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

November 29, 2021

TO: OPRA Multicast Data Subscribers

SUBJECT: OPRA Failover to Secondary Data Center Testing: **Saturday, December 4, 2021 Final Reminder and Test Plan**

Failover Testing

As previously announced, SIAC will conduct OPRA failover testing to the secondary data canter with the OPRA exchanges on **Saturday, December 4, 2021, from 9:00 am - 11:00 am ET**. All OPRA Multicast Data Subscribers are invited to participate in this test to validate expected processing within your systems.
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2021 SIP Failover/MWCB Saturday Testing Schedule
- Sat 12/4/21: SIP Failover / MWCB Level 1/2 Test #3

2022 SIP Failover/MWCB Saturday Testing Schedule
- Sat 3/26/22: SIP Failover / MWCB Level 1/2 Test #1
- Sat 6/11/22: SIP Failover / MWCB Level 1/2 Test #2
- Sat 9/10/22: MWCB Level 1/2/3 Test
- Sat 12/3/22: SIP Failover / MWCB Level 1/2 Test #3

Failover Test Details

The failover to the secondary data center can occur at any time during the 10:00 am - 11:00 am ET time window, to simulate an unexpected real-time event requiring a failover.   Participating exchanges will continue to generate test data, which will be disseminated over the production multicast lines sourced from the secondary data center.

Upon failover to the secondary data center OPRA Data Subscribers will see:

OPRA Failover Messaging Description
Category H, Type K - Reset Block Sequence Number Control messages to '1' (10x)
Category H, Type P - Disaster Recovery Data Center Activation Control messages
Zero quotes for all securities
OPRA trades and quotes after failover from participating Exchanges

Test Registration

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

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.

Documentation

Please reference the latest OPRA Output Multicast Specifications which may be obtained from **www.opraplan.com**.

OPRA Notifications

To automatically receive these notifications and OPRA system alerts, you are required to subscribe at: https://www.opraplan.com/contact-us

OPRA SIP Server Failure/Data Center Failover Test Script
Test Date & Time: Dec 4, 2021, 9:00am to 11:00am ET (approximate)

#	Time	Test Category	Action By	Test Description	Expected Results
				Hourly Test Script	
1	1:30:00 AM	SOD	SIP	SIP to trigger Start of Day message	
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 via the multicast output lines
3	9:15:00 AM	Output Publication Primary Process Failure	SIP	SIP to simulate Primary Output Publication process failure. Data Publication to switch to backup process	-- Subscribers may see a momentary outage in data flow on the output lines -- Subscriber can request retransmission for any gaps
4	9:30:00 AM	Market Open	SIP	Market Open	
5	9:30 - 10:00 AM	Single Participant Line Disconnect	SIP	SIP to simulate primary input line failure of a subset of OPRA input lines for each Participant	Participants will see primary input lines disconnected
			Participants	For the affected lines, Participants to reconnect to OPRA on their backup lines 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). Participants to start submitting Quote and Trade data	-- SIP to accept input connections and respond with Block Sequence Response (Category N / Type M) and Message Count Status Response (Category N / Type S) -- Quotes and trades accepted and disseminated on the output lines
6	10:00 - 11:00 AM	Site failover from Primary Data Center to Disaster Recovery Data Center	SIP	SIP to simulate OPRA 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
				SIP to failover to DR site and publish following messages: 1) Reset Block Sequence Number (Category H Type K) for each OPRA output line to reset to sequence number 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 sequence reset message (Category H / Type K) disseminated from the DR site -- Subscribers to receive the new Disaster Recovery Site Activation Control Message (Category H, Type P) over the multicast lines -- Subscribers to receive the zero quotes disseminated upon failover 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
				SIP 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).	SIP 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 output lines. -- Subscribers can request Retransmission for any gaps via the retransmission lines on the DR site.
			SIP	SIP to recover OPRA Production site for redundancy	
7	11:00:00 AM			End of test	