CME Group
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# Advisory Notice

Clearing House

**09-350**

**TO:** **Clearing Member Firms**

**FROM:** **CME Clearing**

**SUBJECT:** **Clearing Processing for Variable-Size and Eroding Contracts**

**DATE:** **Thursday, August 13, 2009**

This advisory provides important information for clearing firms about variable-size and eroding products.

Although these features have long been supported in the NYMEX clearing system and in firm bookkeeping systems, the upcoming integration of NYMEX into the CME clearing system will mark the first time such features have been processed through the CME clearing system.

CME Clearing will support these features in exactly the same manner as they have previously worked, except with certain improvements described below. Existing bookkeeping system code, however, should continue to work without modification.

## Variable Size Products

A **variable size product** is one where the contracts do not all have the same **contract value factor.** This value, also called simply the **CVF**, is the multiplier which converts a price to its corresponding monetary value.

Variation and premium calculations for variable size contracts work normally, except that it is necessary to use the correct contract value factor.

A good example is **NI**, the ISO New England Internal Hub Peak LMP (Location Marginal Pricing) swap contract, which is processed in the clearing system as a monthly future. The price is quoted in dollars and cents per Mwh (megawatt hour), and the contract size is defined as 2.5 megawatts per peak hour per peak day in the contract month, with 16 peak hours per peak day and between 19 and 23 peak days per month, depending on the month.

2.5 megawatts per peak hour, times 16 peak hours per peak day, means that the contract value factor is 40.0 per peak day. But there are different numbers of peak days per month. For example, for the Sep 09 contract there are 21 peak days, and hence the CVF is 21 * 40 = 840. For the Oct 09 contract there are 22 peak days, and hence the CVF is 880. For the Nov 09 contract there are 20 peak days, and hence the CVF is 800. Etc.

In the new combined positional-format ("pa2") SPAN® file, the contract-specific CVF is provided for each future and for each option series in the 14 bytes from position 129 through position 142, with 7 implied decimal places. For maximum flexibility, a positive or negative power of ten may also be applied to this value, with the power specified in position 143-144, and the sign for this power in position 145. (In essentially all cases the power of ten is specified as zero and the sign as a space, meaning that no power of ten is applied.)

For normal products, the contract-specific CVF will be identical for all contracts in the product family, and will match the value provided on the type "P" record for the product family. But for variable-size products,

the value provided on the type "P" record (bytes 42-55, with the power of ten in bytes 74-75 and the sign for this power in byte 73) will be the value for the **first** eligible contract.

## Eroding Products

There are three NYMEX electricity futures products which are said to **erode**. They are: **JM** – PJM Monthly futures, **UM** – Northern Illinois Hub Monthly futures, and **VM** – AER-Dayton Hub Monthly futures.

Prior to the start of the month corresponding to the contract month, these behave like an ordinary variable size contract, with a contract value factor which is proportional to the total number of **peak days** in the month according to the North American Electric Reliability Council (NERC).

When the contract month arrives, however, eroding contract have two distinct behaviors.

First, as time elapses during the contract month, each peak day is stripped in turn from the contract. Thus, the contract value factor for the lead contract will decrease, day by day, as the end of the contract month approaches.

Second, for each peak day stripped, a special cash adjustment is calculated, called the **erosion cash adjustment**, and is then banked together with the position in the eroding contract. For each such day, the adjustment is typically calculated (a) on the day the peak day is stripped, and (b) on the subsequent day, as follows:

- On the first day, the stripped position (in effect, a position in a daily contract) is marked from the prior day's settlement price of the monthly contract, to that day's settlement price for the daily contract. This is called the **pending erosion cash adjustment.**

- On the next day, the same stripped position is marked from the previous day's settlement price for the daily contract, to the final settlement price for the daily contract. This is called the **final erosion cash adjustment.**

While the first stripped piece is going through the second day of its marking process, a new stripped piece is going through the first day of its process. So on any given day, the total erosion cash adjustment booked to the monthly contract is typically the sum of the pending adjustment from the piece stripped today, plus the final adjustment from the piece stripped yesterday.

The entire process is driven by the daily **erosion file**, and CME Clearing will continue to publish this file in exactly the same positional format and with exactly the same content as previously published by NYMEX Clearing.

The file is published in the early evening of each clearing business day. The **erosion business date**, specified in the first eight bytes of each record, is for the business day just concluded, and indicates that the record is for calculating the erosion cash adjustment in bookkeeping systems for the current business date. The **next erosion business date** is also provided. The file contains a record for each eligible contract for the three products to which the erosion process applies.

For each contract, the following data is provided:

- The **erosion start date** – the first clearing business date on which erosion processing begins for this contract

- The **erosion end date** – the last clearing business date, which will be the final settlement date, on which erosion processing is done for the contract

- The **daily contract value factor** – the value that one peak day represents
- The **total quantity** – the original value for total number of peak days represented in the contract
- The **current quantity** – the number of peak days in the contract as of the current clearing business date
- The **next quantity** – the number of peak days in the contract as of the next clearing business date
- Five **prices:**
    - The **current day** and **previous day settlement price** for the monthly contract
    - The **pending daily marking price**
    - The **previous pending daily marking price**
    - The **final daily marking price**
- Two **monetary amounts** – the **pending per-contract amount** and the **final per-contract amount**. These are per single long position.

