**LCH.CLEARNET**

# Margining Overview for EnClear

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|---|---|
| **Department:** | **Risk Management** |
| **Document Type:** | **Guide** |
| **Issue no.:** | **2.2** |
| **Issue Date:** | **February 2011** |

# Document History

| Date | Version | Author | Summary of Changes |
|------|---------|--------|--------------------|
| 18 April 2008 | 0.1 | Paul Kirkwood | First draft |
| 28 April 2008 | 0.2 | Paul Kirkwood | Second draft |
| 13 May 2008 | 1.0 | Paul Kirkwood | Version issued |
| 24 March 2010 | 2.0 | Natalie Michalakis | Updated option contracts changes (discount rate) |
| 09 August 2010 | 2.1 | Paul Kirkwood | Updated for new contracts |
| 04 February 2011 | 2.2 | Joseph Thompson | Updated for new Coal Swap Options |

# Contents

# 1.Introduction

As part of the EnClear service, OTC Freight and OTC Emissions contracts and commodity contracts such as Coal, Fertilizer and Steel can be traded and, as such, are cleared by LCH.Clearnet. In order to protect itself against the risks assumed as a central counterparty LCH.Clearnet establishes margin requirements for each contract.

One of the main components in calculating the level of initial margin required by LCH.Clearnet is London SPAN (**S**tandard **P**ortfolio **An**alysis of Risk). SPAN looks at a member's portfolio and takes into account any inter-month or inter-commodity held by the member.  These components are explained in more detail within this document.

This document will use several examples to explain how LCH.Clearnet margins on Freight contracts.
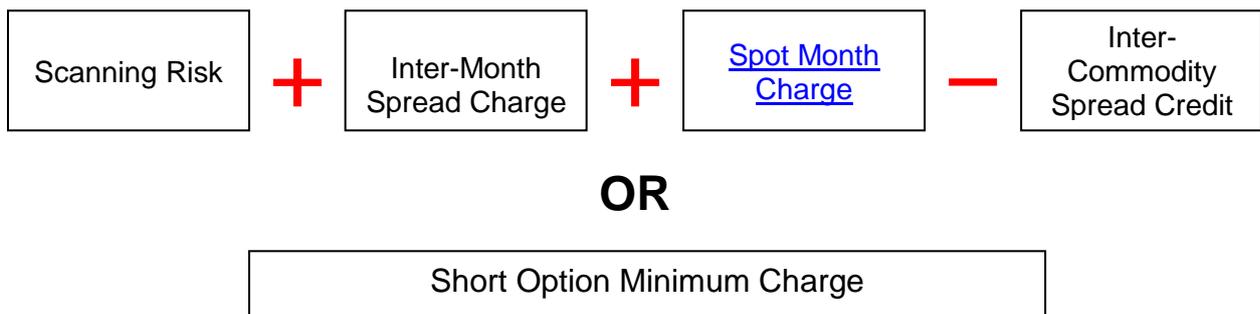
**Margining**

As central counterparty to its members' trades, LCH.Clearnet Limited is at risk from the default of a member. To limit and cover such potential loss in the event of a default, LCH.Clearnet Limited collects margin on all open positions and recalculates members' margin liabilities on a daily basis. There are two major types, **Initial Margin (IM)** is the deposit required on all net positions and is returned by LCH.Clearnet Limited to members when positions are closed, **Variation Margin (VM)** is members' profits or losses that are calculated daily from the market-to-market close value of their open position.

**London SPAN**

London SPAN is a portfolio based margining system that incorporates both futures and options, and calculates the net Initial Margin requirement. There are three major inputs to the London SPAN margin calculation - Positions, Prices and Parameters (determined by LCH.Clearnet Ltd and reviewed on a continual basis). A change to any one of these will result in a change to the margin requirement.

**Initial Margin Calculation**

London SPAN uses the following calculation to work out the initial margin requirements.  It is the maximum of:

| Scanning Risk | **+** | Inter-Month Spread Charge | **+** | Spot Month Charge | **–** | Inter-Commodity Spread Credit |
|---|---|---|---|---|---|---|

## OR

| Short Option Minimum Charge |
|---|

This document will provide more detail about the various sections of the Initial Margin calculation, with examples to help explain how SPAN evaluates portfolios to establish the required margin amount.

## Calculating margin rates

LCH Clearnet Ltd has a set policy to enable it to set margin rates. To calculate outright margin rates LCH Clearnet Ltd take into account the following factors

- Recent price movements – in particular one and two day moves
- Expected change in volatility

The main focus is on recent volatility. This includes calculating three standard deviations of the higher of the one-day or two-day price moves each day. However, we will take into account expected change in volatility. This could be an increase or decrease based on seasonality, political or other factors.

Margin rates are reviewed regularly and members are informed of any changes by means of a margin rate circular ahead of the go live date.

# 2.Variation Margin

For EnClear contracts there are two different methods of calculating Variation Margin.

**Realised Variation Margin**

For the Dry Freight contracts (for example CTC, PTC, P3A), Container Routes (for example CNW, CMD), Emissions (for example CER, EUA), Fertilizer (for example UAN, DNO), Iron Ore (TSI), Coal Swaps (AA2, AA4) and Steel (for example SCN, SST) variation margin is futures style, i.e. variation margin is realised every day. Profits or losses will be either credited or debited from members' relevant accounts.

**Contingent Variation Margin**

For the Tanker Voyage Routes or Wet Freight contracts (for example TD3, TC2) variation margin is contingent style. Profits or losses will only be realised at expiry. If a member has a forward loss then this has to be paid on the day it occurs. Over time if this increases then the difference will be debited from the member. If the loss decreases then the difference will be credited back to the member.

If a member has a forward profit this can be used to offset losses on other Freight contracts or can be used to offset the Initial Margin requirement on Freight contracts. If the profit exceeds other losses and the Initial Margin then it cannot be used to offset requirements for other markets.

# 3.Scanning Risk

## Scanning Risk Explained

SPAN divides contracts into groups of futures and options relating to a single underlying asset. At the first stage of calculation, London SPAN simulates how the value of a 'Portfolio' would react to the changing market conditions defined in the initial margin parameters. This is achieved by adopting a series of market scenarios and evaluating the 'Portfolio' under these conditions.

Each net position (future or option) is valued with the appropriate array (sixteen scenarios consisting of implied volatilities increasing or decreasing by set percentages according to risk management parameters, and futures prices increasing or decreasing by proportions of the futures scanning range). These arrays are then combined, effectively netting losses and profits across a product (CTC and corresponding CTO options are combined, however, Coal options do not carry netting benefits and will be margined independent of their underline swap contracts i.e. AA2 and AA4), enabling London SPAN to determine which is the worst loss scenario for the 'Portfolio'. This is referred to as the Scanning Risk.

*All the current price (scanning range) and volatility parameters are available on LCH.C website and are held in the published margin circulars. The website also has a history of historic margin circulars.*

## Tiered Scanning Ranges

In order to better reflect the variable price volatility along the entire length of the curve, LCH.C allows different Scanning Ranges to be set using a tier structure (see Table 1). Each tier has a discount rate applied.

