Cboe Futures Exchange

Risk Management

Specification

Version 1.1.11

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Contents

1   Introduction

1.1   Overview

CFE Risk Management has been designed to assist Trading Permit Holders ("TPH"s) and Clearing Firms in managing the risk of over-executing using Risk Limits, some of which prevent new orders/quotes from being entered without affecting other orders/quotes (Pre-Order) and others that take effect only after execution and cancel other live orders/quotes (Post-Execution). TPHs and Clearing Firms design risk profiles that define the various limits on a per-product basis using 'CFE Risk Management Tool' presented in this document.

TPHs will not be permitted to enter any orders/quotes to the CFE system for a given product until their Clearing Firm has set values for Limit Order Protection, Max Order Size, Net Long and Net Short Risk Limits in that product. TPHs can optionally also set values for Limit Order Protection, Max Order Size and Traded Volume Rate, but are not required to do so in order to submit orders/quotes to the exchange. When the TPH sets risk limit values, the most restrictive of the values settable by both Clearing Firm and TPHs apply (Limit Order Protection and Max Order Size only).

In addition to Risk Limits, CFE provides Kill Switch functionality through a web interface and Mass Cancel functionality through order entry protocols. Mass Cancel functionality also provides for the ability to lockout subsequent order entry until explicitly reset by TPHs, Clearing Firms or the CFE Trade Desk. This document describes the suite of Risk Management capabilities provided by CFE.

1.2   Certification

TPHs must certify with the CFE Trade Desk prior to using Risk Management features.

1.3   Risk Controls Summary

Risk controls implemented in CFE include Pre-Order and Post-Execution Risk Limits, Kill Switch functionality and the ability for TPHs to impose lockouts through order entry protocols (FIX and BOE). The following summarizes the various CFE risk control types:

Pre-Order Risk Limits – Pre-Order risk limits are evaluated before an order/quote is accepted into the trading system. If an order/quote violates a Pre-Order risk limit, the offending order /quote will be rejected. After the rejection of an order/quote on account of a Pre-Order risk limit, the TPH is free to continue submitting orders/quotes. In other words, Pre-Order risk limits are applied on an order-by-order basis.

Post-Execution Risk Limits – Post-Execution risk limits are evaluated after an execution occurs. If an execution causes a Post-Execution risk limit to be exceeded, all open orders/quotes placed by the TPH using the same Executing Firm ID (EFID) in the *associated product* (e.g., "VX") are

cancelled across all FIX/BOE sessions and new orders/quotes in the associated product are rejected across all FIX/BOE sessions until the risk condition is reset (see 'Resetting Risk Limit, Lockout and Kill Switch Conditions' below).

Kill Switch – Kill Switch functionality is exposed through the Customer Web Portal that allows TPHs and Clearing Firms to cancel all open orders/quotes and reject new orders/quotes by EFID across all products and all FIX/BOE sessions. Only the TPH or Clearing Firm that activated a Kill Switch (or the CFE Trade Desk) can reset it through the Customer Web Portal.

Self-Imposed Lockouts – When issuing Mass Cancel or Purge Request operations through FIX/BOE sessions, TPHs can specify a self-imposed Firm, Product or Custom Group ID Level Lockout, which causes new orders/quotes across all FIX/BOE sessions to be rejected until the Lockout is reset (see 'Resetting Risk Limit, Lockout and Kill Switch Conditions' below).

1.3.1   Risk Limits

Risk limits are associated with EFIDs assigned by CFE. EFIDs specify the designated clearing relationship as well as the risk management setting that applies to an order/quote. EFIDs for each order/quote submitted to CFE are specified using the *ClearingFirm* field (FIX Tag 115) or via the 'Default Executing Firm ID' port setting.

TPHs configure each port with one or more EFIDs that are entitled to submit orders/quotes on that port (via CFE Trade Desk). One EFID can also be entitled to submit orders/quotes on multiple ports. The Risk Limits described in this document are specified and enforced strictly on the basis of EFID, and are not related to individual ports.