The two monetary per-contract amounts make it very easy to calculate the erosion cash adjustment:

- To calculate the **pending cash adjustment:**
    - Take the ending long position and ending short position from the previous clearing business day. Subtract the ending short position from the ending long position to obtain the ending net position for the previous day, as a positive number if net long and a negative number if net short.
    - Multiply this result by the pending amount.
- To calculate the **final cash adjustment:**
    - Take the ending long position and ending short position from the **second previous** clearing business day. Subtract the ending short position from the ending long position to obtain the ending net position for the second previous day, as a positive number if net long and a negative number if net short.
    - Multiply this result by the pending amount.
- The **total erosion cash adjustment** for the contract for the business day is the sum of the pending cash adjustment and the final cash adjustment.

It's easy to replicate the calculation of the monetary per-contract amounts, if you wish:

- The pending per-contract amount is the mark-to-market from the previous day's settlement price for the monthly contract, to the pending daily marking price.

- The final per-contract amount is the mark-to-market from the previous pending daily marking price, to the final daily marking price.

- The calculation should be done using the standard futures method of determining the rounded monetary value at each price point, and using the daily contract value factor. Then you simply take the difference between the two rounded monetary values.

**Holiday processing and "double erosion"**

**First, some background on "exchange business days" versus "clearing business days".**

CME Clearing runs clearing settlement cycles on every weekday except Christmas and New Years (when those holidays occur on weekdays), even on days that are considered "exchange holidays." This is because certain cleared products – for example, the new Gold Forward contracts -- require processing on such holidays.

For clarity, we distinguish between **clearing business days** and **exchange business days**. For example, suppose US Independence Day (July 4) occurs on a Wednesday. That day would be a clearing business day but an exchange holiday.

Of course, clearing of trades is a continuous process that starts on Sunday evening and continues through Friday evening. Trades in normal products (for example, NYMEX crude oil futures) can and do clear at noon Eastern time on Wednesday July 4. **But they are assigned a logical trade date, and a logical clearing business date, of Thursday July 5.**

So on days that are clearing business days but not exchange business days, the following occurs:

> For normal products, there are no new trades, and no expirations. Hence positions don't change. And end-of-day settlement prices are cloned forward from the previous clearing business date. Hence, there are no new settlement variation or option premium requirements to bank. Performance bond requirements may change slightly due to decreased time to expiration.
>
> For special products such as gold forwards, clearing processing proceeds as on any other day.

**Next, how this applies to erosion processing.**

From the point of view of holiday processing, the three erosion products are "normal" products, On exchange holidays, no new trades are allowed to clear for that date. And end-of-day settlement prices are cloned forward from the prior day, so there are no new settlement variation requirements.

If the exchange holiday in question is **not** a peak day, then erosion processing simply skips the holiday, but otherwise works normally. A typical example would be Labor Day. For example, suppose a Wednesday is a clearing processing day but an exchange holiday:

- At end-of-day on Tuesday, using the erosion file for Tuesday, calculate a pending erosion cash adjustment using the end-of-day position from Monday, and a final erosion cash adjustment using the end-of-day position from the previous Friday.
- On the Wednesday holiday, no erosion file is published, and no erosion processing is performed.
- At end-of-day on Thursday, using the erosion file for Thursday, calculate a pending erosion cash adjustment using the end-of-day position from Tuesday (the prior exchange business day) and a final erosion cash adjustment using the end-of-day position from Monday.

**But if the exchange holiday <u>is</u> a peak day, now we have to perform special "double erosion" processing.** Suppose this scenario has occurred for our Wednesday holiday:

- At end-of-day on Tuesday, erosion processing is performed normally, exactly as above.
- On the Wednesday exchange holiday, a special erosion file for Wednesday is published, containing only the small number of affected contracts.
- On the next day Thursday, a normal erosion file is published.
- First, using the special Wednesday file:
    - Calculate the pending erosion cash adjustment using the end-of-day position from Tuesday.
    - Calculate the final erosion cash adjustment using the end-of-day position from Monday.
    - Sum these two values to get the total erosion cash adjustment for Wednesday.
- Next, using the normal Thursday file:
    - Calculate the pending erosion cash adjustment using the end-of-day position from Wednesday, which is the same as the end-of-day position from Tuesday. (because Wednesday was an exchange holiday)
    - Calculate the final erosion cash adjustment using the end-of-day position from Tuesday.
    - Sum these two values to get the total erosion cash adjustment for Thursday.
- The total erosion cash adjustment is the sum of the adjustment for Wednesday and the adjustment for Thursday.

