

**REPORT ON LESSONS LEARNED FROM THE FAILURE OF
KLEIN & CO. FUTURES, INC.**

Commodity Futures Trading Commission
Division of Trading & Markets

July 2001

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INTRODUCTION

Klein & Co. Futures, Inc. (“Klein”), a registered FCM, was a member of contract markets within the Board of Trade of the City of New York (“NYBOT”), including the New York Futures Exchange (“NYFE”), and a clearing member of the New York Clearing Corporation (“NYCC”). Klein was also a clearing member of the New York Mercantile Exchange (“NYMEX”), which served as the firm’s Designated Self-Regulatory Organization (“DSRO”).¹

In May of 2000, a customer of Klein, First West Trading, Inc. (“First West”), incurred losses on NYFE. On Monday, May 15, 2000, Klein’s memberships on markets within NYBOT and its clearing membership in NYCC were suspended as a result of capital charges arising from the failure of First West to meet margin calls related to those losses.² On Wednesday, May 17, 2000, Klein did not meet a “pay” of over \$10 million called for by NYCC. NYCC consequently liquidated Klein’s margin accounts. These events had significant repercussions, including the business failure of a forty-year-old FCM, the filing of multiple lawsuits, and the expenditure by NYBOT of over four million dollars to protect customers against losses of segregated funds.

Staff of the Division of Trading and Markets (the “Division”) of the Commodity Futures Trading Commission (“Commission” or “CFTC”) have worked with a variety of industry participants to determine the lessons to be learned from the foregoing events, and to discern industry best practices in various areas implicated by them. Division staff interviewed key staff and officials of NYBOT, NYFE, NYCC, NYMEX, and Klein. Staff also held discussions with other industry participants, including staff and officials of the Chicago Board of Trade and the Chicago Mercantile Exchange (and their respective clearinghouses), the National Futures Association, and representatives of several futures commission merchants that were not involved in these events.

The attached observations and recommendations reflect some of the lessons learned through those interviews.

¹ Klein was also a member of the Comex Clearing Association.

² Klein resigned its clearing membership on NYMEX on Tuesday, May 16.

OBSERVATIONS

1. **The appropriate risk management practices for an FCM to follow vary according to the risks it carries.**

Each FCM plays an important risk intermediary role in the marketplace. Clearinghouses look to the funds and credit of clearing FCMs for satisfaction of trading obligations rather than to the actual floor broker, floor trader, or other customer. Each clearing FCM, in turn, looks to the funds and credit of its customers. If a customer defaults on its obligation, the FCM places its own capital at risk. If the FCM's capital is inadequate to satisfy an obligation to the clearinghouse, the funds of the FCM's other customers may be put at risk.

It is the responsibility of each FCM to ensure that it can meet its obligations to each customer. Section 4d of the Commodity Exchange Act (the "Act")³ requires an FCM to "treat and deal with" funds received by it "to margin, guarantee, or secure the trades of any customer of [the FCM], or accruing to a customer as the result of such trades ... as belonging to such customer" and to refrain from using such funds "to margin or guarantee the trades or contracts, or to secure or extend the credit, of any customer or person other than the one for whom the same are held." Although the Act authorizes FCMs to commingle such funds in a common depository account, commingling does not in any way diminish the FCM's obligation to each of its customers.⁴ To the extent that customer funds are commingled, each FCM should take appropriate steps to protect against the possibility that a loss in one customer's account will threaten the funds of other customers. These include following risk management practices appropriate to the business it carries.⁵

³ 7 U.S.C. §6d.

⁴ *Id.*

⁵ *See* 17 C.F.R. §166.3

An FCM that carries customer positions is required to collect margin from the customer in an amount that is determined by the exchange on which the position is executed. Margin requirements are generally calculated using the SPAN® portfolio margining system.⁶ While an FCM is not permitted to place lower margin requirements upon its customers, the FCM is free to require any or all customers to post higher levels of margin. An FCM will frequently require higher margin levels from customers that it believes expose the FCM to higher levels of financial risk.

Margin is not designed to cover all possible losses, because if margin levels were set high enough to do so, the products would not be economically viable. The parameters that are input to SPAN are generally designed to result in margin levels that will cover between 95% and 99% of one-day losses from a portfolio.⁷ A margin level that covers 95% of one-day losses is statistically expected to be exceeded on twelve days over a year of 250 trading days. Even where the margin level is designed to cover 99% of the one-day losses, the losses will be expected to exceed the margin level two to three days over the course of a year. Moreover, because market losses may not be normally distributed, and because negative factors tend to correlate together in sharply down markets, losses in excess of margin levels can be very large.