TPHs provision risk limits on an EFID-by-EFID basis. Using the CFE Risk Management Tool (described in Section 2 of this document), TPHs upload files specifying risk settings for one or more of their EFIDs (i.e., they can provision subsets of their EFID risk settings). Clearing Firms, on the other hand, are provided the ability to provision limits on individual EFIDs **and groups of EFIDs.** When provisioning risk settings for an EFID group, the risk settings are applied to the aggregated activity across the EFID group and risk trips affect all EFIDs comprising the group. An EFID that is a member of a group cannot appear in any other group, nor can their risk settings be specified outside of the context of their group. As a result of complexity related to group constraint enforcement, **Clearing Firms using the group-enabled interface must upload all risk settings when any changes are made to any EFID or EFID group risk settings. Clearing Firms may request a by-EFID interface that allows uploading individual EFID risk settings (similar to the TPH interface). Clearing Firms that opt for the by-EFID interface will not be able to apply risk settings to groups of EFIDs. By default, Clearing Firms will be configured to use the group-enabled interface. To change to the by-EFID interface, Clearing Firms must contact the CFE Trade Desk.** See '*Section 2 – CFE Risk Management Tool*' for detailed description of the use of the group-enabled and by-EFID Clearing Firm interfaces for provisioning risk limits.

The following table lists CFE Risk Limits, their types (Pre-Order or Post-Execution) and access for setting limits (TPH and/or Clearing Firm).

Risk Limit	Description	Type	Access
Limit Order Protection	An incoming order/quote will be rejected if the order/quote is more aggressive than the opposite-side best quote by more than the specified percentage. *Applies to simple instruments only.*	Pre-Order	TPHs Clearing Firms
Max Order Size	An incoming order/quote will be rejected if its size exceeds the specified number of contracts. Spread Orders are evaluated by the size of the largest leg.	Pre-Order	TPHs Clearing Firms
Net Long Contracts	The net long contracts is calculated as (buy contracts open) + (buy contracts executed) – (sell contracts executed) for the current trade date. When the calculated number exceeds the specified limit, incoming orders/quotes will be rejected. Block/ECRP trades are counted, as are the individual leg components of spread orders.	Pre-Order	Clearing Firms
Net Short Contracts	The net short contracts is calculated as (sell contracts open) + (sell contracts executed) – (buy contracts executed) for the current trade date. When the calculated number exceeds the specified limit, incoming orders/quotes will be rejected. Block/ECRP trades are counted, as are the individual leg components of spread orders.	Pre-Order	Clearing Firms
Traded Volume Rate	Traded volume is computed as the sum of the number of contracts executed per second. When the total number of contracts executed exceeds the specified value within a single second, the limit is triggered. Full execution of all contracts for an order/quote will not be avoided to prevent exceeding the volume rate limit. For example, if a TPH specifies a limit of 20 contracts per second and receives a full execution of a 10-contract order/quote followed by a second full execution of a 15-contract order/quote (10 + 15 = 25 contracts) within a single second, both executions will occur followed by cancellations of open orders/quotes and rejects of new orders/quotes for that product.	Post-Execution	TPHs

Risk Limits apply to all order types. Any order or quote of any kind submitted to CFE that has been executed either fully or partially will decrement remaining values in a particular Post-Execution risk rule, while any order or quote that has been accepted will contribute to the Net Long/Short calculation.

1.3.2 Kill Switch Control

Kill Switches are activated on an EFID level by TPHs or Clearing Firms through the [Customer Web Portal](). Activating a Kill Switch for an EFID causes all open orders/quotes on all products with the specified EFID to be cancelled and all new orders/quotes on the EFID to be rejected on all FIX/BOEsessions until the associated Kill Switch is reset. Kill Switches can only be reset through the [Customer Web Portal]() by the same TPH or Clearing firm that activated the Kill Switch.

1.3.3 Self-Imposed Lockouts

TPHs can activate Self-Imposed Lockouts when issuing Mass Cancel or Purge Orders operations on FIX/BOE sessions . The following summarizes Mass Cancel and Purge Orders operations:

Mass Cancel – The FIX message (`Order Cancel Request`) and the BOE message (`Cancel Order`) are used to request the cancellation of a single order by client or system-provided order ID. These order cancel operations can be extended to a 'Mass Cancel' operation by including the optional *MassCancelInst* (Mass Cancel Instructions) field. Only orders or quotes on the FIX/BOE session over which the mass cancel request is issued are cancelled.

Purge Orders – The FIX message (`Purge Request`) and the BOE message (`Purge Orders`) both require the *MassCancelInst* field to specify a mass cancel operation that applies to orders and quotes across all FIX/BOE sessions.

In both Mass Cancel and Purge Orders operations, the *MassCancelInst* field provides the ability to specify a Lockout at an EFID level or Product level (EFID + Product combination). In addition, Purge Orders include the ability to cancel and lockout at a Custom Group ID (EFID + Custom Group Id combination). When a Lockout is specified, subsequent orders/quotes are rejected across all FIX/BOE sessions corresponding to the EFID, Product or Custom Group Id level lockout criteria until the Lockout condition is reset (see 'Resetting Risk Limit, Lockout and Kill Switch Conditions' below).

