

Required fields are shown with yellow backgrounds and asterisks.

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| Page 1 of * 104 | SECURITIES AND EXCHANGE COMMISSION<br>WASHINGTON, D.C. 20549<br>Form 19b-4 | File No.* SR - 2019 - * 36 | Amendment No. (req. for Amendments *) |
|-----------------|--|----------------------------|---------------------------------------|

Filing by MIAX PEARL, LLC  
Pursuant to Rule 19b-4 under the Securities Exchange Act of 1934

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| Initial *<br><input checked="" type="checkbox"/> | Amendment *<br><input type="checkbox"/>                                      | Withdrawal<br><input type="checkbox"/> | Section 19(b)(2) *<br><input type="checkbox"/>  | Section 19(b)(3)(A) *<br><input checked="" type="checkbox"/> | Section 19(b)(3)(B) *<br><input type="checkbox"/> |
|  |  |  | Rule  |  |   |
| Pilot<br><input type="checkbox"/>                | Extension of Time Period for Commission Action *<br><input type="checkbox"/> | Date Expires *<br><input type="text"/> | <input type="checkbox"/> 19b-4(f)(1)            | <input type="checkbox"/> 19b-4(f)(4)                         |   |
|  |  |  | <input checked="" type="checkbox"/> 19b-4(f)(2) | <input type="checkbox"/> 19b-4(f)(5)                         |   |
|  |  |  | <input type="checkbox"/> 19b-4(f)(3)            | <input type="checkbox"/> 19b-4(f)(6)                         |   |

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| Notice of proposed change pursuant to the Payment, Clearing, and Settlement Act of 2010 | Security-Based Swap Submission pursuant to the Securities Exchange Act of 1934 |
| Section 806(e)(1) *<br><input type="checkbox"/>   | Section 806(e)(2) *<br><input type="checkbox"/>                                |
| Section 3C(b)(2) *<br><input type="checkbox"/>  |  |

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| Exhibit 2 Sent As Paper Document<br><input type="checkbox"/> | Exhibit 3 Sent As Paper Document<br><input type="checkbox"/> |
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**Description**

Provide a brief description of the action (limit 250 characters, required when Initial is checked \*).

Proposal to amend the Fee Schedule to modify connectivity fees.

**Contact Information**

Provide the name, telephone number, and e-mail address of the person on the staff of the self-regulatory organization prepared to respond to questions and comments on the action.

|                                    |                   |
|------------------------------------|-------------------|
| First Name * Michael               | Last Name * Slade |
| Title * Counsel                    |                   |
| E-mail * mslade@miami-holdings.com |                   |
| Telephone * (609) 897-8499         | Fax               |


**Signature**

Pursuant to the requirements of the Securities Exchange Act of 1934,

has duly caused this filing to be signed on its behalf by the undersigned thereunto duly authorized.

(Title \*)

|                               |  |
|-------------------------------|--|
| Date 12/20/2019               | Senior Vice President and Deputy General Counsel |
| By Joseph Ferraro<br>(Name *) |  |



NOTE: Clicking the button at right will digitally sign and lock this form. A digital signature is as legally binding as a physical signature, and once signed, this form cannot be changed.

SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

For complete Form 19b-4 instructions please refer to the EFFS website.

**Form 19b-4 Information \***

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The self-regulatory organization must provide all required information, presented in a clear and comprehensible manner, to enable the public to provide meaningful comment on the proposal and for the Commission to determine whether the proposal is consistent with the Act and applicable rules and regulations under the Act.

**Exhibit 1 - Notice of Proposed Rule Change \***

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The Notice section of this Form 19b-4 must comply with the guidelines for publication in the Federal Register as well as any requirements for electronic filing as published by the Commission (if applicable). The Office of the Federal Register (OFR) offers guidance on Federal Register publication requirements in the Federal Register Document Drafting Handbook, October 1998 Revision. For example, all references to the federal securities laws must include the corresponding cite to the United States Code in a footnote. All references to SEC rules must include the corresponding cite to the Code of Federal Regulations in a footnote. All references to Securities Exchange Act Releases must include the release number, release date, Federal Register cite, Federal Register date, and corresponding file number (e.g., SR-[SRO]-xx-xx). A material failure to comply with these guidelines will result in the proposed rule change being deemed not properly filed. See also Rule 0-3 under the Act (17 CFR 240.0-3)

**Exhibit 1A- Notice of Proposed Rule Change, Security-Based Swap Submission, or Advance Notice by Clearing Agencies \***

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The Notice section of this Form 19b-4 must comply with the guidelines for publication in the Federal Register as well as any requirements for electronic filing as published by the Commission (if applicable). The Office of the Federal Register (OFR) offers guidance on Federal Register publication requirements in the Federal Register Document Drafting Handbook, October 1998 Revision. For example, all references to the federal securities laws must include the corresponding cite to the United States Code in a footnote. All references to SEC rules must include the corresponding cite to the Code of Federal Regulations in a footnote. All references to Securities Exchange Act Releases must include the release number, release date, Federal Register cite, Federal Register date, and corresponding file number (e.g., SR-[SRO]-xx-xx). A material failure to comply with these guidelines will result in the proposed rule change, security-based swap submission, or advance notice being deemed not properly filed. See also Rule 0-3 under the Act (17 CFR 240.0-3)

**Exhibit 2 - Notices, Written Comments, Transcripts, Other Communications**

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Exhibit Sent As Paper Document

Copies of notices, written comments, transcripts, other communications. If such documents cannot be filed electronically in accordance with Instruction F, they shall be filed in accordance with Instruction G.

**Exhibit 3 - Form, Report, or Questionnaire**

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Exhibit Sent As Paper Document

Copies of any form, report, or questionnaire that the self-regulatory organization proposes to use to help implement or operate the proposed rule change, or that is referred to by the proposed rule change.

**Exhibit 4 - Marked Copies**

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The full text shall be marked, in any convenient manner, to indicate additions to and deletions from the immediately preceding filing. The purpose of Exhibit 4 is to permit the staff to identify immediately the changes made from the text of the rule with which it has been working.

**Exhibit 5 - Proposed Rule Text**

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The self-regulatory organization may choose to attach as Exhibit 5 proposed changes to rule text in place of providing it in Item I and which may otherwise be more easily readable if provided separately from Form 19b-4. Exhibit 5 shall be considered part of the proposed rule change.

**Partial Amendment**

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If the self-regulatory organization is amending only part of the text of a lengthy proposed rule change, it may, with the Commission's permission, file only those portions of the text of the proposed rule change in which changes are being made if the filing (i.e. partial amendment) is clearly understandable on its face. Such partial amendment shall be clearly identified and marked to show deletions and additions.

**1. Text of the Proposed Rule Change**

(a) MIAX PEARL, LLC (“MIAX PEARL” or “Exchange”), pursuant to the provisions of Section 19(b)(1) of the Securities Exchange Act of 1934 (“Act”)<sup>1</sup> and Rule 19b-4 thereunder,<sup>2</sup> proposes to amend the MIAX PEARL Fee Schedule (the “Fee Schedule”) to modify certain of the Exchange’s system connectivity fees.

A notice of the proposed rule change for publication in the Federal Register is attached hereto as Exhibit 1, a copy of the applicable sections of the Audited Unconsolidated Financial Statements of the Exchange and Miami International Securities Exchange, LLC as of December 31, 2018 are attached hereto as Exhibit 3, and a copy of the applicable section of the proposed Fee Schedule is attached hereto as Exhibit 5.

The Exchange previously filed the proposal on October 22, 2019 (SR-PEARL-2019-33). That filing has been withdrawn and replaced with the current filing (SR-PEARL-2019-36).

(b) Not applicable.

(c) Not applicable.

**2. Procedures of the Self-Regulatory Organization**

The proposed rule change was approved by the Chief Executive Officer of the Exchange pursuant to authority delegated by the MIAX PEARL Board of Directors on January 31, 2019. Exchange staff will advise the Board of Directors of any action taken pursuant to delegated authority. No other action by the Exchange is necessary for the filing of the proposed rule change.

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<sup>1</sup> 15 U.S.C. 78s(b)(1).

<sup>2</sup> 17 CFR 240.19b-4.

Questions and comments on the proposed rule change may be directed to Joseph W. Ferraro, Senior Vice President and Deputy General Counsel, at 609-897-8492.

**3. Self-Regulatory Organization's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change**

a. Purpose

The Exchange is refiling its proposal to amend the Fee Schedule to increase the Exchange's network connectivity fees, in order to provide further clarification regarding the Exchange's cost allocation methodology – namely, information that explains the Exchange's rationale for determining that it was reasonable to allocate certain expenses described in this filing towards the total cost to the Exchange to provide network connectivity services. The Exchange is also bolstering its equitable allocation of fees discussion.

The Exchange had previously supplemented its connectivity fee filings in order to provide additional analysis of its baseline revenues, costs, and profitability (before the proposed fee change) and the Exchange's expected revenues, costs, and profitability (following the proposed fee change) for its network connectivity services. This additional analysis includes information regarding its methodology for determining the baseline costs and revenues, as well as expected costs and revenues, for its network connectivity services. The Exchange previously refiled its proposal in order to address certain points raised in the only comment letter received by the Commission on the Exchange's prior proposal to increase connectivity fees.<sup>3</sup>

In order to determine the Exchange's baseline costs associated with providing network connectivity services, the Exchange conducted an extensive cost review in which the Exchange

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<sup>3</sup> See Letter from John Ramsay, Chief Market Policy Officer, Investors Exchange LLC ("IEX"), to Vanessa Countryman, Secretary, Commission, dated October 9, 2019 ("Third IEX Letter," as further described below).

analyzed every expense item in the Exchange's general expense ledger to determine whether each such expense relates to the provision of network connectivity services, and, if such expense did so relate, what portion (or percentage) of such expense actually supports the provision of network connectivity services. The sum of all such portions of expenses represents the total actual baseline cost of the Exchange to provide network connectivity services. (For the avoidance of doubt, no expense amount was allocated twice.) The Exchange is presenting the results of its cost review in a way that corresponds directly with the Exchange's 2018 Audited Unconsolidated Financial Statements, the relevant sections of which are attached hereto as Exhibit 3, which are publicly available as part of the Exchange's Form 1 Amendment.<sup>4</sup> The purpose of presenting it in this manner is to provide greater transparency into the Exchange's actual and expected revenues, costs, and profitability associated with providing network connectivity services. Based on this analysis, the Exchange believes that its proposed fee increases are fair and reasonable because they will permit recovery of less than all of the Exchange's costs for providing the network connectivity services and will not result in excessive pricing or supra-competitive profit, when comparing the Exchange's total annual expense associated with providing the network connectivity services versus the total projected annual revenue the Exchange projects to collect for providing the network connectivity services.

Specifically, the Exchange proposes to amend Sections 5a) and b) of the Fee Schedule to increase the network connectivity fees for the 1 Gigabit ("Gb") fiber connection, the 10Gb fiber

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<sup>4</sup> See the complete Audited Unconsolidated Financial Statements of MIAX PEARL, LLC, LLC as of December 31, 2018, and the Audited Unconsolidated Financial Statements of Miami International Securities Exchange, LLC as of December 31, 2018, which are listed under Exhibit D of MIAX Form 1 Amendment 2019-7 Annual Filing at <https://www.sec.gov/Archives/edgar/vpr/1900/19003680.pdf>.

connection, and the 10Gb ultra-low latency (“ULL”) fiber connection, which are charged to both Members<sup>5</sup> and non-Members of the Exchange for connectivity to the Exchange’s primary/secondary facility. The Exchange also proposes to increase the network connectivity fees for the 1Gb and 10Gb fiber connections for connectivity to the Exchange’s disaster recovery facility. Each of these connections are shared connections, and thus can be utilized to access both the Exchange and the Exchange’s affiliate, Miami International Securities Exchange, LLC (“MIAX”). These proposed fee increases are collectively referred to herein as the “Proposed Fee Increases.”

The Exchange initially filed the Proposed Fee Increases on July 31, 2018, designating the Proposed Fee Increases effective August 1, 2018.<sup>6</sup> The First Proposed Rule Change was published for comment in the Federal Register on August 13, 2018.<sup>7</sup> The Commission received one comment letter on the proposal.<sup>8</sup> The Proposed Fee Increases remained in effect until they were temporarily suspended pursuant to a suspension order (the “Suspension Order”) issued by

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<sup>5</sup> The term “Member” means an individual or organization that is registered with the Exchange pursuant to Chapter II of the Exchange’s Rules for purposes of trading on the Exchange as an “Electronic Exchange Member” or “Market Maker.” Members are deemed “members” under the Exchange Act. See Exchange Rule 100.

<sup>6</sup> See Securities Exchange Act Release No. 83785 (August 7, 2018), 83 FR 40101 (August 13, 2018)(SR-PEARL-2018-16) (the “First Proposed Rule Change”).

<sup>7</sup> Id.

<sup>8</sup> See Letter from Tyler Gellasch, Executive Director, The Healthy Markets Association (“Healthy Markets”), to Brent J. Fields, Secretary, Commission, dated September 4, 2018 (“Healthy Markets Letter”).

the Commission on September 17, 2018.<sup>9</sup> The Suspension Order also instituted proceedings to determine whether to approve or disapprove the First Proposed Rule Change.<sup>10</sup>

The Healthy Markets Letter argued that the Exchange did not provide sufficient information in its filing to support a finding that the proposal is consistent with the Act. Specifically, the Healthy Markets Letter objected to the Exchange's reliance on the fees of other exchanges to demonstrate that its fee increases are consistent with the Act. In addition, the Healthy Markets Letter argued that the Exchange did not offer any details to support its basis for asserting that the Proposed Fee Increases are consistent with the Act.

The Exchange refiled the Proposed Fee Increases on September 18, 2018, designating the Proposed Fee Increases immediately effective.<sup>11</sup> The Proposed Fee Increases remained in effect until they were temporarily suspended pursuant to a suspension order (the "Second Suspension Order") issued by the Commission on October 3, 2018.<sup>12</sup> On October 5, 2018, the Exchange withdrew the First Proposed Rule Change.<sup>13</sup> The Second Proposed Rule Change was published

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<sup>9</sup> See Securities Exchange Act Release No. 84177 (September 17, 2018), 83 FR 47953 (September 21, 2018)(SR-PEARL-2018-16) (Suspension of and Order Instituting Proceedings to Determine Whether to Approve or Disapprove a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

<sup>10</sup> Id.

<sup>11</sup> See Securities Exchange Act Release No. 84358 (October 3, 2018), 83 FR 51022 (October 10, 2018)(SR-PEARL-2018-19) (Notice of Filing of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members; Suspension of and Order Instituting Proceedings to Determine Whether to Approve or Disapprove the Proposed Rule Change) (the "Second Proposed Rule Change").

<sup>12</sup> Id.

<sup>13</sup> See Securities Exchange Act Release No. 84397 (October 10, 2018), 83 FR 52272 (October 16, 2018)(SR-PEARL-2018-16) (Notice of Withdrawal of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

for comment in the Federal Register on October 10, 2018.<sup>14</sup> The Commission received one comment letter on the proposal.<sup>15</sup> The Second Suspension Order also instituted proceedings to determine whether to approve or disapprove the Second Proposed Rule Change.<sup>16</sup>

The SIFMA Letter argued that the Exchange did not provide sufficient information in its filing to support a finding that the proposal should be approved by the Commission after further review of the proposed fee increases. Specifically, the SIFMA Letter objected to the Exchange's reliance on the fees of other exchanges to justify its own fee increases. In addition, the SIFMA Letter argued that the Exchange did not offer any details to support its basis for asserting that the Proposed Fee Increases are reasonable.

On November 23, 2018, the Exchange withdrew the Second Proposed Rule Change.<sup>17</sup>

The Exchange refiled the Proposed Fee Increases on March 1, 2019, designating the Proposed Fee Increases immediately effective.<sup>18</sup> The Third Proposed Rule Change was published for comment in the Federal Register on March 20, 2019.<sup>19</sup> The Third Proposed Rule

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<sup>14</sup> See supra note 11.

<sup>15</sup> See Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, and Ellen Greene, Managing Director Financial Services Operations, The Securities Industry and Financial Markets Association (“SIFMA”), to Brent J. Fields, Secretary, Commission, dated October 15, 2018 (the “SIFMA Letter”).

<sup>16</sup> See supra note 11.

<sup>17</sup> See Securities Exchange Act Release No. 84651 (November 26, 2018), 83 FR 61687 (November 30, 2018)(SR-PEARL-2018-19) (Notice of Withdrawal of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

<sup>18</sup> See Securities Exchange Act Release No. 85317 (March 14, 2019), 84 FR 10380 (March 20, 2019)(SR-PEARL-2019-08) (Notice of Filing and Immediate Effectiveness of a Proposed Rule Change To Amend the MIA X PEARL Fee Schedule) (the “Third Proposed Rule Change”).

<sup>19</sup> Id.



Change provided new information, including additional detail about the market participants impacted by the Proposed Fee Increases, as well as the additional costs incurred by the Exchange associated with providing the connectivity alternatives, in order to provide more transparency and support relating to the Exchange's belief that the Proposed Fee Increases are reasonable, equitable, and non-discriminatory, and to provide sufficient information for the Commission to determine that the Proposed Fee Increases are consistent with the Act.

On March 29, 2019, the Commission issued its Order Disapproving Proposed Rule Changes to Amend the Fee Schedule on the BOX Market LLC Options Facility to Establish BOX Connectivity Fees for Participants and Non-Participants Who Connect to the BOX Network (the "BOX Order").<sup>20</sup> In the BOX Order, the Commission highlighted a number of deficiencies it found in three separate rule filings by BOX Exchange LLC ("BOX") to increase BOX's connectivity fees that prevented the Commission from finding that BOX's proposed connectivity fees were consistent with the Act. These deficiencies relate to topics that the Commission believes should be discussed in a connectivity fee filing.

After the BOX Order was issued, the Commission received four comment letters on the Third Proposed Rule Change.<sup>21</sup>

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<sup>20</sup> See Securities Exchange Act Release No. 85459 (March 29, 2019), 84 FR 13363 (April 4, 2019)(SR-BOX-2018-24, SR-BOX-2018-37, and SR-BOX-2019-04).

<sup>21</sup> See Letter from Joseph W. Ferraro III, SVP & Deputy General Counsel, MIAX, to Vanessa Countryman, Acting Secretary, Commission, dated April 5, 2019 (the "MIAX Letter"); Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated April 10, 2019 (the "Second SIFMA Letter"); Letter from John Ramsay, Chief Market Policy Officer, IEX, to Vanessa Countryman, Acting Secretary, Commission, dated April 10, 2019 (the "IEX Letter"); and Letter from Tyler Gellasch, Executive Director, Healthy Markets, to Brent J. Fields, Secretary, Commission, dated April 18, 2019 (the "Second Healthy Markets Letter").

The Second SIFMA Letter argued that the Exchange did not provide sufficient information in its Third Proposed Rule Change to support a finding that the proposal should be approved by the Commission after further review of the proposed fee increases. Specifically, the Second SIFMA Letter argued that the Exchange's market data fees and connectivity fees were not constrained by competitive forces, the Exchange's filing lacked sufficient information regarding cost and competition, and that the Commission should establish a framework for determining whether fees for exchange products and services are reasonable when those products and services are not constrained by significant competitive forces.

The IEX Letter argued that the Exchange did not provide sufficient information in its Third Proposed Rule Change to support a finding that the proposal should be approved by the Commission and that the Commission should extend the time for public comment on the Third Proposed Rule Change. Despite the objection to the Proposed Fee Increases, the IEX Letter did find that "MIAX has provided more transparency and analysis in these filings than other exchanges have sought to do for their own fee increases."<sup>22</sup> The IEX Letter specifically argued that the Proposed Fee Increases were not constrained by competition, the Exchange should provide data on the Exchange's actual costs and how those costs relate to the product or service in question, and whether and how MIAX considered changes to transaction fees as an alternative to offsetting exchange costs.

The Second Healthy Markets Letter did not object to the Third Proposed Rule Change and the information provided by the Exchange in support of the Proposed Fee Increases.

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<sup>22</sup> See IEX Letter, pg. 1.

Specifically, the Second Healthy Markets Letter stated that the Third Proposed Rule Change was “remarkably different,” and went on to further state as follows:

The instant MIAX filings -- along with their April 5th supplement -- provide much greater detail regarding users of connectivity, the market for connectivity, and costs than the Initial MIAX Filings. They also appear to address many of the issues raised by the Commission staff’s BOX disapproval order. This third round of MIAX filings suggests that MIAX is operating in good faith to provide what the Commission and staff seek.<sup>23</sup>

On April 29, 2019, the Exchange withdrew the Third Proposed Rule Change.<sup>24</sup>

The Exchange refiled the Proposed Fee Increases on April 30, 2019, designating the Proposed Fee Increases immediately effective.<sup>25</sup> The Fourth Proposed Rule Change was published for comment in the Federal Register on May 16, 2019.<sup>26</sup> The Fourth Proposed Rule Change provided further cost analysis information to squarely and comprehensively address each and every topic raised for discussion in the BOX Order, the IEX Letter and the Second SIFMA Letter to ensure that the Proposed Fee Increases are reasonable, equitable, and non-discriminatory, and that the Commission should find that the Proposed Fee Increases are consistent with the Act.