Below is an example of the discount rates that would be set. E.g. Outright CTC contracts from Apr 09 onwards would only be charged 44% of the $31,000 scanning range.
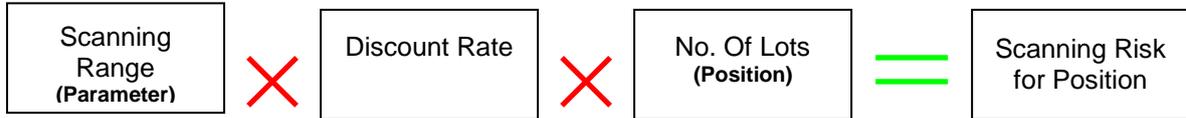
Table 1

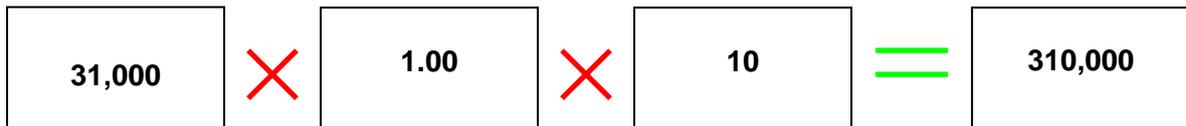| Contract Code | Contract | Scanning Range | Discount Rate / Tier Structure* | | | | |
|---|---|---|---|---|---|---|---|
| | | | Tier 1 | Tier 2 | Tier 3 | Tier 4 | Tier 5 |
| CTC | Dry Timecharter Basket Route CTC | $31,000 | 1.00 | 0.97 | 0.92 | 0.67 | 0.44 |
| | | | Apr 08 to Jun 08 | Jul 08 to Sep 08 | Oct 08 to Dec 08 | Jan 09 to Mar 09 | Apr 09 onwards |
| PTC | Dry Timecharter Basket Route PTC | $14,000 | 1.00 | 0.98 | 0.98 | 0.82 | 0.59 |
| | | | Apr 08 to Jun 08 | Jul 08 to Sep 08 | Oct 08 to Dec 08 | Jan 09 to Mar 09 | Apr 09 onwards |
| STC | Dry Timecharter Basket Route STC | $9,000 | 1.00 | 0.94 | 0.90 | 0.82 | 0.56 |
| | | | Apr 08 to Jun 08 | Jul 08 to Sep 08 | Oct 08 to Dec 08 | Jan 09 to Mar 09 | Apr 09 onwards |

## Scanning Range Example 1. Simple Futures Position

For this example a Long 10 Dry Timecharter Basket Route CTC Future position will be used.

Calculating the Initial Margin for a single futures position is relatively straightforward as it is the Discounted Scanning Range (set by LCH.Clearnet Ltd) multiplied by the number of lots:

| Scanning Range (Parameter) | ✕ | Discount Rate | ✕ | No. Of Lots (Position) | = | Scanning Risk for Position |
|---|---|---|---|---|---|---|

So:

| 31,000 | ✕ | 1.00 | ✕ | 10 | = | 310,000 |
|---|---|---|---|---|---|---|

These figures can be found on the *Summary Value Losses* report (Figure 1), where the scanning risk for the position (310,000) is the worst possible scenario from the risk array.

As this example uses only one simple future position, the initial margin required is the scanning risk for the position, in this case 310,000.

*The setup of the Freight contracts is such that the Scanning Range appears 100 times larger than that on the margin rate circular, as highlighted in the upper green box in figure 1. The delta of the position is 100 times smaller. This ensures that the result of the calculation is still correct.*

Figure 1
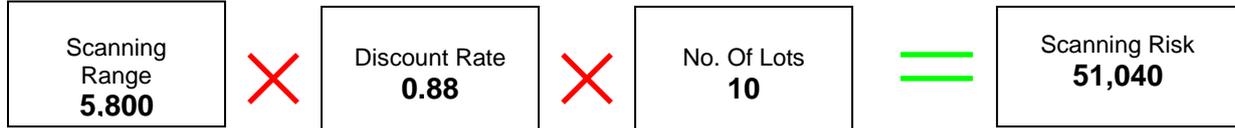
## Scanning Range Example 2. Multiple Futures Positions

In this example two positions in different contracts are now held, 10 long April 10 Dry Timecharter Basket Route PTC and 10 long May 10 Dry Timecharter Basket Route STC. (See Table 1 for applicable discount rates and scanning ranges)

The calculations for this example are as follows:

**PTC**

| Scanning Range **5.800** | $\times$ | Discount Rate **0.88** | $\times$ | No. Of Lots **10** | $=$ | Scanning Risk **51,040** |
| --- | --- | --- | --- | --- | --- | --- |

**STC**

| Scanning Range **3,600** | $\times$ | Discount Rate **0.84** | $\times$ | No. Of Lots **10** | $=$ | Scanning Risk **30,240** |
| --- | --- | --- | --- | --- | --- | --- |
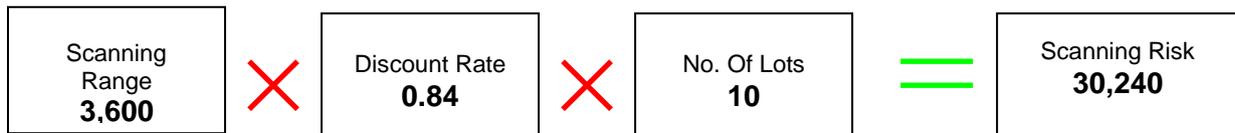
These resultant figures can be seen on the *Summary by Value Losses* SPAN report, and the initial margin requirements in their specific currencies, can be found on the *Summary by Margin Group report,* both below. Positive values in these reports are losses to the member/client.

Figure 2

*NB Figures for volatility up and volatility down are the same since a move in volatility has no effect on futures positions*

Figure 3
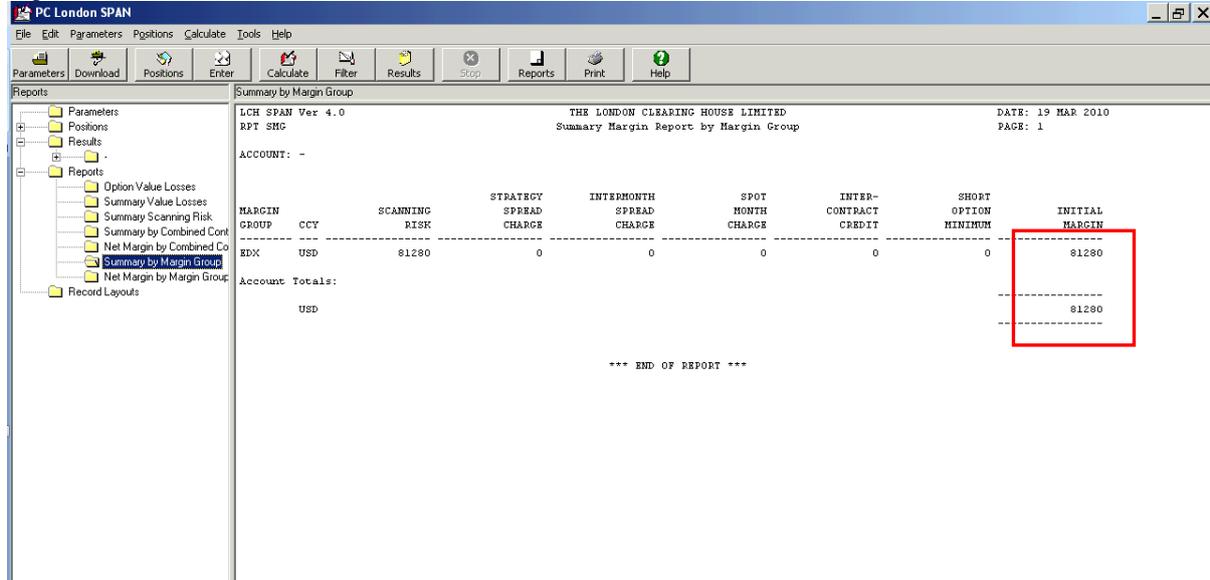


In this case both contracts are in USD, so there is only one margin figure.

