FUTURES INDUSTRY BUSINESS CONTINUITY AND DISASTER RECOVERY

2013 INDUSTRY TEST RESULTS
"DR X"

October 2013

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I. BACKGROUND

- The FIA Information Technology Division successfully conducted it's tenth (10th) annual disaster recovery test in October 2013.

- Starting in Q1, 2013, the FIA Business Continuity Management committee began detailed preparations for this year's tenth annual industry-wide test.

- A Working Group was convened to discuss and agree on a date, goals, objectives, etc.

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BACKGROUND (Cont'd) …

- Regular committee conference calls were held between May and October (bi-weekly and weekly).

- Two futures Industry BC/DR symposiums were held in June and August via WebEx/conference calls.

- Symposium presenters included representatives from the major exchanges and clearinghouses:

Canadian Derivatives Clearing Corp.	ICE Clear US
CBOE Futures Exchange	Mercado Espanol Futuros Financieros
CME Clearing	Montreal Exchange
CME Group	Minneapolis Grain Exchange
ELX Futures	New York Portfolio Clearing
Eris Exchange	NYSE Liffe US
ICE Exchanges	OneChicago
ICE Clear Canada	OCC
ICE Clear Europe	TrueEx
ICE Clear Credit	

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BACKGROUND (CONT'D) …

■ The scope of this year's initiative was designed to test DR back-up connectivity and functionality between exchanges, clearinghouses and member firms:

– Test firm back-up to exchange back-up sites (DR-DR)

– Verify connectivity

– Test round-trip communications capabilities

■ The WebEx sessions were well attended by numerous operations managers and BC/DR representatives from various clearing and non-clearing firms

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■ The committee including representatives from:

- – Clearinghouses
- – Exchanges
- – FCMs
- – Clearing firms
- – Non-clearing firms
- – Key service providers
- – Independent software vendors (ISVs)

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II. EXECUTIVE SUMMARY

- The tenth annual industry-wide disaster recovery test in the U.S. financial services sector was highly successful, largely in part to the good working relationship between exchanges and the firms.

- 23 major U.S. and international futures exchanges, clearinghouses, FCMs and clearing firms participated in this year's test:

  - 64 FCMs, clearing firms and non-clearing firms participated - an increase over last year
  - Between 73% -100% of firms tested successfully, depending on the exchange

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- This year's test initiative was expanded to include other exchanges and clearing houses:

  - ICE Clear Credit
  - TrueEX

- The exchanges and clearinghouses demonstrated that their systems, processes and procedures simultaneously worked very well, communicating from back up systems/sites.

- Firms tested from back up sites located in Florida, Illinois, Missouri, New Jersey, New York, North Carolina and Utah, as well as Frankfurt, London, Madrid, Montreal, Paris and Toronto.

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- Firms indicated that the test helped them:

    - Exercise their business continuity/disaster recovery plans
    - Identify internal single points of failure
    - Test other in-house applications and systems at the same time
    - Tighten up and document their business continuity procedures
    - Better understand the need for cross-training
    - Test connectivity with exchanges' DR sites

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III. OVERALL TEST RESULTS

- 23 domestic and international futures exchanges and clearinghouses, 64 clearing/non-clearing firms* participated in the test

- Test participants included clearing firms, non-clearing firms and non-clearing trading participants

- On average, ~80% of all futures clearing firms participated

- Participant firms represent a significant critical mass of futures order flow and liquidity at the major exchanges:
  - 83% - 95% of futures exchanges' volume.

* Some firms are common members of multiple exchanges

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CANADIAN DERIVATIVES CLEARING TMX GROUP

- Tested via their Toronto back up site

- Trades and positions created by Bourse de Montreal flowed to CDCC via the Clearing Manager of SOLA® Clearing.

- FTP Server access was included within scope of the test

- Reports were generated and uploaded to participating Clearing Members under a specified DR Test directory on Monday, October 7th.

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CBOE FUTURES EXCHANGE

- Tested via member firms' back up connectivity to back up CBOE Command back up trading platform

- Scripted trade entry for VIX futures contracts

- Transmitted trades to/from the OCC's back up systems via MQ and SFTP

- Transmitted regulatory data to NFA via SFTP.