On May 21, 2019, the Commission issued the Staff Guidance on SRO Rule Filings Relating to Fees.<sup>27</sup>

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<sup>23</sup> See Second Healthy Markets Letter, pg. 2.

<sup>24</sup> See SR-PEARL-2019-08.

<sup>25</sup> See Securities Exchange Act Release No. 85837 (May 10, 2019), 84 FR 22214 (May 16, 2019)(SR-PEARL-2019-17) (Notice of Filing and Immediate Effectiveness of a Proposed Rule Change To Amend the MIAX PEARL Fee Schedule) (the “Fourth Proposed Rule Change”).

<sup>26</sup> Id.

<sup>27</sup> See Staff Guidance on SRO Rule Filings Relating to Fees (May 21, 2019), at <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees> (the “Guidance”).

The Commission received two comment letters on the Fourth Proposed Rule Change, after the Guidance was released.<sup>28</sup> The Second IEX Letter and the Third SIFMA Letter argued that the Exchange did not provide sufficient information in its Fourth Proposed Rule Change to justify the Proposed Fee Increases based on the Guidance and the BOX Order. Of note, however, is that unlike their previous comment letter, the Third SIFMA Letter did not call for the Commission to suspend the Fourth Proposed Rule Change. Also, Healthy Markets did not comment on the Fourth Proposed Rule Change.

On June 26, 2019, the Exchange withdrew the Fourth Proposed Rule Change.<sup>29</sup>

The Exchange refiled the Proposed Fee Increases on June 26, 2019, designating the Proposed Fee Increases immediately effective.<sup>30</sup> The Fifth Proposed Rule Change was published for comment in the Federal Register on July 16, 2019.<sup>31</sup> The Fifth Proposed Rule Change bolstered the Exchange's previous cost-based discussion to support its claim that the Proposed Fee Increases are fair and reasonable because they will permit recovery of the Exchange's costs and will not result in excessive pricing or supra-competitive profit, in light of the Guidance issued by Commission staff subsequent to the Fourth Proposed Rule Change, and primarily

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<sup>28</sup> See Letter from John Ramsay, Chief Market Policy Officer, Investors Exchange LLC, to Vanessa Countryman, Acting Secretary, Commission, dated June 5, 2019 (the "Second IEX Letter") and Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, and Ellen Greene, Managing Director, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated June 6, 2019 (the "Third SIFMA Letter").

<sup>29</sup> See SR-PEARL-2019-17.

<sup>30</sup> See Securities Exchange Act Release No. 86343 (July 10, 2019), 84 FR 34003 (July 16, 2019)(SR-PEARL-2019-21) (the "Fifth Proposed Rule Change").

<sup>31</sup> Id.

through the inclusion of anticipated revenue figures associated with the provision of network connectivity services.

The Commission received three comment letters on the Fifth Proposed Rule Change.<sup>32</sup>

Neither the Third Healthy Markets Letter nor the Fourth SIFMA Letter called for the Commission to suspend or disapprove the Proposed Fee Increases. In fact, the Third Healthy Markets Letter acknowledged that “it appears as though MIAX [PEARL] is operating in good faith to provide what the Commission, its staff, and market participants the information needed to appropriately assess the filings.” The Third IEX Letter only reiterated points from the Second IEX Letter and failed to address any of the new information in the Fifth Proposed Rule Change concerning the Exchange’s revenue figures, cost allocation or that the Proposed Fee Increases did not result in excessive pricing or a supra-competitive profit for the Exchange.

On August 23, 2019, the Exchange withdrew the Fifth Proposed Rule Change.<sup>33</sup>

The Exchange refiled the Proposed Fee Increases on August 23, 2019, designating the Proposed Fee Increases immediately effective.<sup>34</sup> The Sixth Proposed Rule Change was published for comment in the Federal Register on July 16, 2019.<sup>35</sup> The Sixth Proposed Rule

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<sup>32</sup> See Letter from John Ramsay, Chief Market Policy Officer, IEX, to Vanessa Countryman, Acting Secretary, Commission, dated August 8, 2019 (the “Third IEX Letter”); Letter from Tyler Gellasch, Executive Director, Healthy Markets, to Vanessa Countryman, Acting Secretary, Commission, dated August 5, 2019 (the “Third Healthy Markets Letter”); and Letter from Theodore R. Lazo, Managing Director and Associate General Counsel and Ellen Greene, Managing Director Financial Services Operations, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated August 5, 2019 (the “Fourth SIFMA Letter”).

<sup>33</sup> See SR-PEARL-2019-21.

<sup>34</sup> See Securities Exchange Act Release No. 86837 (August 30, 2019), 84 FR 46988 (September 6, 2019)(SR-PEARL-2019-25) (the “Sixth Proposed Rule Change”).

<sup>35</sup> Id.

Change provided greater detail and clarity concerning the Exchange's cost methodology as it pertains to the Exchange's expenses for network connectivity services, using a line-by-line analysis of the Exchange's general expense ledger to determine what, if any, portion of those expenses supports the provision of network connectivity services.

The Commission received only one comment letter on the Sixth Proposed Rule Change, twelve days after the comment period deadline ended.<sup>36</sup> Of note, no member of the Exchange commented on the Sixth Proposed Rule Change. Also, no issuer or other person using the facilities of the Exchange commented on the Sixth Proposed Rule Change. Also, no industry group that represents members, issuers, or other persons using the facilities of the Exchange commented on the Sixth Proposed Rule Change. Also, no operator of an options market commented on the Sixth Proposed Rule Change. Also, no operator of a high performance, ultra-low latency network, which network can support access to three distinct exchanges and provides premium network monitoring and reporting services to customers, commented on the Sixth Proposed Rule Change. Rather, the only comment letter came from an operator of a single equities market (equities market structure and resulting network demands are fundamentally different from those in the options markets),<sup>37</sup> which operator also has a fundamentally different business model (and agenda) than does the Exchange. That letter -- the Third IEX Letter -- called for, among other things, the Exchange to explain its basis for concluding that it incurred substantially higher costs to provide lower-latency connections and further describe the nature

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<sup>36</sup> See supra note 3.

<sup>37</sup> See infra pages 19 to 20 (describing the differences in equity market structure and options market structure).

and closeness of the relationship between the identified costs and connectivity products and services as stated in the Exchange's cost allocation analysis.

On October 22, 2019, the Exchange withdrew the Sixth Proposed Rule Change.<sup>38</sup>

The Exchange refiled the Proposed Fee Increases on October 22, 2019, designating the Proposed Fee Increases immediately effective.<sup>39</sup> The Seventh Proposed Rule Change was published for comment in the Federal Register on November 6, 2019.<sup>40</sup> The Seventh Proposed Rule Change provided additional analysis of the Exchange's baseline revenues, costs, and profitability (before the proposed fee change) and the Exchange's expected revenues, costs, and profitability (following the proposed fee change) for its network connectivity services. This additional analysis includes information regarding its methodology for determining the baseline costs and revenues, as well as expected costs and revenues, for its network connectivity services. The Seventh Proposed Rule Change also addressed certain points raised in the Third IEX Letter.

On December 20, 2019, the Exchange withdrew the Seventh Proposed Rule Change.<sup>41</sup> The Exchange notes that the Seventh Proposed Rule Change did not receive any comment letters, however the Exchange has determined to refile the Proposed Fee Increases to provide further clarification regarding the Exchange's cost allocation methodology – namely, information that explains the Exchange's rationale for determining that it was reasonable to allocate certain expenses described in this filing towards the total cost to the Exchange of

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<sup>38</sup> See SR-PEARL-2019-25.

<sup>39</sup> See Securities Exchange Act Release No. 87432 (October 31, 2019), 84 FR 59889 (November 6, 2019)(SR-PEARL-2019-33) (the "Seventh Proposed Rule Change").

<sup>40</sup> Id.

<sup>41</sup> See SR-PEARL-2019-33.

providing network connectivity services. The Exchange is also bolstering its equitable allocation of fees discussion. The Exchange believes that the Proposed Fee Increases are consistent with the Act because they (i) are reasonable, equitably allocated, not unfairly discriminatory, and not an undue burden on competition; (ii) comply with the BOX Order and the Guidance; (iii) are supported by evidence (including data and analysis), constrained by significant competitive forces; and (iv) are supported by specific information (including quantitative information), fair and reasonable because they will permit recovery of the Exchange's costs (less than all) and will not result in excessive pricing or supra-competitive profit. Accordingly, the Exchange believes that the Commission should find that the Proposed Fee Increases are consistent with the Act. The proposed rule change is immediately effective upon filing with the Commission pursuant to Section 19(b)(3)(A) of the Act.

The Exchange currently offers various bandwidth alternatives for connectivity to the Exchange to its primary and secondary facilities, consisting of a 1Gb fiber connection, a 10Gb fiber connection, and a 10Gb ULL fiber connection. The 10Gb ULL offering uses an ultra-low latency switch, which provides faster processing of messages sent to it in comparison to the switch used for the other types of connectivity. The Exchange currently assesses the following monthly network connectivity fees to both Members and non-Members for connectivity to the Exchange's primary/secondary facility: (a) \$1,100 for the 1Gb connection; (b) \$5,500 for the 10Gb connection; and (c) \$8,500 for the 10Gb ULL connection. The Exchange also assesses to both Members and non-Members a monthly per connection network connectivity fee of \$500 for each 1Gb connection to the disaster recovery facility and a monthly per connection network connectivity fee of \$2,500 for each 10Gb connection to the disaster recovery facility.



The Exchange's MIAX Express Network Interconnect ("MENI") can be configured to provide Members and non-Members of the Exchange network connectivity to the trading platforms, market data systems, test systems, and disaster recovery facilities of both the Exchange and its affiliate, MIAX, via a single, shared connection. Members and non-Members utilizing the MENI to connect to the trading platforms, market data systems, test systems and disaster recovery facilities of the Exchange and MIAX via a single, shared connection are assessed only one monthly network connectivity fee per connection, regardless of the trading platforms, market data systems, test systems, and disaster recovery facilities accessed via such connection.

The Exchange proposes to increase the monthly network connectivity fees for such connections for both Members and non-Members. The network connectivity fees for connectivity to the Exchange's primary/secondary facility will be increased as follows: (a) from \$1,100 to \$1,400 for the 1Gb connection; (b) from \$5,500 to \$6,100 for the 10Gb connection; and (c) from \$8,500 to \$9,300 for the 10Gb ULL connection. The network connectivity fees for connectivity to the Exchange's disaster recovery facility will be increased as follows: (a) from \$500 to \$550 for the 1Gb connection; and (b) from \$2,500 to \$2,750 for the 10Gb connection.

b. Statutory Basis

The Exchange believes that its proposal to amend its Fee Schedule is consistent with Section 6(b) of the Act<sup>42</sup> in general, and furthers the objectives of Section 6(b)(4) of the Act<sup>43</sup> in particular, in that it provides for the equitable allocation of reasonable dues, fees and other

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<sup>42</sup> 15 U.S.C. 78f(b).

<sup>43</sup> 15 U.S.C. 78f(b)(4).

charges among Exchange Members and issuers and other persons using any facility or system which the Exchange operates or controls. The Exchange also believes the proposal furthers the objectives of Section 6(b)(5) of the Act<sup>44</sup> in that it is designed to promote just and equitable principles of trade, to remove impediments to and perfect the mechanism of a free and open market and a national market system, and, in general to protect investors and the public interest and is not designed to permit unfair discrimination between customers, issuers, brokers and dealers.

The Commission has repeatedly expressed its preference for competition over regulatory intervention in determining prices, products, and services in the securities markets. In Regulation NMS, the Commission highlighted the importance of market forces in determining prices and SRO revenues and, also, recognized that current regulation of the market system “has been remarkably successful in promoting market competition in its broader forms that are most important to investors and listed companies.”<sup>45</sup>

The Exchange believes that its proposal is consistent with Section 6(b)(4) of the Act, in that the Proposed Fee Increases are fair, equitable and not unreasonably discriminatory, because the fees for the connectivity alternatives available on the Exchange, as proposed to be increased, are constrained by significant competitive forces. The U.S. options markets are highly competitive (there are currently 16 options markets) and a reliance on competitive markets is an appropriate means to ensure equitable and reasonable prices.

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<sup>44</sup> 15 U.S.C. 78f(b)(5).

<sup>45</sup> See Securities Exchange Act Release No. 51808 (June 9, 2005), 70 FR 37496 (June 29, 2005).

The Exchange acknowledges that there is no regulatory requirement that any market participant connect to the Exchange, or that any participant connect at any specific connection speed. The rule structure for options exchanges are, in fact, fundamentally different from those of equities exchanges. In particular, options market participants are not forced to connect to (and purchase market data from) all options exchanges, as shown by the number of Members of MIAX PEARL as compared to the much greater number of members at other options exchanges (as further detailed below). Not only does MIAX PEARL have less than half the number of members as certain other options exchanges, but there are also a number of the Exchange's Members that do not connect directly to MIAX PEARL. Further, of the number of Members that connect directly to MIAX PEARL, many such Members do not purchase market data from MIAX PEARL. There are a number of large market makers and broker-dealers that are members of other options exchange but not Members of MIAX PEARL. For example, the following are not Members of MIAX PEARL: The D. E. Shaw Group, CTC, XR Trading LLC, Hardcastle Trading AG, Ronin Capital LLC, Belvedere Trading, LLC, Bluefin Trading, and HAP Capital LLC. In addition, of the market makers that are connected to MIAX PEARL, it is the individual needs of the market maker that require whether they need one connection or multiple connections to the Exchange. The Exchange has market maker Members that only purchase one connection (10Gb or 10Gb ULL) and the Exchange has market maker Members that purchase multiple connections. It is all driven by the business needs of the market maker. Market makers that are consolidators that target resting order flow tend to purchase more connectivity than Market Makers that simply quote all symbols on the Exchange. Even though non-Members purchase and resell 10Gb and 10Gb ULL connections to both Members and non-Members, no market makers currently connect to the Exchange indirectly through such resellers.

The argument that all broker-dealers are required to connect to all exchanges is not true in the options markets. The options markets have evolved differently than the equities markets both in terms of market structure and functionality. For example, there are many order types that are available in the equities markets that are not utilized in the options markets, which relate to mid-point pricing and pegged pricing which require connection to the SIPs and each of the equities exchanges in order to properly execute those orders in compliance with best execution obligations. In addition, in the options markets there is a single SIP (OPRA) versus two SIPs in the equities markets, resulting in fewer hops and thus alleviating the need to connect directly to all the options exchanges. Additionally, in the options markets, the linkage routing and trade through protection are handled by the exchanges, not by the individual members. Thus not connecting to an options exchange or disconnecting from an options exchange does not potentially subject a broker-dealer to violate order protection requirements. Gone are the days when the retail brokerage firms (the Fidelity's, the Schwab's, the eTrade's) were members of the options exchanges – they are not members of MIAX PEARL or its affiliates, MIAX and MIAX Emerald, they do not purchase connectivity to MIAX PEARL, and they do not purchase market data from MIAX PEARL. The Exchange further recognizes that the decision of whether to connect to the Exchange is separate and distinct from the decision of whether and how to trade on the Exchange. The Exchange acknowledges that many firms may choose to connect to the Exchange, but ultimately not trade on it, based on their particular business needs.

To assist prospective Members or firms considering connecting to MIAX PEARL, the Exchange provides information about the Exchange's available connectivity alternatives in a Connectivity Guide, which contains detailed specifications regarding, among other things,

throughput and latency for each available connection.<sup>46</sup> The decision of which type of connectivity to purchase, or whether to purchase connectivity at all for a particular exchange, is based on the business needs of the firm. For example, if the firm wants to receive the top-of-market data feed product or depth data feed product, due to the amount/size of data contained in those feeds, such firm would need to purchase either the 10Gb or 10Gb ULL connection. The 1Gb connection is too small to support those data feed products. MIAX PEARL notes that there are twelve (12) Members that only purchase the 1Gb connectivity alternative. Thus, while there is a meaningful percentage of purchasers of only 1Gb connections (12 of 33), by definition, those twelve (12) members purchase connectivity that cannot support the top-of-market data feed product or depth data feed product and thus they do not purchase such data feed products. Accordingly, purchasing market data is a business decision/choice, and thus the pricing for it is constrained by competition.

There is competition for connectivity to MIAX PEARL and its affiliates. MIAX PEARL competes with nine (9) non-Members who resell MIAX PEARL connectivity. These are resellers of MIAX PEARL connectivity – they are not arrangements between broker-dealers to share connectivity costs. Those non-Members resell that connectivity to multiple market participants over that same connection, including both Members and non-Members of MIAX PEARL (typically extranets and service bureaus). When connectivity is re-sold by a third-party, MIAX PEARL does not receive any connectivity revenue from that sale. It is entirely between the third-party and the purchaser, thus constraining the ability of MIAX PEARL to set its

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<sup>46</sup> See the MIAX Connectivity Guide at [https://www.miaxoptions.com/sites/default/files/page-files/MIAX\\_Connectivity\\_Guide\\_v3.6\\_01142019.pdf](https://www.miaxoptions.com/sites/default/files/page-files/MIAX_Connectivity_Guide_v3.6_01142019.pdf).

connectivity pricing as indirect connectivity is a substitute for direct connectivity. There are currently nine (9) non-Members that purchase connectivity to MIAX PEARL and/or MIAX. Those non-Members resell that connectivity to eleven (11) customers, some of whom are agency broker-dealers that have tens of customers of their own. Some of those eleven (11) customers also purchase connectivity directly from MIAX PEARL and/or MIAX. Accordingly, indirect connectivity is a viable alternative that is already being used by non-Members of MIAX PEARL, constraining the price that MIAX PEARL is able to charge for connectivity to its Exchange.

The Exchange<sup>47</sup> and MIAX<sup>48</sup> are comprised of 41 distinct Members between the two exchanges, excluding any additional affiliates of such Members that are also Members of MIAX PEARL, MIAX, or both. Of those 41 distinct Members, 33 Members have purchased the 1Gb, 10Gb, 10Gb ULL connections or some combination of multiple various connections. Furthermore, every Member who has purchased at least one connection also trades on the Exchange, MIAX, or both. The 8 remaining Members who have not purchased any connectivity to the Exchange are still able to trade on the Exchange indirectly through other Members or non-Member service bureaus that are connected. These 8 Members who have not purchased connectivity are not forced or compelled to purchase connectivity, and they retain all of the other benefits of Membership with the Exchange. Accordingly, Members have the choice to purchase connectivity and are not compelled to do so in any way.

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<sup>47</sup> MIAX PEARL has 36 distinct Members, excluding affiliated entities. See MIAX PEARL Exchange Member Directory, available at <https://www.miaxoptions.com/exchange-members/pearl>.

<sup>48</sup> MIAX has 38 distinct Members, excluding affiliated entities. See MIAX Exchange Member Directory, available at <https://www.miaxoptions.com/exchange-members>.

The Exchange believes that the Proposed Fee Increases are reasonable, equitable and not unfairly discriminatory because the connectivity pricing is directly related to the relative costs to the Exchange to provide those respective services, and does not impose a barrier to entry to smaller participants. Accordingly, the Exchange offers three direct connectivity alternatives and various indirect connectivity (via third-party) alternatives, as described above. MIAX PEARL recognizes that there are various business models and varying sizes of market participants conducting business on the Exchange. The 1Gb direct connectivity alternative is 1/10<sup>th</sup> the size of the 10Gb direct connectivity alternative. Because it is 1/10<sup>th</sup> of the size, it does not offer access to many of the products and services offered by the Exchange, such as the ability to quote or receive certain market data products. Approximately just less than half of MIAX PEARL and MIAX Members that connect (14 out of 33) purchase 1Gb connections. The 1Gb direct connection can support the sending of orders and the consumption of all market data feed products, other than the top-of-market data feed product or depth data feed product (which require a 10Gb connection). The 1Gb direct connection is generally purchased by market participants that utilize less bandwidth and also generally do not require the high touch network support services provided by the Exchange. Accordingly, these connections consume the least resources of the Exchange and are the least costly to the Exchange to provide. The market participants that purchase 10Gb ULL direct connections utilize the most bandwidth and also generally do require the high touch network support services provided by the Exchange. Accordingly, these connections consume the most resources of the Exchange and are the most costly to the Exchange to provide. Accordingly, the Exchange believes the allocation of the Proposed Fee Increases (\$9,300 for a 10Gb ULL connection versus \$1,400 for a 1Gb connection) are reasonable based on the resources consumed by the respective type of connection – lowest

resource consuming members pay the least, and highest resource consuming members pays the most, particularly since higher resource consumption translates directly to higher costs to the Exchange. The 10Gb ULL connection offers optimized connectivity for latency sensitive participants and is approximately single digit microseconds faster in round trip time for connection oriented traffic to the Exchange than the 10Gb connection. This lower latency is achieved through more advanced network equipment, such as advanced hardware and switching components, which translates to increased costs to the Exchange. Market participants that are less latency sensitive can purchase 10Gb direct connections and quote in all products on the Exchange and consume all market data feeds, and such 10Gb direct connections are priced lower than the 10Gb ULL direct connections, offering smaller sized market makers a lower cost alternative. 10Gb connections are less costly to provide than 10Gb ULL connections, which require greater network support services.