A. Option contracts present types of risk beyond those of futures contracts.

The risk in holding a futures contract is that of adverse movements in the expected future value of the product. While the value of an option contract is also affected by changes in the expected future value of the product, its value is significantly affected by changes in the expected volatility of the price of the underlying futures contract during the life of the option. To assess properly the risks of options positions, one must accurately measure three aspects of option risk. These are designated as delta risk, gamma risk, and vega (or volatility) risk.

⁶ SPAN® stands for the Standard Portfolio Analysis of Risk. It is a system used by clearinghouses, exchanges, and FCMs to calculate an FCM's (or customer's) margin requirement based on the overall risk of all positions carried by that entity. The risk is determined by a statistical analysis, which measures the effect on a portfolio of positions of possible changes in underlying values. This analysis takes into account both correlations between commodities and option pricing analysis (including underlying price, volatility, and time to expiration). SPAN was developed and is maintained by the Chicago Mercantile Exchange, and is currently used by thirty exchanges and clearinghouses worldwide.

⁷ As discussed in greater detail in the Division's recent report "Review of Standard Portfolio Analysis of Risk ('SPAN') Margin System," the parameters for this analysis are set by the exchange or clearinghouse on which each position is traded or cleared. These parameters may be set to result in margin levels that are greater or lesser than those described in the text.

Delta risk measures the degree to which an options portfolio is sensitive to small changes in the price of the underlying asset. For example, a portfolio that has been constructed so that gains and losses attributable to changes in the price of the underlying asset will exactly offset is called “delta neutral.” Delta neutrality, however, does not hold true for price changes that are significantly above or below the current level.

Gamma risk measures the degree to which a portfolio of options is sensitive to larger changes in the price of the underlying asset. It is particularly important to focus on the gamma risk of options in markets that are prone to large price moves, that are illiquid, or that are concentrated.

Volatility risk measures the degree to which an options portfolio is sensitive to changes in the market’s expectation of the volatility of the price of the underlying contract. For both puts and calls, an increase in expected price volatility increases the value (cost) of these positions, while a decrease in expected price volatility decreases their value (cost). Volatility risk is a key input to any option pricing model because the more volatile the price of the underlying asset is expected to be, the more likely it is that an option that currently has no intrinsic value, or is “out-of-the-money,” will gain intrinsic value, or become “in-the-money,” during the time remaining before its expiration.

Thus, a portfolio that is delta neutral and appears to be hedged against price changes may nonetheless have a large exposure to price volatility and thus may suffer significant losses due to adverse changes in expected volatility.

B. Positions in thinly traded markets pose special risks, as do positions that represent a large percentage of the open interest in a market.

The general approach of margining systems in the futures industry is to address risks that last no more than one day. Positions are marked to market every day, and it is generally assumed that positions that the customer fails to margin can be liquidated within a day. This is the rationale for calculating margins based on predicted one-day moves in the market. This basic assumption, however, may not always be relied upon. Therefore, the risk disclosure statement, which FCMs are required to provide to less sophisticated customers pursuant to Rule 1.55, states “[u]nder certain market conditions, you may find it difficult or impossible to liquidate a position.”

Positions in thinly traded markets, and positions that represent a large percentage of open interest in a market, may be difficult to liquidate at or near the previously existing market price. Where a trader or a firm is forced to close positions in an illiquid market, it is exposed to severe losses. An FCM that carries positions in thinly traded markets, or positions that represent a large portion of a market, should take account of the risks posed by the resulting illiquidity in its analysis of the losses to which it is exposed, and should manage those risks.

2. Undercapitalized FCMs are required to notify the Commission.

Rule 1.12(a)(1) requires an FCM whose net capital is less than required by the capital rule of any SRO of which the FCM is a member to give telephonic notice of that fact to the Commission “immediately after the [FCM] knows or should know that its adjusted net capital is less than required.” An outstanding margin call may only be included in calculating adjusted net capital for purposes of Rule 1.17(c)(5)(viii) so long as the FCM reasonably expects it to be fulfilled. In promulgating Rule 1.12(h), the Commission clearly indicated that an FCM “knows or should know” of a financial problem mandating notification of the Commission where (1) there is a significant undermargined account; (2) the customer makes clear that it is unable or unwilling to meet the margin call; and (3) the FCM is aware that it will be unable to transfer enough funds from its own accounts into segregation or separate set-aside accounts to cover the shortfall.⁸ Moreover, Rule 1.12(e) requires any SRO that learns that a member has failed to notify the Commission as required by Rule 1.12 to immediately notify the Commission itself. The possibility that the positions in such an account may be transferred does not diminish the obligation to notify the Commission as described above.

3. The “best practice” among contract markets and clearinghouses is to perform thorough financial surveillance of member FCMs.

Contract markets have long been required to monitor, on a daily basis, their members’ open positions and market risk exposure.⁹ This financial monitoring is important both in their role as membership organizations, ensuring that each member can fulfill its obligations to

⁸ 63 Fed. Reg. 45711, 45713 (August 27, 1998).