1.4 Order/Quote Cancel and Reject Reasons

In response to Mass Cancel and Purge Orders operations, TPHs may receive cancellations of existing orders/quotes. In addition, as a result of a Post-Execution Risk Limit violation, Kill Switch or Lockouts new orders/quotes may be rejected. In all cases FIX and BOE order entry

protocols provide the ability to introspect the specific reason for an order/quote cancellation/rejection as follows:

BOE – `Order Cancelled` messages contain the *CancelReason* mandatory field and `Order Rejected` messages contain the *OrderRejectReason* mandatory field. These values reference a set of Reason Codes defined in the CFE BOE specification.

BOE Quote – `Quote Cancelled` messages contain the *CancelReason* mandatory field and `Quote Rejected` messages contain the *QuoteRejectReason* mandatory field. These values reference a set of Reason Codes defined in the CFE BOE specification

FIX – An `Execution Report` message representing an order cancellation will contain *ExecType* (150) = "4". An `Execution Report` message representing an order rejection will contain *ExecType* (150) = "8". In both cases, the *Text* (58) field will encode the reason for cancellation or rejection comprising a reason code and formatted text as described in the Execution Report *Text* (58) field description in the CFE FIX Specification.

1.5   Resetting Risk Limit, Lockout and Kill Switch Conditions

1.5.1   Protocol Level Risk Reset

Risk limit conditions and self-imposed lockouts applied by the TPH in FIX/BOEsession mass cancel and purge order operations are cleared using the `Reset Risk` (BOE) message or by sending a new FIX/BOE order with the optional *RiskReset* field set. Note that a risk reset can be submitted on any FIX/BOE session to clear the associated risk limit or lockout condition for all FIX/BOE sessions. There are three types of risk resets:

- **EFID Level Risk Reset** – If the *Reason* for order/quote cancel/rejection indicates a EFID level lockout is activated, the TPH includes an EFID level risk reset in the next `New Order` message or in a `Reset Risk` message submitted to CFE with the associated EFID specified in order to clear the EFID level lockout.
- **Product Level Risk Reset** – If the *Reason* for order/quote cancel/rejection indicates a product level lockout is activated or a Post-Execution risk limit has been exceeded, the TPH includes a product level Risk Reset in the next `New Order` message or in a `Reset Risk` message submitted to CFE for the associated EFID and product to clear the lockout or risk limit condition.
- **Custom Group ID Level Risk Reset** – If the *Reason* for order/quote cancel/rejection indicates a custom group ID level lockout is activated resulting from a `Purge Orders` request using Custom Group IDs, the TPH will include a Custom Group ID Level risk reset in the next order message or in a `Reset Risk` message submitted to CFE with the optional EFID and *CustomGroupID* specified.

CFE restricts risk resets to one reset per second per product. This restriction is designed to safeguard the CFE system from excessive risk messaging.

For more information on the use of the *RiskReset* field to reset Risk Limit and Lockout conditions, refer to the CFE BOE Specification or the CFE FIX Specification.

1.5.2 Resetting Kill Switches

Reason codes supplied on order/quote cancel/reject messages will indicate whether a Kill Switch is the reason for the cancel/reject. A Kill Switch condition must be cleared through the Customer Web Portal by the TPH or Clearing Firm that activated the associated Kill Switch. Alternatively, the TPH or Clearing Firm can call the CFE Trade Desk for assistance.

2   CFE Risk Management Tool

CFE offers TPHs and Clearing Firms the ability to manage risk profiles through its [Customer Web Portal](#) available at https://markets.cboe.com/account/login/.

2.1   CFE Customer Portal

TPHs and Clearing Firms of CFE can request a login to the [Customer Web Portal](#) from the CFE Trade Desk. After logging into their Web Portal account, users with appropriate access will be able to select the **Risk Management** link to access the Risk Management upload tool.

The risk management interface for TPHs enables risk settings to be provisioned on an EFID-by-EFID basis. Risk settings can be downloaded and uploaded for individual EFIDs while leaving other EFIDs unaffected.

The default risk management interface for Clearing Firms requires that all risk settings for all EFIDs be uploaded each time risk setting changes are made. The reason for this is that Clearing Firms are allowed to apply risk settings to aggregated groups of EFIDs, and EFIDs that are part of a group cannot have their risk settings set individually. The all-EFID upload eliminates complexity and confusion that could be caused by group conflicts. As a convenience for Clearing Firms with the default configuration, the ability to download the current all-EFID settings file is provided, which Clearing Firms can edit and then upload back into the system. This approach provides a single file that can be configuration managed.

