**SR-NFX-2018-41 Exhibit B**

**NASDAQ Futures, Inc. (NFX)
TradeGuard PTRM Reference Guide**

Version1.0~~3~~4 **|**201~~6~~8 10 3

****

**CONFIDENTIALITY/DISCLAIMER**

This  Reference Guide is being forwarded to you strictly for informational purposes and solely for the purpose of developing or operating systems for your use that interact with systems of NASDAQ Futures, Inc. (NFXSM) and its affiliates (collectively, NFX).  This specification is proprietary to NFX.

NFX reserves the right to withdraw, modify, or replace this Reference Guide at any time, without prior notice.  No obligation is made by NFX regarding the level, scope or timing of NFX’s implementation of the functions or features discussed in this specification. The Reference Guide is provided “AS IS,” “WITH ALL FAULTS”. NFX makes no warranties to this Reference Guide or its accuracy, and disclaims all warranties, whether express, implied, or statutory related to the Reference Guide or its accuracy. This document is not intended to represent an offer of any terms by NFX. While reasonable care has been taken to ensure that the details contained herein are true and not misleading at the time of publication, no liability whatsoever is assumed by NFX for any incompleteness or inaccuracies.  By using this Reference Guide you agree that you will not, without prior written permission from NFX, copy or reproduce the information in this Reference Guide except for the purposes noted above. You further agree that you will not, without prior written permission from NFX, store the information contained in this Reference Guide in a retrieval system, or transmit it in any form or by any means, whether electronic, mechanical, or otherwise except for the purposes noted above. In addition you agree that you will not, without prior written permission from NFX, permit access to the information contained herein except to those with a need-to-know for the purposes noted above.

NFX℠is a servicemark of Nasdaq Futures, Inc.

© Copyright 2016, Nasdaq Futures, Inc. All rights reserved.

#

#

TABLE OF CONTENTS
1 executive summary 4

1.1 Introduction 4

1.2 TradeGuard’s Key Benefits 5

2 Tradeguard overview 6

3 Tradeguard definitions and configuration 7

3.1 Account 7

3.2 Account Setup 7

3.3 Authorized Trader 7

3.4 Futures and Option Contracts 8

3.5 CLEARING FUTURES Participant 8

3.6 Pre-Trade Limits Group 9

4 tradeguard risk checks 11

4.1 Trading Activity Risk Checks 12

4.1.1 Daily Accumulated Volume/Quantity Checks 12

4.1.2 Reaching an Accumulated Volume or Quantity Limit 12

4.1.3 Limitations of Accumulated Volume or Quantity Limits 13

4.2 Order Management Risk Checks 13

4.2.1 Maximum Order Volume/Quantity Check 13

4.2.2 Maximum Trade Report Size 14

4.2.3 Mass Cancel of Open Orders 15

4.3 Order Rate Risk Check 16

4.4 Trading Restrictions 17

4.4.1 Restricted Contracts 17

4.4.2 Blocking PTLGs 17

4.5 Connectivity Issues 17

4.5.1 Automatic Block at Drop Copy Disconnect Safeguard 17

4.6 Risk Manager Support Tools 18

4.6.1 Email Notifications 18

4.6.2 TradeGuard User Interface 18

4.6.3 Intra-day and Next Day Changes 19

5 Appendix A – Examples on daily volume checks 20

#  executive summary

\*\*\*\*\*

# 3 Tradeguard definitions and configuration

\*\*\*\*\*

## 3.4 Futures and Option Contracts

All risk checks, except the maximum Orders/sec rate, are configurable at the Instrument Class Limit Group (ICLG), Instrument Class, Futures and Options on Futures Contracts level. Each ICLG, ~~NFX~~ Futures Contract, or Option on Futures Contract, ~~will~~ can have its own risk limits (Options on Futures Contracts ~~will~~ can have individual limits for Calls and Puts). See examples below:

 **Contract Risk Limits**

ICLGs are pre-defined risk buckets grouping Instrument classes together, allowing for more efficient risk limit associations. ICLGs will be limited to only include Power / Electricity contracts. Trade at Settlement (TAS) Orders and transactions will be allocated to their related delivery Contracts and associated risk checks.