### Position processing for eroding contracts

Erosion cash adjustments appear for individual positions in the FIXML Trade Register File as cash adjustments with a reason code value of "1" for pending erosion cash adjustment amounts and "2" for final erosion cash adjustment amounts. For example:

```
<Amt Typ="CASH" Amt="-2637419.2" Rsn="1"/>      // pending amount
<Amt Typ="CASH" Amt="327645.22" Rsn="2"/>       // final amount
```

On the Trade Register (POS591) report, erosion cash adjustments are displayed in the position cash adjustment section. For example:

| | |
|---|---|
| **PENDING EROSION:** | **-3,572.67** |
| **FINAL EROSION:** | **5,477.91** |
| **NET EROSION:** | **1,905.24** |

The Trade Register Summary (POS593) report includes erosion amounts as part of "Cash Adjustments".

As with any cash adjustment amount for a future, these amounts are included with settlement variation for processing at each settlement cycle.

One additional important note regarding position processing for eroding contracts. If a position is liquidated prior to final settlement, it must be kept in the system as a zero-quantity position for at least one additional erosion processing day, so that the final erosion quantity calculated on the following day can be banked.

The last day of trading for an eroding contract is typically the second-to-last business day of the contract month, and the final settlement date is the first business day of the next month. The last peak day erodes on the last business day of the contract month. So on the final settlement date – the first day off the new month – the erosion adjustment consists only of the final erosion adjustment for that last peak day. And on the morning of the next day, the position may be adjusted to zero as any cash-settled future would be.

### Erosion file location

Erosion files are available at ftp.cmegroup.com/pub/span/data/nym.

A typical filename is **nym.erosion.20090810.txt,** being the file published on August 10 for use in bookkeeping processing on August 10. And the latest file is always available named **nym.erosion.txt**.

### Erosion file layout

The layout for the positional-format erosion file is provided below. CME Clearing will be adding two new fields to the end of each record. These will provide the dates for which the end-of-day positions should be taken for the pending and final adjustment calculations, respectively.

### For more information

For more information please contact CME Clearing at 312-207-2525.

## Erosion File Layout

| Field Name | Length | From | To | Data Type | Example | Further explanation |
|---|---|---|---|---|---|---|
| Erosion business date | 8 | 1 | 8 | N | 20030603 | File is published in the late afternoon on this date |
| Product code | 5 | 9 | 13 | AN | JM | |
| Contract period code | 8 | 14 | 21 | N | 20030600 | Provided as **00** for day for standard monthly contract |
| Erosion start date | 8 | 22 | 29 | N | 20030602 | First business date on which erosion processing is done for this contract |
| Erosion end date | 8 | 30 | 37 | N | 20030701 | Last business date on which erosioin processing is done for this contract |
| Total quantity | 2 | 38 | 39 | N | 21 | Original number of peak days in the contract month |
| Daily contract value factor | 5 | 40 | 44 | N | 00040 | CVF per peak day |
| Current quantity | 2 | 45 | 46 | N | 19 | Number of peak days on the current business date |
| Pending quantity | 2 | 47 | 48 | N | 01 | Number of peak days for pending adjustment calculation – either zero or one, always |
| Final quantity | 2 | 49 | 50 | N | 01 | Number of peak days for final adjustment calculation – either zero or one, always |
| Price decimal locator | 1 | 51 | 51 | N | 2 | Implied decimal places in prices |
| Settlement price sign | 1 | 52 | 52 | AN | + | Sign for the contract's current day settlement price |
| Settlement price | 7 | 53 | 59 | N | 0005286 | Contract's current day end-of-day settlement price |
| Previous settlement price sign | 1 | 60 | 60 | AN | + | Sign for the previous end-of-day settlement price |
| Previous settlement price | 7 | 61 | 67 | N | 0005253 | Contract's previous day end-of-day settlement price |
| Pending daily marking price sign | 1 | 68 | 68 | AN | + | Sign for the pending price |
| Pending daily marking price | 7 | 69 | 75 | N | 0005400 | Mark-to price for pending cash adjustment |
| Pending per-contract adjustment amount sign | 1 | 76 | 76 | AN | + | Sign for the pending adjustment amount |
| Pending per-contract adjustment amount | 7 | 77 | 83 | N | 0005880 | Pending cash adjustment amount per one long contract at the end of the previous erosion business date |
| Previous pending daily marking price sign | 1 | 84 | 84 | AN | + | Sign for the previous pending price |
| Previous pending daily marking price | 7 | 85 | 91 | N | 0005580 | Mark-from price for the final cash adjustment |
| Final daily marking price sign | 1 | 92 | 92 | AN | + | |
| Final daily marking price | 7 | 93 | 99 | N | 0005699 | Mark-to price for the final cash adjustment |
| Final per-contract adjustment amount sign | 1 | 100 | 100 | AN | + | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Final per-contract adjustment amount | 7 | 101 | 107 | N | 0004760 | Final cash adjustment amount per one long contract at the end of the second previous erosion business date |
| Next day quantity | 2 | 108 | 109 | N | 18 | Number of peak days in the contract on the next clearing business date |
| Next erosion business date | 8 | 110 | 117 | N | 20030604 | Next clearing business date on which erosion processing is performed |
| Pending position date | 8 | 118 | 125 | N | 20030604 | Business date for which the ending position should be taken for the pending adjustment calculation – **new field to be added** |
| Final position date | 8 | 126 | 133 | N | 20030603 | Business date for which the ending position should be taken for the final adjustment calculation – **new field to be added** |