2011 SECURITIES INDUSTRY BUSINESS CONTINUITY TEST

October 29, 2011

SUMMARY OF RESULTS

Test Lead By

Securities Industry and Financial Markets Association
Executive Summary

The 2011 test is part of an ongoing industry-driven backup site testing initiative that began in 2003 and is led by Securities Industry and Financial Markets Association (SIFMA)\(^1\).

The 2011 test followed the format of prior industry-wide tests where firms submit test orders and transactions from their backup sites to the markets and industry utilities. The test involved components for Equities, Options, Fixed Income, Clearing and Settlement Utilities, Market Data, Payment Systems, Treasuries and FX. The exercise was supported by all major exchanges, markets and industry utilities. Participation in the test was voluntary and results for specific firms, exchanges, markets and utilities are retained in strict confidence by SIFMA.

Participants in the SIFMA test included over 220 securities firms and 60 market organizations. During the test approximately 1570 communications connections were establish between securities firms and banks and the exchanges, markets and utilities. Test transactions on these connections were successful 95% of the time. These results were generally comparable to prior tests. These results underscore the ability of the securities industry to operate through adverse conditions.

In parallel with the SIFMA test on October 29, the Futures Industry Association led a backup site test of the futures exchanges and clients. The Futures test included 16 futures exchanges and clearing organizations. In the futures test, 62 clearing/non-clearing firms and 47 trading firms participated. 93% of these firms tested successfully.

\(^1\) The Securities Industry and Financial Markets Association (“SIFMA”) brings together the shared interests of hundreds of securities firms, banks and asset managers. SIFMA’s mission is to support a strong financial industry, investor opportunity, capital formation, job creation and economic growth, while building trust and confidence in the financial markets. SIFMA, with offices in New York and Washington, D.C., is the U.S. regional member of the Global Financial Markets Association (“GFMA”). For more information, visit www.sifma.org.
Test Objectives

1. To assess the ability of securities market participants to operate through a significant emergency from their backup data centers and work area recovery sites and to examine the level of resiliency of the markets and the industry overall.

2. To provide firms and exchanges with an opportunity to test and evaluate their backup sites and backup communications with the markets on a single day.

Markets and Utilities Tested and Expanded Test Components

The 2011 test included components for Equities, Options, Fixed Income, Clearing and Settlement Utilities, Market Data, Payment Systems, Treasuries and FX.

Market participants included all major exchanges, markets and industry utilities plus major service bureaus and market data vendors. See Appendix A for list of participating market entities.

For 2011, the test was enhanced in a number of ways with new test components and additional participating markets.

- New exchanges and markets were added including BATS Equities (BZX, BYX), BATS Options, Direct Edge Equities (EDGA, EDGX) and Tullet Prebon (FI IDB)

- A new test component was added for foreign exchange (FX) that included Bloomberg TRADEBOOK, Bloomberg FXGO, Hotspot and Thomson Reuters.

- The 2010 Treasury Auction pilot test was expanded this year to include additional dealers.

- A new test was included with the New York Fed that involved a mock securities lending operation in Fed Trade v3.6 (production environment).

- Buy side firms were encouraged to participate in the test this year. A number of additional firms registered that conduct business directly with the exchanges, markets and utilities. We began experimenting with a test between buy side firms and broker/dealers. This concept will be expanded in 2012.

The Financial Information Forum assisted in coordinating with the services bureaus and market data vendors during the test.
Test Format

Participating firms, exchanges, industry utilities, service bureaus and payment banks, operating from backup sites (data center and work area recovery), simultaneously submitted scripted test transactions to markets and settlement entities and receive simulated confirmations. The test was not intended to be a simulation of any specific real event.

Firms and markets were requested to test from backup locations but, in some instances, this was not technically feasible. For a connection between a firm and a market to be considered a valid test interaction, at least one of the entities had to test from a backup site. A number of exchanges and markets and some firms run multiple “hot” sites as a normal data center configuration. In a multiple hot site configuration, order traffic is routed automatically to one or more of the sites and if a site fails, traffic is automatically shifted to the operational sites. This test did not require shutdown of one of the hot sites.

Test Participants Summary

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exchanges, Markets and Industry Utilities (Equities, Options, FI, Clearing, Treasuries, FX)</td>
<td>41</td>
</tr>
<tr>
<td>Securities Firms (Including those testing directly with markets and through service bureaus)</td>
<td>220</td>
</tr>
<tr>
<td>Service Bureaus</td>
<td>11</td>
</tr>
<tr>
<td>Market Data Vendors</td>
<td>8</td>
</tr>
<tr>
<td>Payment Organizations</td>
<td>3</td>
</tr>
<tr>
<td>Future Exchanges and Clearing Organizations</td>
<td>16</td>
</tr>
</tbody>
</table>

See Appendix A for a complete list of market entities participating. The names of the participating firms will not be released.

