Securities Industry Automation Corporation
11 Wall Street, New York, NY 10005

September 8, 2023

To: OPRA Multicast Subscribers

Subject: Expansion of OPRA Data Dissemination from a 48-Line to a 96-Line Multicast Network:
Industry Test #6 - Saturday, September 16, 2023 - Reminder

What's New:

As previously announced, for optimal symbol balancing and line capacity utilization, OPRA will be expanding data dissemination from a 48-line to a 96-line multicast data distribution network.

Changes Being Made:

As part of expanding data dissemination from a 48-line to a 96-line multicast data distribution network, and to help facilitate capacity upgrades to the ICE Global Network (IGN), new subnets, rendezvous points, source addresses, and multicast addresses are being introduced (including Global Trading Hours (GTH)). Note that these changes apply to customer connections via both IGN and the NMS Network in Mahwah.

The changes are being made in two phases:

- **Phase 1**: migration of the current 48-line symbol distribution schema to new network subnets, rendezvous points, source addresses, and multicast addresses -- Complete
- **Phase 2**: migration of the new symbol distribution schema over 96 lines

When it is Changing:

Activation of the new network subnets, rendezvous points, source addresses, and multicast addresses were completed on Monday, July 10, 2023. -- Complete

Activation of data dissemination on the 96-line multicast data distribution network is scheduled to take place at start of day, **Monday, October 9, 2023.**

For detailed schedule information including all industry tests, please consult the OPRA 96-Line Migration FAQ's, here.

Testing Opportunities:

- **Cert System Functional Testing:** New symbol routing test schema
  - Began: Monday, April 3, 2023
  - Ends: Friday, October 6, 2023

- **Industry Test #6: Saturday September 16, 2023, 9:00AM-3:15PM, ET**

  - **OPRA**
    a) OPRA 96-Line Industry Test Session 1 (9:00-10:30AM): OPRA Primary and Secondary Data Centers with new 96-line symbol distribution schema
    b) OPRA 96-Line Industry Test Session 2: failover from Primary Data Center to Secondary Data Center (11:00-11:30AM)
    c) OPRA Restart (12:00-12:45PM)
    d) OPRA 96-Line Industry Test Session 3 (12:45PM-3:15PM): Capacity testing
  - **The test plan can be located on page 3**

OPRA subnets, rendezvous points, source addresses, and multicast addresses can be found in the appendices of the Common IP Multicast Distribution specification here.

Data Subscribers who receive OPRA from connectivity service providers other than ICE Global Network (IGN) or the NMS Network must contact their connectivity service providers to coordinate testing.

Test Registration

Each OPRA Data Subscriber participating in the test should register at CTA-OPRA-Support@siac.com .

Technical Inquiries

- NMS Product Management Support Email: CTA-OPRA-Support@siac.com
- NMS Production Management Support Line: 212-656-8177, Option 2 (Monday through Friday, 9:00 AM-5:00 PM ET)

OPRA Migration to new network subnets, rendezvous points, source addresses, and multicast addresses
Test Date & Time: Sep 16, 2023, 9:00 AM to 3:15 PM ET (Approximate)

Hourly Test Script

#	Time	Test Category	Action By	Test Description	Expected Results
Both Primary and Disaster Recovery Data Center on NEW Output Multicast Network with 96-Line Traffic Distribution					
1	1:30:00 AM	SOD	OPRA	OPRA Production and DR sites on the New Output Multicast addresses for both Realtime and Retransmission line, using the **96-line Traffic Distribution**. (Refer to Common IP Multicast Distribution Network Specification for network addresses)	
				OPRA to trigger Start-of-Day message on the new Output Multicast lines	Start-of-Day messages published over the new Output Multicast lines followed by the multicast Line Integrity messages every 10 seconds until the participants begin to generate data
2	1:30:00 -9:30:00 AM	Participant Connectivity/Input	Participants	Participants to establish connectivity for OPRA Input lines	Participants establish connections
				Participants to start submitting Quote and Trade data	Quotes and trades accepted and disseminated across the 96-lines via the new multicast output lines
3	9:30:00 AM	Market Open	OPRA	Market Open	
4	9:30:00 - 11:00:00 AM	Data Verification	Participants	Participants to continue submitting Quote and Trade data	Data Subscribers to verify Data over the new Output Multicast addresses across the 96-lines
4	11:00 - 11:30 AM	Site failover from Primary Data Center to Disaster Recovery Data Center *(Both Production and DR sites on the new Output Multicast lines)*	OPRA	OPRA to simulate Production site failure	-- Disconnection of all OPRA Input and Retransmission lines for all Participants and Data Subscribers -- Disruption in Output Multicast data dissemination for all lines
				OPRA to failover to DR site and publish following messages via the new Output Multicast lines on DR site: 1) Reset Block Sequence Number (Category H Type K) for each OPRA output line to reset the sequence number to 1 2) Disaster Recovery Data Center Activation (Category H Type P) message 3) Zero Quotes (Quote messages with Zero Price and Size) on behalf of all participants across all symbols	Subscribers to receive and process following messages disseminated over the new multicast output lines on the DR site across the 96-lines -- Sequence Reset Message (Category H / Type K) -- Disaster Recovery Site Activation Control Message (Category H, Type P) -- Zero quotes Note: To request retransmission for any range of messages disseminated after the sequence reset to 1, Data Subscriber would be required to apply the offset up to 4,294,967,295 in the message sequence number
				OPRA to enable input lines and Retransmission lines of the DR site	DR Input IP/Ports available to establish connections
			Participants	Participants to reconnect to input IP/ports on OPRA DR site and establish sequence numbers by sending Block Sequence Number Status Inquiry Request (Category N / Type L) and Message Count Status Inquiry Request (Category N / Type R).	OPRA to accept input connections and respond with Block Sequence Response (Category N / Type M) and Message Count Status Response (Category N / Type S)
				Participants to start submitting Options data from the latest Sequence Numbers	-- Subscribers to accept Quotes and trades disseminated on the new multicast output lines. -- Subscribers can request Retransmission for any gaps via the retransmission lines on the DR site. Retransmitted data disseminated via the new multicast output lines
5	12:00:00 PM			End of Session (Note - An End-of-Day message will not be triggered by OPRA, but system will be rebooted for next test)	
SYSTEM RESTART - OPRA to run End of Day, reboot and run Start of Day to bring up system in a clean state (*No Network change during this restart*)					
Capacity Test for the 96-Line Traffic Distribution over the NEW Output Multicast Network					
6	12:45:00 PM	SOD	OPRA	OPRA on the New Output Multicast addresses for Realtime and Retransmission lines on the new 96-line Traffic Distribution	
				OPRA to trigger Start-of-Day message on the new Output Multicast lines	
7	01:00:00 - 2:00:00 PM	Capacity Test Part 1	OPRA	OPRA to simulate data for Capacity Test - 20M msg/sec to 11M msg/sec, each rate maintained for 1 second (total 10 seconds) - Pattern repeated for 60 minutes	
8	02:15:00 - 3:15:00 PM	Capacity Test Part 2	OPRA	OPRA to simulate data for Capacity Test - Initial Rate = 1M msg/100ms. Rate will be maintained for 4 minutes - Rate will increase by 1M msg/100ms every 4 minutes, with highest rate at 15M msg/100ms - Total duration = ~ 60 Minutes	
9	3:15:00 PM			End of Test	