⁹ See Division of Trading and Markets, Financial and Segregation Interpretation 4-1, ¶43 Cf. Core Principle 11, §5(d)(11) of the Act.

other members, as well as in their role as self-regulatory organizations, ensuring that each member can fulfill its obligations to customers. Clearinghouses have a similar interest in monitoring their members' financial status, to ensure that each member is capable of performing its obligations to the clearinghouse. Contract markets and clearinghouses usually coordinate their efforts in this area, frequently contacting each other regarding common concerns through both formal and informal means. This coordination enables them to fulfill their individual functions effectively while minimizing duplicative effort.

Some exchanges and clearinghouses perform financial analysis of members' option positions using full option revaluation, while others use futures equivalents. An analysis using futures equivalents, while easier to compute, is less accurate than revaluing options using an options pricing model. This is explained in more detail in the accompanying note.¹⁰ In particular, a futures equivalents analysis will significantly underestimate the impact on deep-out-of-the-money options of a large move in the price of the underlying future (such as might be expected in a volatile market).

¹⁰ The impact of a change in the price of the underlying future on the price of an option can be measured in two ways: full option revaluation and futures equivalents. A full option revaluation will use an option pricing formula (such as the Black-Scholes Model) to measure the value of the option, using as inputs the new underlying price, holding constant the other factors (volatility, time to expiration, interest rate).

Alternatively, the impact of a change in the price of the underlying on the price of the option may be measured using "futures equivalents." Futures equivalents are easier to compute, but far less accurate than full option revaluation, especially in the case of large moves in the underlying future affecting deep-out-of-the-money options. The futures equivalents technique focuses on the rate of change in the value of the option per unit change in the value of the underlying future, for small moves. (This rate of change is referred to as the "delta"). To determine the impact on a portfolio of options of a price change in the underlying using futures equivalents, one sums the futures equivalents of the positions in the portfolio and multiplies the sum of futures equivalents times the price change in the underlying.

The problem with using futures equivalents stems from the fact that, for larger moves in the value of the underlying future, as an option gets closer to being "at the money," the delta changes, and the increase in value (or cost) can accelerate. A move which appears to have an impact of \$x using futures equivalents can in fact have an impact of many times \$x as revealed using full option revaluation. For example, for a call option at the money, a one-unit increase in the value of the underlying may increase the value of the option by 0.5 units (the "delta" is 0.5), and thus 100 such option contracts would represent 50 futures equivalents ($100 \times 0.5 = 50$). For a call option deep-out-of-the-money, a one-unit increase in the value of the underlying may only increase the value of the option 0.05 units (the "delta" is 0.05), and thus 100 such option contracts would represent only 5 futures equivalents ($100 \times 0.05 = 5$).

A futures equivalent analysis of a move of \$10,000/futures contract affecting 1000 deep-out-of-the-money short option contracts with a delta of 0.05/contract at the current price would give a result of \$500,000. [$\$10,000/\text{futures contract} \times 1000 \text{ short options} \times .05 \text{ futures contract equivalents/short option} = \$500,000$] For a large move of the deep-out-of-the-money contract, the delta will increase, and when at-the-money might reach 0.50. This would result in an impact that may be closer to \$5,000,000 than \$500,000. Thus, a clearinghouse or FCM that conducts stress testing using futures equivalents may obtain a false sense of security, with tested movements in price yielding a far greater impact than would be revealed using futures equivalents.

The Division believes that the “best practice” is for exchanges and clearinghouses to perform, on a daily basis, overnight stress tests on members’ positions using full option revaluation. These “what if” or “worst case” evaluations can expose key vulnerabilities of member FCMs caused by the positions they carry. Similar insights can be gained with scenario tests in which SPAN parameters are altered to permit analyses suited to particular circumstances.

In general, the “best practice” among financial surveillance staffs is an emphasis on the importance of communicating directly with FCMs as often as necessary. They contact FCMs on the basis of large trader information to help determine which FCMs might be exposed to particular types of problems so that, in the event of a large market movement, staff can follow up immediately with the appropriate FCMs to ensure they are managing the risk exposures posed by their clients’ positions. They also contact firms based on intra-day transactions and market moves. During periods of unusual market volatility, the staffs contact FCMs that are heavily involved in the volatile market to check on how the firms are handling the situation.

The clearinghouses interviewed perform pays and collects on an intra-day basis at least once a day. This practice reduces the time during which a member’s losses may accumulate unrevealed. At least one clearinghouse tracks pay and collect information on a near real-time basis (real-time for prices, every half-hour for positions), including information concerning unmatched trades. This information is available to members on an on-line basis, and is provided to financial surveillance staff when a firm exceeds pre-determined watch levels. Using this information, member firms and financial surveillance staff can rapidly identify positions that may be suffering sharp losses. This information also provides advance notice of potential outrades, as well as of trades that are being assigned to the member firm, but of which it may be unaware.