\*\*\*\*\*

# 4 tradeguard risk checks

TradeGuard provides Clearing Futures Participants with the following risk checks and support tools:

**Trading Activity**

* Daily Total Net Buy Checks (Traded Net + Open Buy Orders) per PTLG, ICLG or ~~and~~ Contract
* Daily Total Net Sell Checks (Traded Net + Open Sell Orders) per PTLG ICLG or ~~and~~ Contract

**Order Management**

* Maximum Order Volume or Quantity per PTLG, ICLG, Contract, and Combination Class
* Maximum Trade Report (Block and EFRP) Size per PTLG, ICLG, Contract, and Combination Instrument Class
* Mass Cancellation of open Orders (including Quotes) per PTLG

**Order Rates**

* Order Rate Checks per PTLG

**Trading Restrictions**

* PTLG defined Trading Restrictions (per symbol or ICLG)
* Manual blocking of Order flow per PTLG

**Connectivity Issues**

* Automatic blocking of Order flow at drop copy disconnect safeguard

**Risk Manager Support Tools**

* Notifications via e-mail for risk limit notification and warning levels.
* TradeGuard User Interface for administering risk limits, accounts and e-mail alerts, view risk checks consumption, mass cancel Orders (including Quotes) and block Order flow.

All configured risk checks are active during all Trading Sessions. NFX will operate 2~~2~~3x5 hours/days basis, which, for example, may be 7PM EPT to ~~5~~6PM EPT Sunday through Friday. All risk checks will be reset for the Pre-Open Session prior to Open Session that starts at 7PM EPT Sunday, and each night through and including Thursday and will remain in force until the completion of the Open Session at ~~5~~6PM EPT the following business day.

## 4.1 Trading Activity Risk Checks

### 4.1.1 Daily Accumulated Volume/Quantity Checks

The daily accumulated checks are Pre-Trade risk checks that involve monitoring of a series of counters for each Contract or ICLG. These risk checks will count transactions executed via the Order Book as well as off-Order Book (Block and EFRP) transactions via a single limit.

Different checks can be set on different PTLGs for the same User ID. Therefore, different limits can be assigned to different accounts within a User ID as long as the accounts are assigned to different PTLGs.

Limits are individually configured for each Contract or ICLG and PTLG for the following risk limits:

|  |  |
| --- | --- |
| Total Net Buy | Total Net Buy = Traded Bought – Traded Sold + Open Buy Orders per Contract or ICLG  |
| Total Net Sell | Total Net Sell = Traded Sold – Traded Bought + Open Sell Orders per Contract or ICLG |

The limit quantifier can be based on either the number of contracts (Quantity Calculation) or the underlying units of the specific Contract (Volume Calculation).

### 4.1.2 Reaching an Accumulated Volume or Quantity Limit

Since all accumulated volume or quantity Order (excluding Quotes) limits are Pre-Trade limits, they can never equal to or exceed the limits, except for Quotes. The Trading System may accept a portion of new Quotes if the entire Quote would cause the Pre-Trade risk parameters to be met or exceeded. A pre-trade accumulated volume or quantity Order (excluding Quotes) limit can be breached if a Clearing Futures Participant were to lower a limit below the existing consumption for a Contract or ICLG. Thus when an Order (excluding Quotes) is entered that will equal or exceed an accumulated volume or quantity limit for a Contract or ICLG, the Order would be ejected. The Trading System would reject all new Orders in their entirety, and accept the portion of new Quotes that permit the Pre-Trade risk parameters to not be met or exceeded. Likewise, if a Participant were to enter an Off-Exchange (i.e. Block or EFRP) transaction on behalf of a PTLG that will equal or exceed an accumulated volume or quantity limit for a Contract or ICLG the entire trade report would be rejected. The PTLG could re-enter a new Order or trade reported transaction in the same Contract or ICLG up to the amount of any unused consumption, but any Order/trade equal to or larger (excluding Quotes) than the unused consumption will always lead to a rejection. Any non-cancelling, open Order modifications for the affected Contract or ICLG that would equal or exceed the same accumulated volume or quantity limit would also be rejected. The PTLG can increase capacity (unused consumption) under a rejected limit by entering offsetting trades and/or canceling open Orders for the specific Contract or ICLG. Regardless, Authorized Traders connected to the PTLG will still be allowed to enter Orders on Order Books traded on other Contracts or ICLG until their respective accumulated volume or quantity limits are reached.