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CME GROUP / CME CLEARING

- Tested member firms back-up connectivity to the production GLOBEX trading platform via remote data center
- Simulated a disruption of downtown Chicago (including CME Jackson Direct and LNet)
- Entered a script of orders for various products
- Received ex-pit, block trade information via CME remote site portal URL
- For clearing, generated trade registers and SPAN files from 10/04 trade date
- Received PCS and large trader information from member firms
- Transmitted trade registry data and SPAN files via FTP.

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ELX FUTURES

- Tested via eSpeed electronic trading system

- Trading products included all ELX UST and Eurodollar futures contracts via eSpeed supported API's

- Block trades or EFP trade types were not accepted

- End of day files were produced by OCC.

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ERIS EXCHANGE

- Tested an outage scenario that reflected a loss of the primary matching engine and primary post-trade processing system

- The test validated trade data and customer account setup in DR environment

- Firms successfully tested file and data transfer from the backup site.

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ICE CLEAR US

- Tested member firms' back-up connectivity to the ICE electronic trading system

- Order entry for Russell 2000 and Sugar futures contracts

- Utilized MFT, ECS, PTMS/ACT, and MQ systems

- Trade messages sent via FIXML to Clearing Members

- Clearing file submission via MFT

  – Match off files, clearing report files, Large Trader, PCS and SPAN files.

ICE EXCHANGES

- Tested member firms' back-up connectivity to the ICE Exchange electronic trading system DR site

- Scripted order entry for Canola, Cotton, Russell 2000, Sugar and Brent futures contracts

- Tested Web ICE, ICE Block, FIX, Pricefeed and other non trading functionality from the DR site

- WebICE reporting via Internet portal for deal reporting, position reports, etc.

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ICE CLEAR CANADA

- Tested member firms' back-up connectivity to the ICE Clear DR site

- Members entered a scripted list of orders

- Clearing members accessed back up MFT, ECS and PTMS/ACT systems

- ETS trades flowed to TEMS

- Firms downloaded clearing reports from ICE Clear Canada website for deal reporting, position reports, etc.

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ICE CLEAR CREDIT

- Tested member firms' back-up connectivity to the ICE Clear Credit DR site

- Members accessed the Web Report Distribution, File Download and File Upload systems

- Printing of test reports were achieved via Web Report Distribution

- Data files were downloaded and retrieved via SFTP.

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ICE CLEAR EU

- Tested member firms' back-up connectivity to the ICE Clear EU system DR site

- Tested ECS, MFT, PTMS/ACT, MQ and Crystal Reports

- Member firms submitted Large Trader files and PCS files via MFT

- Banking and Delivery files were available to members via MFT

- SPAN files were delivered via MFT and the ICE website.

- Tested member firms MQ connectivity to the ICE MQ in DR environment.

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LCH CLEARNET

- The test scenario simulated an outage the London primary data center

- SwapClear and MemberWeb system access operated via the backup data center (CDC)

- All customers were able to reach the backup data center without any changes to their systems as cutover was seamless using the same IP Addresses and access methods.

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MEFF

- Tested via the MEFF production SMART ETS environment
- Simulated a failure of the Madrid Las Rozas main data center, including collocated member's appliances
- Members entered trades and received reports
- Transfer files were delivered from clearing
- Clearing data was restricted and not sent to member firms' back office systems.

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MINNEAPOLIS GRAIN EXCHANGE

- Trades were entered for MGEX products into the CME GLOBEX platform and MGEX TEMS system.
- Trades were processed by MGEX Clearing via the MGEX DR site
- TREX trade files were generated by the MGEX DR Clearing Server and placed on the MGEX DR FTP server
- The MGEX DR remote access and FTP servers were accessible with the same logins and passwords as the production system.

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MONTREAL EXCHANGE/TMX GROUP

- Tested the SOLA® Trading electronic system via the Toronto back up site

- Orders were entered with an October 5th trade date

- Trades were transmitted to firms via HSVF and ATR protocols

- Executed trades were transmitted to CDCC for processing.

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NEW YORK PORTFOLIO CLEARING

- Tested the failover of the TRS post trade system, as per its standard disaster recovery procedures

- Tested trade flow to/from NYSE Liffe systems

- For TRS, members used their normal IP address's and ports to connect, as the data center redirection was completed by the clearing house

- Members were able to connect to TRS and login.

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NYSE LIFFE US

- Tested trade flow to/from NYSE Liffe CONNECT system

- Trading was done in two products (VFED – Eurodollar and CFMPP – MSCI Pan Euro)

- Members interfaced via their normal gateways; the data center redirection was completed by the exchange

- Members connected and logged on to the CONNECT system but were not be able to view market data.