As noted above, positions in thinly traded markets pose special risks, as do positions that represent a large percentage of the open interest in a market. The best practice surveillance staffs interviewed work to identify exceptional risks presented by concentrated positions (including aggregate positions that may be owned by common principals through several different clearing members) and illiquid markets. Knowledge of these situations

enables surveillance staff to respond rapidly to market situations that might adversely affect their clearing systems and the financial stability of their clearing members.

The best practice surveillance staffs devote significant portions of their time and effort to the smaller markets on their respective exchanges because positions in these smaller markets tend to be more concentrated. The volatility and illiquidity that are often characteristic of these smaller markets also increase their potential threat to the stability of clearing members and clearing systems.

4. The “best practice” among contract markets and clearinghouses is to independently verify the reasonableness of settlement prices.

Settlement prices serve as the basis for valuing option positions at the end of each trading session. Those values, in turn, serve as the basis on which clearinghouses calculate daily mark-to-market margin requirements. If the settlement price does not accurately reflect the market price at the time of settlement, then the difference between the settlement price and the market price at the time of offset may be greater than the amount attributable to market movements since the last settlement. This difference affects both the liability of the clearing member, and the potential loss to the clearinghouse.

The process for setting settlement prices varies among the exchanges and clearinghouses. The most significant differences lie in the degree of involvement in, and monitoring of, the process and its results that is exercised by the staff of the exchange and/or the clearinghouse. There is a marked distinction between those exchanges that have a heavy staff involvement with substantial monitoring and those exchanges that give more deference to member committees.

On most markets, initial responsibility for setting settlement premiums falls to a committee of members called the “settlement committee” or the “pit committee.” Such a committee usually exists for each pit or ring and can vary in size from several to several dozen members. Although exchange rules typically call for fixed terms of service and provide for the appointment or election of new members to the settlement committee, most committees see little actual turnover from term to term. This is, in part, because committee membership requires a significant commitment of time and effort at the end of each trading

session. Moreover, members who are active in the market for which settlement prices are being set tend to make more meaningful contributions on the committee. In some of the smaller markets, the number of participants is quite limited. In some cases, all active participants in a market may serve regularly on the committee. Staff at all exchanges interviewed described committee members as generally diligent in their effort to represent the consensus of the market, as opposed to their own outlooks.

The exchanges permit pit committees varying degrees of autonomy in setting settlement prices. One approach is to have exchange staff participate in each pit committee's proceedings. Under this approach, exchange staff, using automated tools, are responsible for actually setting some or all of the settlement prices. Once the entire array of option premiums has been produced, staff perform checks for internal inconsistencies, and analyze the option settlement premiums relative to the settlement prices of the underlying futures contracts.

Another approach is to have exchange and clearinghouse staff verify the reasonableness of the settlement prices recommended by the pit committee. First, exchange staff input committee recommendations into the exchange computer system and run a verification program that performs both horizontal checks to make sure that the futures settlement price and the premium for the put and the call at each strike are in line, and vertical checks to discover any inconsistencies among adjacent strikes. If a discrepancy is flagged by the system, it is communicated to the pit committee, which can either change its recommendation or justify it. Any change is accompanied by a reason. Any justification for a refusal to make a change is input on the screen by a staff member with attribution to the committee member providing such justification.

A second stage verification can be performed by a clearinghouse. In such cases, clearinghouse staff use an options pricing model to produce theoretical premiums. Using automated tools, these are compared for reasonableness against the settlement premiums recommended by the pit committee. The clearinghouse rejects settlement premiums found through this process to be unreasonable. The market surveillance staff is notified of changes, typically by e-mail. Although the first stage, exchange verification, would not detect an anomaly in volatility if it were consistently anomalous across all settlement premiums in the array, the second stage, clearinghouse verification, should detect such a problem. In the course of this second-stage verification, clearinghouse staff may also consider the

concentration and liquidity of each options market. They have found that heavy market concentration and significant illiquidity may be leading indicators of pricing problems in the option markets.

The Division believes that the “best practice” among exchanges and clearinghouses is to have professional staff involved in the setting or verification of the reasonableness of settlement prices. The best practice exchanges and clearinghouses interviewed do not rely completely on complaints from market participants to guard against the manipulation or misstatement of option settlement premiums. Rather, complaints from market participants serve only as a check on the proactive oversight efforts of the exchange and/or clearinghouse professional staffs with respect to the settlement process.

5. Periodic audits performed in accordance with the current JAC audit program address risk management in a limited manner.