With respect to options trading, the Exchange had only a 4.78% market share of the U.S. options industry in November 2019 in Equity/Exchange Traded Fund (“ETF”) classes according to the OCC.<sup>49</sup> For November 2019, the Exchange’s affiliate, MIAX, had only a 4.32% market share of the U.S. options industry in Equity/ETF classes according to the OCC.<sup>50</sup> For November 2019, the Exchange’s affiliate, MIAX Emerald, had only a 0.92% market share of the U.S. options industry in Equity/ETF classes according to the OCC.<sup>51</sup> The Exchange is not aware of any evidence that a combined market share of approximately 10% provides the Exchange with

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<sup>49</sup> See Exchange Market Share of Equity Products – 2019, The Options Clearing Corporation, available at <https://www.theocc.com/webapps/exchange-volume>.

<sup>50</sup> Id.

<sup>51</sup> Id.



anti-competitive pricing power. This, in addition to the fact that not all broker-dealers are required to connect to all options exchanges, supports the Exchange's conclusion that its pricing is constrained by competition.

Separately, the Exchange is not aware of any reason why market participants could not simply drop their connections and cease being Members of the Exchange if the Exchange were to establish unreasonable and uncompetitive price increases for its connectivity alternatives. Market participants choose to connect to a particular exchange and because it is a choice, MIAX PEARL must set reasonable connectivity pricing, otherwise prospective members would not connect and existing members would disconnect or connect through a third-party reseller of connectivity. No options market participant is required by rule, regulation, or competitive forces to be a Member of the Exchange. As evidence of the fact that market participants can and do disconnect from exchanges based on connectivity pricing, R2G Services LLC ("R2G") filed a comment letter after BOX's proposed rule changes to increase its connectivity fees (SR-BOX-2018-24, SR-BOX-2018-37, and SR-BOX-2019-04).<sup>52</sup> The R2G Letter stated, "[w]hen BOX instituted a \$10,000/month price increase for connectivity; we had no choice but to terminate connectivity into them as well as terminate our market data relationship. The cost benefit analysis just didn't make any sense for us at those new levels." Accordingly, this example shows that if an exchange sets too high of a fee for connectivity and/or market data services for its relevant marketplace, market participants can choose to disconnect from the exchange.

Several market participants choose not to be Members of the Exchange and choose not to access the Exchange, and several market participants also access the Exchange indirectly through

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<sup>52</sup> See Letter from Stefano Durdic, R2G, to Vanessa Countryman, Acting Secretary, Commission, dated March 27, 2019 (the "R2G Letter").

another market participant. To illustrate, the Exchange has only 41 Members (including all such Members' affiliate Members). However, Cboe Exchange, Inc. ("Cboe") has over 200 members,<sup>53</sup> Nasdaq ISE, LLC has approximately 100 members,<sup>54</sup> and NYSE American LLC has over 80 members.<sup>55</sup> If all market participants were required to be Members of the Exchange and connect directly to the Exchange, the Exchange would have over 200 Members, in line with Cboe's total membership. But it does not. The Exchange only has 41 Members (inclusive of Members' affiliates).

The Exchange finds it compelling that all of the Exchange's existing Members continued to purchase the Exchange's connectivity services during the period for which the Proposed Fee Increases took effect in August 2018, particularly in light of the R2G disconnection example cited above.<sup>56</sup> In particular, the Exchange believes that the Proposed Fee Increases are reasonable because the Exchange did not lose any Members (or the number of connections each Member purchased) or non-Member connections due to the Exchange increasing its connectivity fees through the First Proposed Rule Change, which fee increase became effective August 1, 2018. For example, in July 2018, fourteen (14) Members purchased 1Gb connections, ten (10)

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<sup>53</sup> See Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002831.pdf>); Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002833.pdf>); Form 1/A, filed July 24, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002781.pdf>); Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/data/1473845/999999999718007832/9999999997-18-007832-index.htm>).

<sup>54</sup> See Form 1/A, filed July 1, 2016 (<https://www.sec.gov/Archives/edgar/vpr/1601/16019243.pdf>).

<sup>55</sup> See <https://www.nyse.com/markets/american-options/membership#directory>.

<sup>56</sup> See supra note 52.

Members purchased 10Gb connections, and fifteen (15) Members purchased 10Gb ULL connections. (The Exchange notes that 1Gb connections are purchased primarily by EEM Members; 10Gb ULL connections are purchased primarily by higher volume Market Makers quoting all products across both MIAX PEARL and MIAX; and 10Gb connections are purchased by higher volume EEMs and lower volume Market Makers.) The vast majority of those Members purchased multiple such connections with the actual number of connections depending on the Member's throughput requirements based on the volume of their quote/order traffic and market data needs associated with their business model. After the fee increase, beginning August 1, 2018, the same number of Members purchased the same number of connections.<sup>57</sup> Furthermore, the total number of connections did not decrease from July to August 2018, and in fact one Member even purchased two (2) additional 10Gb ULL connections in August 2018, after the fee increase.

Also, in July 2018, four (4) non-Members purchased 1Gb connections, two (2) non-Members purchased 10Gb connections, and one (1) non-Member purchased 10Gb ULL connections. After the fee increase, beginning August 1, 2018, the same non-Members purchased the same number of connections across all available alternatives and two (2) additional non-Members purchased three (3) more connections after the fee increase. These non-Members freely purchased their connectivity with the Exchange in order to offer trading services to other firms and customers, as well as access to the market data services that their connections to the Exchange provide them, but they are not required or compelled to purchase any of the

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<sup>57</sup> The Exchange notes that one Member downgraded one connection in July of 2018, however such downgrade was done well ahead of notice of the Proposed Fee Increase and was the result of a change to the Member's business operation that was completely independent of, and unrelated to, the Proposed Fee Increases.

Exchange's connectivity options. MIAX PEARL did not experience any noticeable change (increase or decrease) in order flow sent by its market participants as a result of the fee increase.

Of those Members and non-Members that bought multiple connections, no firm dropped any connections beginning August 1, 2018, when the Exchange increased its fees. Nor did the Exchange lose any Members. Furthermore, the Exchange did not receive any comment letters or official complaints from any Member or non-Member purchaser of connectivity regarding the increased fees regarding how the fee increase was unreasonable, unduly burdensome, or would negatively impact their competitiveness amongst other market participants. These facts, coupled with the discussion above, showing that it is not necessary to join and/or connect to all options exchanges and market participants can disconnect if pricing is set too high (the R2G example),<sup>58</sup> demonstrate that the Exchange's fees are constrained by competition and are reasonable and not contrary to the Law of Demand. Therefore, the Exchange believes that the Proposed Fee Increases are fair, equitable, and non-discriminatory, as the fees are competitive.

The Exchange believes that the Proposed Fee Increases are equitably allocated among Members and non-Members, as evidenced by the fact that the fee increases are allocated across all connectivity alternatives according to the Exchange's costs to provide such alternatives, and there is not a disproportionate number of Members purchasing any alternative -- fourteen (14) Members purchased 1Gb connections, ten (10) Members purchased 10Gb connections, fifteen (15) Members purchased 10Gb ULL connections, four (4) non-Members purchased 1Gb connections, two (2) non-Members purchased 10Gb connections, and one (1) non-Member purchased 10Gb ULL connections. The Exchange recognizes that the relative fee increases are

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<sup>58</sup> See supra note 52.

27% for the 1Gb connection, 10.9% for the 10Gb connection, and 9.4% for the 10Gb ULL connection, but the Exchange believes that percentage increase differentiation is appropriate, given the actual costs to the Exchange to provide network connectivity and the respective connection options, including the costs associated with providing the different levels of service associated with the respective connections.

The Exchange further believes that the Proposed Fee Increases, as they pertain to purchasers of each type of connectivity alternative, constitute an equitable allocation of reasonable fees charged to the Exchange's Members and non-Members and are allocated fairly amongst the types of market participants using the facilities of the Exchange. For example, for November 2019, between the Exchange and MIAX: (i) Members and non-Members that purchased 10Gb ULL connections accounted for approximately 80% of the total network connectivity revenue collected by the Exchange and MIAX from all connectivity alternatives; (ii) Members and non-Members that purchased 10Gb connections accounted for approximately 15% of the total network connectivity revenue collected by the Exchange and MIAX from all connectivity alternatives; and (iii) Members and non-Members that purchased 1Gb connections accounted for approximately 5% of the revenue collected by the Exchange and MIAX from all connectivity alternatives. As described above, the Exchange believes the Proposed Fee Increases are equitably allocated because 10Gb and 10Gb ULL purchasers (while they account for the vast majority of the Exchange's total connectivity revenue – approximately 95%): (1) consume the most bandwidth and resources of the network; (2) transact the vast majority of the volume on the Exchange; and (3) require the high touch network support services provided by the Exchange and its staff, including more costly network monitoring, reporting and support services, resulting in a much higher cost to the Exchange to provide such connectivity alternatives, compared to the

cost to provide a 1Gb connectivity alternative (as further described in the Exchange's cost discussion, below).

The Exchange believes that the connectivity fees are equitably allocated among users of the three network connectivity alternatives, as the users of the 10Gb and 10Gb ULL connections consume the most bandwidth and resources of the network. Specifically, the Exchange notes that these users account for approximately greater than 99% of message traffic over the network, while the users of the 1Gb connections account for approximately less than 1% of message traffic over the network. In the Exchange's experience, users of the 1Gb connections do not have a business need for the high performance network solutions required by 10Gb and 10Gb ULL users. The Exchange's high performance network solutions and supporting infrastructure (including employee support), provides unparalleled system throughput with the network ability to support access to three distinct options markets and the capacity to handle approximately 10.7 million quote messages per second. On an average day, the Exchange and MIAX handle approximately 8,304,500,000 total messages. Of those, users of the 10Gb and 10Gb ULL connections generate approximately 8,300,000,000 messages, and users of the 1Gb connections generate 4,500,000 messages. However, in order to achieve a consistent, premium network performance, the Exchange must build out and maintain a network that has the capacity to handle the message rate requirements of its most heavy network consumers. These billions of messages per day consume the Exchange's resources and significantly contribute to the overall network connectivity expense for storage and network transport capabilities. Given this difference in network utilization rate, the Exchange believes that it is reasonable, equitable, and not unfairly discriminatory that the 10Gb and 10Gb ULL users pay for the vast majority of the shared network resources from which all Member and non-Member users benefit, but is designed and

maintained from a capacity standpoint to specifically handle the message rate and performance requirements of 10Gb and 10Gb ULL users.

The Exchange also believes that the connectivity fees are equitably allocated amongst users of the three network connectivity alternatives, when these fees are viewed in the context of the overall trading volume on the Exchange. To illustrate, the purchasers of 10Gb ULL connectivity account for approximately 78% of the volume on the Exchange. For example, for all of November 2019, approximately 13.4 million contracts of the 17.1 million contracts executed were done by the top market making firms on the Exchange in simple (non-complex) volume. This overall volume percentage (78% of total Exchange volume) is in line with the amount of network connectivity revenue collected from 10Gb ULL purchasers (80% of total Exchange connectivity revenue).

The Exchange further believes that the fees are equitably allocated, as the amount of the fees for the various connectivity alternatives are directly related to the actual costs associated with providing the respective connectivity alternatives. That is, the cost to the Exchange of providing a 1Gb network connection is significantly lower than the cost to the Exchange of providing a 10Gb or 10Gb ULL network connection. Pursuant to its extensive cost review described above, the Exchange believes that the average cost to provide a 10Gb/10Gb ULL network connection is approximately 4 to 6 times more than the average cost to provide a 1Gb connection. The simple hardware and software component costs alone of a 10Gb/10Gb ULL connection are not 4 to 6 times more than the 1Gb connection. Rather, it is the associated premium-product level network monitoring, reporting, and support services costs that accompany a 10Gb/10Gb ULL connection which cause it to be 4 to 6 times more costly to provide than the 1Gb connection. Accordingly, the Exchange believes it is equitable to allocate

those network infrastructure costs that accompany a 10Gb/10Gb ULL connection to the purchasers of those connections, and not to purchasers of 1Gb connections.

As discussed above, the Exchange differentiates itself by offering a “premium-product” network experience, as an operator of a high performance, ultra-low latency network with unparalleled system throughput, which network can support access to three distinct options markets and multiple competing market-makers having affirmative obligations to continuously quote over 750,000 distinct trading products (per exchange), and the capacity to handle approximately 10.7 million quote messages per second. The “premium-product” network experience enables users of 10Gb and 10Gb ULL connections to receive the network monitoring and reporting services for those approximately 750,000 distinct trading products. There is a significant, quantifiable amount of research and development (“R&D”) effort, employee compensation and benefits expense, and other expense associated with providing the high touch network monitoring and reporting services that are utilized by the 10Gb and 10Gb ULL connections offered by the Exchange. These value add services are fully-discussed herein, and the actual costs associated with providing these services are the basis for the differentiated amount of the fees for the various connectivity alternatives.

The Exchange believes that its proposal is consistent with Section 6(b)(4) of the Act because the Proposed Fee Increases will permit recovery of the Exchange’s costs and will not result in excessive pricing or supra-competitive profit. The Proposed Fee Increases will allow the Exchange to recover a portion (less than all) of the increased costs incurred by the Exchange associated with providing and maintaining the necessary hardware and other network infrastructure as well as network monitoring and support services in order to provide the network connectivity services, since the Exchange launched operations in February 2017. Put simply, the



costs of the Exchange to provide these services have increased considerably over this time, as more fully-detailed and quantified below. The Exchange believes that it is reasonable and appropriate to increase its fees charged for use of its connectivity to partially offset the increased costs the Exchange incurred during this time associated with maintaining and enhancing a state-of-the-art exchange network infrastructure in the U.S. options industry.

In particular, the Exchange's increased costs associated with supporting its network are due to several factors, including increased costs associated with maintaining and expanding a team of highly-skilled network engineers (the Exchange also hired additional network engineering staff in 2017 and 2018), increasing fees charged by the Exchange's third-party data center operator, and costs associated with projects and initiatives designed to improve overall network performance and stability, through the Exchange's R&D efforts.

In order to provide more detail and to quantify the Exchange's increased costs, the Exchange notes that increased costs are associated with the infrastructure and increased headcount to fully-support the advances in infrastructure and expansion of network level services, including customer monitoring, alerting and reporting. Additional technology expenses were incurred related to expanding its Information Security services, enhanced network monitoring and customer reporting, as well as Regulation SCI mandated processes associated with network technology. All of these additional expenses have been incurred by the Exchange since it became operational in February 2017.

Additionally, while some of the expense is fixed, much of the expense is not fixed, and thus increases as the number of connections increase. For example, new 1Gb, 10Gb, and 10Gb ULL connections require the purchase of additional hardware to support those connections as well as enhanced monitoring and reporting of customer performance that MIAX PEARL and its

affiliates provide. And 10Gb ULL connections require the purchase of specialized, more costly hardware. Further, as the total number of all connections increase, MIAX PEARL and its affiliates need to increase their data center footprint and consume more power, resulting in increased costs charged by their third-party data center provider. Accordingly, the cost to MIAX PEARL and its affiliates is not entirely fixed. Just the initial fixed cost buildout of the network infrastructure of MIAX PEARL and its affiliates, including both primary/secondary sites and disaster recovery, was over \$30 million. These costs have increased over 10% since the Exchange became operational in February 2017. As these network connectivity-related expenses increase, MIAX PEARL and its affiliates look to offset those costs through increased connectivity fees.

A more detailed breakdown of the expense increases since February 2017 include an approximate 70% increase in technology-related personnel costs in infrastructure, due to expansion of services/support (increase of approximately \$800,000); an approximate 10% increase in data center costs due to price increases and footprint expansion (increase of approximately \$500,000); an approximate 5% increase in vendor-supplied dark fiber due to price increases and expanded capabilities (increase of approximately \$25,000); and a 30% increase in market data connectivity fees (increase of approximately \$200,000). Of note, regarding market data connectivity fee increased cost, this is the cost associated with MIAX PEARL consuming connectivity/content from the equities markets in order to operate the Exchange, causing MIAX PEARL to effectively pay its competitors for this connectivity. While the Exchange and MIAX have incurred a total increase in connectivity expenses since January 2017 (the last time connectivity fees were raised) of approximately \$1.5 million per year (as described above), the total increase in connectivity revenue amount as a result of the Proposed Fee Increases is

projected to be approximately \$1.2 million per year for MIAX PEARL and MIAX. Accordingly, the total projected MIAX PEARL and MIAX connectivity revenue as a result of the proposed increase, on an annualized basis, is less than the total annual actual MIAX PEARL and MIAX connectivity expense. Accordingly, the Proposed Fee Increases are fair and reasonable because they will not result in excessive pricing or supra-competitive profit, when comparing the increase in actual costs to the Exchange (since February 2017) versus the projected increase in annual revenue. The Exchange also incurred additional significant capital expenditures over this same period to upgrade and enhance the underlying technology components, as more fully-detailed below.

Further, because the costs of operating a data center are significant and not economically feasible for the Exchange, the Exchange does not operate its own data centers, and instead contracts with a third-party data center provider. The Exchange notes that larger, dominant exchange operators own and operate their data centers, which offers them greater control over their data center costs. Because those exchanges own and operate their data centers as profit centers, the Exchange is subject to additional costs. As a result, the Exchange is subject to fee increases from its data center provider, which the Exchange experienced in 2017 and 2018 of approximately 10%, as cited above. Connectivity fees, which are charged for accessing the Exchange's data center network infrastructure, are directly related to the network and offset such costs.

Further, the Exchange invests significant resources in network R&D, which are not included in direct expenses to improve the overall performance and stability of its network. For example, the Exchange has a number of network monitoring tools (some of which were developed in-house, and some of which are licensed from third-parties), that continually

monitor, detect, and report network performance, many of which serve as significant value-adds to the Exchange's Members and enable the Exchange to provide a high level of customer service. These tools detect and report performance issues, and thus enable the Exchange to proactively notify a Member (and the SIPs) when the Exchange detects a problem with a Member's connectivity. In fact, the Exchange often receives calls from other industry participants regarding the status of networking issues outside of the Exchange's own network environment that are impacting the industry as a whole via the SIPs, including calls from regulators, because the Exchange has a superior, state-of-the-art network that, through its enhanced monitoring and reporting solutions, often detects and identifies industry-wide networking issues ahead of the SIPs. The costs associated with the maintenance and improvement of existing tools and the development of new tools resulted in significant increased cost to the Exchange since February 2017 and are loss leaders for the Exchange to provide these added benefits for Members and non-Members.

Certain recently developed network aggregation and monitoring tools provide the Exchange with the ability to measure network traffic with a much more granular level of variability. This is important as Exchange Members demand a higher level of network determinism and the ability to measure variability in terms of single digit nanoseconds. Also, the Exchange routinely conducts R&D projects to improve the performance of the network's hardware infrastructure. As an example, in the last year, the Exchange's R&D efforts resulted in a performance improvement, requiring the purchase of new equipment to support that improvement, and thus resulting in increased costs in the hundreds of thousands of dollars range. In sum, the costs associated with maintaining and enhancing a state-of-the-art exchange network in the U.S. options industry is a significant expense for the Exchange that continues to increase,

and thus the Exchange believes that it is reasonable to offset a portion of those increased costs by increasing its network connectivity fees, which are designed to recover those costs, as proposed herein. The Exchange invests in and offers a superior network infrastructure as part of its overall options exchange services offering, resulting in significant costs associated with maintaining this network infrastructure, which are directly tied to the amount of the connectivity fees that must be charged to access it, in order to recover those costs. As detailed in the Exchange's 2018 Audited Unconsolidated Financial Statements, the Exchange only has four primary sources of revenue: transaction fees, access fees (of which network connectivity constitutes the majority), regulatory fees, and market data fees. Accordingly, the Exchange must cover all of its expenses from these four primary sources of revenue.