It can be seen that an outright long or short futures only position (or combination of both) will only ever show a maximum loss in either the F –3/3 or F+3/3 scenario column i.e. a maximum scanning range move

## Scanning Range Example 3. Options Positions

Options margining involves more calculations. In this example we will hold three long Dry Timecharter Basket Route CTC (CTO) positions, one in-the-money (ITM) call, one at-the-money (ATM) call and one out-of-the-money (OTM) call.

| Delta for ITM Position **0.998** | + | Delta for ATM Position **0.5136** | + | Delta for OTM Position **0.0145** | — | Total Delta for Positions **1.5261** |
| --- | --- | --- | --- | --- | --- | --- |
| IM for ITM Position **30,898** | + | IM for ATM Position **5,844** | + | IM for OTM Position **12** | — | Total IM for Positions **36,754** |

The Initial Margin for each position varies depending on how 'in' or 'out' of the money it is. In this example the 'in the money' position will behave almost the same as a future and this is reflected in the delta being almost 1, with the Initial Margin requirement being very similar as that for a future position, 31,000. The 'out of the money' position has a delta of 0.0145, and a very small initial margin requirement of 12.

N.B. The Delta is drawn from the theoretical options pricing model and it shows the rate of change in an option premium, with respect to a change in the underlying asset or security.

The Initial Margin requirement is the sum of initial margins for each position. This can be seen on the *Option Value Losses* report, where the IM for each position is the worst-case scenario indicated, and the sum of these is the total IM.

Figure 4
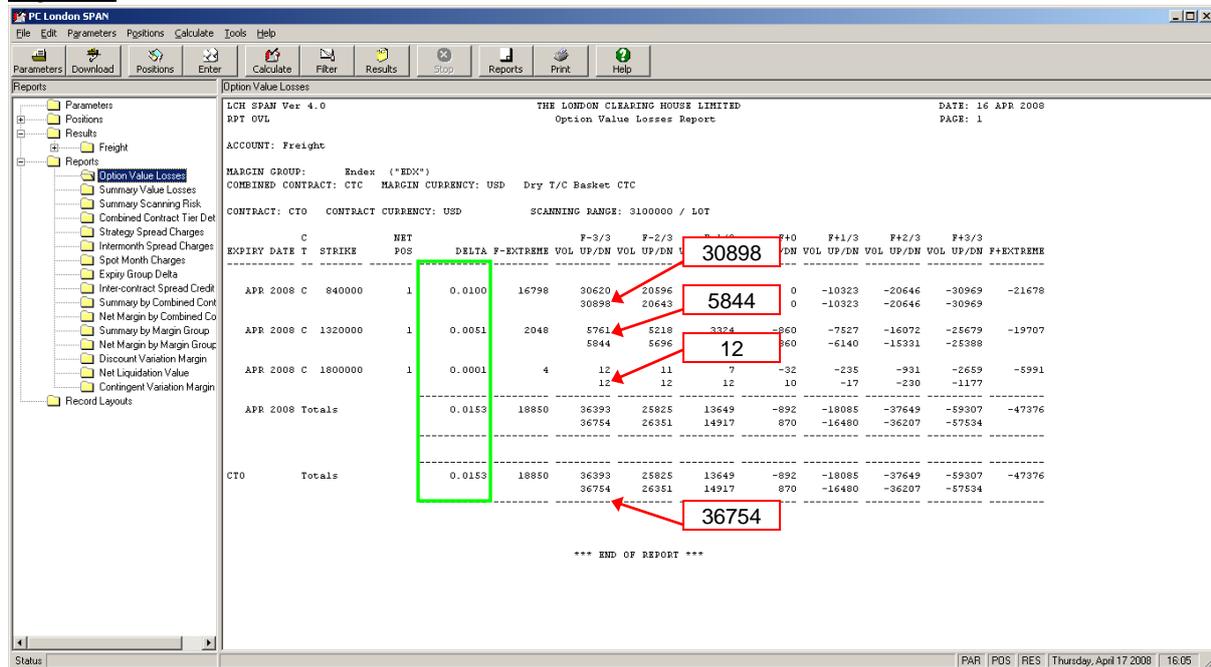


NB In Figure 4, it can be seen that because the contracts are options that for each scenario the value calculated for volatility up and volatility down are different. SPAN will treat all 16 scenarios separately and net all values accordingly. In the example above because all the positions are long options SPAN has identified volatility down, price down scenario as being the largest loss scenario.

# 4.Intermonth Spread Charge

When calculating the scanning risk, London SPAN assumes that futures prices move by exactly the same amount across all contracts months; therefore, a long position in one month exactly offsets a short position in another month.

Since futures prices do not correlate exactly across contract months, gains in one month may not exactly offset losses in another and vice versa. Therefore, 'portfolios' face inter-month price risk. London SPAN calculates an <u>inter-month spread charge</u> to cover this risk.

**Intermonth Spread Charge Example 1.**

The example below uses two offsetting positions in months, 10 long July 10 Dry Timecharter Basket Route CTC Futures, and 10 short October 10 Dry Timecharter Basket Route CTC Futures.

The amount of delta where the Intermonth charge can be applied is multiplied by the current rate charge:

   July 10 (5.2) – October 10(4.6) = 0.6

So 4.6 of this delta will be used for an Intermonth spread, and 0.6 is left as a net delta position.

This net delta position is multiplied by the Scanning Range of 10,000 to give a Scanning Risk of 6,000 (see Figure 5).