In order to avoid duplication of effort by exchanges and undue burdens upon FCMs that are members of and active on more than one exchange, the Commission has long permitted delegation of aspects of the financial surveillance responsibility for any FCM that is a member of and active on more than one exchange to a single exchange or to the NFA through the mechanism of the Joint Audit Committee (“JAC”).¹¹ The delegate entity is referred to as the “designated self-regulatory organization” or “DSRO” for that FCM.¹² Pursuant to the Joint Audit Committee “Agreement for Services” (the “JAC Agreement”), the DSRO is responsible for “monitor[ing] and audit[ing] the financial and operational condition of the FCMs for which it acts as” DSRO, and for furnishing reports of full audits, copies of required financial filings, and summary analyses of those filings to other SROs where the FCM is a member.¹³

DSROs conduct periodic audits of each firm for which they have DSRO responsibility every 9-15 months. The audits are conducted in accordance with the JAC audit program,

¹¹ 17 C.F.R. §1.52(c). *See also* §5c(b)(1) of the Act (permitting a contract market to “comply with any applicable core principle through delegation of any relevant function to a registered futures association or any other registered entity.”)

¹² This authorization is made explicit in the CEA as amended by the CFMA. *See* §5c(b)(1).

¹³ JAC Agreement ¶4.

which is submitted to the Division annually, and are intended to determine whether the FCM is in compliance with CFTC and SRO rules, including net capital, segregation, recordkeeping, and reporting requirements. The JAC audit program consideration of the risk management practices of an FCM focuses almost entirely on the firm's margin collection practices.

The audit program contains five questions that address risk management beyond margin collection.¹⁴ The program does not prescribe any testing for verifying the answers to these questions, nor any procedures for identifying or addressing troublesome answers. The financial surveillance staffs of the DSROs interviewed reported to Division staff that they look at the internal risk management practices of FCMs during financial audits but do not perform comprehensive reviews of such practices or make final judgments as to the adequacy of risk management systems. With no universally accepted standards for such systems, they do not feel justified in substituting their own business judgment for that of an FCM's managers. Thus, while DSRO audit staffs may review and discuss risk management practices with FCMs, they do not audit or test such systems against clear standards.

An FCM with inadequate risk management practices that leave it unable to properly manage such things as the volatility risk of option positions may have great difficulty fulfilling its obligation under section 4d of the Act to protect against the use of one customer's funds to margin the trades of another customer. This is accordingly an important area for all DSROs to review.

¹⁴ 4)(A) How are margin practices (e.g., Exchange minimums versus additional margin, wires versus checks, etc.), concentration issues and position limits for customers and affiliates monitored by the firm?
(B) What actions are taken for an account approaching its market limits?
(C) Does the firm perform periodic stress testing or cash flow/value at risk analysis?
(D) What actions are taken if results indicate accounts are potentially at risk?
(E) How are major market moves and their effects on individual accounts monitored? Are both futures and options considered (i.e. does firm look at both OTE [open trade equity] and NLV[net liquidating value])?

6. A contract market is uniquely well situated to address difficulties at a member FCM arising primarily from contracts traded on that contract market.

Each SRO¹⁵ is required by Commission Rule 1.52 to adopt “rules prescribing minimum financial and related reporting requirements for all its members who are registered futures commission merchants.”¹⁶ It is the responsibility of each exchange to ensure that FCMs are evaluated under a “continuing affirmative action program to secure compliance with ... all of [its] bylaws, rules, regulations, and resolutions ... [which] shall include: ... [e]xamination of the books and records kept by ... members relating to their business of dealing in commodity futures, commodity options, and cash commodities ... [and] [s]uch other surveillance, record examination and investigation as is necessary to enforce such bylaws, rules, regulations and resolutions”¹⁷ The Division has taken the position that “[e]ach SRO which is a contract market must establish surveillance procedures for monitoring its members current financial condition and market risk exposure. Such procedures should include ... daily monitoring of all members’ open positions on that contract market.”¹⁸

While an SRO may delegate to a DSRO responsibility for routine reviews of books and records and review of periodic financial filings, the role and capabilities of a DSRO are necessarily limited. Paragraph 6 of the JAC Agreement provides that “[n]othing contained herein shall be deemed a waiver of or a limitation on the right of any [SRO] party to inspect the books and records of any of its members or to request information directly from any of its members.” Understanding unusual risks posed by positions traded on a particular contract market requires knowledge particularly within the insight of the staff of the contract market where those positions are traded and the clearinghouse where they are cleared.

¹⁵ The term self-regulatory organization includes both contract markets (futures exchanges) and registered futures associations (currently National Futures Association is the only registered futures association). *See* Commission Rule 1.3(ee).