The Proposed Fee Increases are fair and reasonable because they will not result in excessive pricing or supra-competitive profit, when comparing the total annual expense of MIAX PEARL and MIAX associated with providing network connectivity services versus the total projected annual revenue of both exchanges associated with providing network connectivity services. For 2018, the total annual expense associated with providing network connectivity services (that is, the shared network connectivity of MIAX PEARL and MIAX, but excluding MIAX Emerald) was approximately \$19.3 million. The \$19.3 million in total annual expense is comprised of the following, all of which is directly related to the provision of network connectivity services by MIAX PEARL and MIAX to their respective Members and non-Members: (1) third-party expense, relating to fees paid by MIAX PEARL and MIAX to third-parties for certain products and services; and (2) internal expense, relating to the internal costs of MIAX PEARL and MIAX to provide the network connectivity services. All such expenses are more fully-described below, and are mapped to the MIAX PEARL and MIAX

2018 Statements of Operations and Member's Deficit (the "2018 Financial Statements"). The \$19.3 million in total annual expense is directly related to the provision of network connectivity services and not any other product or service offered by the Exchange. It does not, as the Third IEX Letter baselessly claims, include general costs of operating matching systems and other trading technology. (And as stated previously, no expense amount was allocated twice.) As discussed, the Exchange conducted an extensive cost review in which the Exchange analyzed every expense item in the Exchange's general expense ledger (this includes over 150 separate and distinct expense items) to determine whether each such expense relates to the provision of network connectivity services, and, if such expense did so relate, what portion (or percentage) of such expense actually supports the provision of network connectivity services, and thus bears a relationship that is, "in nature and closeness," directly related to network connectivity services. The sum of all such portions of expenses represents the total actual baseline cost of the Exchange to provide network connectivity services.

As discussed above, the Exchange differentiates itself by offering a "premium-product" network experience, as an operator of a high performance, ultra-low latency network with unparalleled system throughput, which network can support access to three distinct options markets and multiple competing market-makers having affirmative obligations to continuously quote over 750,000 distinct trading products (per exchange), and the capacity to handle approximately 38 million quote messages per second. The "premium-product" network experience enables users of 10Gb and 10Gb ULL connections to receive the network monitoring and reporting services for those approximately 750,000 distinct trading products. Thus, the Exchange is acutely aware of and can isolate the actual costs associated with providing such a service to its customers, a significant portion of which relates to the premium,

value-add customer network monitoring and support services that accompany the service, as fully-described above. IEX, on the other hand, does not offer such a network, and thus has no legal basis to offer a qualified opinion on the Exchange's costs associated with operating such a network. In fact, IEX differentiates itself as a provider of low cost connectivity solutions to an intentionally delayed trading platform – quite the opposite from the Exchange. Thus, there is no relevant comparison between IEX network connectivity costs and the Exchange's network connectivity costs, and IEX's attempt to do so in the Third IEX Letter is ill-informed and self-serving.<sup>59</sup>

For 2018, total third-party expense, relating to fees paid by MIAX PEARL and MIAX to third-parties for certain products and services for the Exchange to be able to provide network connectivity services, was \$5,052,346. This includes, but is not limited to, a portion of the fees paid to: (1) Equinix, for data center services, for the primary, secondary, and disaster recovery locations of the MIAX PEARL and MIAX trading system infrastructure; (2) Zayo Group Holdings, Inc. (“Zayo”) for connectivity services (fiber and bandwidth connectivity) linking MIAX PEARL and MIAX office locations in Princeton, NJ and Miami, FL to all data center locations; (3) Secure Financial Transaction Infrastructure (“SFTI”)<sup>60</sup>, which supports connectivity and feeds for the entire U.S. options industry; (4) various other services providers

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<sup>59</sup> See Third IEX Letter, pg. 5.

<sup>60</sup> In fact, on October 22, 2019, the Exchange was notified by SFTI that it is again raising its fees charged to the Exchange by approximately 11%, without having to show that such fee change complies with the Act by being reasonable, equitably allocated, and not unfairly discriminatory. It is unfathomable to the Exchange that, given the critical nature of the infrastructure services provided by SFTI, that its fees are not required to be rule-filed with the Commission pursuant to Section 19(b)(1) of the Act and Rule 19b-4 thereunder. See 15 U.S.C. 78s(b)(1) and 17 CFR 240.19b-4, respectively.

(including Thompson Reuters, NYSE, Nasdaq, and Internap), which provide content, connectivity services, and infrastructure services for critical components of options connectivity; and (5) various other hardware and software providers (including Dell and Cisco, which support the production environment in which Members and non-Members connect to the network to trade, receive market data, etc.).

All of the third-party expense described above is contained in the information technology and communication costs line item under the section titled “Operating Expenses Incurred Directly or Allocated From Parent” of the 2018 Financial Statements. For clarity, only a portion of all fees paid to such third-parties is included in the third-party expense herein (only the portion that actually supports the provision of network connectivity services and no expense amount is allocated twice). Accordingly, MIAX PEARL and MIAX do not allocate their entire information technology and communication costs to the provision of network connectivity services.

The Exchange believes it is reasonable to allocate such third-party expense described above towards the total cost to the Exchange to operate and support the network, including providing network connectivity services. In particular, the Exchange believes it is reasonable to allocate the identified portion of the Equinix expense because Equinix operates the data centers (primary, secondary, and disaster recovery) that host the Exchange’s network infrastructure, which enables the provision of network connectivity services. This includes, among other things, the necessary storage space, which continues to expand and increase in cost, power to operate the network infrastructure, and cooling apparatuses to ensure the Exchange’s network infrastructure maintains stability. Without these services from Equinix, the Exchange would not be able to operate and support the network and provide network



connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the Equinix expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 68% of the total Equinix expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the Zayo expense because Zayo provides the internet, fiber and bandwidth connections with respect to the network, linking MIAX PEARL with its affiliates, MIAX and MIAX Emerald, as well as the data center and disaster recovery locations. As such, all of the trade data, including the billions of messages each day per exchange, flow through Zayo's infrastructure over the Exchange's network. Without these services from Zayo, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the Zayo expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 62% of the total Zayo expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the SFTI expense and various other service providers' (including Thompson Reuters, NYSE, Nasdaq, and Internap) expense because those entities provide connectivity and feeds for the entire U.S. options industry as well as the content, connectivity services, and infrastructure services for

critical components of the network. Without these services from SFTI and various other service providers, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the SFTI and other service providers' expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 89% of the total SFTI and other service providers' expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the other hardware and software provider expense because this includes costs for dedicated hardware licenses for switches and servers, as well as dedicated software licenses for security monitoring and reporting across the network. Without this hardware and software, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the hardware and software provider expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 54% of the total hardware and software provider expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review. For 2018, total internal expense, relating to the internal costs of MIAX PEARL and MIAX to provide the network connectivity services, was \$14,271,870. This includes, but is not limited to, costs associated with: (1) employee compensation and

benefits for full-time employees that support network connectivity services, including staff in network operations, trading operations, development, system operations, business, etc., as well as staff in general corporate departments (such as legal, regulatory, and finance) that support those employees and functions; (2) depreciation and amortization of hardware and software used to provide network connectivity services, including equipment, servers, cabling, purchased software and internally developed software used in the production environment to support the provision of network connectivity for trading; and (3) occupancy costs for leased office space for staff that support the provision of network connectivity services. The breakdown of these costs is more fully-described below.

All of the internal expenses described above are contained in the following line items under the section titled “Operating Expenses Incurred Directly or Allocated From Parent” in the 2018 Financial Statements: (1) Employee compensation and benefits; (2) Depreciation and amortization; and (3) Occupancy costs. For clarity, only a portion of all such internal expenses are included in the internal expense herein (only the portion that supports the provision of network connectivity services), and no expense amount is allocated twice). Accordingly, MIAX PEARL and MIAX do not allocate their entire costs contained in those line items to the provision of network connectivity services.

The Exchange believes it is reasonable to allocate such internal expense described above towards the total cost to the Exchange to operate and support the network, including providing network connectivity services. In particular, MIAX PEARL’s and MIAX’s combined employee compensation and benefits expense relating to providing network connectivity services was \$5,264,151, which is only a portion of the \$11,997,098 (for MIAX) and \$8,545,540 (for MIAX PEARL) total expense for employee compensation and benefits that is

stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because this includes the time spent by employees of several departments, including Technology, Back Office, Systems Operations, Networking, Business Strategy Development (who create the business requirement documents that the Technology staff use to develop network features and enhancements), Trade Operations, Finance (who provide billing and accounting services relating to the network), and Legal (who provide legal services relating to the network, such as rule filings and various license agreements and other contracts). As part of the extensive cost review conducted by the Exchange, the Exchange reviewed the amount of time spent by each employee on matters relating to the operation and support of the network. Without these employees, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the employee compensation and benefits expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 26% of the total employee compensation and benefits expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

MIAX's and MIAX PEARL's combined depreciation and amortization expense relating to providing network connectivity services was \$8,269,048, which is only a portion of the \$6,179,506 (for MIAX) and \$4,783,245 (for MIAX PEARL) total expense for depreciation and amortization that is stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because such expense includes the

actual cost of the computer equipment, such as dedicated servers, computers, laptops, monitors, information security appliances and storage, and network switching infrastructure equipment, including switches and taps that were purchased to operate and support the network. Without this equipment, the Exchange would not be able to operate the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the depreciation and amortization expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 75% of the total depreciation and amortization expense, as connectivity services would not be possible without relying on such equipment. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

MIAX's and MIAX PEARL's combined occupancy expense relating to providing network connectivity services was \$738,669, which is only a portion of the \$945,431 (for MIAX) and \$581,783 (for MIAX PEARL) total expense for occupancy that is stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because such expense represents the portion of the Exchange's cost to rent and maintain a physical location for the Exchange's staff who operate and support the network, including providing network connectivity services. This amount consists primarily of rent for the Exchange's Princeton, NJ office, as well as various related costs, such as physical security, property management fees, property taxes, and utilities. The Exchange operates its Network Operations Center (NOC) and Security Operations Center (SOC) from its Princeton, New Jersey office location. A centralized office space is required to house the staff that

operates and supports the network. The Exchange currently has 130 employees.

Approximately two-thirds of the Exchange's staff are in the Technology department, and the majority of those staff have some role in the operation and performance of the network.

Without this office space, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. Accordingly, the Exchange believes it is reasonable to allocate the identified portion of its occupancy expense because such amount represents the Exchange's actual cost to house the equipment and personnel who operate and support the Exchange's network infrastructure and connectivity services. The Exchange did not allocate all of the occupancy expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting network connectivity services, approximately 48% of the total occupancy expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

Accordingly, the total projected MIAX and MIAX PEARL combined revenue for providing network connectivity services, reflective of the proposed increase, on an annualized basis, of \$14.5 million, is less than total annual actual MIAX PEARL and MIAX combined expense for providing network connectivity services during 2018 of approximately \$19.3 million. MIAX PEARL and MIAX project comparable combined expenses for providing network connectivity services for 2019, as compared to 2018.

For the avoidance of doubt, none of the expenses included herein relating to the provision of network connectivity services relate to the provision of any other services offered

by MIAX PEARL and MIAX. Stated differently, no expense amount of the Exchange is allocated twice.

The Exchange believes it is reasonable, equitable and not unfairly discriminatory to allocate the respective percentages of each expense category described above towards the total cost to the Exchange of operating and supporting the network, including providing network connectivity services, because the Exchange performed a line-by-line item analysis of all the expenses of the Exchange, and has determined the expenses that directly relate to operation and support of the network, including providing network connectivity to the Exchange. Further, the Exchange notes that, without the specific third-party and internal items listed above, the Exchange would not be able to operate and support the network, including providing network connectivity services to its Members and non-Members and their customers. Each of these expense items, including physical hardware, software, employee compensation and benefits, occupancy costs, and the depreciation and amortization of equipment, have been identified through a line-by-line item analysis to be integral to the operation and support of the network. Network connectivity fees are intended to recover the Exchange's costs of operating and supporting the network.

Accordingly, the Proposed Fee Increases are fair and reasonable because they do not result in excessive pricing or supra-competitive profit, when comparing the actual network operation and support costs to the Exchange versus the projected network connectivity annual revenue, including the increased amount. Additional information on overall revenue and expense of the Exchange can be found in the Exchange's 2018 Financial Statements.

The Exchange notes that other exchanges have similar connectivity alternatives for their participants, including similar low-latency connectivity. For example, Nasdaq PHLX LLC

(“Phlx”), NYSE Arca, Inc. (“Arca”), NYSE American LLC (“NYSE American”) and Nasdaq ISE, LLC (“ISE”) all offer a 1Gb, 10Gb and 10Gb low latency ethernet connectivity alternatives to each of their participants.<sup>61</sup> The Exchange further notes that Phlx, ISE, Arca and NYSE American each charge higher rates for such similar connectivity to primary and secondary facilities.<sup>62</sup> While MIAX PEARL’s proposed connectivity fees are substantially lower than the fees charged by Phlx, ISE, Arca and NYSE American, MIAX PEARL believes that it offers significant value to Members over other exchanges in terms of network monitoring and reporting, which MIAX PEARL believes is a competitive advantage, and differentiates its connectivity versus connectivity to other exchanges. Additionally, the Exchange’s proposed connectivity fees to its disaster recovery facility are within the range of the fees charged by other exchanges for similar connectivity alternatives.<sup>63</sup>

#### **4. Self-Regulatory Organization’s Statement on Burden on Competition**

MIAX PEARL does not believe that the proposed rule change will impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Act.

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<sup>61</sup> See Phlx and ISE Rules, General Equity and Options Rules, General 8, Section 1(b). Phlx and ISE each charge a monthly fee of \$2,500 for each 1Gb connection, \$10,000 for each 10Gb connection and \$15,000 for each 10Gb Ultra connection, which the equivalent of the Exchange’s 10Gb ULL connection. See also NYSE American Fee Schedule, Section V.B, and Arca Fees and Charges, Co-Location Fees. NYSE American and Arca each charge a monthly fee of \$5,000 for each 1Gb circuit, \$14,000 for each 10Gb circuit and \$22,000 for each 10Gb LX circuit, which the equivalent of the Exchange’s 10Gb ULL connection.

<sup>62</sup> Id.

<sup>63</sup> See Nasdaq ISE, Options Rules, Options 7, Pricing Schedule, Section 11.D. (charging \$3,000 for disaster recovery testing & relocation services); see also Cboe Exchange, Inc. (“Cboe”) Fees Schedule, p. 14, Cboe Command Connectivity Charges (charging a monthly fee of \$2,000 for a 1Gb disaster recovery network access port and a monthly fee of \$6,000 for a 10Gb disaster recovery network access port).



### Intra-Market Competition

The Exchange does not believe that the proposed rule change would place certain market participants at the Exchange at a relative disadvantage compared to other market participants or affect the ability of such market participants to compete. In particular, the Exchange has received no official complaints from Members, non-Members (extranets and service bureaus), third-parties that purchase the Exchange's connectivity and resell it, and customers of those resellers, that the Exchange's fees or the Proposed Fee Increases are negatively impacting or would negatively impact their abilities to compete with other market participants or that they are placed at a disadvantage. The Exchange believes that the Proposed Fee Increases do not place certain market participants at a relative disadvantage to other market participants because the connectivity pricing is associated with relative usage of the various market participants and does not impose a barrier to entry to smaller participants. As described above, the less expensive 1Gb direct connection is generally purchased by market participants that utilize less bandwidth. The market participants that purchase 10Gb ULL direct connections utilize the most bandwidth, and those are the participants that consume the most resources from the network. Accordingly, the Proposed Fee Increases do not favor certain categories of market participants in a manner that would impose a burden on competition; rather, the allocation of the Proposed Fee Increases reflects the network resources consumed by the various size of market participants – lowest bandwidth consuming members pay the least, and highest bandwidth consuming members pay the most, particularly since higher bandwidth consumption translates to higher costs to the Exchange.

### Inter-Market Competition

The Exchange believes the Proposed Fee Increases do not place an undue burden on competition on other SROs that is not necessary or appropriate. In particular, options market participants are not forced to connect to (and purchase market data from) all options exchanges, as shown by the number of Members of MIAX PEARL as compared to the much greater number of members at other options exchanges (as described above). Not only does MIAX PEARL have less than half the number of members as certain other options exchanges, but there are also a number of the Exchange's Members that do not connect directly to MIAX PEARL. There are a number of large market makers and broker-dealers that are members of other options exchange but not Members of MIAX PEARL. Additionally, other exchanges have similar connectivity alternatives for their participants, including similar low-latency connectivity, but with much higher rates to connect.<sup>64</sup> The Exchange is also unaware of any assertion that its existing fee levels or the Proposed Fee Increases would somehow unduly impair its competition with other options exchanges. To the contrary, if the fees charged are deemed too high by market participants, they can simply disconnect. While the Exchange recognizes the distinction between connecting to an exchange and trading at the exchange, the Exchange notes that it operates in a highly competitive options market in which market participants can readily connect and trade with venues they desire. In such an environment, the Exchange must continually adjust its fees to remain competitive with other exchanges. The Exchange believes that the proposed changes reflect this competitive environment.

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<sup>64</sup> See supra note 61.

5. **Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received from Members, Participants, or Others**

No written comments were either solicited or received.

6. **Extension of Time Period for Commission Action**

Not applicable.

7. **Basis for Summary Effectiveness Pursuant to Section 19(b)(3) or for Accelerated Effectiveness Pursuant to Section 19(b)(2)**

Pursuant to Section 19(b)(3)(A)(ii) of the Act, and Rule 19b-4(f)(2) thereunder the Exchange has designated this proposal as establishing or changing a due, fee, or other charge imposed on any person, whether or not the person is a member of the self-regulatory organization, which renders the proposed rule change effective upon filing.

8. **Proposed Rule Change Based on Rules of Another Self-Regulatory Organization or of the Commission**

The proposed rule change is not specifically based upon the rules of any other exchange; provided, however, that the Exchange notes that, as applicable, Phlx, ISE, Arca, and NYSE American all offer similar connectivity alternatives as that proposed by the Exchange with fees within the range of, or higher, than the fees proposed to be charged by the Exchange.<sup>65</sup> Additionally, the connectivity fees for the disaster recovery facilities of other exchanges are within the range of the fees proposed by the Exchange.<sup>66</sup>

9. **Security-Based Swap Submissions Filed Pursuant to Section 3C of the Act**

Not applicable.

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<sup>65</sup> See supra note 61.

<sup>66</sup> See supra note 63.

**10. Advance Notices Filed Pursuant to Section 806(e) of the Payment, Clearing and Settlement Supervision Act**

Not applicable.

**11. Exhibits**

1. Notice of proposed rule for publication in the Federal Register.
3. Applicable sections of the MIAX PEARL and MIAX 2018 Financial Statements.
5. Applicable section of the MIAX PEARL Fee Schedule.

**EXHIBIT 1**

SECURITIES AND EXCHANGE COMMISSION  
(Release No. 34- ; File No. SR-PEARL-2019-36

December \_\_\_\_, 2019

Self-Regulatory Organizations: Notice of Filing and Immediate Effectiveness of a Proposed Rule Change by MIAX PEARL, LLC to Amend the MIAX PEARL Fee Schedule

Pursuant to the provisions of Section 19(b)(1) of the Securities Exchange Act of 1934 (“Act”)<sup>1</sup> and Rule 19b-4 thereunder,<sup>2</sup> notice is hereby given that on December 20, 2019, MIAX PEARL, LLC (“MIAX PEARL” or “Exchange”) filed with the Securities and Exchange Commission (“Commission”) a proposed rule change as described in Items I, II, and III below, which Items have been prepared by the Exchange. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

I. Self-Regulatory Organization's Statement of the Terms of Substance of the Proposed Rule Change

The Exchange is filing a proposal to amend the MIAX PEARL Fee Schedule (the “Fee Schedule”) to modify certain of the Exchange’s system connectivity fees.

The Exchange previously filed the proposal on October 22, 2019 (SR-PEARL-2019-33). That filing has been withdrawn and replaced with the current filing (SR-PEARL-2019-36).

The text of the proposed rule change is available on the Exchange’s website at <http://www.miaxoptions.com/rule-filings/pearl> at MIAX PEARL’s principal office, and at the Commission’s Public Reference Room.

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<sup>1</sup> 15 U.S.C. 78s(b)(1).

<sup>2</sup> 17 CFR 240.19b-4.

II. Self-Regulatory Organization's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the Exchange included statements concerning the purpose of and basis for the proposed rule change and discussed any comments it received on the proposed rule change. The text of these statements may be examined at the places specified in Item IV below. The Exchange has prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements.

A. Self-Regulatory Organization's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

1. Purpose

The Exchange is refiling its proposal to amend the Fee Schedule to increase the Exchange's network connectivity fees, in order to provide further clarification regarding the Exchange's cost allocation methodology – namely, information that explains the Exchange's rationale for determining that it was reasonable to allocate certain expenses described in this filing towards the total cost to the Exchange to provide network connectivity services. The Exchange is also bolstering its equitable allocation of fees discussion.

