K3 Limits Service

With the effective provisions of Dodd-Frank, EMIR and other regulatory regimes, trading and position limits have taken on a new vigor. Breaching these limits can result in an array of civil and criminal penalties. This whitepaper is designed to introduce K3 Limits and discuss the technical challenges inherent in the limits calculation.

Overview of the Limits Challenge

The limits challenge is two-fold. First, exchange trading limits must be monitored in real time within the dimensions of "All Months", "Single Month," and "Spot Month." That is for each of these dimensions the exchanges publish a "lot" limit that if breached, even momentarily, could subject a trading firm to sanctions.

The second key challenge is Dodd Frank Limits or the equivalent for EMIR, Canada etc. These limits track positions across exchanges and OTC for certain designated products. For example, a firm's total position across exchanges and OTC products must stay below proscribed limits in the All, Single and Spot periods.

Why tracking limits is difficult

There are a number of detailed technical things that make tracking limits very challenging. The largest of which is what we refer to as **_Standing Precursor Data_**. Standing precursor data refers to all the data elements necessary to calculate the limits themselves. This data about things like "when a spot period starts" is actually very murky. Let's discuss these in detail.

Standing Precursor Data: Precursor Data is the fundamental underlying data that we evaluate positions against. For example, every product has a limit. That limit is precursor data that we need to have at our fingertips in order to see if our position is above or below the limit.

- **Spot Period Calculation**
  The spot period calculation is probably the most challenging precursor element. The reason why is because exchanges and regulatory bodies dictate different spot periods *by product.* For example a spot period for a particular product may start "the first day of the last trading month;" or, "three days prior to the expiration of the last trading month." This requires data setup that is flexible to get it right. Here is the underlying:

  - **Expiration Date**
    The expiration date seems straightforward enough at first blush. Or so one would think. This date is published by the exchange and indicates the last day a product will be traded. Caution is warranted, however, because this date can and will change on calendars and market events. Thus, the expiration date is subject to revision.
  - **Spot Period Start Differential**
    The Spot Period Differential is the number of business or calendar days before or after the expiration date that the spot period starts.
  - **Spot Period Update**

Each of the exchanges (and likely regulatory bodies) will publish Single update to the expiration and spot period calculations prior to the initiation of the spot period. This is very important since the expiry and spot period that we previously calculated is now over-written.

K3 Compliance Solves the Precursor Data Spot Challenge

Without good precursor data at ones fingertips the entire calculation becomes very difficult. Thus, K3 Atlas connects to all exchanges and regulatory bodies and downloads all of the spot limit information regularly directly from the exchange. The K3 Atlas service, allows all of this data to be regularly (at least daily) downloaded and assembled in an simple format so it can be readily used in the limits calculation. This includes expiration dates for all products, the calculated spot period, and most importantly, Single update issued from the exchange or regulatory body.

Not only does K3 capture and update this information automatically, K3 also captures:

- o **Limits Update**
  Each exchange and regulatory body publishes a updated version of express limits for the Spot, Single and All months periods. K3 captures this and consolidates it in the Precursor File.
- o **Option Deltas**
  Option Deltas are important for limits monitoring in that they drive the weight given to options on the underlying product limit. To correctly calculate limits it is necessary to have the *updated* option precursor data
- o **Aggregation Ratios**
  Aggregation ratios operate similarly to option deltas. That is, some products roll up to other products for limits monitoring purposes. For example a refined product position may roll up to a heating oil position for limits purposes. K3 regularly pulls this information into the precursor file such that it can be used in the calculation.

Calculation Logic

Now that K3 Atlas has assembled all the correct precursor data we can begin calculating the limits. Like other elements, calculating limits correctly is dependent on key features of K3 Atlas.

- • Current Outright Limits

  The greatest challenge firms face is being able to calculate this *in real time*. Even a momentary breach of limits can subject a firm to sanctions. Thus, to calculate in real time it is necessary that trades be populated (either directly or indirectly) from the exchange itself. The nature of limits is real time in nature and calculating limits from FCM statements is anathema to this requirement. Thus, K3 Atlas leverages our real time

exchange connectivity to facilitate limits monitoring. Every trade executed on an exchange is routed instantly to the limits calculation.

- **Modified Exemption Limit**
  To the uninitiated might think that the limits as published by the exchange are hard and fast. Nothing could be further from the truth. In reality, limits are frequently issued exemptions from the exchange (and likely regulators) to reflect hedging and other non-speculative positions. Thus, we made it a core part the K3 limits calculation to enable users to manually update and reflect these changes in the regular course of business.

- **Custom Limits & e-Mail Alerts**
  K3 enables clients to set up and maintain custom limits and alerts by product. For example, compliance may want to be alerted when a product hits 70% of a particular limit. In short, K3 Atlas is designed to allow firms to segregate alerts relative to their own internal limit monitoring policies.

Graphical Dashboard Output

All data processed by K3 Atlas is recorded in K3's data warehouse. This off the shelf warehouse maintains position & limit information and produces customizable limits related dashboards. This enables compliance officers to both monitor their limits in real time as well as look back and forward to anticipate limits related challenges.

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