Figure 5
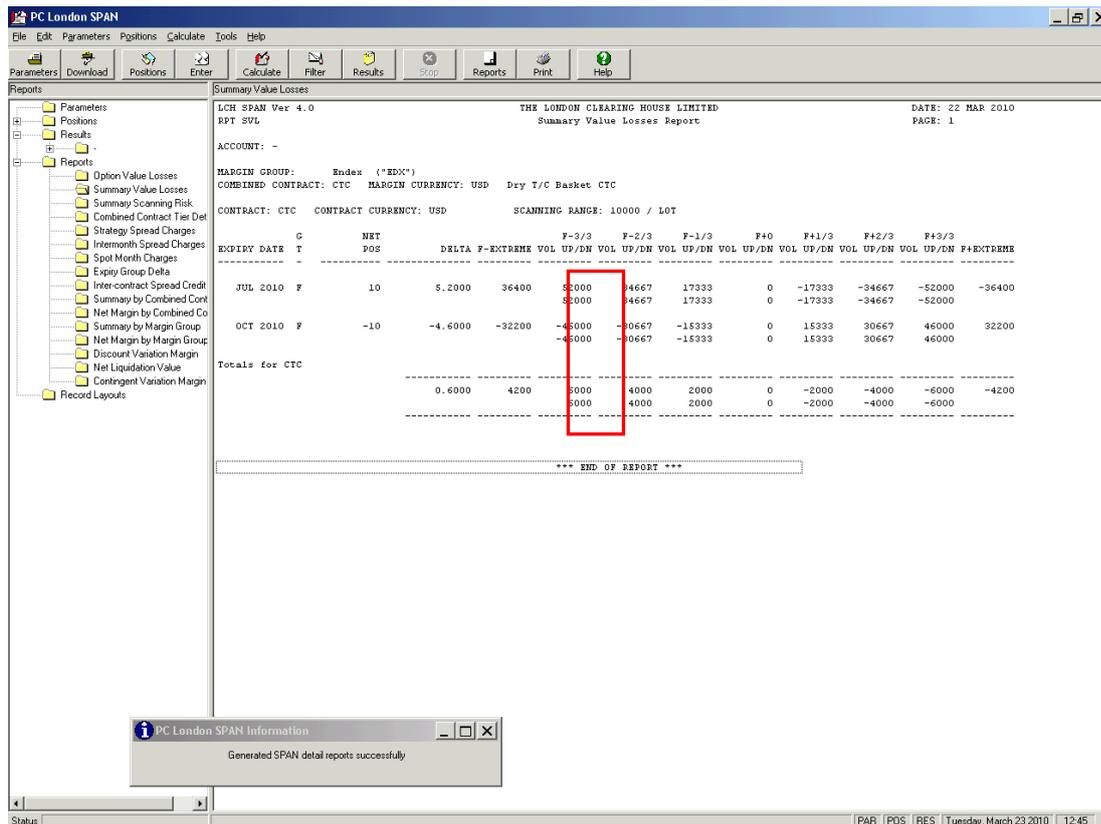
This leaves a spread position of 4.6 lots, which is multiplied by the Intermonth Spread Charge of 5,360 (Parameter set by LCH.C and available with other rates in margin circular)

4.6 * 5,360 = 24,656

This information is contained in the *Intermonth Spread Charges* report. (See Figure 6)

Figure 6



The total Initial Margin is therefore the sum of these two numbers:
6,000 + 24,656 =30,656.

The summing of these two figures can be seen in Figure 7, in the Summary Margin Report by Margin Group.

Figure 7

# 5.Intercommodity Spread Credit

In certain cases, offsets in respect of different contracts are allowed across 'portfolios'. The inter-commodity spread credits recognise cases where offsetting positions in price-related but discrete contracts reduce overall portfolio risk. The offset reduces the amount of margin required on the spread position.

The Intercommodity credit is merely a saving, or reduction, made on the scanning range charge. The Intercommodity spread credit calculation can be seen below.

**Inter-Commodity Spread Credit =**

| Weighted Futures Price Risk (Scanning Range) | ✕ | Spread Credit Rate | ✕ | No. of Spreads | ✕ | Delta Spread Ratio |
|---|---|---|---|---|---|---|

**Intercommodity Spread Credit Example 1. Two Offsetting Positions**

For this example two offsetting positions are held in different contracts, these are 10 Long April 08 Dry Timecharter Basket Route CTC Futures, and 10 Short April 08 Dry Timecharter Basket Route PTC Futures. SPAN recognises that these positions offset one another, and calculating the Intercommodity spread credit would be as follows.

Figure 8

| CTC: 31,000 PTC: 14,000 | X X | 10 10 | X X | 1 1 | X X | 0.55 0.55 | = | 170,500 77,000 |
|---|---|---|---|---|---|---|---|---|
| Scanning Range | | No. Of Spreads | | Delta Spread Ratio | | Spread Credit Rate | | |

Figure 8

**No. Of Spreads**

Number of spreads that can be applied to long and short 10 lots in CTC and PTC. As the delta ratio is 1:1, this is 10 (10/1 = 10). If the delta ratio is not 1:1 then this will be lower of the two numbers
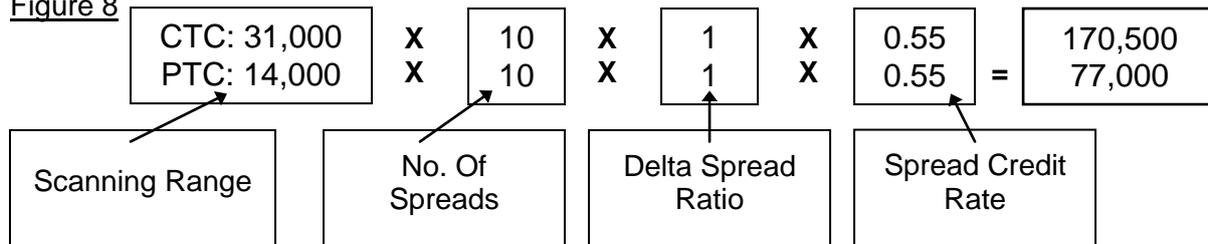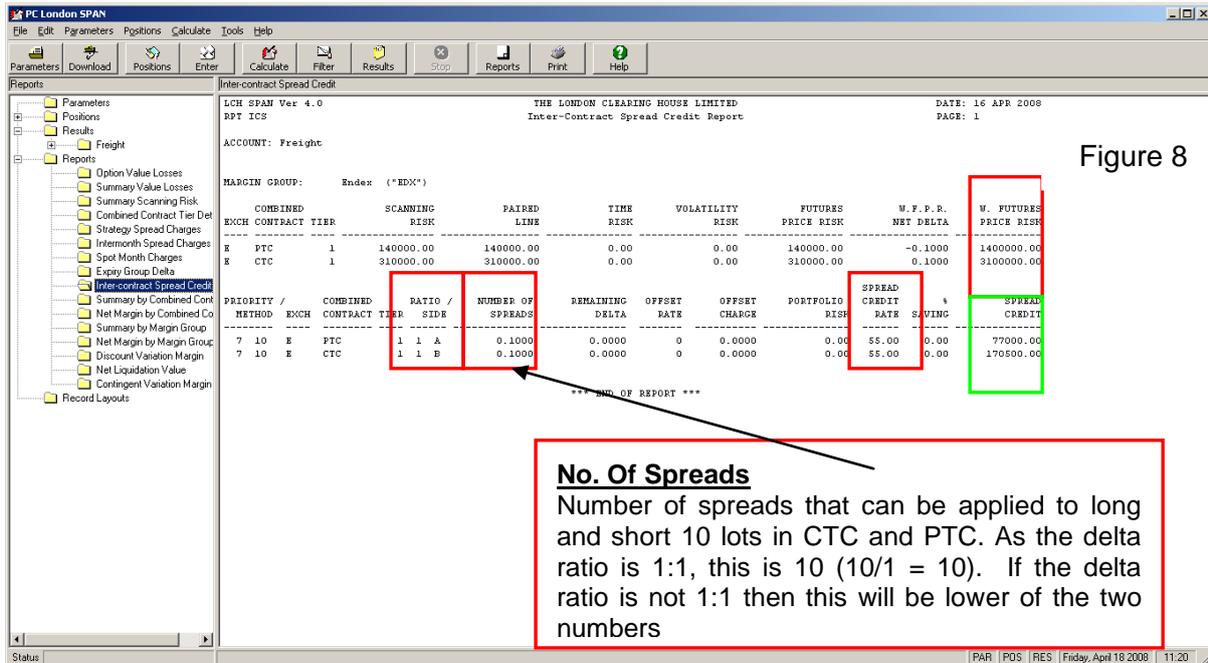
This saving is then subtracted from the Scanning Risk for the outright position, as can be seen on the *Summary by Margin Group (Figure 9)* report below, to produce the required Initial Margin for holding both of the positions.