The Exchange had previously supplemented its connectivity fee filings in order to provide additional analysis of its baseline revenues, costs, and profitability (before the proposed fee change) and the Exchange's expected revenues, costs, and profitability (following the proposed fee change) for its network connectivity services. This additional analysis includes information regarding its methodology for determining the baseline costs and revenues, as well as expected costs and revenues, for its network connectivity services. The Exchange previously

refiled its proposal in order to address certain points raised in the only comment letter received by the Commission on the Exchange's prior proposal to increase connectivity fees.<sup>3</sup>

In order to determine the Exchange's baseline costs associated with providing network connectivity services, the Exchange conducted an extensive cost review in which the Exchange analyzed every expense item in the Exchange's general expense ledger to determine whether each such expense relates to the provision of network connectivity services, and, if such expense did so relate, what portion (or percentage) of such expense actually supports the provision of network connectivity services. The sum of all such portions of expenses represents the total actual baseline cost of the Exchange to provide network connectivity services. (For the avoidance of doubt, no expense amount was allocated twice.) The Exchange is presenting the results of its cost review in a way that corresponds directly with the Exchange's 2018 Audited Unconsolidated Financial Statements, the relevant sections of which are attached hereto as Exhibit 3, which are publicly available as part of the Exchange's Form 1 Amendment.<sup>4</sup> The purpose of presenting it in this manner is to provide greater transparency into the Exchange's actual and expected revenues, costs, and profitability associated with providing network connectivity services. Based on this analysis, the Exchange believes that its proposed fee increases are fair and reasonable because they will permit recovery of less than all of the Exchange's costs for providing the network connectivity services and will not result in excessive pricing or supra-competitive profit, when comparing the Exchange's total annual expense

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<sup>3</sup> See Letter from John Ramsay, Chief Market Policy Officer, Investors Exchange LLC ("IEX"), to Vanessa Countryman, Secretary, Commission, dated October 9, 2019 ("Third IEX Letter," as further described below).

<sup>4</sup> See the complete Audited Unconsolidated Financial Statements of MIAX PEARL, LLC, LLC as of December 31, 2018, and the Audited Unconsolidated Financial Statements of Miami International Securities Exchange, LLC as of December 31, 2018, which are listed under Exhibit D of MIAX Form 1 Amendment 2019-7 Annual Filing at <https://www.sec.gov/Archives/edgar/vpr/1900/19003680.pdf>.

associated with providing the network connectivity services versus the total projected annual revenue the Exchange projects to collect for providing the network connectivity services.

Specifically, the Exchange proposes to amend Sections 5a) and b) of the Fee Schedule to increase the network connectivity fees for the 1 Gigabit (“Gb”) fiber connection, the 10Gb fiber connection, and the 10Gb ultra-low latency (“ULL”) fiber connection, which are charged to both Members<sup>5</sup> and non-Members of the Exchange for connectivity to the Exchange’s primary/secondary facility. The Exchange also proposes to increase the network connectivity fees for the 1Gb and 10Gb fiber connections for connectivity to the Exchange’s disaster recovery facility. Each of these connections are shared connections, and thus can be utilized to access both the Exchange and the Exchange’s affiliate, Miami International Securities Exchange, LLC (“MIAX”). These proposed fee increases are collectively referred to herein as the “Proposed Fee Increases.”

The Exchange initially filed the Proposed Fee Increases on July 31, 2018, designating the Proposed Fee Increases effective August 1, 2018.<sup>6</sup> The First Proposed Rule Change was published for comment in the Federal Register on August 13, 2018.<sup>7</sup> The Commission received one comment letter on the proposal.<sup>8</sup> The Proposed Fee Increases remained in effect until they were temporarily suspended pursuant to a suspension order (the “Suspension Order”) issued by

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<sup>5</sup> The term “Member” means an individual or organization that is registered with the Exchange pursuant to Chapter II of the Exchange’s Rules for purposes of trading on the Exchange as an “Electronic Exchange Member” or “Market Maker.” Members are deemed “members” under the Exchange Act. See Exchange Rule 100.

<sup>6</sup> See Securities Exchange Act Release No. 83785 (August 7, 2018), 83 FR 40101 (August 13, 2018)(SR-PEARL-2018-16) (the “First Proposed Rule Change”).

<sup>7</sup> Id.

<sup>8</sup> See Letter from Tyler Gellasch, Executive Director, The Healthy Markets Association (“Healthy Markets”), to Brent J. Fields, Secretary, Commission, dated September 4, 2018 (“Healthy Markets Letter”).



the Commission on September 17, 2018.<sup>9</sup> The Suspension Order also instituted proceedings to determine whether to approve or disapprove the First Proposed Rule Change.<sup>10</sup>

The Healthy Markets Letter argued that the Exchange did not provide sufficient information in its filing to support a finding that the proposal is consistent with the Act. Specifically, the Healthy Markets Letter objected to the Exchange's reliance on the fees of other exchanges to demonstrate that its fee increases are consistent with the Act. In addition, the Healthy Markets Letter argued that the Exchange did not offer any details to support its basis for asserting that the Proposed Fee Increases are consistent with the Act.

The Exchange refiled the Proposed Fee Increases on September 18, 2018, designating the Proposed Fee Increases immediately effective.<sup>11</sup> The Proposed Fee Increases remained in effect until they were temporarily suspended pursuant to a suspension order (the "Second Suspension Order") issued by the Commission on October 3, 2018.<sup>12</sup> On October 5, 2018, the Exchange withdrew the First Proposed Rule Change.<sup>13</sup> The Second Proposed Rule Change was published for comment in the Federal Register on October 10, 2018.<sup>14</sup> The Commission received one

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<sup>9</sup> See Securities Exchange Act Release No. 84177 (September 17, 2018), 83 FR 47953 (September 21, 2018)(SR-PEARL-2018-16) (Suspension of and Order Instituting Proceedings to Determine Whether to Approve or Disapprove a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

<sup>10</sup> Id.

<sup>11</sup> See Securities Exchange Act Release No. 84358 (October 3, 2018), 83 FR 51022 (October 10, 2018)(SR-PEARL-2018-19) (Notice of Filing of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members; Suspension of and Order Instituting Proceedings to Determine Whether to Approve or Disapprove the Proposed Rule Change) (the "Second Proposed Rule Change").

<sup>12</sup> Id.

<sup>13</sup> See Securities Exchange Act Release No. 84397 (October 10, 2018), 83 FR 52272 (October 16, 2018)(SR-PEARL-2018-16) (Notice of Withdrawal of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

<sup>14</sup> See supra note 11.

comment letter on the proposal.<sup>15</sup> The Second Suspension Order also instituted proceedings to determine whether to approve or disapprove the Second Proposed Rule Change.<sup>16</sup>

The SIFMA Letter argued that the Exchange did not provide sufficient information in its filing to support a finding that the proposal should be approved by the Commission after further review of the proposed fee increases. Specifically, the SIFMA Letter objected to the Exchange's reliance on the fees of other exchanges to justify its own fee increases. In addition, the SIFMA Letter argued that the Exchange did not offer any details to support its basis for asserting that the Proposed Fee Increases are reasonable.

On November 23, 2018, the Exchange withdrew the Second Proposed Rule Change.<sup>17</sup>

The Exchange refiled the Proposed Fee Increases on March 1, 2019, designating the Proposed Fee Increases immediately effective.<sup>18</sup> The Third Proposed Rule Change was published for comment in the Federal Register on March 20, 2019.<sup>19</sup> The Third Proposed Rule Change provided new information, including additional detail about the market participants impacted by the Proposed Fee Increases, as well as the additional costs incurred by the Exchange associated with providing the connectivity alternatives, in order to provide more transparency

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<sup>15</sup> See Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, and Ellen Greene, Managing Director Financial Services Operations, The Securities Industry and Financial Markets Association (“SIFMA”), to Brent J. Fields, Secretary, Commission, dated October 15, 2018 (the “SIFMA Letter”).

<sup>16</sup> See supra note 11.

<sup>17</sup> See Securities Exchange Act Release No. 84651 (November 26, 2018), 83 FR 61687 (November 30, 2018)(SR-PEARL-2018-19) (Notice of Withdrawal of a Proposed Rule Change to Amend the Fee Schedule Regarding Connectivity Fees for Members and Non-Members).

<sup>18</sup> See Securities Exchange Act Release No. 85317 (March 14, 2019), 84 FR 10380 (March 20, 2019)(SR-PEARL-2019-08) (Notice of Filing and Immediate Effectiveness of a Proposed Rule Change To Amend the MIAX PEARL Fee Schedule) (the “Third Proposed Rule Change”).

<sup>19</sup> Id.

and support relating to the Exchange's belief that the Proposed Fee Increases are reasonable, equitable, and non-discriminatory, and to provide sufficient information for the Commission to determine that the Proposed Fee Increases are consistent with the Act.

On March 29, 2019, the Commission issued its Order Disapproving Proposed Rule Changes to Amend the Fee Schedule on the BOX Market LLC Options Facility to Establish BOX Connectivity Fees for Participants and Non-Participants Who Connect to the BOX Network (the "BOX Order").<sup>20</sup> In the BOX Order, the Commission highlighted a number of deficiencies it found in three separate rule filings by BOX Exchange LLC ("BOX") to increase BOX's connectivity fees that prevented the Commission from finding that BOX's proposed connectivity fees were consistent with the Act. These deficiencies relate to topics that the Commission believes should be discussed in a connectivity fee filing.

After the BOX Order was issued, the Commission received four comment letters on the Third Proposed Rule Change.<sup>21</sup>

The Second SIFMA Letter argued that the Exchange did not provide sufficient information in its Third Proposed Rule Change to support a finding that the proposal should be approved by the Commission after further review of the proposed fee increases. Specifically, the Second SIFMA Letter argued that the Exchange's market data fees and connectivity fees were

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<sup>20</sup> See Securities Exchange Act Release No. 85459 (March 29, 2019), 84 FR 13363 (April 4, 2019)(SR-BOX-2018-24, SR-BOX-2018-37, and SR-BOX-2019-04).

<sup>21</sup> See Letter from Joseph W. Ferraro III, SVP & Deputy General Counsel, MIAX, to Vanessa Countryman, Acting Secretary, Commission, dated April 5, 2019 (the "MIAX Letter"); Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated April 10, 2019 (the "Second SIFMA Letter"); Letter from John Ramsay, Chief Market Policy Officer, IEX, to Vanessa Countryman, Acting Secretary, Commission, dated April 10, 2019 (the "IEX Letter"); and Letter from Tyler Gellasch, Executive Director, Healthy Markets, to Brent J. Fields, Secretary, Commission, dated April 18, 2019 (the "Second Healthy Markets Letter").

not constrained by competitive forces, the Exchange's filing lacked sufficient information regarding cost and competition, and that the Commission should establish a framework for determining whether fees for exchange products and services are reasonable when those products and services are not constrained by significant competitive forces.

The IEX Letter argued that the Exchange did not provide sufficient information in its Third Proposed Rule Change to support a finding that the proposal should be approved by the Commission and that the Commission should extend the time for public comment on the Third Proposed Rule Change. Despite the objection to the Proposed Fee Increases, the IEX Letter did find that "MIAX has provided more transparency and analysis in these filings than other exchanges have sought to do for their own fee increases."<sup>22</sup> The IEX Letter specifically argued that the Proposed Fee Increases were not constrained by competition, the Exchange should provide data on the Exchange's actual costs and how those costs relate to the product or service in question, and whether and how MIAX considered changes to transaction fees as an alternative to offsetting exchange costs.

The Second Healthy Markets Letter did not object to the Third Proposed Rule Change and the information provided by the Exchange in support of the Proposed Fee Increases. Specifically, the Second Healthy Markets Letter stated that the Third Proposed Rule Change was "remarkably different," and went on to further state as follows:

The instant MIAX filings -- along with their April 5th supplement -- provide much greater detail regarding users of connectivity, the market for connectivity, and costs than the Initial MIAX Filings. They also appear to address many of the issues raised by the Commission staff's BOX disapproval order. This third round of MIAX filings suggests that MIAX is operating in good faith to provide what the Commission and staff seek.<sup>23</sup>

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<sup>22</sup> See IEX Letter, pg. 1.

<sup>23</sup> See Second Healthy Markets Letter, pg. 2.

On April 29, 2019, the Exchange withdrew the Third Proposed Rule Change.<sup>24</sup>

The Exchange refiled the Proposed Fee Increases on April 30, 2019, designating the Proposed Fee Increases immediately effective.<sup>25</sup> The Fourth Proposed Rule Change was published for comment in the Federal Register on May 16, 2019.<sup>26</sup> The Fourth Proposed Rule Change provided further cost analysis information to squarely and comprehensively address each and every topic raised for discussion in the BOX Order, the IEX Letter and the Second SIFMA Letter to ensure that the Proposed Fee Increases are reasonable, equitable, and non-discriminatory, and that the Commission should find that the Proposed Fee Increases are consistent with the Act.

On May 21, 2019, the Commission issued the Staff Guidance on SRO Rule Filings Relating to Fees.<sup>27</sup>

The Commission received two comment letters on the Fourth Proposed Rule Change, after the Guidance was released.<sup>28</sup> The Second IEX Letter and the Third SIFMA Letter argued that the Exchange did not provide sufficient information in its Fourth Proposed Rule Change to justify the Proposed Fee Increases based on the Guidance and the BOX Order. Of note,

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<sup>24</sup> See SR-PEARL-2019-08.

<sup>25</sup> See Securities Exchange Act Release No. 85837 (May 10, 2019), 84 FR 22214 (May 16, 2019)(SR-PEARL-2019-17) (Notice of Filing and Immediate Effectiveness of a Proposed Rule Change To Amend the MIAX PEARL Fee Schedule) (the “Fourth Proposed Rule Change”).

<sup>26</sup> Id.

<sup>27</sup> See Staff Guidance on SRO Rule Filings Relating to Fees (May 21, 2019), at <https://www.sec.gov/tm/staff-guidance-sro-rule-filings-fees> (the “Guidance”).

<sup>28</sup> See Letter from John Ramsay, Chief Market Policy Officer, Investors Exchange LLC, to Vanessa Countryman, Acting Secretary, Commission, dated June 5, 2019 (the “Second IEX Letter”) and Letter from Theodore R. Lazo, Managing Director and Associate General Counsel, and Ellen Greene, Managing Director, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated June 6, 2019 (the “Third SIFMA Letter”).

however, is that unlike their previous comment letter, the Third SIFMA Letter did not call for the Commission to suspend the Fourth Proposed Rule Change. Also, Healthy Markets did not comment on the Fourth Proposed Rule Change.

On June 26, 2019, the Exchange withdrew the Fourth Proposed Rule Change.<sup>29</sup>

The Exchange refiled the Proposed Fee Increases on June 26, 2019, designating the Proposed Fee Increases immediately effective.<sup>30</sup> The Fifth Proposed Rule Change was published for comment in the Federal Register on July 16, 2019.<sup>31</sup> The Fifth Proposed Rule Change bolstered the Exchange's previous cost-based discussion to support its claim that the Proposed Fee Increases are fair and reasonable because they will permit recovery of the Exchange's costs and will not result in excessive pricing or supra-competitive profit, in light of the Guidance issued by Commission staff subsequent to the Fourth Proposed Rule Change, and primarily through the inclusion of anticipated revenue figures associated with the provision of network connectivity services.

The Commission received three comment letters on the Fifth Proposed Rule Change.<sup>32</sup>

Neither the Third Healthy Markets Letter nor the Fourth SIFMA Letter called for the Commission to suspend or disapprove the Proposed Fee Increases. In fact, the Third Healthy

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<sup>29</sup> See SR-PEARL-2019-17.

<sup>30</sup> See Securities Exchange Act Release No. 86343 (July 10, 2019), 84 FR 34003 (July 16, 2019)(SR-PEARL-2019-21) (the "Fifth Proposed Rule Change").

<sup>31</sup> Id.

<sup>32</sup> See Letter from John Ramsay, Chief Market Policy Officer, IEX, to Vanessa Countryman, Acting Secretary, Commission, dated August 8, 2019 (the "Third IEX Letter"); Letter from Tyler Gellasch, Executive Director, Healthy Markets, to Vanessa Countryman, Acting Secretary, Commission, dated August 5, 2019 (the "Third Healthy Markets Letter"); and Letter from Theodore R. Lazo, Managing Director and Associate General Counsel and Ellen Greene, Managing Director Financial Services Operations, SIFMA, to Vanessa Countryman, Acting Secretary, Commission, dated August 5, 2019 (the "Fourth SIFMA Letter").

Markets Letter acknowledged that “it appears as though MIAX [PEARL] is operating in good faith to provide what the Commission, its staff, and market participants the information needed to appropriately assess the filings.” The Third IEX Letter only reiterated points from the Second IEX Letter and failed to address any of the new information in the Fifth Proposed Rule Change concerning the Exchange’s revenue figures, cost allocation or that the Proposed Fee Increases did not result in excessive pricing or a supra-competitive profit for the Exchange.

On August 23, 2019, the Exchange withdrew the Fifth Proposed Rule Change.<sup>33</sup>

The Exchange refiled the Proposed Fee Increases on August 23, 2019, designating the Proposed Fee Increases immediately effective.<sup>34</sup> The Sixth Proposed Rule Change was published for comment in the Federal Register on July 16, 2019.<sup>35</sup> The Sixth Proposed Rule Change provided greater detail and clarity concerning the Exchange’s cost methodology as it pertains to the Exchange’s expenses for network connectivity services, using a line-by-line analysis of the Exchange’s general expense ledger to determine what, if any, portion of those expenses supports the provision of network connectivity services.

The Commission received only one comment letter on the Sixth Proposed Rule Change, twelve days after the comment period deadline ended.<sup>36</sup> Of note, no member of the Exchange commented on the Sixth Proposed Rule Change. Also, no issuer or other person using the facilities of the Exchange commented on the Sixth Proposed Rule Change. Also, no industry group that represents members, issuers, or other persons using the facilities of the Exchange commented on the Sixth Proposed Rule Change. Also, no operator of an options market

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<sup>33</sup> See SR-PEARL-2019-21.

<sup>34</sup> See Securities Exchange Act Release No. 86837 (August 30, 2019), 84 FR 46988 (September 6, 2019)(SR-PEARL-2019-25) (the “Sixth Proposed Rule Change”).

<sup>35</sup> Id.

<sup>36</sup> See supra note 3.

commented on the Sixth Proposed Rule Change. Also, no operator of a high performance, ultra-low latency network, which network can support access to three distinct exchanges and provides premium network monitoring and reporting services to customers, commented on the Sixth Proposed Rule Change. Rather, the only comment letter came from an operator of a single equities market (equities market structure and resulting network demands are fundamentally different from those in the options markets),<sup>37</sup> which operator also has a fundamentally different business model (and agenda) than does the Exchange. That letter -- the Third IEX Letter -- called for, among other things, the Exchange to explain its basis for concluding that it incurred substantially higher costs to provide lower-latency connections and further describe the nature and closeness of the relationship between the identified costs and connectivity products and services as stated in the Exchange's cost allocation analysis.

On October 22, 2019, the Exchange withdrew the Sixth Proposed Rule Change.<sup>38</sup>

The Exchange refiled the Proposed Fee Increases on October 22, 2019, designating the Proposed Fee Increases immediately effective.<sup>39</sup> The Seventh Proposed Rule Change was published for comment in the Federal Register on November 6, 2019.<sup>40</sup> The Seventh Proposed Rule Change provided additional analysis of the Exchange's baseline revenues, costs, and profitability (before the proposed fee change) and the Exchange's expected revenues, costs, and profitability (following the proposed fee change) for its network connectivity services. This additional analysis includes information regarding its methodology for determining the baseline

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<sup>37</sup> See infra pages 19 to 20 (describing the differences in equity market structure and options market structure).

<sup>38</sup> See SR-PEARL-2019-25.

<sup>39</sup> See Securities Exchange Act Release No. 87432 (October 31, 2019), 84 FR 59889 (November 6, 2019)(SR-PEARL-2019-33) (the "Seventh Proposed Rule Change").

<sup>40</sup> Id.



costs and revenues, as well as expected costs and revenues, for its network connectivity services. The Seventh Proposed Rule Change also addressed certain points raised in the Third IEX Letter.