¹⁶ The policy basis underlying Rule 1.52 continues to be reflected in the CEA as modified by the CFMA. Section 5(d)(11) of the CEA establishes as a Core Principle for Contract Markets the requirement to “establish and enforce ... rules to ensure the financial integrity of any futures commission merchants ... and the protection of customer funds.”

¹⁷ 17 C.F.R. §1.51. *See also* Core Principle 2 for Contract Markets, CEA §5(d)(2), (Contract markets are required to “monitor and enforce compliance with the rules of the contract market ...”).

¹⁸ Division of Trading and Markets, Financial and Segregation Interpretation 4-1, ¶43.

RECOMMENDATIONS

- 1. Contract markets and clearinghouses should perform periodic stress tests and use other appropriate monitoring tools to identify member FCMs that would be affected by large or unusual price moves in particular products, including options.**

Core Principle 11, Section 5(d)(11) of the Act, requires a contract market¹⁹ “to establish and enforce ... rules to ensure the financial integrity of any futures commission merchants ... and the protection of customer funds.” Core Principle D, Section 5b(c)(2)(D) of the Act, requires a derivatives clearing organization to “have the ability to manage the risks associated with discharging the responsibilities of a derivatives clearing organization through the use of appropriate tools and procedures.” As discussed above, even an FCM that collects all required margin may nonetheless be exposed to significant losses from a large price move in a particular product. These losses may threaten the financial integrity of the FCM and the FCM’s ability to protect customer funds. To identify member FCMs exposed to such losses, boards of trade and derivatives clearing organizations need to conduct stress tests.²⁰ These stress tests should be performed on a frequent basis because positions and exposures can change quickly. In determining the significance of losses, they should be compared to factors such as the FCM’s net capital. A loss that would bankrupt a thinly capitalized FCM might merely inconvenience one that is well capitalized.

For the purposes of this analysis, pricing for options should be based on full option revaluation (using an option pricing model) rather than a futures equivalent basis, since futures equivalent analysis may underestimate the impact on a portfolio of large price movements. Potential changes in expected volatility should be included in the analysis. The effects of thinly traded or highly concentrated markets should be taken into account. For large traders, contract markets should calculate an FCM’s losses on an individual customer basis rather than a net basis, since the FCM is not permitted to use the gains of one customer to offset the losses of another.

¹⁹ This report does not address Derivatives Transaction Execution Facilities.

²⁰ As discussed above (in Observation 3), the efforts covered in these recommendations will likely be coordinated between the board of trade and the clearinghouse.

Performing these stress tests and other monitoring activities will enhance the likelihood that situations leading to FCM insolvencies might be detected earlier. This early detection may have the effect of avoiding or ameliorating the impact of such situations on the exchange, the clearinghouse, and the other customers of the FCM.

2. Contract markets and clearinghouses should develop and maintain the ability to evaluate quickly the level of risk a member is exposed to on their markets, including the ability to use option pricing models.

Core Principle 6, Section 5(d)(6) of the Act, requires a contract market to “adopt rules to provide for the exercise of emergency authority, in consultation or cooperation with the Commission, where necessary and appropriate.” Core Principle 11, Section 5(d)(11) of the Act, requires a contract market “to establish and enforce ... rules to ensure the financial integrity of any futures commission merchants ... and the protection of customer funds.” Core Principle D, Section 5b(c)(2)(D) of the Act, requires a derivatives clearing organization to “have the ability to manage the risks associated with discharging the responsibilities of a derivatives clearing organization through the use of appropriate tools and procedures.” Core Principle G, Section 5b(c)(2)(G) of the Act, requires a derivatives clearing organization to “have rules and procedures to allow for the efficient, fair and safe management of events when members or participants become insolvent” In order to fulfill these responsibilities in the case of a member in financial distress holding large positions, contract markets and clearing organizations need the ability to estimate the value of the member’s positions quickly, and to perform a financially sophisticated analysis of the risks to which those positions expose the member, its customer accounts, and if the losses become large enough, ultimately the clearinghouse.

The need for this ability will likely coincide with an enhanced risk of large price movements. Accordingly, this evaluation capability should include an ability to assess options using an option-pricing model, rather than an estimate based on futures equivalents. These capabilities should be maintained either on staff, or with a provider that is able and contractually obligated to give the project its full attention immediately.

3. Contract markets and clearinghouses should develop and maintain programs to review settlement prices to determine if they are reasonable.

Settlement prices estimate the market price at a particular point in time. The ultimate liability of a trader for a position is determined by the market price when a trade is offset or delivered. This liability is guaranteed by the clearing member, and ultimately guaranteed by the clearinghouse. If the settlement price does not accurately reflect the market price at the time of settlement, the potential loss may be greater than one day's price movement. Consequently, verifying the reasonableness of settlement prices is an essential part of a clearing organization's risk management program (in accordance with Core Principle D, Section 5b(c)(2)(D) of the Act), and a contract market's program for ensuring the financial integrity of member FCMs and the protection of customer funds (in accordance with Core Principle 11, Section 5(d)(11) of the Act).