Figure 9
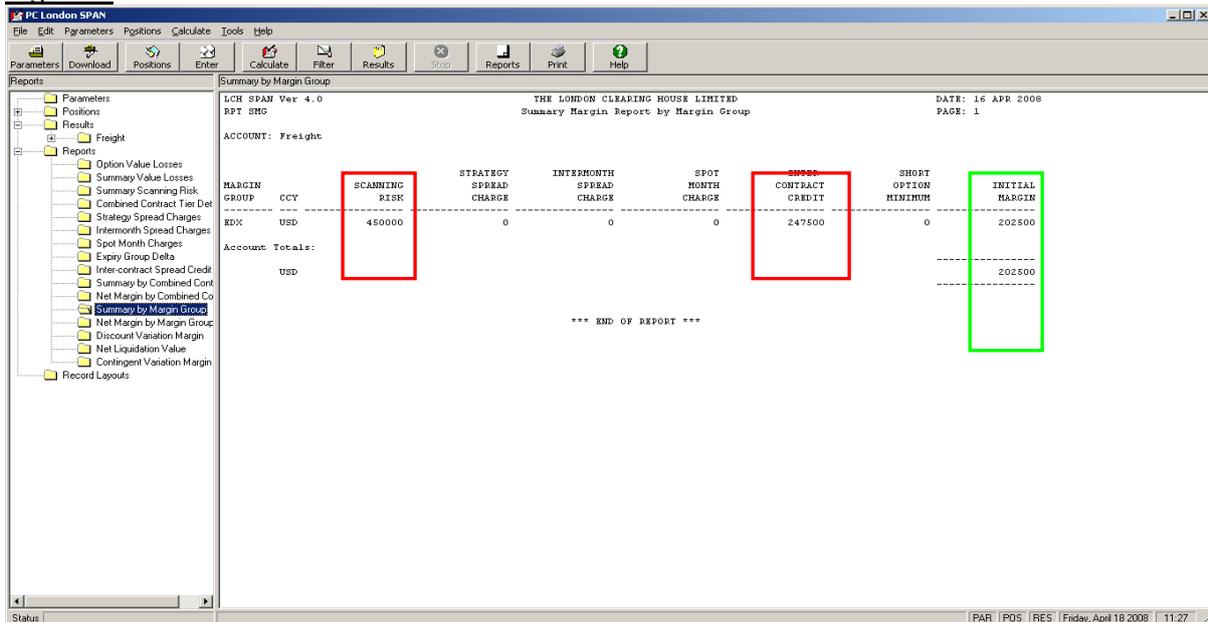


## Intercommodity Spread Credit Example 2. Multiple Positions

Much like with the Intermonth charge, SPAN will always attempt to levy the lowest charge, or in the case of Intercommodity positions, the highest spread credit saving. This is illustrated in the example below in which three positions are held, 50 Long Apr 08 Dry Timecharter Basket Route CTC Futures, 30 Short Apr 08 Dry Timecharter Basket Route PTC Futures, and 20 Short Apr 08 Dry Timecharter Basket Route STC Futures.

SPAN will always apply the highest saving first, which in this case is when CTC offsets PTC, a 55% credit saving (the saving between CTC and STC is only 45%). This can be seen in Figure 10.

Figure 10
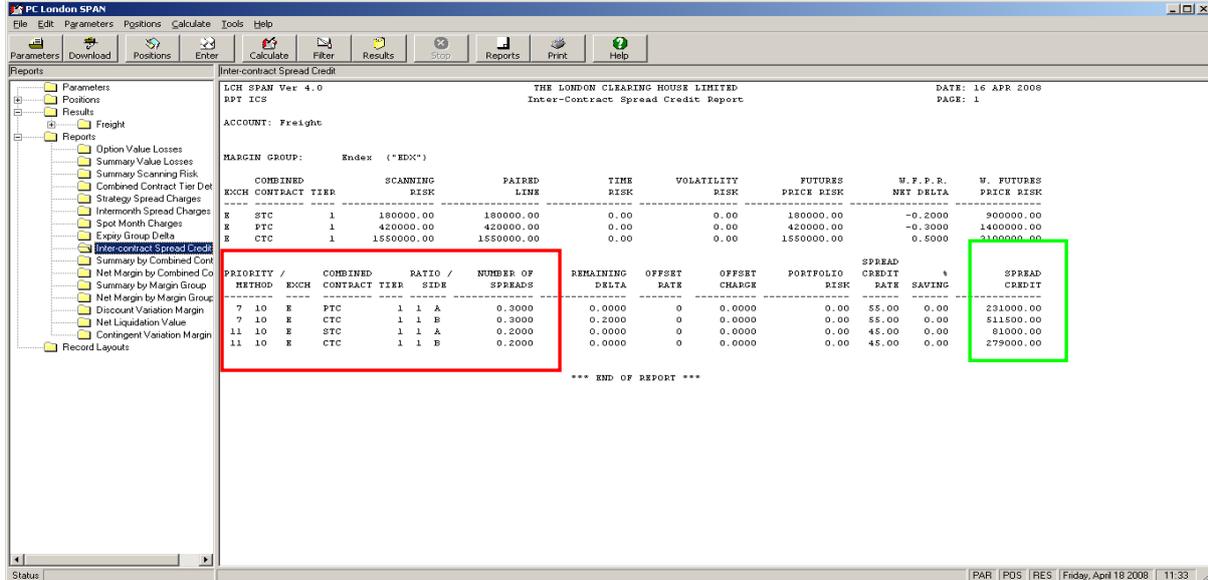
# 6.Short Option Minimum Charge

Certain option 'portfolios' may show zero or minimal risk when assessed using SPAN. In these cases, SPAN requires a minimum charge for each net short option. The charge sets an absolute minimum margin for the portfolio. If the short option minimum charge is lower than the total initial margin calculated, then the short option minimum charge is ignored. This is generally the case with most option portfolios.

**Short option minimum charge =** net short position x short option minimum charge.

### Short Option Minimum Charge Example

In this example 10 deep out of the money Short Puts are held. The delta value for the position is 0. There is no Scanning Risk produced from the scenarios, however the Short Option Premium is the IM requirement for the trade.