On December 20, 2019, the Exchange withdrew the Seventh Proposed Rule Change.<sup>41</sup> The Exchange notes that the Seventh Proposed Rule Change did not receive any comment letters, however the Exchange has determined to refile the Proposed Fee Increases to provide further clarification regarding the Exchange's cost allocation methodology – namely, information that explains the Exchange's rationale for determining that it was reasonable to allocate certain expenses described in this filing towards the total cost to the Exchange of providing network connectivity services. The Exchange is also bolstering its equitable allocation of fees discussion. The Exchange believes that the Proposed Fee Increases are consistent with the Act because they (i) are reasonable, equitably allocated, not unfairly discriminatory, and not an undue burden on competition; (ii) comply with the BOX Order and the Guidance; (iii) are supported by evidence (including data and analysis), constrained by significant competitive forces; and (iv) are supported by specific information (including quantitative information), fair and reasonable because they will permit recovery of the Exchange's costs (less than all) and will not result in excessive pricing or supra-competitive profit. Accordingly, the Exchange believes that the Commission should find that the Proposed Fee Increases are consistent with the Act. The proposed rule change is immediately effective upon filing with the Commission pursuant to Section 19(b)(3)(A) of the Act.

The Exchange currently offers various bandwidth alternatives for connectivity to the Exchange to its primary and secondary facilities, consisting of a 1Gb fiber connection, a 10Gb fiber connection, and a 10Gb ULL fiber connection. The 10Gb ULL offering uses an ultra-low

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<sup>41</sup> See SR-PEARL-2019-33.

latency switch, which provides faster processing of messages sent to it in comparison to the switch used for the other types of connectivity. The Exchange currently assesses the following monthly network connectivity fees to both Members and non-Members for connectivity to the Exchange's primary/secondary facility: (a) \$1,100 for the 1Gb connection; (b) \$5,500 for the 10Gb connection; and (c) \$8,500 for the 10Gb ULL connection. The Exchange also assesses to both Members and non-Members a monthly per connection network connectivity fee of \$500 for each 1Gb connection to the disaster recovery facility and a monthly per connection network connectivity fee of \$2,500 for each 10Gb connection to the disaster recovery facility.

The Exchange's MIAX Express Network Interconnect ("MENI") can be configured to provide Members and non-Members of the Exchange network connectivity to the trading platforms, market data systems, test systems, and disaster recovery facilities of both the Exchange and its affiliate, MIAX, via a single, shared connection. Members and non-Members utilizing the MENI to connect to the trading platforms, market data systems, test systems and disaster recovery facilities of the Exchange and MIAX via a single, shared connection are assessed only one monthly network connectivity fee per connection, regardless of the trading platforms, market data systems, test systems, and disaster recovery facilities accessed via such connection.

The Exchange proposes to increase the monthly network connectivity fees for such connections for both Members and non-Members. The network connectivity fees for connectivity to the Exchange's primary/secondary facility will be increased as follows: (a) from \$1,100 to \$1,400 for the 1Gb connection; (b) from \$5,500 to \$6,100 for the 10Gb connection; and (c) from \$8,500 to \$9,300 for the 10Gb ULL connection. The network connectivity fees for connectivity to the Exchange's disaster recovery facility will be increased as follows: (a) from \$500 to \$550 for the 1Gb connection; and (b) from \$2,500 to \$2,750 for the 10Gb connection.

## 2. Statutory Basis

The Exchange believes that its proposal to amend its Fee Schedule is consistent with Section 6(b) of the Act<sup>42</sup> in general, and furthers the objectives of Section 6(b)(4) of the Act<sup>43</sup> in particular, in that it provides for the equitable allocation of reasonable dues, fees and other charges among Exchange Members and issuers and other persons using any facility or system which the Exchange operates or controls. The Exchange also believes the proposal furthers the objectives of Section 6(b)(5) of the Act<sup>44</sup> in that it is designed to promote just and equitable principles of trade, to remove impediments to and perfect the mechanism of a free and open market and a national market system, and, in general to protect investors and the public interest and is not designed to permit unfair discrimination between customers, issuers, brokers and dealers.

The Commission has repeatedly expressed its preference for competition over regulatory intervention in determining prices, products, and services in the securities markets. In Regulation NMS, the Commission highlighted the importance of market forces in determining prices and SRO revenues and, also, recognized that current regulation of the market system “has been remarkably successful in promoting market competition in its broader forms that are most important to investors and listed companies.”<sup>45</sup>

The Exchange believes that its proposal is consistent with Section 6(b)(4) of the Act, in that the Proposed Fee Increases are fair, equitable and not unreasonably discriminatory, because the fees for the connectivity alternatives available on the Exchange, as proposed to be increased,

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<sup>42</sup> 15 U.S.C. 78f(b).

<sup>43</sup> 15 U.S.C. 78f(b)(4).

<sup>44</sup> 15 U.S.C. 78f(b)(5).

<sup>45</sup> See Securities Exchange Act Release No. 51808 (June 9, 2005), 70 FR 37496 (June 29, 2005).

are constrained by significant competitive forces. The U.S. options markets are highly competitive (there are currently 16 options markets) and a reliance on competitive markets is an appropriate means to ensure equitable and reasonable prices.

The Exchange acknowledges that there is no regulatory requirement that any market participant connect to the Exchange, or that any participant connect at any specific connection speed. The rule structure for options exchanges are, in fact, fundamentally different from those of equities exchanges. In particular, options market participants are not forced to connect to (and purchase market data from) all options exchanges, as shown by the number of Members of MIAX PEARL as compared to the much greater number of members at other options exchanges (as further detailed below). Not only does MIAX PEARL have less than half the number of members as certain other options exchanges, but there are also a number of the Exchange's Members that do not connect directly to MIAX PEARL. Further, of the number of Members that connect directly to MIAX PEARL, many such Members do not purchase market data from MIAX PEARL. There are a number of large market makers and broker-dealers that are members of other options exchange but not Members of MIAX PEARL. For example, the following are not Members of MIAX PEARL: The D. E. Shaw Group, CTC, XR Trading LLC, Hardcastle Trading AG, Ronin Capital LLC, Belvedere Trading, LLC, Bluefin Trading, and HAP Capital LLC. In addition, of the market makers that are connected to MIAX PEARL, it is the individual needs of the market maker that require whether they need one connection or multiple connections to the Exchange. The Exchange has market maker Members that only purchase one connection (10Gb or 10Gb ULL) and the Exchange has market maker Members that purchase multiple connections. It is all driven by the business needs of the market maker. Market makers that are consolidators that target resting order flow tend to purchase more connectivity than Market Makers that simply quote all symbols on the Exchange. Even though non-Members

purchase and resell 10Gb and 10Gb ULL connections to both Members and non-Members, no market makers currently connect to the Exchange indirectly through such resellers.

The argument that all broker-dealers are required to connect to all exchanges is not true in the options markets. The options markets have evolved differently than the equities markets both in terms of market structure and functionality. For example, there are many order types that are available in the equities markets that are not utilized in the options markets, which relate to mid-point pricing and pegged pricing which require connection to the SIPs and each of the equities exchanges in order to properly execute those orders in compliance with best execution obligations. In addition, in the options markets there is a single SIP (OPRA) versus two SIPs in the equities markets, resulting in fewer hops and thus alleviating the need to connect directly to all the options exchanges. Additionally, in the options markets, the linkage routing and trade through protection are handled by the exchanges, not by the individual members. Thus not connecting to an options exchange or disconnecting from an options exchange does not potentially subject a broker-dealer to violate order protection requirements. Gone are the days when the retail brokerage firms (the Fidelity's, the Schwab's, the eTrade's) were members of the options exchanges – they are not members of MIAX PEARL or its affiliates, MIAX and MIAX Emerald, they do not purchase connectivity to MIAX PEARL, and they do not purchase market data from MIAX PEARL. The Exchange further recognizes that the decision of whether to connect to the Exchange is separate and distinct from the decision of whether and how to trade on the Exchange. The Exchange acknowledges that many firms may choose to connect to the Exchange, but ultimately not trade on it, based on their particular business needs.

To assist prospective Members or firms considering connecting to MIAX PEARL, the Exchange provides information about the Exchange's available connectivity alternatives in a Connectivity Guide, which contains detailed specifications regarding, among other things,

throughput and latency for each available connection.<sup>46</sup> The decision of which type of connectivity to purchase, or whether to purchase connectivity at all for a particular exchange, is based on the business needs of the firm. For example, if the firm wants to receive the top-of-market data feed product or depth data feed product, due to the amount/size of data contained in those feeds, such firm would need to purchase either the 10Gb or 10Gb ULL connection. The 1Gb connection is too small to support those data feed products. MIAX PEARL notes that there are twelve (12) Members that only purchase the 1Gb connectivity alternative. Thus, while there is a meaningful percentage of purchasers of only 1Gb connections (12 of 33), by definition, those twelve (12) members purchase connectivity that cannot support the top-of-market data feed product or depth data feed product and thus they do not purchase such data feed products. Accordingly, purchasing market data is a business decision/choice, and thus the pricing for it is constrained by competition.

There is competition for connectivity to MIAX PEARL and its affiliates. MIAX PEARL competes with nine (9) non-Members who resell MIAX PEARL connectivity. These are resellers of MIAX PEARL connectivity – they are not arrangements between broker-dealers to share connectivity costs. Those non-Members resell that connectivity to multiple market participants over that same connection, including both Members and non-Members of MIAX PEARL (typically extranets and service bureaus). When connectivity is re-sold by a third-party, MIAX PEARL does not receive any connectivity revenue from that sale. It is entirely between the third-party and the purchaser, thus constraining the ability of MIAX PEARL to set its connectivity pricing as indirect connectivity is a substitute for direct connectivity. There are currently nine (9) non-Members that purchase connectivity to MIAX PEARL and/or MIAX.

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<sup>46</sup> See the MIAX Connectivity Guide at [https://www.miaxoptions.com/sites/default/files/page-files/MIAX\\_Connectivity\\_Guide\\_v3.6\\_01142019.pdf](https://www.miaxoptions.com/sites/default/files/page-files/MIAX_Connectivity_Guide_v3.6_01142019.pdf).

Those non-Members resell that connectivity to eleven (11) customers, some of whom are agency broker-dealers that have tens of customers of their own. Some of those eleven (11) customers also purchase connectivity directly from MIAX PEARL and/or MIAX. Accordingly, indirect connectivity is a viable alternative that is already being used by non-Members of MIAX PEARL, constraining the price that MIAX PEARL is able to charge for connectivity to its Exchange.

The Exchange<sup>47</sup> and MIAX<sup>48</sup> are comprised of 41 distinct Members between the two exchanges, excluding any additional affiliates of such Members that are also Members of MIAX PEARL, MIAX, or both. Of those 41 distinct Members, 33 Members have purchased the 1Gb, 10Gb, 10Gb ULL connections or some combination of multiple various connections. Furthermore, every Member who has purchased at least one connection also trades on the Exchange, MIAX, or both. The 8 remaining Members who have not purchased any connectivity to the Exchange are still able to trade on the Exchange indirectly through other Members or non-Member service bureaus that are connected. These 8 Members who have not purchased connectivity are not forced or compelled to purchase connectivity, and they retain all of the other benefits of Membership with the Exchange. Accordingly, Members have the choice to purchase connectivity and are not compelled to do so in any way.

The Exchange believes that the Proposed Fee Increases are reasonable, equitable and not unfairly discriminatory because the connectivity pricing is directly related to the relative costs to the Exchange to provide those respective services, and does not impose a barrier to entry to smaller participants. Accordingly, the Exchange offers three direct connectivity alternatives and

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<sup>47</sup> MIAX PEARL has 36 distinct Members, excluding affiliated entities. See MIAX PEARL Exchange Member Directory, available at <https://www.miaxoptions.com/exchange-members/pearl>.

<sup>48</sup> MIAX has 38 distinct Members, excluding affiliated entities. See MIAX Exchange Member Directory, available at <https://www.miaxoptions.com/exchange-members>.

various indirect connectivity (via third-party) alternatives, as described above. MIAX PEARL recognizes that there are various business models and varying sizes of market participants conducting business on the Exchange. The 1Gb direct connectivity alternative is 1/10<sup>th</sup> the size of the 10Gb direct connectivity alternative. Because it is 1/10<sup>th</sup> of the size, it does not offer access to many of the products and services offered by the Exchange, such as the ability to quote or receive certain market data products. Approximately just less than half of MIAX PEARL and MIAX Members that connect (14 out of 33) purchase 1Gb connections. The 1Gb direct connection can support the sending of orders and the consumption of all market data feed products, other than the top-of-market data feed product or depth data feed product (which require a 10Gb connection). The 1Gb direct connection is generally purchased by market participants that utilize less bandwidth and also generally do not require the high touch network support services provided by the Exchange. Accordingly, these connections consume the least resources of the Exchange and are the least costly to the Exchange to provide. The market participants that purchase 10Gb ULL direct connections utilize the most bandwidth and also generally do require the high touch network support services provided by the Exchange. Accordingly, these connections consume the most resources of the Exchange and are the most costly to the Exchange to provide. Accordingly, the Exchange believes the allocation of the Proposed Fee Increases (\$9,300 for a 10Gb ULL connection versus \$1,400 for a 1Gb connection) are reasonable based on the resources consumed by the respective type of connection – lowest resource consuming members pay the least, and highest resource consuming members pay the most, particularly since higher resource consumption translates directly to higher costs to the Exchange. The 10Gb ULL connection offers optimized connectivity for latency sensitive participants and is approximately single digit microseconds faster in round trip time for connection oriented traffic to the Exchange than the 10Gb connection. This lower latency is



achieved through more advanced network equipment, such as advanced hardware and switching components, which translates to increased costs to the Exchange. Market participants that are less latency sensitive can purchase 10Gb direct connections and quote in all products on the Exchange and consume all market data feeds, and such 10Gb direct connections are priced lower than the 10Gb ULL direct connections, offering smaller sized market makers a lower cost alternative. 10Gb connections are less costly to provide than 10Gb ULL connections, which require greater network support services.

With respect to options trading, the Exchange had only a 4.78% market share of the U.S. options industry in November 2019 in Equity/Exchange Traded Fund (“ETF”) classes according to the OCC.<sup>49</sup> For November 2019, the Exchange’s affiliate, MIAX, had only a 4.32% market share of the U.S. options industry in Equity/ETF classes according to the OCC.<sup>50</sup> For November 2019, the Exchange’s affiliate, MIAX Emerald, had only a 0.92% market share of the U.S. options industry in Equity/ETF classes according to the OCC.<sup>51</sup> The Exchange is not aware of any evidence that a combined market share of approximately 10% provides the Exchange with anti-competitive pricing power. This, in addition to the fact that not all broker-dealers are required to connect to all options exchanges, supports the Exchange’s conclusion that its pricing is constrained by competition.

Separately, the Exchange is not aware of any reason why market participants could not simply drop their connections and cease being Members of the Exchange if the Exchange were to establish unreasonable and uncompetitive price increases for its connectivity alternatives.

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<sup>49</sup> See Exchange Market Share of Equity Products – 2019, The Options Clearing Corporation, available at <https://www.theocc.com/webapps/exchange-volume>.

<sup>50</sup> Id.

<sup>51</sup> Id.

Market participants choose to connect to a particular exchange and because it is a choice, MIAX PEARL must set reasonable connectivity pricing, otherwise prospective members would not connect and existing members would disconnect or connect through a third-party reseller of connectivity. No options market participant is required by rule, regulation, or competitive forces to be a Member of the Exchange. As evidence of the fact that market participants can and do disconnect from exchanges based on connectivity pricing, R2G Services LLC (“R2G”) filed a comment letter after BOX’s proposed rule changes to increase its connectivity fees (SR-BOX-2018-24, SR-BOX-2018-37, and SR-BOX-2019-04).<sup>52</sup> The R2G Letter stated, “[w]hen BOX instituted a \$10,000/month price increase for connectivity; we had no choice but to terminate connectivity into them as well as terminate our market data relationship. The cost benefit analysis just didn’t make any sense for us at those new levels.” Accordingly, this example shows that if an exchange sets too high of a fee for connectivity and/or market data services for its relevant marketplace, market participants can choose to disconnect from the exchange.

Several market participants choose not to be Members of the Exchange and choose not to access the Exchange, and several market participants also access the Exchange indirectly through another market participant. To illustrate, the Exchange has only 41 Members (including all such Members’ affiliate Members). However, Cboe Exchange, Inc. (“Cboe”) has over 200

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<sup>52</sup> See Letter from Stefano Durdic, R2G, to Vanessa Countryman, Acting Secretary, Commission, dated March 27, 2019 (the “R2G Letter”).

members,<sup>53</sup> Nasdaq ISE, LLC has approximately 100 members,<sup>54</sup> and NYSE American LLC has over 80 members.<sup>55</sup> If all market participants were required to be Members of the Exchange and connect directly to the Exchange, the Exchange would have over 200 Members, in line with Cboe's total membership. But it does not. The Exchange only has 41 Members (inclusive of Members' affiliates).

The Exchange finds it compelling that all of the Exchange's existing Members continued to purchase the Exchange's connectivity services during the period for which the Proposed Fee Increases took effect in August 2018, particularly in light of the R2G disconnection example cited above.<sup>56</sup> In particular, the Exchange believes that the Proposed Fee Increases are reasonable because the Exchange did not lose any Members (or the number of connections each Member purchased) or non-Member connections due to the Exchange increasing its connectivity fees through the First Proposed Rule Change, which fee increase became effective August 1, 2018. For example, in July 2018, fourteen (14) Members purchased 1Gb connections, ten (10) Members purchased 10Gb connections, and fifteen (15) Members purchased 10Gb ULL connections. (The Exchange notes that 1Gb connections are purchased primarily by EEM Members; 10Gb ULL connections are purchased primarily by higher volume Market Makers quoting all products across both MIAX PEARL and MIAX; and 10Gb connections are purchased

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<sup>53</sup> See Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002831.pdf>); Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002833.pdf>); Form 1/A, filed July 24, 2018 (<https://www.sec.gov/Archives/edgar/vpr/1800/18002781.pdf>); Form 1/A, filed August 30, 2018 (<https://www.sec.gov/Archives/edgar/data/1473845/999999999718007832/9999999997-18-007832-index.htm>).

<sup>54</sup> See Form 1/A, filed July 1, 2016 (<https://www.sec.gov/Archives/edgar/vpr/1601/16019243.pdf>).

<sup>55</sup> See <https://www.nyse.com/markets/american-options/membership#directory>.

<sup>56</sup> See supra note 52.

by higher volume EEMs and lower volume Market Makers.) The vast majority of those Members purchased multiple such connections with the actual number of connections depending on the Member's throughput requirements based on the volume of their quote/order traffic and market data needs associated with their business model. After the fee increase, beginning August 1, 2018, the same number of Members purchased the same number of connections.<sup>57</sup> Furthermore, the total number of connections did not decrease from July to August 2018, and in fact one Member even purchased two (2) additional 10Gb ULL connections in August 2018, after the fee increase.

Also, in July 2018, four (4) non-Members purchased 1Gb connections, two (2) non-Members purchased 10Gb connections, and one (1) non-Member purchased 10Gb ULL connections. After the fee increase, beginning August 1, 2018, the same non-Members purchased the same number of connections across all available alternatives and two (2) additional non-Members purchased three (3) more connections after the fee increase. These non-Members freely purchased their connectivity with the Exchange in order to offer trading services to other firms and customers, as well as access to the market data services that their connections to the Exchange provide them, but they are not required or compelled to purchase any of the Exchange's connectivity options. MIAX PEARL did not experience any noticeable change (increase or decrease) in order flow sent by its market participants as a result of the fee increase.

Of those Members and non-Members that bought multiple connections, no firm dropped any connections beginning August 1, 2018, when the Exchange increased its fees. Nor did the Exchange lose any Members. Furthermore, the Exchange did not receive any comment letters or

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<sup>57</sup> The Exchange notes that one Member downgraded one connection in July of 2018, however such downgrade was done well ahead of notice of the Proposed Fee Increase and was the result of a change to the Member's business operation that was completely independent of, and unrelated to, the Proposed Fee Increases.

official complaints from any Member or non-Member purchaser of connectivity regarding the increased fees regarding how the fee increase was unreasonable, unduly burdensome, or would negatively impact their competitiveness amongst other market participants. These facts, coupled with the discussion above, showing that it is not necessary to join and/or connect to all options exchanges and market participants can disconnect if pricing is set too high (the R2G example),<sup>58</sup> demonstrate that the Exchange's fees are constrained by competition and are reasonable and not contrary to the Law of Demand. Therefore, the Exchange believes that the Proposed Fee Increases are fair, equitable, and non-discriminatory, as the fees are competitive.

The Exchange believes that the Proposed Fee Increases are equitably allocated among Members and non-Members, as evidenced by the fact that the fee increases are allocated across all connectivity alternatives according to the Exchange's costs to provide such alternatives, and there is not a disproportionate number of Members purchasing any alternative -- fourteen (14) Members purchased 1Gb connections, ten (10) Members purchased 10Gb connections, fifteen (15) Members purchased 10Gb ULL connections, four (4) non-Members purchased 1Gb connections, two (2) non-Members purchased 10Gb connections, and one (1) non-Member purchased 10Gb ULL connections. The Exchange recognizes that the relative fee increases are 27% for the 1Gb connection, 10.9% for the 10Gb connection, and 9.4% for the 10Gb ULL connection, but the Exchange believes that percentage increase differentiation is appropriate, given the actual costs to the Exchange to provide network connectivity and the respective connection options, including the costs associated with providing the different levels of service associated with the respective connections.