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<u>ONECHICAGO</u>

- Tested CBOEdirect ETS via the back up site
- Trade entry from firms was successfully completed for AAPL1C futures and AAPL1D futures products.

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OCC

- Tested back up systems from the back up site
- Supported FTP+ Pull/Push, SFTP, NDM and MQ file connectivity
- IP addresses and TCP Ports were unchanged, as they were the same as production for this test
- Firms submitted file transmissions and received output test files.

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TRUE EX

- Tested the DCM and PTC back up platforms
- Test trades were successfully executed on the 2Y
- Test orders were successfully posted/received on the 5Y
- The trueEX support staff acted as the respondent for all trades.

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IV. PROBLEMS ENCOUNTERED

- A number of problems were encountered; most were resolved quickly, although some caused an unexpected delay to test start/progress

- Problems that were encountered and resolved included:
  - Incorrect IP address in firewalls prevented connectivity to the exchange DR site
  - MQ session ID and MQ channel connectivity problems
  - Citrix configuration issues
  - Inability to connect to clearing house back up site due to incorrect software configuration

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PROBLEMS ENCOUNTERED (CONT'D)...

- – Firms with primary systems co-located in the exchange's data center were impacted when the exchange failed over to their DR data center; they also failed over

- – One exchange had a delayed start due to the misconfiguration of market open times

- – Member firm(s) was unable to submit orders and could not resolve the problem before the test window closed

- – An exchange's web portal was not accessible in DR by several of its members.

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PROBLEMS ENCOUNTERED (CONT'D)…

- – Lack of domain or technical knowledge on test day impeded firms' and exchanges' problem solving capabilities
- – On test day, a firm that had not pre-registered could not enable their gateways and did not participate in the test
- – One member firm cancelled the test participation due to its management's concerns surrounding the government shut down.

V.   LESSONS LEARNED

- The futures industry proved that it is capable of successfully orchestrating an industry-wide disaster recovery test

- Most problems that were encountered were rectified quickly, although some caused an unexpected delay to the test start/progress

- Under real life situations, most problems could probably be resolved within hours or by/before the start of the next business day.

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LESSONS LEARNED (CONT'D)…

■ The exchanges and clearinghouses' internal support processes and procedures worked well; they indicated that the test helped them:

- – Test connectivity to/from DR sites.
- – Identify/refine pre-test and post-test procedures for connectivity testing
- – Tighten up and document their business continuity and system fail over procedures
- – Improve test scripts and plans for future tests
- – Identify some internal single points of failure
- – Better understand the need for cross-training.

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LESSONS LEARNED (CONT'D)...

- Firms must be prepared for any changes or impact to their networks caused by the test requirements:

  - Highlight any environmental impact or expectations on the firms networks, IP address changes, firewalls etc.
  - Be aware of any impacts and make changes accordingly to accommodate testing
  - Have proper network staffing support actively engaged before and during the test
  - Participate in pre-test communications testing to shake down any issues or problems.

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LESSONS LEARNED (CONT'D)…

- Exchanges should investigate more efficient methods to facilitate seamless failover from primary to back up, and/or faster activation of MQ channels (e.g., logical domain names vs. static IP addresses, use of more automated network tools etc.).

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VI.   SUGGESTED NEXT STEPS

- Start to plan for a regional disruption scenario as part of the 2014 test initiative

- Pre-test communications testing should be mandatory for all clearing firms to ensure any MQ or connectivity issues are resolved prior to test day

- Firms must confirm that any ISVs utilized in production support their testing on test day and confirm that their systems are correctly point to DR

- Test registration must include firms' key IT and operations contacts for pre-test and on test day

- After test completion, clearing firms should provide screen shots to exchanges as evidence of test success

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- It is imperative that all DR sites and systems be tested and confirmed as operational at least annually

- Encourage exchanges to provide as much full "round trip" testing as possible (i.e., trading through clearing outputs)

- Include Swap Execution Facilities and Swap Data Repositories in next year's test

- Continue to push firms to register directly for the test via the FIA web portal, and not assume their ISV will do it for them

- Continue to coordinate the 2014 test (Saturday October 25, 2014) with SIFMA; this facilitates firms to participate that are joint FIA/SIFMA members.

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