By permitting market participants a role in setting settlement prices, exchanges and clearinghouses obtain the benefit of the wisdom and perception of skilled traders who are familiar with the markets in question. These traders, however, may also have an interest in the settlement prices, which can affect their own funding requirements on a day-to-day basis. This may provide an opportunity for a settlement committee member to set settlement prices in accordance with his or her own interests.

To ensure that settlement prices reflect market realities, each contract market and/or clearinghouse should develop and maintain programs to review settlement prices to determine if they are reasonable. These programs should include reviews of the reasonableness of, at minimum, samples of settled prices. They are especially important for markets that lack active trading during the close. These reviews should be performed using automated tools, as appropriate. The personnel who conduct these reviews should understand the basis for establishing the prices on the applicable market. For option markets, the exchange personnel should understand option pricing theory, and should be equipped with and use computerized options pricing models.

4. The Division should work with the Joint Audit Committee to enhance the steps in the Joint Audit Program that address FCM risk management procedures.

Because an FCM is responsible for losses suffered in the customer accounts it carries, and because such losses place the funds of other customers at risk, the FCM, through its risk management function, should understand, monitor, and manage material risks in those accounts. The resources devoted to any account will vary depending on the magnitude of the risks carried in the account relative to the size of the FCM's operations. The sophistication of the human and technological resources that are necessary will vary depending on the risks the FCM carries. Technological resources can range from the use of third-party service bureaus to commercially available options pricing software to complex, custom-designed systems.

Most FCMs pay close attention to the basic level of risk management, margin collection. As discussed above, however, margin is designed to cover only 95-99% of all one-day moves. Thus, by design, one-day losses can be expected to exceed required margin, on average, two to twelve times a year. Moreover, price movements under statistically unusual circumstances often are not normally distributed. A well-designed risk management system will address the possibility of exceptional price movements, far beyond margin levels.

Where the FCM carries options on futures, it should understand, monitor, and manage the unique risks posed by these instruments. An option position, which is neutral with respect to small changes in the underlying future ("delta neutral"), may still be exposed to significant risk from changes in prices. Deep-out-of-the-money short options are exposed to accelerating losses from large price movements, as the price of the underlying approaches the strike price. Options are exposed to loss from changes in expected volatility. A risk management function that focuses only on delta risk leaves the FCM vulnerable to these other risks, and has failed in its function.

An FCM that carries futures or options on futures that are in thinly-traded markets should understand, monitor and manage the special risks posed by the illiquidity inherent in such markets. These risks include the possibility that the customer, or the FCM, might be unable to liquidate a position, or might only be able to liquidate it at a substantial loss relative to the most recent settlement price. An FCM that carries a position that represents a

significant portion of the open interest in the relevant market should be aware of that fact and must understand, monitor, and manage the risks posed by such a concentrated position.

An FCM should carefully check and periodically review the credit of at least those customers that pose a level of risk that is significant in relation to the FCM's capital. Where such customers provide guarantees and/or collateral, FCMs should periodically review the value of the guarantee or collateral, and consider whether that value is sufficient in comparison to the customer's trading limits. Solid guarantees and collateral are particularly important when the customer is a limited liability entity.

An FCM that is unexpectedly exposed to a large loss, such as the default of a large customer, will need to take action quickly. These actions may include revaluation of positions on a real-time basis, or trading to reduce the risks of the customer's positions. The firm's obligation to "top up segregation" – to cover a customer's debit balance with the FCM's own assets rather than the funds or property of other customers – may require the firm to access reserve lines of credit quickly or seek additional capital contributions. Where the firm lacks the financial ability to meet its obligation to top up, it must take all available steps to avoid degrading the position of the non-defaulting customers. These may include revoking authorization for transfers from accounts segregated for the benefit of customers.

The actions that an FCM is required to take in a financial crisis may be outside the normal scope of the firm's operations, will likely take place in an environment of unusually high stress, and will likely involve little time or opportunity for research or planning. A contingency plan, appropriate to the nature and scope of the FCM's operations, may aid the firm in properly carrying out its responsibilities in compliance with the Act.

Based on discussions with industry participants, it appears that the quality of FCM risk management systems varies. While many are highly sophisticated, some others may have weaknesses.

Review of the Joint Audit Program is an ongoing process. Each year, the JAC makes modifications to the Program based on its experience, and submits the revised Program to the Commission. As noted in Observation 5 above, the Program contains some steps that address risk management. The Division believes that these steps could be enhanced in light of the lessons learned in this process. The Division recognizes that DSROs have limited resources,

and cannot undertake full-scope audits of FCM risk management programs. The Division believes, however, that the DSROs have a great deal of expertise in risk management and would be able to identify potential vulnerabilities and to make valuable suggestions, particularly to less sophisticated FCM operations. Any changes to the programs should be designed to increase the likelihood that potential problems could be addressed earlier. They would not be made with either the intent or the effect of transforming the role of the DSRO with respect to FCM risk management systems.