Overall Test Results

There were 1570 test interactions in the SIFMA test components of which 95% were successful.

The success rate for 2011 is in line with results for the past few years.

The firms participating in the test account for greater than 85 percent of the normal market volume.

Notes: A test interaction is a connection between a firm and an exchange, market, service bureau or utility. Test interactions are considered successful if a two-way communication is recorded during the test window. Interactions that experienced issues that were corrected during the test window were counted as successful tests.
Successful Test Interactions by Market

<table>
<thead>
<tr>
<th>Market</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equities</td>
<td>94%</td>
</tr>
<tr>
<td>Options</td>
<td>93%</td>
</tr>
<tr>
<td>Fixed Income</td>
<td>93%</td>
</tr>
<tr>
<td>Clearing &amp; Settlement</td>
<td>100%</td>
</tr>
<tr>
<td>Treasury</td>
<td>100%</td>
</tr>
<tr>
<td>FX</td>
<td>100%</td>
</tr>
<tr>
<td>Market Data</td>
<td>96%</td>
</tr>
<tr>
<td>Service Bureaus</td>
<td>96%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>95%</strong></td>
</tr>
</tbody>
</table>

Types of Issues Resulting in Unsuccessful Test Interactions

The type of issues noted during this year’s test are consistent with issues encountered in prior test except that the organizations experiencing the problems seem to vary from year to year. Types of problems include:

- General connectivity issues at firms
- System specific connectivity issues at firms
- System specific connectivity issues at one clearing bank

Observations and Conclusions

- This test and prior annual industry tests have consistently achieved extremely positive results that underscore the ability of the industry as a whole to operate through adverse conditions.
- One of the primary values of the annual test is the opportunity it provides for firms and markets to test their backup strategies collectively as an industry.
- The types of problems that caused the failures during this test were not so significant that, during a real event, they could not be addressed fairly quickly with full resources.
- Participants agree that it is valuable to continue to modify and expand the scope of the test each year.
- The backup strategies installed by securities firms and market entities performed extremely well.
- The need for firms to regularly and frequently test their backup connections to market entities is critical.
- Firms should ensure that appropriate controls are in place to manage changes to applications and hardware that may impact backup site connectivity to markets. Some of the problems seen during the test resulted from applications changes and hardware configuration changes that were installed since the last test.
Inquires About the SIFMA Test

Inquires about the test may be directed to:

Karl Schimmeck
Vice President
SIFMA
120 Broadway, 35th floor, New York, NY 10271
212-313-1183
kschimmeck@sifma.org

Futures Industry Test

For information about the Futures test led by Futures Industry Association, see
# Appendix A

## PARTICIPATING MARKET ORGANIZATIONS

### Equities
- BATS BZX
- BATS BYZ
- Chicago Stock Exchange
- Direct Edge EDGA
- Direct Edge EDGX
- NASDAQ
- NASDAQ OMX PSX
- NASDAQ OMX BX
- National Stock Exchange
- NYSE/Euronext
- NYSE/AMEX

### Options
- BATS Options
- Boston Options Exchange
- Chicago Board Options Exchange
- NASDAQ OMX PHLX
- NASDAQ NOM
- NYSE/ARCA
- The Options Clearing Corporation

### Fixed Income
- BondDesk - ATS
- MarketAxess - ATS
- The Municenter - ATS
- TradeWeb - ATS
- Dealerweb - IDB
- eSpeed - IDB
- ICAP - IDB
- Tullett Prebon – IDB
- Bank of New York - Clrg Bank
- JP Morgan Chase - Clrg Bank

### Clearing/Settlement
- DTCC
- NASDAQ ACT
- Omgeo
- SWIFT

### Payments
- Fedwire
- CHIPS
- SWIFT

### Market Data
- Bloomberg
- eSignal
- Factset
- Fidessa
- FT Interactive Data
- OCT Markets Group
- SIX Telekurs
- Thomson Reuters

### Service Bureaus
- Broadridge ICI
- Broadridge BPS
- Broadridge SIS
- CRI
- Fidessa
- Lava Trading
- OTC Markets Group SB
- ReadQ
- SunGard Phase 3
- SunGard Brass
- Thomson Reuters BETA Systems

### Treasuries
- US Treasury Auctions
- Govex

### FX
- Bloomberg Tradebook
- Bloomberg FXGO
- Hotspot
- Thomson Reuters RTFX

### Futures
- Canadian Derivatives Clearing Corporation
- CBOE Futures Exchange
- CME Group
- ELX Futures
- ICE Clear Canada
- ICE Clear EU
- ICE Clear US
- ICE Exchanges
- International Derivatives Clearing Group
- Kansas City Board of Trade
- Mercado Español de Futuros Financieros
- Minneapolis Grain Exchange
- Montreal Exchange
- New York Portfolio Clearing
- NYSE Liffe US
- Options Clearing Corporation