Figure 11
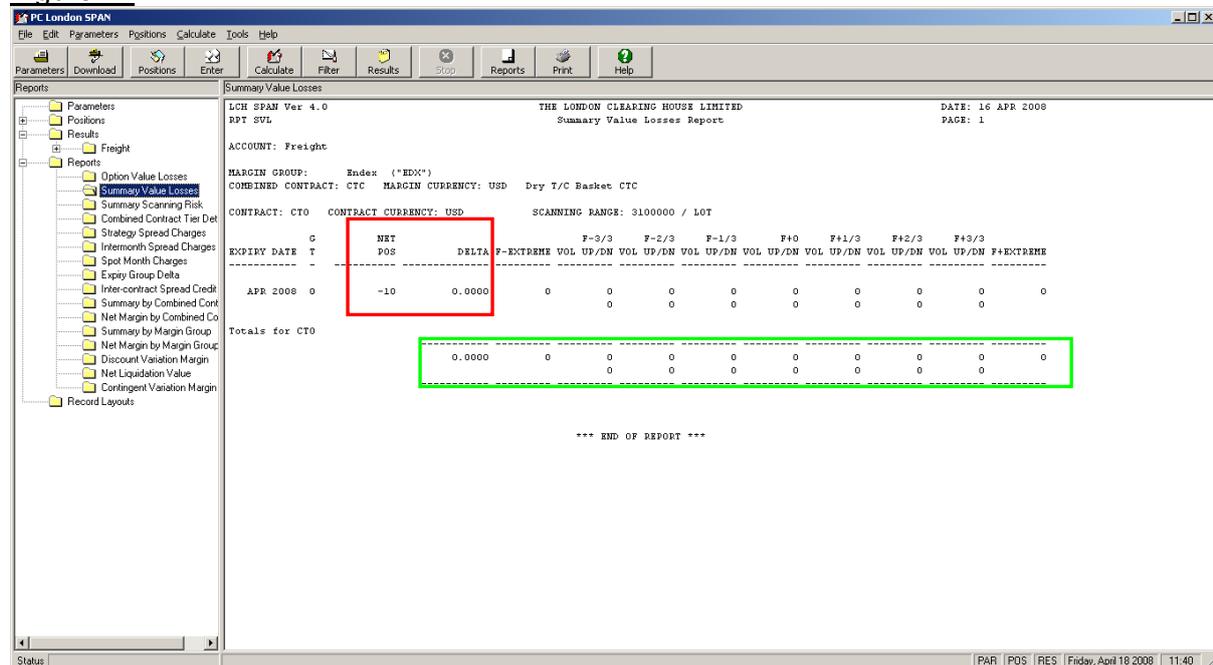


When looking at the *Summary Value losses* report (Figure 11), the total delta is 0, with the worst-case loss also being 0. So, no Initial Margin is required on this position, as there appears to be no risk. However, no position is risk free, and as such, SPAN levies the short option minimum charge of 10 (1 X 10 short options held) to cover any potential losses. This can be seen below in the *Summary by Margin Group (Figure 12)* report.

Figure 12



As can be seen, the Scanning Risk for the position is 0, so SPAN has charged 10 for the 10 short options held.

# 7. EnClear Options

**Net Liquidating Value (NLV)**

EnClear options are premium paid-up-front style. The concept of NLV is introduced to enable LCH.Clearnet Limited (LCH.C) to close out a position in the event of a default.

The NLV calculation is:
**Net Liquidation Value =** *Price of option x Contract Size x Number of lots.*

For the buyer of an option, as they will pay the premium on trade date to the seller, SPAN will calculate NLV, which is the value of the option, and will be a credit for the buyer of an option. SPAN will calculate an Initial Margin figure for the position and will offset the Initial Margin with the credit NLV and so the Net Margin will be zero.

The reverse occurs for the seller of the option who will receive the premium on the trade date but will also be required to pay Initial Margin as calculated by SPAN. In the event of a default LCH.C would have to go into the market and buy an option to trade out of the position. Therefore the seller also has to pay the NLV to cover this risk.

*For more information of this please see the Margining Equity Style options document on the LCH.C website.*

**Entering EnClear options into PC London SPAN**

The setup of the EnClear contracts is such that the strike prices in the SPAN Parameter file are 10 times larger, i.e. a 150000 call needs to be entered as 1500000. For the expiry you should not enter the exact date of the expiry, but just the month and year. An example is given below.

Figure 13
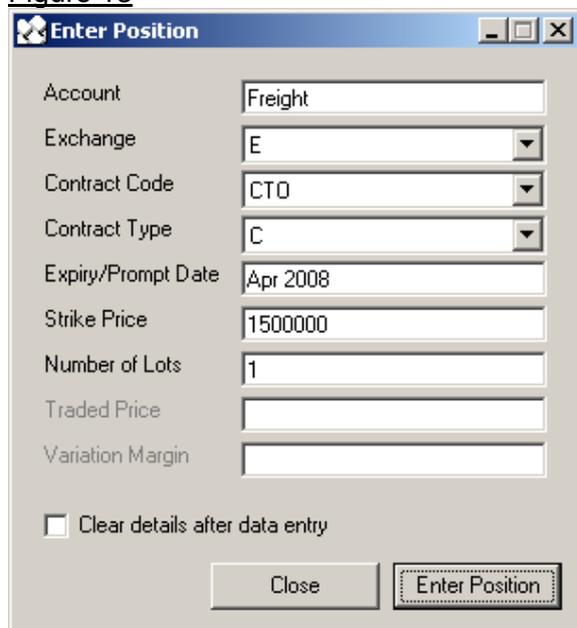
Since the entire universe of strikes is not generated every night (only those currently with open positions and those within a certain proximity to the ATM strike (see contract specs for details)), a SPAN user may want to find out what strike prices are available. The EnClear SPAN Parameter file can be opened and then searched for the relevant option code and below this will be all the delivery months and prices. The Parameter file is downloadable from the LCH.C website.

Figure 14



## Finding Option Strikes

To find a an option strike in the parameter file, firstly, use the Control and Find function i.e. Ctrl+F. Below indicates what must be typed in order to find the strikes for the corresponding option contracts.

CTO – Enter 40CTOO
PTO – Enter 40PTOO
STO – Enter 40STOO
HTO – Enter 40HTOO
A2C – Enter 40A2CO
A2Q – Enter 40A2QO
A4C – Enter 40A4CO
A4Q – Enter 40A4QO

Below is an example of how to find the Strike, Option Value (NLV) and scanning range for a PTO Call MAR11 delivery.

```
40PTOODry TC Bskt Rte PTC USD    10    1      0.10000    1.00    1    10  290001

50201103001.000000  0.08  0.08  120110300

60   40000C     1  105766 0.999300     0     0  -9659  -9659  9660   9660 -19319 -19319 19320  19320 -28979 -28979 28980  28980 -20286 20284
60   40000P     1      0 0.000000     0     0     0      0      0      0     0      0     0      0     0      0     0      0     0     -2
```

Delta

NLV (option value)

Strike

Scanning Range

1. Search 40PTOO, this will bring you to the desired Option.
2. Scroll down to 50YYYYMM001.000000 for the relevant delivery month.
3. Scroll down to rows 60 and find the relevant strike (strikes are scaled up 10 times along with the NLV and scanning ranges).