5. The Division should work with members of the Joint Audit Committee to clarify the relative roles and responsibilities of the DSRO and the exchange on which the relevant trading is taking place in the event of an FCM financial emergency.

Every SRO at which an FCM is a member has full power to act in the event the FCM experiences a financial emergency. Moreover, the policy at most exchanges is to take charge of situations where an FCM's difficulties arose on that exchange. Nevertheless, there may be a degree of disagreement as to the relative responsibilities of the DSRO and the SRO on which the trading that leads to an FCM's difficulties takes place. Accordingly, the Division should work with the members of the Joint Audit Committee to clarify the roles and responsibilities of the DSRO and other SROs in the event of a financial emergency at an FCM.

All SROs and clearinghouses of which a troubled FCM is a member should be attentive to obligations under the Act and Commission's rules to promptly notify the Commission of circumstances such as undercapitalization, undersegregation, or removal from good standing, as applicable. Moreover, an SRO which learns that a member FCM has a material problem involving positions on another exchange should be careful to inform staff of the other exchange, and the DSRO, of this problem.

6. The Division should work with the Joint Audit Committee and derivatives clearing organizations to draft, for the approval of the Commission, a rule to make clear the rights of a clearinghouse to funds on deposit.

Interpretative Statement 85-3 provides that “Section 4d(2) [now 4d(b)] of the [Commodity Exchange] Act requires ... only that the clearing organization use [customer margin deposits] as the property of the clearing firm’s customers collectively, but does not require the clearing organization to treat such funds as the property of the particular customers who deposited them or to whose positions they have accrued.”²¹ There is other language in the Interpretative Statement, however, that has been used to question a clearinghouse’s rights in an FCM insolvency. The Division should work with the JAC and the derivatives clearing organizations to draft a rule that will make clear the validity of the clearinghouse’s claim to funds it holds in segregation.

In particular, a clearinghouse that receives customer funds from a clearing member should be able to use those funds to cover customer obligations. The rule should be designed to encourage clearinghouses that suspect that particular members are experiencing financial difficulties to obtain a full understanding of the member’s financial status, and should avoid creating any disincentive to obtaining such understanding. The Division believes that such a rule would not change existing law but that clarification of these matters might provide an additional degree of legal certainty in an emergency.

7. The Division should draft a regulation codifying an FCM’s obligation to “top up” the funds it maintains in segregation for customers when a customer has a debit balance.

Section 4d(a)(2) of the CEA provides that an FCM shall not use the property of one customer “to margin or guarantee the trades or contracts, or to secure or extend the credit of any customer or person other than the one for whom the same are held.” In furtherance of this provision, Commission Regulation 1.22 (17 C.F.R. §1.22) provides, in pertinent part, that “[n]o futures commission merchant shall use, or permit the use of, the customer funds of one commodity and/or option customer to purchase, margin, or settle the trades, contracts, or

²¹ Interpretative Statement No. 85-3, Regarding the Use of Segregated Funds by Clearing Organizations upon Default by Member Firms, Commodity Futures Trading Commission, Office of the General Counsel, CCH Commodity Futures Law Reporter ¶22,703 (August 12, 1985).

commodity options of, or to secure or extend the credit of, any person other than such customer or option customer.” Thus, each FCM must segregate sufficient funds to cover any amounts it owes to its customers in connection with commodity interest transactions. If the balance of any of the FCM’s customers falls into a deficit, the FCM is obligated to restore immediately the amount of such deficit out of its own funds or property; that is, the FCM must “top up” its segregated accounts in order to avoid the use of the funds or property of any other customer to meet the obligations of the customer in deficit. There may, however, be circumstances where an FCM simply lacks the resources to fulfill its obligation to restore a deficit in its segregated accounts from its own funds. Questions may arise concerning such an FCM’s obligation to use all available capital to cover this deficit, if only partially.

The obligation to use all available capital to “top up” is clearly evident from an analysis of the language of §4d. This has been the consistent position of the CFTC and its predecessor for more than half a century.²² Nevertheless, any possible ambiguity could be removed by explicitly codifying this obligation in Commission Regulation 1.22. Such explicit language could be helpful in a financial emergency when an FCM is trying to determine its obligations quickly.

²² *See, e.g.*, CEA Admin. Determ. 57 (April 28, 1938) (“no account of a ... customer may show a deficit or loss without covering the amount of such deficit either from funds of the registered commission merchant or those of the particular customer.”)