mr. DeWaal opened the panel and stated that there are two main issues that the subcommittee had been asked to review. The first issue is how to look at the derivatives markets and leverage the characteristics, standards, and best practices from a largely institutional derivatives market to enhance the integrity and degree of trust in the underlying spot markets. The second issue is whether crypto assets are a security and/or derivative and under what parameters should the Commission determine that crypto assets are derivatives contracts.

Mr. Gorelick gave a brief primer on the virtual currency spot markets and the benefits and potential issues associated with these markets. He discussed the decentralized exchanges, the centralized exchanges, and the over-the-counter market. He stated that there were some good things about the market structure that should carefully be preserved and not lost. For example, the innovation and creativity in the markets can at times solve difficult problems. Another benefit discussed was the demand to participate in these markets including a wider variety of participants. Further, he noted that the potential issues associated with these markets include: the lack of transparency, venue risk including the risk of hacking and theft, market manipulation including wash trades and spoofing, inadequate surveillance, conflicts of interest due to a lack of defined roles, and issues of supervision due to the global framework of these markets.

Mr. Gorelick then discussed potential solutions to the issues associated with virtual currency spot markets. First, he stated that smart regulation was part of the solution. However, difficult definitional and jurisdictional issues need to be addressed before figuring out the right regulatory model. The CFTC has authority for fraud and manipulation in the spot market for commodities in the U.S. However, the CFTC must consider how to best influence the regulatory landscape in the virtual currency spot market as there are many regulators that will be involved in regulating this market because of its global nature. Mr. Gorelick then stated that one of the potential solutions the Commission could consider to assist in the regulation of these markets is a number of self-regulatory organizations or similar organizations that could touch markets in multiple jurisdictions.

With regard to technology, Mr. Gorelick stated that the technology associated with crypto assets including block chain, identity tokens, and smart contracts will all help enforce rules and contracts. Additionally, technology used in traditional financial markets such as surveillance systems, order management and execution management systems, risk management systems, and compliance technologies could also be refined to be used in the virtual currency markets.

Mr. DeWaal then discussed ideas on how to classify crypto assets. He stated that crypto assets can be put into three categories: crypto currencies, security tokens, and utility tokens. He explained that crypto currencies are typically mediums of exchange similar to fiat currency. Security tokens have the qualities of securities where people are collectively investing in an enterprise with the expectation of a profit. Utility tokens are consumption tokens where you may purchase use or access to goods and services, but there might be a secondary market for this token. He suggested three broad questions that must be considered to classify crypto assets: 1) how was the coin issued?, 2) how did the sponsors promote it and or retain control?, and 3) should subjective or quantitative measures be used to group assets?

Mr. Stein followed with a brief discussion regarding the quick pace that the technology in the virtual currency industry is changing. He stated that there seemed to be a consensus in the Virtual Currencies Subcommittee that the Commission should take a principles based approach to regulation to allow itself maximum regulatory flexibility in a changing industry.

Mr. McGregor then shared remarks regarding safeguarding digital assets. He discussed crypto hacks in the news and the causes of these hacks as being very simple things like employees failing to protect private keys, hackers sending malicious files to exchange employees, deposits being on a single wallet and allowing for extreme exposure, etc. He highlighted that 90% of attacks still happen over email. As a result, custody regulations are very important and could prevent exchanges from being hacked. He emphasized the need for institutions to have insured, qualified custodians. He also emphasized the need to have industry wide standards regarding custody. He stated that these standards could come from the government, a consortium, or an SRO. These standards should include a “know your customer”

(KYC)/anti-money laundering (AML) and anti-bribery corruption process to ensure safety and education for all the relevant actors.

The panel then turned to a question and answer session. Generally, the concerns and discussions raised in this session included: how it was easy to create a new crypto currency but getting others to adopt it was more difficult, the use of the tokens by fraudsters including money launderers, the need to explore all the devices and tools that have been useful in traditional finance and apply them to the virtual currency market, the impact and role of smart contracts and the underlying jurisdiction which they fall under and the arbitration provisions that underlie them, the misunderstanding that Bitcoin is anonymous and that in reality if there is an issue you can see every wallet and transaction, the problem of unregulated Bitcoin exchanges that do not employ AML/KYC, and the role of the Securities and Exchange Commission (SEC), CFTC and banking regulators in regulating crypto currency.

IV. Panel II: Automated and Modern Trading Markets Subcommittee Presentation

Mr. Gorfine opened the panel by asking Mr. Durkin to present. Mr. Durkin began by stating that electronic trading has emerged as the principal trade execution method for futures markets, resulting in important, well recognized public benefits of increasing liquidity, promoting price discovery, narrowing the bid ask spreads in markets, and lowering risk management costs.