For more information on how the accumulated volume or quantity checks work, please refer to Appendix A of this Reference Guide– Examples on Daily Accumulated Quantity Checks.

*Please note that if no action is taken by the Clearing Futures Participant when a limit is reached, on the next trading day, the PTLG will be able to enter Orders (including Quotes) in the concerned Contract* or ICLG *up to the full amount of the existing limit as the limits reset to zero for each trading day.*

*Please be advised that PTRM is NOT designed to automatically cancel open Orders (including Quotes) and thereby prevent future executions of Orders already residing on the Order Book once a limit is reached. PTRM will only prevent new Orders from being accepted; previous Orders in the matching engine before the limit was reached may still be executed or cancelled.*

### 4.1.3 Limitations of Accumulated Volume or Quantity Limits

Clearing Futures Participants are encouraged to consider the limitations stated below when defining the limits for the volume or quantity based checks:

All the accumulated volume or quantity limits are counted for each individual Contract or ICLG~~only and therefore there are no global cross-Contract counters available~~.

* Combination Orders only affect the counters as described below:
	+ Combination Orders are broken down into their individual legs and the size of the individual legs shall be added to the counters of the individual Contract legs.
	+ For Combination Orders where the same Contract is both bought and sold in different legs, the buy and sell volume or quantity shall be netted and only the surplus shall be added to the Open Order Buy/Sell and traded bought/sold counters.
* Combination Order risk checks can be configured and set for combinations where Contracts in the same Products are bought and sold, providing flexible risk management of time spreading.
* Already resting Stop Orders can be triggered and traded after a PTLG has been blocked.

## 4.2 Order Management Risk Checks

### 4.2.1 Maximum Order Volume/Quantity Check

The Maximum Order Volume or Quantity Check is a Pre-Trade risk check that provides Clearing Futures Participants with the ability to check Central Limit Order Book (CLOB) Order volume or quantity against a pre-set volume or quantity limit per Contract, ICLG or Combination Order. The Order quantifier can be based on either the number of contracts (quantity calculation) or the underlying units of the specific Contract (volume calculation). For example, if the max Order quantity is set to calculate based on the quantity limit methodology and is set to 200 for the number of WTI futures contracts and an Order equals or exceeds 200 contracts, it will be rejected. Likewise, if the max Order limit is set to calculate based on the volume limit methodology and is set to 200,000 for the number of WTI barrels and an Order equals or exceeds 200,000 barrels, it will be rejected.

Different maximum Order volume or quantity checks can be set on different PTLG for the same Participant. Therefore, it is possible for a Clearing Futures Participant to assign different limits to different accounts for a Participant as long as the accounts are assigned to different PTLGs.

Different maximum Order volume or quantity thresholds can be specified per Contract or ICLG. As an example, Clearing Futures Participants could request that the CLOB maximum Order size for WTI Crude should be less than 1,000 contracts while for Brent Crude the CLOB limit should be less than 250 contracts.

For Mass Quotes the maximum Order quantity check is performed per transaction. This means that the maximum quantity a user can add via one mass quote transaction is always 2 \* MaxSize \* Maximum Number of Quote Items. E.g., with a Max CLOB Order Limit of 2, an optimized mass quote (NFX caps the max number of Instruments at 37), it’s possible to add 1,776 (2\*24\*37) contracts regardless of any active daily accumulated quantity checks.