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<sup>58</sup> See supra note 52.

The Exchange further believes that the Proposed Fee Increases, as they pertain to purchasers of each type of connectivity alternative, constitute an equitable allocation of reasonable fees charged to the Exchange's Members and non-Members and are allocated fairly amongst the types of market participants using the facilities of the Exchange. For example, for November 2019, between the Exchange and MIAX: (i) Members and non-Members that purchased 10Gb ULL connections accounted for approximately 80% of the total network connectivity revenue collected by the Exchange and MIAX from all connectivity alternatives; (ii) Members and non-Members that purchased 10Gb connections accounted for approximately 15% of the total network connectivity revenue collected by the Exchange and MIAX from all connectivity alternatives; and (iii) Members and non-Members that purchased 1Gb connections accounted for approximately 5% of the revenue collected by the Exchange and MIAX from all connectivity alternatives. As described above, the Exchange believes the Proposed Fee Increases are equitably allocated because 10Gb and 10Gb ULL purchasers (while they account for the vast majority of the Exchange's total connectivity revenue – approximately 95%): (1) consume the most bandwidth and resources of the network; (2) transact the vast majority of the volume on the Exchange; and (3) require the high touch network support services provided by the Exchange and its staff, including more costly network monitoring, reporting and support services, resulting in a much higher cost to the Exchange to provide such connectivity alternatives, compared to the cost to provide a 1Gb connectivity alternative (as further described in the Exchange's cost discussion, below).

The Exchange believes that the connectivity fees are equitably allocated among users of the three network connectivity alternatives, as the users of the 10Gb and 10Gb ULL connections consume the most bandwidth and resources of the network. Specifically, the Exchange notes that these users account for approximately greater than 99% of message traffic over the network,

while the users of the 1Gb connections account for approximately less than 1% of message traffic over the network. In the Exchange's experience, users of the 1Gb connections do not have a business need for the high performance network solutions required by 10Gb and 10Gb ULL users. The Exchange's high performance network solutions and supporting infrastructure (including employee support), provides unparalleled system throughput with the network ability to support access to three distinct options markets and the capacity to handle approximately 10.7 million quote messages per second. On an average day, the Exchange and MIAX handle approximately 8,304,500,000 total messages. Of those, users of the 10Gb and 10Gb ULL connections generate approximately 8,300,000,000 messages, and users of the 1Gb connections generate 4,500,000 messages. However, in order to achieve a consistent, premium network performance, the Exchange must build out and maintain a network that has the capacity to handle the message rate requirements of its most heavy network consumers. These billions of messages per day consume the Exchange's resources and significantly contribute to the overall network connectivity expense for storage and network transport capabilities. Given this difference in network utilization rate, the Exchange believes that it is reasonable, equitable, and not unfairly discriminatory that the 10Gb and 10Gb ULL users pay for the vast majority of the shared network resources from which all Member and non-Member users benefit, but is designed and maintained from a capacity standpoint to specifically handle the message rate and performance requirements of 10Gb and 10Gb ULL users.

The Exchange also believes that the connectivity fees are equitably allocated amongst users of the three network connectivity alternatives, when these fees are viewed in the context of the overall trading volume on the Exchange. To illustrate, the purchasers of 10Gb ULL connectivity account for approximately 78% of the volume on the Exchange. For example, for all of November 2019, approximately 13.4 million contracts of the 17.1 million contracts

executed were done by the top market making firms on the Exchange in simple (non-complex) volume. This overall volume percentage (78% of total Exchange volume) is in line with the amount of network connectivity revenue collected from 10Gb ULL purchasers (80% of total Exchange connectivity revenue).

The Exchange further believes that the fees are equitably allocated, as the amount of the fees for the various connectivity alternatives are directly related to the actual costs associated with providing the respective connectivity alternatives. That is, the cost to the Exchange of providing a 1Gb network connection is significantly lower than the cost to the Exchange of providing a 10Gb or 10Gb ULL network connection. Pursuant to its extensive cost review described above, the Exchange believes that the average cost to provide a 10Gb/10Gb ULL network connection is approximately 4 to 6 times more than the average cost to provide a 1Gb connection. The simple hardware and software component costs alone of a 10Gb/10Gb ULL connection are not 4 to 6 times more than the 1Gb connection. Rather, it is the associated premium-product level network monitoring, reporting, and support services costs that accompany a 10Gb/10Gb ULL connection which cause it to be 4 to 6 times more costly to provide than the 1Gb connection. Accordingly, the Exchange believes it is equitable to allocate those network infrastructure costs that accompany a 10Gb/10Gb ULL connection to the purchasers of those connections, and not to purchasers of 1Gb connections.

As discussed above, the Exchange differentiates itself by offering a “premium-product” network experience, as an operator of a high performance, ultra-low latency network with unparalleled system throughput, which network can support access to three distinct options markets and multiple competing market-makers having affirmative obligations to continuously quote over 750,000 distinct trading products (per exchange), and the capacity to handle approximately 10.7 million quote messages per second. The “premium-product” network



experience enables users of 10Gb and 10Gb ULL connections to receive the network monitoring and reporting services for those approximately 750,000 distinct trading products. There is a significant, quantifiable amount of research and development (“R&D”) effort, employee compensation and benefits expense, and other expense associated with providing the high touch network monitoring and reporting services that are utilized by the 10Gb and 10Gb ULL connections offered by the Exchange. These value add services are fully-discussed herein, and the actual costs associated with providing these services are the basis for the differentiated amount of the fees for the various connectivity alternatives.

The Exchange believes that its proposal is consistent with Section 6(b)(4) of the Act because the Proposed Fee Increases will permit recovery of the Exchange’s costs and will not result in excessive pricing or supra-competitive profit. The Proposed Fee Increases will allow the Exchange to recover a portion (less than all) of the increased costs incurred by the Exchange associated with providing and maintaining the necessary hardware and other network infrastructure as well as network monitoring and support services in order to provide the network connectivity services, since the Exchange launched operations in February 2017. Put simply, the costs of the Exchange to provide these services have increased considerably over this time, as more fully-detailed and quantified below. The Exchange believes that it is reasonable and appropriate to increase its fees charged for use of its connectivity to partially offset the increased costs the Exchange incurred during this time associated with maintaining and enhancing a state-of-the-art exchange network infrastructure in the U.S. options industry.

In particular, the Exchange’s increased costs associated with supporting its network are due to several factors, including increased costs associated with maintaining and expanding a team of highly-skilled network engineers (the Exchange also hired additional network engineering staff in 2017 and 2018), increasing fees charged by the Exchange’s third-party data

center operator, and costs associated with projects and initiatives designed to improve overall network performance and stability, through the Exchange's R&D efforts.

In order to provide more detail and to quantify the Exchange's increased costs, the Exchange notes that increased costs are associated with the infrastructure and increased headcount to fully-support the advances in infrastructure and expansion of network level services, including customer monitoring, alerting and reporting. Additional technology expenses were incurred related to expanding its Information Security services, enhanced network monitoring and customer reporting, as well as Regulation SCI mandated processes associated with network technology. All of these additional expenses have been incurred by the Exchange since it became operational in February 2017.

Additionally, while some of the expense is fixed, much of the expense is not fixed, and thus increases as the number of connections increase. For example, new 1Gb, 10Gb, and 10Gb ULL connections require the purchase of additional hardware to support those connections as well as enhanced monitoring and reporting of customer performance that MIAX PEARL and its affiliates provide. And 10Gb ULL connections require the purchase of specialized, more costly hardware. Further, as the total number of all connections increase, MIAX PEARL and its affiliates need to increase their data center footprint and consume more power, resulting in increased costs charged by their third-party data center provider. Accordingly, the cost to MIAX PEARL and its affiliates is not entirely fixed. Just the initial fixed cost buildout of the network infrastructure of MIAX PEARL and its affiliates, including both primary/secondary sites and disaster recovery, was over \$30 million. These costs have increased over 10% since the Exchange became operational in February 2017. As these network connectivity-related expenses increase, MIAX PEARL and its affiliates look to offset those costs through increased connectivity fees.

A more detailed breakdown of the expense increases since February 2017 include an approximate 70% increase in technology-related personnel costs in infrastructure, due to expansion of services/support (increase of approximately \$800,000); an approximate 10% increase in data center costs due to price increases and footprint expansion (increase of approximately \$500,000); an approximate 5% increase in vendor-supplied dark fiber due to price increases and expanded capabilities (increase of approximately \$25,000); and a 30% increase in market data connectivity fees (increase of approximately \$200,000). Of note, regarding market data connectivity fee increased cost, this is the cost associated with MIAX PEARL consuming connectivity/content from the equities markets in order to operate the Exchange, causing MIAX PEARL to effectively pay its competitors for this connectivity. While the Exchange and MIAX have incurred a total increase in connectivity expenses since January 2017 (the last time connectivity fees were raised) of approximately \$1.5 million per year (as described above), the total increase in connectivity revenue amount as a result of the Proposed Fee Increases is projected to be approximately \$1.2 million per year for MIAX PEARL and MIAX. Accordingly, the total projected MIAX PEARL and MIAX connectivity revenue as a result of the proposed increase, on an annualized basis, is less than the total annual actual MIAX PEARL and MIAX connectivity expense. Accordingly, the Proposed Fee Increases are fair and reasonable because they will not result in excessive pricing or supra-competitive profit, when comparing the increase in actual costs to the Exchange (since February 2017) versus the projected increase in annual revenue. The Exchange also incurred additional significant capital expenditures over this same period to upgrade and enhance the underlying technology components, as more fully-detailed below.

Further, because the costs of operating a data center are significant and not economically feasible for the Exchange, the Exchange does not operate its own data centers, and instead

contracts with a third-party data center provider. The Exchange notes that larger, dominant exchange operators own and operate their data centers, which offers them greater control over their data center costs. Because those exchanges own and operate their data centers as profit centers, the Exchange is subject to additional costs. As a result, the Exchange is subject to fee increases from its data center provider, which the Exchange experienced in 2017 and 2018 of approximately 10%, as cited above. Connectivity fees, which are charged for accessing the Exchange's data center network infrastructure, are directly related to the network and offset such costs.

Further, the Exchange invests significant resources in network R&D, which are not included in direct expenses to improve the overall performance and stability of its network. For example, the Exchange has a number of network monitoring tools (some of which were developed in-house, and some of which are licensed from third-parties), that continually monitor, detect, and report network performance, many of which serve as significant value-adds to the Exchange's Members and enable the Exchange to provide a high level of customer service. These tools detect and report performance issues, and thus enable the Exchange to proactively notify a Member (and the SIPs) when the Exchange detects a problem with a Member's connectivity. In fact, the Exchange often receives calls from other industry participants regarding the status of networking issues outside of the Exchange's own network environment that are impacting the industry as a whole via the SIPs, including calls from regulators, because the Exchange has a superior, state-of-the-art network that, through its enhanced monitoring and reporting solutions, often detects and identifies industry-wide networking issues ahead of the SIPs. The costs associated with the maintenance and improvement of existing tools and the development of new tools resulted in significant

increased cost to the Exchange since February 2017 and are loss leaders for the Exchange to provide these added benefits for Members and non-Members.

Certain recently developed network aggregation and monitoring tools provide the Exchange with the ability to measure network traffic with a much more granular level of variability. This is important as Exchange Members demand a higher level of network determinism and the ability to measure variability in terms of single digit nanoseconds. Also, the Exchange routinely conducts R&D projects to improve the performance of the network's hardware infrastructure. As an example, in the last year, the Exchange's R&D efforts resulted in a performance improvement, requiring the purchase of new equipment to support that improvement, and thus resulting in increased costs in the hundreds of thousands of dollars range. In sum, the costs associated with maintaining and enhancing a state-of-the-art exchange network in the U.S. options industry is a significant expense for the Exchange that continues to increase, and thus the Exchange believes that it is reasonable to offset a portion of those increased costs by increasing its network connectivity fees, which are designed to recover those costs, as proposed herein. The Exchange invests in and offers a superior network infrastructure as part of its overall options exchange services offering, resulting in significant costs associated with maintaining this network infrastructure, which are directly tied to the amount of the connectivity fees that must be charged to access it, in order to recover those costs. As detailed in the Exchange's 2018 Audited Unconsolidated Financial Statements, the Exchange only has four primary sources of revenue: transaction fees, access fees (of which network connectivity constitutes the majority), regulatory fees, and market data fees. Accordingly, the Exchange must cover all of its expenses from these four primary sources of revenue.

The Proposed Fee Increases are fair and reasonable because they will not result in excessive pricing or supra-competitive profit, when comparing the total annual expense of

MIAX PEARL and MIAX associated with providing network connectivity services versus the total projected annual revenue of both exchanges associated with providing network connectivity services. For 2018, the total annual expense associated with providing network connectivity services (that is, the shared network connectivity of MIAX PEARL and MIAX, but excluding MIAX Emerald) was approximately \$19.3 million. The \$19.3 million in total annual expense is comprised of the following, all of which is directly related to the provision of network connectivity services by MIAX PEARL and MIAX to their respective Members and non-Members: (1) third-party expense, relating to fees paid by MIAX PEARL and MIAX to third-parties for certain products and services; and (2) internal expense, relating to the internal costs of MIAX PEARL and MIAX to provide the network connectivity services. All such expenses are more fully-described below, and are mapped to the MIAX PEARL and MIAX 2018 Statements of Operations and Member's Deficit (the "2018 Financial Statements"). The \$19.3 million in total annual expense is directly related to the provision of network connectivity services and not any other product or service offered by the Exchange. It does not, as the Third IEX Letter baselessly claims, include general costs of operating matching systems and other trading technology. (And as stated previously, no expense amount was allocated twice.) As discussed, the Exchange conducted an extensive cost review in which the Exchange analyzed every expense item in the Exchange's general expense ledger (this includes over 150 separate and distinct expense items) to determine whether each such expense relates to the provision of network connectivity services, and, if such expense did so relate, what portion (or percentage) of such expense actually supports the provision of network connectivity services, and thus bears a relationship that is, "in nature and closeness," directly related to network connectivity services. The sum of all such portions of expenses represents the total actual baseline cost of the Exchange to provide network connectivity services.

As discussed above, the Exchange differentiates itself by offering a “premium-product” network experience, as an operator of a high performance, ultra-low latency network with unparalleled system throughput, which network can support access to three distinct options markets and multiple competing market-makers having affirmative obligations to continuously quote over 750,000 distinct trading products (per exchange), and the capacity to handle approximately 38 million quote messages per second. The “premium-product” network experience enables users of 10Gb and 10Gb ULL connections to receive the network monitoring and reporting services for those approximately 750,000 distinct trading products. Thus, the Exchange is acutely aware of and can isolate the actual costs associated with providing such a service to its customers, a significant portion of which relates to the premium, value-add customer network monitoring and support services that accompany the service, as fully-described above. IEX, on the other hand, does not offer such a network, and thus has no legal basis to offer a qualified opinion on the Exchange’s costs associated with operating such a network. In fact, IEX differentiates itself as a provider of low cost connectivity solutions to an intentionally delayed trading platform – quite the opposite from the Exchange. Thus, there is no relevant comparison between IEX network connectivity costs and the Exchange’s network connectivity costs, and IEX’s attempt to do so in the Third IEX Letter is ill-informed and self-serving.<sup>59</sup>

For 2018, total third-party expense, relating to fees paid by MIAX PEARL and MIAX to third-parties for certain products and services for the Exchange to be able to provide network connectivity services, was \$5,052,346. This includes, but is not limited to, a portion of the fees paid to: (1) Equinix, for data center services, for the primary, secondary, and disaster

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<sup>59</sup> See Third IEX Letter, pg. 5.

recovery locations of the MIAX PEARL and MIAX trading system infrastructure; (2) Zayo Group Holdings, Inc. (“Zayo”) for connectivity services (fiber and bandwidth connectivity) linking MIAX PEARL and MIAX office locations in Princeton, NJ and Miami, FL to all data center locations; (3) Secure Financial Transaction Infrastructure (“SFTI”)<sup>60</sup>, which supports connectivity and feeds for the entire U.S. options industry; (4) various other services providers (including Thompson Reuters, NYSE, Nasdaq, and Internap), which provide content, connectivity services, and infrastructure services for critical components of options connectivity; and (5) various other hardware and software providers (including Dell and Cisco, which support the production environment in which Members and non-Members connect to the network to trade, receive market data, etc.).

All of the third-party expense described above is contained in the information technology and communication costs line item under the section titled “Operating Expenses Incurred Directly or Allocated From Parent” of the 2018 Financial Statements. For clarity, only a portion of all fees paid to such third-parties is included in the third-party expense herein (only the portion that actually supports the provision of network connectivity services and no expense amount is allocated twice). Accordingly, MIAX PEARL and MIAX do not allocate their entire information technology and communication costs to the provision of network connectivity services.

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<sup>60</sup> In fact, on October 22, 2019, the Exchange was notified by SFTI that it is again raising its fees charged to the Exchange by approximately 11%, without having to show that such fee change complies with the Act by being reasonable, equitably allocated, and not unfairly discriminatory. It is unfathomable to the Exchange that, given the critical nature of the infrastructure services provided by SFTI, that its fees are not required to be rule-filed with the Commission pursuant to Section 19(b)(1) of the Act and Rule 19b-4 thereunder. See 15 U.S.C. 78s(b)(1) and 17 CFR 240.19b-4, respectively.



The Exchange believes it is reasonable to allocate such third-party expense described above towards the total cost to the Exchange to operate and support the network, including providing network connectivity services. In particular, the Exchange believes it is reasonable to allocate the identified portion of the Equinix expense because Equinix operates the data centers (primary, secondary, and disaster recovery) that host the Exchange's network infrastructure, which enables the provision of network connectivity services. This includes, among other things, the necessary storage space, which continues to expand and increase in cost, power to operate the network infrastructure, and cooling apparatuses to ensure the Exchange's network infrastructure maintains stability. Without these services from Equinix, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the Equinix expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 68% of the total Equinix expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the Zayo expense because Zayo provides the internet, fiber and bandwidth connections with respect to the network, linking MIAX PEARL with its affiliates, MIAX and MIAX Emerald, as well as the data center and disaster recovery locations. As such, all of the trade data, including the billions of messages each day per exchange, flow through Zayo's infrastructure over the Exchange's network. Without these services from Zayo, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the Zayo expense

toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 62% of the total Zayo expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the SFTI expense and various other service providers' (including Thompson Reuters, NYSE, Nasdaq, and Internap) expense because those entities provide connectivity and feeds for the entire U.S. options industry as well as the content, connectivity services, and infrastructure services for critical components of the network. Without these services from SFTI and various other service providers, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the SFTI and other service providers' expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 89% of the total SFTI and other service providers' expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

The Exchange believes it is reasonable to allocate the identified portion of the other hardware and software provider expense because this includes costs for dedicated hardware licenses for switches and servers, as well as dedicated software licenses for security monitoring and reporting across the network. Without this hardware and software, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the

hardware and software provider expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 54% of the total hardware and software provider expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review. For 2018, total internal expense, relating to the internal costs of MIAX PEARL and MIAX to provide the network connectivity services, was \$14,271,870. This includes, but is not limited to, costs associated with: (1) employee compensation and benefits for full-time employees that support network connectivity services, including staff in network operations, trading operations, development, system operations, business, etc., as well as staff in general corporate departments (such as legal, regulatory, and finance) that support those employees and functions; (2) depreciation and amortization of hardware and software used to provide network connectivity services, including equipment, servers, cabling, purchased software and internally developed software used in the production environment to support the provision of network connectivity for trading; and (3) occupancy costs for leased office space for staff that support the provision of network connectivity services. The breakdown of these costs is more fully-described below.

All of the internal expenses described above are contained in the following line items under the section titled "Operating Expenses Incurred Directly or Allocated From Parent" in the 2018 Financial Statements: (1) Employee compensation and benefits; (2) Depreciation and amortization; and (3) Occupancy costs. For clarity, only a portion of all such internal expenses are included in the internal expense herein (only the portion that supports the provision of network connectivity services), and no expense amount is allocated twice). Accordingly,

MIAX PEARL and MIAX do not allocate their entire costs contained in those line items to the provision of network connectivity services.