An alternative interface is made available to Clearing Firms that do not wish to use EFID groups, and instead would prefer to provision EFID risk settings individually (similar to the TPH interface). To use this mode, Clearing Firms must contact the CFE Trade Desk and request the by-EFID interface configuration.

2.2   File Format

The file format used for uploading a new profile or downloading a copy of an active file is identical. Each line of the file represents a rule containing a comma-separated list of fields. The fields are described in the example that follows:

`executing_firm_ids, limit_type, product, limit_value`

- `executing_firm_ids` – This field specifies the EFID (or EFIDs) to which the risk setting applies. TPHs specify one EFID per record whereas Clearing Firms can group EFIDs as described below:

  For TPHs and Clearing Firms with by-EFID interface: This field may contain only a single EFID.

  For Clearing Firms with group-enabled interface: This field may contain multiple EFIDs by separating them with the vertical bar (|) character. Note that EFIDs associated with multiple TPH firms cannot be intermixed on the same line.

- `limit_type` – The limit type is one of the following values:
    1. `lmt_pct`   - Limit Order Protection percentage value.
    2. `max_size`   - Maximum Order Size value.
    3. `net_long`   - Net Long Exposure limit (Clearing Firms only).
    4. `net_short` - Net Short Exposure limit (Clearing Firms only).
    5. `rate_vol`   - Limit for number of contracts traded per second (TPHs only).

- `product` – The product is the futures root symbol, such as, AMB1, VA, VX, IBIG, etc or the pool symbol. See section 2.4.1 for more information on pooled risk limits for net_long and net_short limit types.

- `limit_value` – This value must be an integer value. Floating point values are not accepted. When the limit type is a volume type, this represents cumulative contracts traded in a product.

2.3   TPH vs. Clearing Firm Usage

The above specified file format is identical for usage by TPHs and Clearing Firms. However, the manner in which risk settings are applied is different between the two as follows:

TPH

- TPHs can update risk settings using multiple file uploads and a file upload can be used to selectively update risk settings for individual EFIDs without affecting active risk settings for other EFIDs.

- If a single value for an EFID is updated in a file, the TPH should take care to specify all values for the EFID. Any value not specified for an EFID will be zeroed out. In other words, when specifying values for an EFID, all values must be specified for that EFID.

- If a single record in a TPH file upload contains specification for Net Long or Net Short exposure limits, which are only applicable to Clearing Firms, the upload will fail with the reason communicated back to the user.

Clearing Firm with group-enabled interface (default):

- When Clearing Firms configured with the group-enabled interface (default) upload a risk settings file, they must define all risk settings for all associated EFIDs. To change settings associated with a single EFID or group of EFIDs, a file representing all settings is uploaded with changes applied to a subset of the contained EFIDs. Clearing Firms will find useful the ability to download the current risk settings in an upload-compatible format, to which changes can be applied and uploaded.

- If a Clearing Firm with the group-enabled interface uploads a risk setting file that does not contain risk settings for all EFIDs assigned to the firm, a notification is presented to the user that one or more EFIDs assigned to the Clearing Firm are not present, with the specific EFIDs enumerated. The user has the ability to cancel the upload prior to accepting. If accepted, risk settings for missing EFIDs will be zeroed out, which will result in the associated EFID not being able to submit orders to the system until risk settings for that EFID are uploaded.

- If a Clearing Firm attempts to set a Rate Limit risk setting, which is available only to TPHs, in any single record within an uploaded file, the upload will fail with the reason communicated back to the user.

Clearing Firm with by-EFID interface:

- Clearing Firms with the by-EFID interface can update risk settings using multiple file uploads and a file upload can be used to selectively update risk settings for individual EFIDs without affecting active risk settings for other EFIDs.

- If a single value for an EFID is updated in a file, the Clearing Firm should take care to specify all values for the EFID. Any value not specified for an EFID will be zeroed out. In other words, when specifying values for an EFID, all values must be specified for that EFID.

- If a Clearing Firm attempts to set a Rate Limit risk setting, which is available only to TPHs, in any single record within an uploaded file, the upload will fail with the reason communicated back to the user.

2.4   Using the Risk Management Tool

A download of currently active rules is available through the Risk Management Tool. In the Upload Risk File section, users can choose whether the new rules will have immediate effect or will be activated at the start of the next trading day. For Clearing Firms with the group-enabled interface, if any grouping of EFIDs is changing (in the `executing_firm_ids` field), the only option is to have the new file take effect on the next trading day. Note that no dates are contained in the file and profiles cannot be staged for dates beyond the next trading day. CFE changes the trading date in the system at 4 p.m. CT. Once a profile is activated, it stays active permanently until a new profile is loaded.