# 8. Coal Swaps Options

**Margin Rates**

Initial margin rates for coal swaps options will be set in line with the corresponding underline contract.

These options will be margined like the other Freight options available to trade, therefore premium is paid-up-front style. The concept of NLV is introduced to enable LCH.Clearnet Limited (LCH.C) to close out a position in the event of a default.

Coal swaps options carry their own contract codes depending on what expiry/duration of contracted is traded. See the below table.

| Contract | Contract Series | Contract Code |
|---|---|---|
| API 2 Option | Quarter | A2Q |
| API 2 Option | Calendar | A2C |
| API 4 Option | Quarter | A4Q |
| API 4 Option | Calendar | A4C |

These contracts are *independent* of their underline and therefore will not benefit from delta netting. That is SPAN will not calculate a benefit from +10 AA2 Swaps and -10 A2Q Swap Options. However, an inter-commodity spread credit will be incorporated, giving a discount on Initial Margin requirement.

This example shows a short/sell Call option position for A2C and a long/buy position for AA2. That is, -1 A2C Call options and +12 AA2 futures. We can see that they are independent of each other and therefore the scanning risk will look to be charged independently. However, SPAN will calculate that there is a correlation between the two contracts and will therefore offer an inter-commodity spread credit.

```
MARGIN GROUP:      Endex  ("EDX")
COMBINED CONTRACT: A2C   MARGIN CURRENCY: USD   Coal AA2 Cal Options

CONTRACT: A2C   CONTRACT CURRENCY: USD        SCANNING RANGE: 9000 / LOT    Coal AA2 Cal Options

             G         NET                      F-3/3      F-2/3      F-1/3      F+0    F+1/3      F+2/3      F+3/3
EXPIRY DATE  T         POS          DELTA F-EXTREME VOL UP/DN VOL UP/DN VOL UP/DN VOL UP/DN VOL UP/DN VOL UP/DN VOL UP/DN F+EXTREME
-----------  -    ---------    --------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

   JAN 2012  O        -1       -11.9100   -75000   -107160    -71400    -35640        0     35760     71520    107280     75000
                                                   -107160    -71400    -35640        0     35760     71520    107280

Totals for A2C
                              ----------- --------- --------- --------- --------- --------- --------- --------- --------- ---------
                               -11.9100   -75000   -107160    -71400    -35640        0     35760     71520    107280     75000
                                                   -107160    -71400    -35640        0     35760     71520    107280
                              ----------- --------- --------- --------- --------- --------- --------- --------- --------- ---------

MARGIN GROUP:      Endex  ("EDX")
COMBINED CONTRACT: AA2   MARGIN CURRENCY: USD   Coal AA2 Swap

CONTRACT: AA2   CONTRACT CURRENCY: USD        SCANNING RANGE: 9000 / LOT

   JAN 2012  F        12        12.0000    75600    108000     72000     36000        0    -36000    -72000   -108000    -75600
                                                    108000     72000     36000        0    -36000    -72000   -108000

Totals for AA2
                              ----------- --------- --------- --------- --------- --------- --------- --------- --------- ---------
                               12.0000     75600    108000     72000     36000        0    -36000    -72000   -108000    -75600
                                                    108000     72000     36000        0    -36000    -72000   -108000
                              ----------- --------- --------- --------- --------- --------- --------- --------- --------- ---------
```

Below shows that the initial margin is discounted due to the inter-contract credit, therefore reducing a member's initial margin requirement. Just like other EnClear contracts, Coal Swap Options will have inter-commodity credits with various contracts. These rates can be found on the website on the latest margin rate circular.

```
                         STRATEGY    INTERMONTH     SPOT        INTER-      SHORT
MARGIN              SCANNING    SPREAD       SPREAD      MONTH     CONTRACT    OPTION      INITIAL
GROUP    CCY        RISK        CHARGE       CHARGE      CHARGE    CREDIT      MINIMUM     MARGIN
-------  ---  ---------------- ------------ ------------ --------- ---------------- --------- ----------------
EDX      USD       215280          0            0          0        150133          1         65147

Account Totals:
                                                                             ----------------
         USD                                                                        65147
                                                                             ----------------
```

It is also important to remember that +1 Quarter Coal Swap Option contract i.e. A2Q or A4Q will have a delta different to +1 AA2 or AA4 Swap. This is due to the contract set-up specifying that 1 contract will contain a minimum amount of lots. This differs for Quarter or Calendar contracts. Further details of the contract specification can be found on the website. Below illustrates the different delta values between; +1 AA2 Coal Swap, +1 A2Q Coal Swap Option and +1 A2C Coal Swap Option.

```
COMBINED CONTRACT: AA2    MARGIN CURRENCY: USD    Coal AA2 Swap

CONTRACT: AA2    CONTRACT CURRENCY: USD           SCANNING RANGE: 9000 / LOT

                G        NET                              F-3/3     F-2/3
EXPIRY DATE     T        POS        DELTA F-EXTREME VOL UP/DN VOL UP/DN VOL
-----------     -   ---------- --------------- --------- --------- --------- ----

   APR 2011     F        1         1.0000       6300       9000      6000
                                                           9000      6000


COMBINED CONTRACT: A2Q    MARGIN CURRENCY: USD    Coal AA2 Qtr Options

CONTRACT: A2Q    CONTRACT CURRENCY: USD           SCANNING RANGE: 9000 / LOT

                G        NET                              F-3/3     F-2/3
EXPIRY DATE     T        POS        DELTA F-EXTREME VOL UP/DN VOL UP/DN VOL
-----------     -   ---------- --------------- --------- --------- --------- ---

   APR 2011     O        1         2.9991       18900      26970     17970
                                                           26970     17970

COMBINED CONTRACT: A2C    MARGIN CURRENCY: USD    Coal AA2 Cal Options

CONTRACT: A2C    CONTRACT CURRENCY: USD           SCANNING RANGE: 9000 / LOT

                G        NET                              F-3/3     F-2/3
EXPIRY DATE     T        POS        DELTA F-EXTREME VOL UP/DN VOL UP/DN VOL
-----------     -   ---------- --------------- --------- --------- --------- ---

   JAN 2012     O        1         11.9100      75000      107280    71520
```
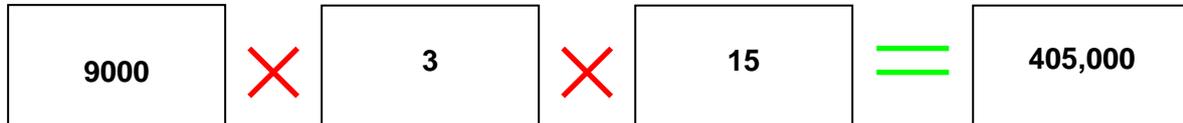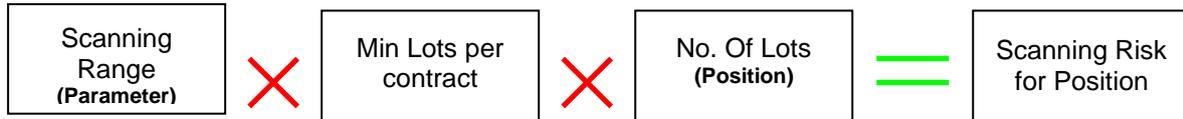
**Expiry**