The Exchange believes it is reasonable to allocate such internal expense described above towards the total cost to the Exchange to operate and support the network, including providing network connectivity services. In particular, MIAX PEARL's and MIAX's combined employee compensation and benefits expense relating to providing network connectivity services was \$5,264,151, which is only a portion of the \$11,997,098 (for MIAX) and \$8,545,540 (for MIAX PEARL) total expense for employee compensation and benefits that is stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because this includes the time spent by employees of several departments, including Technology, Back Office, Systems Operations, Networking, Business Strategy Development (who create the business requirement documents that the Technology staff use to develop network features and enhancements), Trade Operations, Finance (who provide billing and accounting services relating to the network), and Legal (who provide legal services relating to the network, such as rule filings and various license agreements and other contracts). As part of the extensive cost review conducted by the Exchange, the Exchange reviewed the amount of time spent by each employee on matters relating to the operation and support of the network. Without these employees, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the employee compensation and benefits expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 26% of the total employee compensation and benefits expense. The Exchange believes this allocation is reasonable because it represents the

Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

MIAX's and MIAX PEARL's combined depreciation and amortization expense relating to providing network connectivity services was \$8,269,048, which is only a portion of the \$6,179,506 (for MIAX) and \$4,783,245 (for MIAX PEARL) total expense for depreciation and amortization that is stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because such expense includes the actual cost of the computer equipment, such as dedicated servers, computers, laptops, monitors, information security appliances and storage, and network switching infrastructure equipment, including switches and taps that were purchased to operate and support the network. Without this equipment, the Exchange would not be able to operate the network and provide network connectivity services to its Members and non-Members and their customers. The Exchange did not allocate all of the depreciation and amortization expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting the network, approximately 75% of the total depreciation and amortization expense, as connectivity services would not be possible without relying on such equipment. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

MIAX's and MIAX PEARL's combined occupancy expense relating to providing network connectivity services was \$738,669, which is only a portion of the \$945,431 (for MIAX) and \$581,783 (for MIAX PEARL) total expense for occupancy that is stated in the 2018 Financial Statements. The Exchange believes it is reasonable to allocate the identified portion of such expense because such expense represents the portion of the Exchange's cost to

rent and maintain a physical location for the Exchange's staff who operate and support the network, including providing network connectivity services. This amount consists primarily of rent for the Exchange's Princeton, NJ office, as well as various related costs, such as physical security, property management fees, property taxes, and utilities. The Exchange operates its Network Operations Center (NOC) and Security Operations Center (SOC) from its Princeton, New Jersey office location. A centralized office space is required to house the staff that operates and supports the network. The Exchange currently has 130 employees.

Approximately two-thirds of the Exchange's staff are in the Technology department, and the majority of those staff have some role in the operation and performance of the network.

Without this office space, the Exchange would not be able to operate and support the network and provide network connectivity services to its Members and non-Members and their customers. Accordingly, the Exchange believes it is reasonable to allocate the identified portion of its occupancy expense because such amount represents the Exchange's actual cost to house the equipment and personnel who operate and support the Exchange's network infrastructure and connectivity services. The Exchange did not allocate all of the occupancy expense toward the cost of providing network connectivity services, only that portion which the Exchange identified as being specifically mapped to operating and supporting network connectivity services, approximately 48% of the total occupancy expense. The Exchange believes this allocation is reasonable because it represents the Exchange's actual cost to operate and support the network, and not any other service, as supported by its cost review.

Accordingly, the total projected MIAX and MIAX PEARL combined revenue for providing network connectivity services, reflective of the proposed increase, on an annualized basis, of \$14.5 million, is less than total annual actual MIAX PEARL and MIAX combined expense for providing network connectivity services during 2018 of approximately \$19.3 million. MIAX

PEARL and MIAX project comparable combined expenses for providing network connectivity services for 2019, as compared to 2018.

For the avoidance of doubt, none of the expenses included herein relating to the provision of network connectivity services relate to the provision of any other services offered by MIAX PEARL and MIAX. Stated differently, no expense amount of the Exchange is allocated twice.

The Exchange believes it is reasonable, equitable and not unfairly discriminatory to allocate the respective percentages of each expense category described above towards the total cost to the Exchange of operating and supporting the network, including providing network connectivity services, because the Exchange performed a line-by-line item analysis of all the expenses of the Exchange, and has determined the expenses that directly relate to operation and support of the network, including providing network connectivity to the Exchange. Further, the Exchange notes that, without the specific third-party and internal items listed above, the Exchange would not be able to operate and support the network, including providing network connectivity services to its Members and non-Members and their customers. Each of these expense items, including physical hardware, software, employee compensation and benefits, occupancy costs, and the depreciation and amortization of equipment, have been identified through a line-by-line item analysis to be integral to the operation and support of the network. Network connectivity fees are intended to recover the Exchange's costs of operating and supporting the network.

Accordingly, the Proposed Fee Increases are fair and reasonable because they do not result in excessive pricing or supra-competitive profit, when comparing the actual network operation and support costs to the Exchange versus the projected network connectivity annual

revenue, including the increased amount. Additional information on overall revenue and expense of the Exchange can be found in the Exchange's 2018 Financial Statements.

The Exchange notes that other exchanges have similar connectivity alternatives for their participants, including similar low-latency connectivity. For example, Nasdaq PHLX LLC ("Phlx"), NYSE Arca, Inc. ("Arca"), NYSE American LLC ("NYSE American") and Nasdaq ISE, LLC ("ISE") all offer a 1Gb, 10Gb and 10Gb low latency ethernet connectivity alternatives to each of their participants.<sup>61</sup> The Exchange further notes that Phlx, ISE, Arca and NYSE American each charge higher rates for such similar connectivity to primary and secondary facilities.<sup>62</sup> While MIAX PEARL's proposed connectivity fees are substantially lower than the fees charged by Phlx, ISE, Arca and NYSE American, MIAX PEARL believes that it offers significant value to Members over other exchanges in terms of network monitoring and reporting, which MIAX PEARL believes is a competitive advantage, and differentiates its connectivity versus connectivity to other exchanges. Additionally, the Exchange's proposed connectivity fees to its disaster recovery facility are within the range of the fees charged by other exchanges for similar connectivity alternatives.<sup>63</sup>

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<sup>61</sup> See Phlx and ISE Rules, General Equity and Options Rules, General 8, Section 1(b). Phlx and ISE each charge a monthly fee of \$2,500 for each 1Gb connection, \$10,000 for each 10Gb connection and \$15,000 for each 10Gb Ultra connection, which the equivalent of the Exchange's 10Gb ULL connection. See also NYSE American Fee Schedule, Section V.B, and Arca Fees and Charges, Co-Location Fees. NYSE American and Arca each charge a monthly fee of \$5,000 for each 1Gb circuit, \$14,000 for each 10Gb circuit and \$22,000 for each 10Gb LX circuit, which the equivalent of the Exchange's 10Gb ULL connection.

<sup>62</sup> Id.

<sup>63</sup> See Nasdaq ISE, Options Rules, Options 7, Pricing Schedule, Section 11.D. (charging \$3,000 for disaster recovery testing & relocation services); see also Cboe Exchange, Inc. ("Cboe") Fees Schedule, p. 14, Cboe Command Connectivity Charges (charging a monthly fee of \$2,000 for a 1Gb disaster recovery network access port and a monthly fee of \$6,000 for a 10Gb disaster recovery network access port).



B. Self-Regulatory Organization's Statement on Burden on Competition

MIAX PEARL does not believe that the proposed rule change will impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Act.

Intra-Market Competition

The Exchange does not believe that the proposed rule change would place certain market participants at the Exchange at a relative disadvantage compared to other market participants or affect the ability of such market participants to compete. In particular, the Exchange has received no official complaints from Members, non-Members (extranets and service bureaus), third-parties that purchase the Exchange's connectivity and resell it, and customers of those resellers, that the Exchange's fees or the Proposed Fee Increases are negatively impacting or would negatively impact their abilities to compete with other market participants or that they are placed at a disadvantage. The Exchange believes that the Proposed Fee Increases do not place certain market participants at a relative disadvantage to other market participants because the connectivity pricing is associated with relative usage of the various market participants and does not impose a barrier to entry to smaller participants. As described above, the less expensive 1Gb direct connection is generally purchased by market participants that utilize less bandwidth. The market participants that purchase 10Gb ULL direct connections utilize the most bandwidth, and those are the participants that consume the most resources from the network. Accordingly, the Proposed Fee Increases do not favor certain categories of market participants in a manner that would impose a burden on competition; rather, the allocation of the Proposed Fee Increases reflects the network resources consumed by the various size of market participants – lowest bandwidth consuming members pay the least, and highest bandwidth consuming members pays the most, particularly since higher bandwidth consumption translates to higher costs to the Exchange.

### Inter-Market Competition

The Exchange believes the Proposed Fee Increases do not place an undue burden on competition on other SROs that is not necessary or appropriate. In particular, options market participants are not forced to connect to (and purchase market data from) all options exchanges, as shown by the number of Members of MIAX PEARL as compared to the much greater number of members at other options exchanges (as described above). Not only does MIAX PEARL have less than half the number of members as certain other options exchanges, but there are also a number of the Exchange's Members that do not connect directly to MIAX PEARL. There are a number of large market makers and broker-dealers that are members of other options exchange but not Members of MIAX PEARL. Additionally, other exchanges have similar connectivity alternatives for their participants, including similar low-latency connectivity, but with much higher rates to connect.<sup>64</sup> The Exchange is also unaware of any assertion that its existing fee levels or the Proposed Fee Increases would somehow unduly impair its competition with other options exchanges. To the contrary, if the fees charged are deemed too high by market participants, they can simply disconnect. While the Exchange recognizes the distinction between connecting to an exchange and trading at the exchange, the Exchange notes that it operates in a highly competitive options market in which market participants can readily connect and trade with venues they desire. In such an environment, the Exchange must continually adjust its fees to remain competitive with other exchanges. The Exchange believes that the proposed changes reflect this competitive environment.

C. Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received from Members, Participants, or Others

Written comments were neither solicited nor received.

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<sup>64</sup> See supra note 61.

### III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

The foregoing rule change has become effective pursuant to Section 19(b)(3)(A)(ii) of the Act,<sup>65</sup> and Rule 19b-4(f)(2)<sup>66</sup> thereunder. At any time within 60 days of the filing of the proposed rule change, the Commission summarily may temporarily suspend such rule change if it appears to the Commission that such action is necessary or appropriate in the public interest, for the protection of investors, or otherwise in furtherance of the purposes of the Act. If the Commission takes such action, the Commission shall institute proceedings to determine whether the proposed rule should be approved or disapproved.

### IV. Solicitation of Comments

Interested persons are invited to submit written data, views, and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act.

Comments may be submitted by any of the following methods:

#### Electronic comments:

- Use the Commission's Internet comment form (<http://www.sec.gov/rules/sro.shtml>);
- or
- Send an e-mail [to rule-comments@sec.gov](mailto:to-rule-comments@sec.gov). Please include File Number SR-PEARL-2019-36 on the subject line.

#### Paper comments:

- Send paper comments in triplicate to Vanessa Countryman, Secretary, Securities and Exchange Commission, 100 F Street, NE, Washington, DC 20549-1090.

All submissions should refer to File Number SR-PEARL-2019-36. This file number should be included on the subject line if e-mail is used. To help the Commission process and

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<sup>65</sup> 15 U.S.C. 78s(b)(3)(A)(ii).

<sup>66</sup> 17 CFR 240.19b-4(f)(2).

review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's Internet Web site (<http://www.sec.gov/rules/sro.shtml>).

Copies of the submission, all subsequent amendments, all written statements with respect to the proposed rule change that are filed with the Commission, and all written communications relating to the proposed rule change between the Commission and any person, other than those that may be withheld from the public in accordance with the provisions of 5 U.S.C. 552, will be available for website viewing and printing in the Commission's Public Reference Room, 100 F Street, NE, Washington, DC 20549, on official business days between the hours of 10:00 a.m. and 3:00 p.m. Copies of the filing also will be available for inspection and copying at the principal office of the Exchange. All comments received will be posted without change; the Commission does not edit personal identifying information from submissions. You should submit only information that you wish to make available publicly

All submissions should refer to File Number SR-PEARL-2019-36 and should be submitted on or before [insert date 21 days from publication in the Federal Register]. For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.<sup>67</sup>

Vanessa Countryman  
Secretary

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<sup>67</sup> 17 CFR 200.30-3(a)(12).

**Exhibit 3**
**MIAMI International Securities Exchange, LLC**  
**Statements of Operations and Member's Deficit**  
**December 31, 2018 and 2017**

|  | <u>Years Ended December 31,</u> |                         |
|--|---------------------------------|-------------------------|
|  | <u>2018</u>                     | <u>2017</u>             |
| REVENUES   |                                 |                         |
| Transaction fees   | \$ 46,984,676                   | \$ 44,680,673           |
| Access fees  | 17,609,914                      | 16,430,988              |
| Regulatory fees  | 22,395,308                      | 18,719,283              |
| Market data fees   | 3,795,925                       | 4,122,069               |
| Other revenue  | <u>1,085,706</u>                | <u>898,254</u>          |
| Total revenues   | 91,871,530                      | 84,851,267              |
| COST OF REVENUES   |                                 |                         |
| Transaction rebates  | <u>(28,170,516)</u>             | <u>(23,776,267)</u>     |
| NET REVENUES   | <u>63,701,014</u>               | <u>61,075,000</u>       |
| OPERATING EXPENSES INCURRED DIRECTLY OR<br>ALLOCATED FROM PARENT |                                 |                         |
| Employee compensation and benefits                               | 11,997,098                      | 17,442,710              |
| Information technology and communication costs                   | 3,977,116                       | 4,624,547               |
| Depreciation and amortization                                    | 6,179,506                       | 7,587,202               |
| Occupancy costs  | 945,431                         | 1,209,993               |
| Professional services  | 197,417                         | 391,134                 |
| Regulatory services fees   | 1,025,051                       | 1,219,827               |
| Financial and banking consulting services                        | 353,837                         | 465,480                 |
| Trading operations costs   | 7,712,404                       | 8,557,071               |
| Share based compensation to third parties                        | 21,405                          | 66,517                  |
| Directors' fees  | 1,317,798                       | 1,062,107               |
| Other  | <u>1,145,259</u>                | <u>1,392,453</u>        |
| Total operating expenses   | <u>34,872,322</u>               | <u>44,019,041</u>       |
| OPERATING PROFIT   | <u>28,828,692</u>               | <u>17,055,959</u>       |
| Interest expense   | (138,587)                       | (177,256)               |
| Financing related costs  | <u>(4,428,017)</u>              | <u>(20,176,291)</u>     |
| NET INCOME (LOSS)  | <u>24,262,088</u>               | <u>(3,297,588)</u>      |
| Member's deficit at beginning of year                            | <u>(251,290,399)</u>            | <u>(247,992,811)</u>    |
| Member's deficit at end of year                                  | <u>\$ (227,028,311)</u>         | <u>\$ (251,290,399)</u> |

**MIAX PEARL, LLC**  
**Statements of Operations and Member's Deficit**  
**December 31, 2018 and 2017**

|  | <b>Year Ended</b>        | <b>Year Ended</b>        |
|--|--------------------------|--------------------------|
|  | <b>December 31, 2018</b> | <b>December 31, 2017</b> |
| REVENUES   |                          |                          |
| Transaction fees   | \$ 109,553,554           | \$ 19,263,286            |
| Access fees  | 3,568,785                | 1,992,691                |
| Regulatory fees  | 7,176,912                | 3,459,167                |
| Market data fees   | 3,255,005                | 177,896                  |
| Other revenue  | <u>76,333</u>            | <u>-</u>                 |
| Total revenues   | 123,630,589              | 24,893,040               |
| COST OF REVENUES   |                          |                          |
| Transaction rebates  | <u>(114,680,701)</u>     | <u>(19,123,738)</u>      |
| NET REVENUES   | <u>8,949,888</u>         | <u>5,769,302</u>         |
| OPERATING EXPENSES INCURRED DIRECTLY OR<br>ALLOCATED FROM PARENT |                          |                          |
| Employee compensation and benefits                               | 8,545,540                | 11,892,727               |
| Information technology and communication costs                   | 3,698,440                | 4,243,783                |
| Depreciation and amortization                                    | 4,783,245                | 4,173,234                |
| Occupancy costs  | 581,783                  | 722,287                  |
| Professional services  | 188,548                  | 71,648                   |
| Regulatory services fees   | 879,812                  | 875,546                  |
| Financial and banking consulting services                        | 478,695                  | 119,626                  |
| Trading operations costs   | 5,788,535                | 1,009,191                |
| Share based compensation to third parties                        | 41,671                   | 13,929                   |
| Directors' fees  | 482,511                  | 406,419                  |
| Other  | <u>799,287</u>           | <u>1,100,518</u>         |
| Total operating expenses   | <u>26,268,067</u>        | <u>24,628,908</u>        |
| OPERATING LOSS   | <u>(17,318,179)</u>      | <u>(18,859,606)</u>      |
| Interest expense   | (140,507)                | (279,777)                |
| Financing related costs  | <u>(4,972,145)</u>       | <u>-</u>                 |
| NET LOSS   | <u>(22,430,831)</u>      | <u>(19,139,383)</u>      |
| Member's deficit at beginning of year                            | <u>(36,258,523)</u>      | <u>(17,119,140)</u>      |
| Member's deficit at end of year                                  | <u>\$ (58,689,354)</u>   | <u>\$ (36,258,523)</u>   |

**Exhibit 5**

New text is underlined;  
 Deleted text is in [brackets]

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**MIAX PEARL Fee Schedule**

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**1) – 4) No change.**

**5) System Connectivity Fees**

**a) Monthly Member Network Connectivity Fee**

| Member Network Connectivity Per Month | Primary/Secondary Facility<br>1 Gigabit<br>Per Connection | Disaster Recovery Facility<br>1 Gigabit<br>Per Connection | Primary/Secondary Facility<br>10 Gigabit<br>Per Connection | Disaster Recovery Facility<br>10 Gigabit<br>Per Connection | Primary/Secondary Facility<br>10 Gigabit ULL<br>Per Connection |
|---------------------------------------|---|---|--|--|--|
| Individual Firm                       | \$[1,100.00] <u>1,400.00</u>                              | \$[500.00] <u>550.00</u>                                  | \$[5,500.00] <u>6,100.00</u>                               | \$[2,500.00] <u>2,750.00</u>                               | \$[8,500.00] <u>9,300.00</u>                                   |

Monthly Member Network Connectivity fees for connectivity with the Primary/Secondary Facility will be assessed in any month the Member is credentialed to use any of the MIAX PEARL APIs or Market Data feeds in the production environment and will be pro-rated when a Member makes a change to the connectivity (by adding or deleting connections) with such pro-rated fees based on the number of trading days that the Member has been credentialed to utilize any of the MIAX PEARL APIs or Market Data feeds in the production environment through such connection, divided by the total number of trading days in such month multiplied by the applicable monthly rate. Monthly Member Network Connectivity fees for connectivity with the Disaster Recovery Facility will be assessed in each month during which the Member has established connectivity with the Disaster Recovery Facility.

Members utilizing the MENI to connect to the trading platforms, market data systems, test systems, and disaster recovery facilities of the Exchange and MIAX Options via a single, shared connection will only be assessed one Monthly Member Network Connectivity Fee per connection, regardless of the trading platforms, market data systems, test systems, and disaster recovery facilities accessed via such connection.

**b) Monthly Non-Member Network Connectivity Fee**

| Non-Member Network Connectivity Per Month              | Primary/Secondary Facility 1 Gigabit Per Connection | Disaster Recovery Facility 1 Gigabit Per Connection | Primary/Secondary Facility 10 Gigabit Per Connection | Disaster Recovery Facility 10 Gigabit Per Connection | Primary/Secondary Facility 10 Gigabit ULL Per Connection |
|--|---|---|--|--|--|
| Service Bureau/Extranet Provider and other non-Members | \$[1,100.00] <u>1,400.00</u>                        | \$[500.00] <u>550.00</u>                            | \$[5,500.00] <u>6,100.00</u>                         | \$[2,500.00] <u>2,750.00</u>                         | \$[8,500.00] <u>9,300.00</u>                             |

Monthly Non-Member Network Connectivity fees for connectivity with the Primary/Secondary Facility will be assessed in each month the Non-Member has been credentialed to use any of the MIAX PEARL APIs or Market Data feeds via the network connection in the production environment and will be pro-rated when a Non-Member makes a change to the connectivity (by adding or deleting connections) with such pro-rated fees based on the number of trading days that the Non-Member has been credentialed to utilize any one of the two MIAX Exchanges’ APIs or Market Data feeds in the production environment through such connection, divided by the total number of trading days in such month multiplied by the applicable monthly rate. Monthly Non-Member Network Connectivity fees for connectivity with the Disaster Recovery Facility will be assessed in each month during which the Non-Member has established connectivity with the Disaster Recovery Facility.

Non-Members utilizing the MENI to connect to the trading platforms, market data systems, test systems, and disaster recovery facilities of the Exchange and MIAX Options via a single, shared connection will only be assessed one Monthly Non-Member Network Connectivity Fee per connection, regardless of the trading platforms, market data systems, test systems, and disaster recovery facilities accessed via such connection.

**c) – f) No change.**

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