2.4.1   Usage of Product Field for Pooled Risk Limits

CFE will pool activity from certain related CFE products together for the purposes of calculating the Net Long and Net Short position limits. CFE will designate the product pool symbol and the relationship of the pooled products to users by exchange notice. Users are advised to not upload the individual futures product when setting net_long and net_short limits for a pool, but instead should use the pool symbol noted above. Risk uploads that include an invalid product (i.e. VXM or VMXT) **and** a net_long or net_short limit type will be rejected.

The pools that exist on the CFE platform are also detailed below. A multiplier may be assigned to one or more products in a pool in order to ensure that risk values tracked across disparate products is normalized to one of the products in the group.

Pool Name	Pool Symbol (used in risk upload)	Risk Root 1 (multiplier)	Risk Root 2 (multiplier)
VX Futures (non-TAS)	VX	VX (1.0)	VXM (0.1)
VX Futures (TAS)	VXT	VXT (1.0)	VXMT (0.1)

Multiplier Example:

- Order 1 = VX buy order for 100 contracts = 100 net long
- Order 2 = VXM buy order for 100 contracts = 110 net long

Resulting decimal values for any risk value resulting from a multiplier calculation are always rounded up.

Decimal Example:

- Order 1 = VX buy order for 100 contracts = 100 net long
- Order 2 = VXM buy order for 1 contract = 100.1 net long = 101 net long

2.4.2   Email Alerts

Email alerts may be requested for the net long/short exposure limits. If configured, Clearing Firms and/or their TPH clients will receive an email when a pre-defined warning threshold is crossed and another when the risk limit is met or exceeded. If a single event causes both the

warning threshold and the risk limit to be exceeded, only the risk limit exceeded email event notification email will be sent. Clearing Firms will be able to add, edit, and identify default email addresses where automatically generated notifications will be sent.

When requesting alerts, Clearing Firms should provide one or more email addresses to which email notifications will be sent. Note that email alerts will not automatically reset any limits, and the Clearing Firm must log in to the [Customer Web Portal](#) or reach out to the CFE Trade Desk in order to reset the rule and allow the TPH to resume trading. In addition, threshold crossing and risk trip emails will only be sent once (i.e., repeated alerts will not be sent when a threshold is crossed repeatedly prior to a risk trip).

3 Contact Details

If you have any questions or would like to begin using CFE Risk Management, please contact:

CFE Trade Desk
cfetradedesk@cboe.com

Revision History

Rev	Date	Description
1.0.0	05/01/17	Initial version.
1.1.0	07/24/17	Updated to reflect use of *MassCancelInst* for Mass Cancel with lockout specification.
1.1.1	09/18/17	Updated the ordering of the fields in the File Format section.
1.1.2	10/17/17	Cboe branding/logo changes.
1.1.3	01/19/18	Clarification of Net Long and Net Short calculation.
1.1.4	01/23/18	Added description of Clearing Firm interface optionality in which Clearing Firms can request by-EFID interface that precludes use of EFID groups for risk settings applied to activity aggregated across the group. Email alerts for Clearing Firms clarified.
1.1.5	02/01/18	Clarified that Clearing Firms must set risk values in order for TPHs to submit orders to the system, and that TPH may optionally specify values, the most restrictive of those that are settable by both Clearing Firms and TPHs apply.
1.1.6	03/01/18	If a single event causes both the warning threshold and the risk limit to be exceeded, only the risk limit exceeded email event notification email will be sent.
1.1.7	05/29/18	Updated the Email alerts section to include TPH clients of Clearing Firms.
1.1.8	12/31/19	Updated this specification to clarify that all risk limits apply to both orders and quotes with the introduction of the BOE Quoting Interface on CFE expected in Q2 2020. Added new BOE Reset Risk message as another means of clearing a risk trip.
1.1.9	07/20/20	Updated description of the product field for the CFE Customer Web Portal Risk Management Tool to include pooled products for Net Long/Net Short Risk Controls. Added section 2.4.1 – Use of Product Field for Pooled Products by Clearing Firm Risk Controls Users.
1.1.10	09/22/20	Added note indicating Clearing Firms will be able to enter and edit email addresses for risk limit notifications via the Risk Management tool effective 09/25/20.
1.1.11	11/27/20	Removed past effective dates.