Mr. Durkin stated that since its establishment, the TAC has examined these changes and produced principles based guidance to inform the industry and Commission on risk management, pre and post-trade protocols, systems safeguards, access to co-location facilities, messaging policies, and proposed rules on automated trading (Regulation AT).

Mr. Durkin then discussed the volatility controls and principles that the International Organization of Securities Commissioners (IOSCO) advocated for in a report it recently produced called “Mechanism Used by Trading Venues to Manage Extreme Volatility and Preserve Orderly Trading.” He stated that the U.S. markets were largely ahead in complying with the principles based guidance of the IOSCO report due to the principles based guidance the Automated and Modern Trading Markets Subcommittee had issued earlier and U.S markets had already adopted.

Mr. Durkin stated that the TAC has had a great deal of influence in the industry more broadly. For example, as a result of the dialogue that this committee promoted, the Futures Industry Association (FIA) produced best practices and industry guidelines for risk protocols and controls in 2010. In addition, in 2010, 2015, and 2018, the FIA conducted a survey of global exchanges’ derivatives venues regarding the types and the position of controls that are offered. Mr. Durkin noted that in 2018, the FIA survey found that, of the seventeen major derivatives exchanges that responded globally, eleven implemented dynamic price bands and thirteen implemented trading halts during extreme volatility. He stated that every exchange in the

Americas that responded had implemented both price banding and trading halts without being required to do so.

Mr. Durkin then discussed the eight recommendations of the 2018 best practices and industry guidelines report. The recommendations included: 1) trading venues should have appropriate volatility control mechanisms, 2) trading venues should have appropriately calibrated volatility control mechanisms, 3) trading venues should regularly monitor volatility control mechanisms, 4) regulatory authorities should determine what information they require to effectively monitor volatility control mechanism frameworks, 5) trading venues should provide regulatory authorities information regarding the triggering of volatility control mechanisms, 6) trading venues should communicate information to market participants and to the public about volatility control mechanisms, 7) trading venues should make available to market participants and the public information regarding the triggering of a volatility control mechanism, and 8) where the same or related instruments are traded on multiple trading venues, the relevant trading venues should communicate regarding these instruments.

The panel then turned to a question and answer session. Generally, the concerns and discussions raised in this session included: how the IOSCO report was aligned with the work that the TAC and Commission have led particularly regarding the principles based approach and volatility control mechanisms, the potential for further improvement to risk controls with the introduction of inline credit controls, how qualitative calibrations can go wrong, future trends including quantum computing, next steps for the committee including making adjustments to its guidance based on the TAC meeting, the need for more details on how industry has implemented the subcommittee's principles, and the need for an analysis on how the subcommittee's principles differ from the aforementioned IOSCO principles.

(Lunch Break)

V. Panel III: RegTech and Robo-Rulebooks

Following the lunch break, Mr. Gorfine called the meeting back to order. He previewed the panel stating that the panel would discuss RegTech and how it is opening up the possibility of machine-readable and machine-executable rulebooks. He then introduced the panelists.

Ms. Barefoot framed the panel with quote from Chairman Giancarlo – "The biggest challenge facing virtually every regulator is: How do we take a 20th century analog rulebook and apply it in a 21st century digital world?" She discussed the experiments the Financial Conduct Authority (FCA) has been running in London to see if it was possible to issue a regulation in the form of code rather than words (model-driven machine-executable regulation) and the subsequent hackathon or TechSprint for these code regulations. She stated that by attempting to digitize regulations the FCA and other regulators attempting to do the same are making regulation faster and more cost-effective.

Ms. Barefoot stated the leading use case that regulators and companies are working on is converting the rulebook to being machine readable. She explained that the idea is to put an electronic tag on the sections of regulations and rules and enable a machine to be able to understand who and what is covered by it, and then to implement the changes. She also stated that there is a great deal of work underway on market monitoring through RegTech using artificial intelligence to detect patterns of conduct that could indicate misbehavior or noncompliance or regulatory risk. She also cited digital identity as another area where RegTech can be used.

Ms. Barefoot walked through the key concepts that should be kept in mind regarding RegTech: 1) the goal of actual transformation of the regulatory space, 2) the technology to make the regulatory changes exists but the institutional readiness and capacity is the problem, 3) the regulatory need to learn to move faster, 4) the need for more collaboration, 5) the need for `regulators to have the capacity for experimentation, 6) the need to be working to interoperability, 7) the need to move toward open source design in regulation, and 8) the need to introduce some of the RegTech changes on the side rather than trying to reform the whole entire system at once.