Orders in Combination Order Books are handled differently depending of the composition of the leg contracts.

|  |  |  |
| --- | --- | --- |
| **Type of Combination** | **Examples** | **Max Order Volume or Quantity Check** |
| All leg contracts are of the same Instrument class. | WTI Crude combo: CLQM5/N5RBOB Combo: RBQZ5/F6 | Net exposure is validated against the specified limit in the applicable Instrument. If zero net exposure no validation is done. |
| Leg contracts are not of the same Instrument class. | Combo Contracts combining Crude Oil futures: WTI vs Brent Crude– CLQM5/BFQM5Combo Contracts combining different commodities:Crack: RBOB versus WTI CrudeRBQZ5/CLQZ5 | The exposure in each leg contract is validated against the corresponding limit for the Instrument. |

### 4.2.2 Maximum Trade Report Size

Maximum Trade Report (Block and EFRP) Size is a Pre-Trade risk tool that permits Participant to place an upper limit on the volume or quantity for trade reporting of Off-Exchange transactions. If the trade report volume or quantity is equal to or greater than the pre-set limit, the off-exchange trade report will be rejected. Similar to other risk tools, the Maximum Trade Report Size can be set at the Product, ICLG or Combination level ~~and PTLG~~.

For multi-leg trade report transactions, each leg will be validated individually against the Maximum Trade Report Size limit. If at least one leg exceeds the pre-set limit, the entire transaction will be rejected.

The Max Trade Report Size limit, along with the Max Order Quantity Check (for CLOB Orders), will allow Participants to manage both Orders within the CLOB and Block Trade transactions using a combined volumetric position limit. Participants will be able to manage max order/trade sizes in both CLOB and trade reported transactions independently at significantly different levels.

The Max Trade Report Size will also allow Participants to restrict accounts from transacting certain trade reported transactions, which meet or exceed the limit, by instrument type, class or ICLG. Participants may set the Max Trade Report Size below the specific product Block Trade threshold (note that minimum threshold allowable for EFRPs is 1 contract). Setting the Max Trade Report Size limit to zero will allow for an “unlimited” trade report size.

\*\*\*\*\*

## 4.3 Order Rate Risk Check

The maximum Order rate/sec limit is defined as new Orders/second-time-interval and is set per PTLG and is measured as the combined Order flow sent to the Trading System for all Users connected to that PTLG.

The Order rate is based on information received after Order insertion (post Order validation). Thus, it is possible that Orders that are above the configured limit will be accepted and inserted to the Order Book.

The limit shall be expressed as an Order per 0.1 second to 5.0 second-time-interval (configurable at a minimum increment of 0.1 second by the user). If the Order rate equals or exceeds the configured Order rate limit when the TradeGuard check is done, a breach will occur and the PTLG group is blocked on all Contracts and/or ICLGs. For example, with a time interval setting at 2.0 seconds and a corresponding Order rate limit set at 50 Orders, TradeGuard will accept a maximum number of 49 Orders every 2.0 seconds.

The goal with this control is to capture abnormal aggregated Order/sec rates resulting from Orders submitted via a PTLG.

It is not possible to set different max Order/sec limit per Contract or ICLGs within a PTLG.

Should the limit be breached, the following actions will be taken:

* The affected PTLG will be blocked and all new Orders will be rejected; and
* It will still be possible to cancel open Orders (including Quotes), which remain in the Order Book and are not canceled.

A block of a PTLG as a result of an Order rate breach must be unblocked manually by the Clearing Futures Participant or the Exchange, once the root cause of the excessive Order generation has been identified and resolved.

The Order Rate Check is based on new Orders inserted into the book. If an Order is traded at entry it will also count towards the Order Rate limit. The following examples will be ignored by the Order Rate Check:

* Order cancel requests;
* Time in Force Conditions that do not stay in the Order Book, such as Immediate or Cancel Orders (IOC) or Fill or Kill Orders (FOK) (except in auctions where they do stay in the Order Book);
* rejected Orders; and
* Order modifications.