Mr. Lamy provided a background on REGnosys a Fintech company which was created with a vision to radically transform the financial industry's approach to regulatory compliance by providing a digital repository of data (Rosetta), workflow, market practices, and regulatory provisions that are accessible to all market participants. He stated that REGnosys participated in a TechSprint with the FCA and a key takeaway for them was that source documents need to be expressed in unambiguous terms and syntax so that they can be converted into a sequence of subject-object predicates that can be executed by machines. Mr. Lamy also explained that the core of Rosetta is the syntax that provides the ability to express data presentation, data validation, data mapping, and workflow logic in an intuitive and legible manner than can be automatically translated into executable code. Rosetta is currently used by ISDA and market participants to develop the Common Domain Model, a digital representation of derivatives products and workflows.

Mr. Solanki stated that Credit-Suisse started looking at machine-executable and machine-readable regulations sometime last year in order to understand the potential of technologies to transform this space. They approach their thinking on these topics with three conceptual buckets: 1) inputs, 2) the processing part of how to read and understand, and 3) outputs. For inputs, he stressed the need to have a common language which does not currently exist. For processing, he stressed the challenge is around understanding how to structure the process steps involved as well as how to organize the execution of rules and the data quality expectations. For outputs, he stressed looking at what is actually produced and what is actually submitted to the regulators and how this can be aided with technology. Mr. Solanki also stressed the need to have consistency in terms of expectations across regulators globally.

Mr. Trackman presented next stating the main objective of LabCFTC was engagement with the industry to spur innovative thinking and activity around applications of new technology. He stated that in the spring LabCFTC initiated a request for input on potential prize competitions that the CFTC would sponsor requesting both substantive topic areas and input on administration of such competitions. The substantive areas proposed were machine-readable and machine-executable regulation, automated regulatory reporting, and leveraging new sources of market data for things such as better market development. Key takeaways from the input received included global interest in the robo-rulebook concept and interest in automated regulatory reporting. Commenters suggested that any competition the CFTC undertakes should focus on practical steps and focus on standards. Mr. Trackman concluded by discussing the next steps including the goal of moving forward with the competition next year.

The panel then turned to a question and answer session. Generally, the concerns and discussions raised in this session included: how to get various regulators to work together, establishing a common language and common data among regulators, how to phase in machine-readable forms and regulations, and the use of artificial intelligence to address end runs around machine-executable regulatory reporting.

VI. Panel IV: Distributed Ledger Technology and Market Infrastructure Subcommittee Presentation

Mr. Gorfine introduced the panel. Mr. Levy led the panel discussion with some questions for consideration including whether DLT frees the industry and regulators for the challenges of an open, but secure, digital world. He emphasized the importance of cryptography, which is about data protection and information security, and the potential for more automation around the concept of smart contracts.

Mr. Levy discussed three major initiatives. First, he discussed "Stax Payments for Loans," which is a highly sensitive private market which is low to settle and in which cash is a relatively painful process. In this private market, a replica of true money can be used to reconcile portfolios and the accuracy of this process could be tested. The second initiative he discussed was a project called "Ubin." The central bank of Singapore created and exact replica of the paper fiat in their systems. The central bank of Canada did the same in a project called "Jasper." He stated that central banks should see whether they can move fiat money amongst each other with DLT. This has the potential to modernize the central banking system. The third initiative he discussed was an initiative in Australia to fully replatform the entire front, middle, and back end from an exchange and clearing perspective.

Mr. Barry presented next and stated that he is hopeful that many of the concerns that the FCMs have tried to solve independently can be addressed through DLT. For example, identifiers don't currently carry through from execution through clearing in a normal manner across the industry. DLT could solve this problem by providing for consistent identifiers. In another example, he explained that messaging could be centralized through DLT and the risk of failed messages could go down. Mr. Barry urged all to move towards a common language and common framework to bring efficiency and better communication to the industry on a central ledger. He concluded by highlighting the next steps, including refining the DLT and Market Infrastructure Subcommittee's focus on the functional areas and drilling down on the instruments involved, looking at how new technologies may be adopted, and looking at specific industry efforts to adopt new technology to inform its work.

The panel then turned to a question and answer session. Generally, the concerns and discussions raised in this session included: industry initiatives to move DLT along, further refining the scope of the DLT and Market Infrastructure Subcommittee's focus to include taking a look at what it really takes to bring some newer technologies to market, and how to drive standardization of data reporting given the numerous vendors providing the data.

VII. Closing Remarks

In closing, the Chairman and Commissioners all expressed enthusiasm for the excellent discussion and stated they were looking forward to future discussions.

Mr. Gorfine adjourned the meeting at 3:22 p.m.

______________________________ ______May 29, 2019_

Daniel Gorfine Date

TAC Acting Chair/Designated Federal Officer and Director LabCFTC