For Mass Quotes the maximum Orders/sec check is done per item and side, meaning that a limit of 100 Orders/second will only allow the user to enter 49 double sided items per transaction without being blocked.

Stop Orders are validated against the maximum Orders/sec when triggered, and not at entry.

\*\*\*\*\*

## 4.6 Risk Manager Support Tools

### 4.6.1 Email Notifications

The PTRM service automatically sends e-mail alerts to a list of pre-defined recipients connected to a PTLG in the following cases:

* For Pre-Trade risk checks there are two levels that can be configured to generate emails:
	+ A notice level (percentage of limit) that is configurable per PTLG; and a
	+ A warning level (percentage of limit) that is configurable per PTLG.
* When an Order is rejected TradeGuard will send a FIX message to the associated Users ~~I~~in the event that a limit is lowered by the Clearing Futures Participant below its current consumption and therefore breached, an email notification of the breach will be sent to the configured recipients.

Not more than one of each the notification and warning emails will be generated per day per PTLG, Contract or ICLG and type of risk check. Thus, no more than one notification and warning mail for every configured limit will be sent per day.

If a limit is changed intra-day by the Clearing Futures Participant, the counter is reset, meaning that one notification and warning and email will be allowed for that specific limit check regardless of what emails have been sent before the limit was adjusted.

Please note, as an Order rate limit breach results in a hard block (i.e. it requires a manual unblock by the sponsor), a new email will be generated each time the Order rate limit is breached.

Below are examples TradeGuard e-mail notifications:

Breach Event, Group: XXX\_XXX, Risk Check: TOTAL\_NET\_BUY, Time: Fri Feb 15 09:23:16 CET 2013, Event Level: Notice, Consumed: 40, Limit: 50

Breach Event, Group: XXX\_XXX, Risk Check: TOTAL\_NET\_BUY, Time: Wed Feb 13 13:17:18 CET 2013, Event Level: Warning, Consumed: 95, Limit: 100

### 4.6.2 TradeGuard User Interface

The Exchange provides Clearing Futures Participants with a TradeGuard User Interface which allows Clearing Futures Participants to:

* Define PTLG and risk checks;
	+ Configure Contracts or ICLGs and the associated limits for each risk check;
	+ Define restricted Contracts;
	+ Add/remove account to/from a PTLG; and
	+ Add or change monitored user for a PTLG.
* View the current consumption level of each risk check in real-time;
* Intra-day emergency block/unblock Order flow for a PTLG;
* Mass cancellation of all active, open Orders, including Quotes, for a PTLG;
* Identify if the maximum Order/sec limit has been breached;
* Unblock a PTLG that has breached the limit for maximum Order/sec; and
* Administrate e-mail addresses to receive alerts and warnings.



The TradeGuard UI may be configured such that a User has write access or read-only access. The scope of information available to a User may also be configured for all Participants (exchange users) or only for the Participant to which the User belongs (Participant users).

The UI is a web-based application accessed via a certificate and user credentials. The requirements to run the application are a Windows PC, at least 512MB of free memory, and Java 7 installed.

### 4.6.3 Intra-day and Next Day Changes

The following table shows what changes can be made intraday or for the next day.

|  |  |  |
| --- | --- | --- |
| **CHANGE** | **Intraday** | **Next Day** |
| Update the quantity or volume check limit values | X |  |
| Update the Order rate limit | X |  |
| Select restricted Instruments | X |  |
| Add an email address to a PTLG notification list | X |  |
| Update an email address of a PTLG notification list | X |  |
| Update the warning and notice percentages on a PTLG | X |  |
| Add/Remove a Contract/ICLG to/from a PTLG |  | X |
| Change the calculation unit on a Contract |  | X |
| Remove an e-mail address from a PTLG notification list |  | X |
| Create or delete a PTLG |  | X |

\*\*\*\*\*