Coal Swaps Options will expire into futures, this will happen for any options ITM. These contracts will expire 1 month before the end of the contract e.g. the Calendar 2012 and Q1 2012 contracts will expire on 02/12/2011.
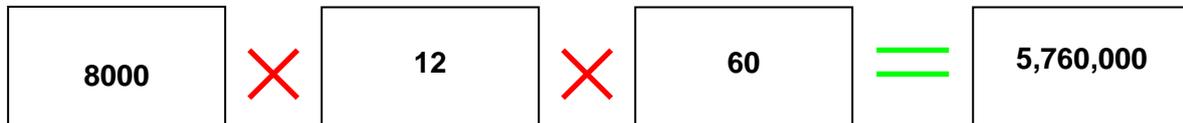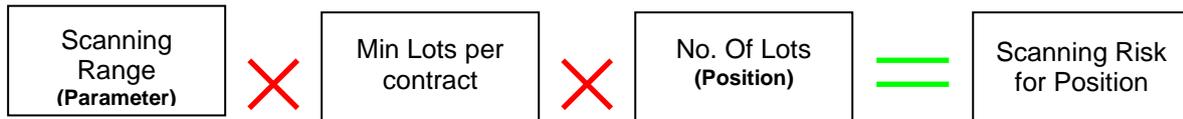
Until delivery, variation margin is futures style, i.e. variation margin is realised every day. Profits or losses will be either credited or debited from members' relevant accounts.

Below are examples of how IM for coal swap options will be calculated. Please see the contract specification on the website for a full break down of the contract series.

IM for 1 quarterly contract for API2 (AA2) option, contract code A2Q will be margined as follows:

| Scanning Range **(Parameter)** | × | Min Lots per contract | × | No. Of Lots **(Position)** | = | Scanning Risk for Position |
|---|---|---|---|---|---|---|
| **9000** | × | **3** | × | **15** | = | **405,000** |

IM for 1 calendar contract for API4 (AA4) option, contract code A4C, will be margined as follows:

| Scanning Range **(Parameter)** | × | Min Lots per contract | × | No. Of Lots **(Position)** | = | Scanning Risk for Position |
|---|---|---|---|---|---|---|
| **8000** | × | **12** | × | **60** | = | **5,760,000** |

# 9.Glossary Of Terms

**At-the-money**

An option or warrant where the exercise price is equal to the current market price of the asset subject to the option.  For example, a call option with an exercise price of 100p on a share with a share price of 100p is at-the-money.

More generally, however, an at-the-money option is an option whose exercise price is nearest to that of the underlying asset.  For example, where an option has strike prices at intervals of 10p, e.g. 90p, 100p, 110p etc, if the underlying asset has a price of 97p, the at-the-money option is the 100p strike, which is the nearest strike price to the underlying price.  See also In-the-Money.
Back

**Call Option**

An option that gives the holder the right, but not the obligation, to buy an asset at a given price on or before a given date.  See also Option.
Back

**Contract Size**

The amount of the underlying asset which one futures contract represents, e.g. the contract size for a Copper contract is 25 tonnes.  This means that underlying one Copper future is 25 tonnes of Copper, which the investor has the obligation to buy (long future) or sell (short future).

**Delta**

Drawn from the theoretical options pricing model the delta of an option shows the rate of change in an option premium with respect to a change in price of the underlying asset or security.  For example, the premium on an option with a delta of 0.5 will move by 0.5p for every 1p move in the price of the underlying.  Delta can also be defined as either (i) the probability that the option will expire in-the-money, or (ii) the theoretical number of futures contracts of which the holder is either long (with a call option) or short (put option).
Back

**Futures Contract**

A legal agreement to buy or sell a standard quantity of a specified asset for delivery at a fixed future date at a price agreed today.  Futures are traded on futures exchanges, such as Liffe (London market), ICE Futures, ICE, EDX London or the London Metal Exchange.  They are available in a range of assets, such as wheat and copper and also on indices, such as the FTSE 100.
Back

**In-the-Money**

A call option or warrant where the exercise price is below the asset price is in-the-money.
Back

**Initial Margin**

The returnable deposit paid to the Clearing House by the clearing member when entering into transactions on the cleared markets. The purpose of initial margin allows the Clearing House to hold sufficient funds on behalf of each clearing member to offset any losses incurred between the last payment of margin and the close out of clearing member's positions should the clearing member default. Initial margin is usually calculated by taking the worst probable loss that the position could sustain over a fixed amount of time, and can be paid in either cash or non-cash collateral.
Back

**Initial Margin Requirement**

The size of deposit a member must lodge with the Clearing House to cover potential losses to the Clearing House in closing out the open positions in the event of a member defaulting.
Back

**Intermonth Spread Charge**

A charge to cover the basis risk that prices of contracts (with the same underlying asset) in different delivery (prompt) months will move independently of one another.
Back

**Inter Commodity Spread Saving**

In certain cases, offsets or margin liabilities in respect of different contracts are allowed across "portfolios". The inter-commodity spread credits recognise cases where offsetting positions in price-related but discrete contracts reduce overall portfolio risk. The offset reduces the amount of margin required on the spread position.

Details of spreads allowed are available from the Clearing House Risk Management department or from frequently distributed Clearing House and exchange circulars. The Clearing House and the exchanges decide where it is justifiable, on risk assessment criteria, to allow intercontract margin offsets and set the corresponding spread credit rates. Delta spreads are calculated and then used with these parameters to calculate the inter-commodity spread credits. The calculation of inter-commodity spread credits is explained in detail in the London SPAN Technical Information Package (TIP).
Back

**London SPAN**

Standard Portfolio Analysis of Risk, a margining system used by the Clearing House to calculate initial margins due from and to its clearing members for Liffe (London market), ICE Futures, LME, LCH EnClear and RepoClear positions. SPAN is a computerised system, which calculates the effect of a range of possible changes in price and volatility on portfolios of derivatives. The worst probable loss calculated by the system is then used as the initial margin requirement.
Back

**Long Position**

Any position that has been purchased. For example, a long futures position means that you have bought a future. Contrast with Short.
Back

**Lot**

Another term for a contract.
Back

**Option**

A contract which gives the holder the right, but not the obligation to buy or sell a specified asset at an agreed price on or before an agreed date in the future. The right to buy an asset is referred to as a call option. The right to sell is referred to as a put option.
Back

**Out-of-the-Money**

A call option or warrant where the exercise price exceeds the asset price is out-of-the-money. For example, a call option on a share with an exercise price of 100p when the share price is 90p is out-of-the-money. A put option is out-of-the-money when the asset price exceeds the exercise price. For example, a put option on a share with an exercise price of 100p when the share price is 110p is out-of-the-money. See also In-The-Money and At-The-Money.
Back

**Portfolio**

The current open positions held in any futures or options contracts. If all the contracts held are based on the same underlying asset then the portfolio is more correctly known as a contract family.
Back

### Position

A long or short market commitment, an obligation, or right, to make or take delivery.

### Put Option

A contract which confers upon the holder the right, but not the obligation, to sell an asset at a given price on or before a given date.
[Back](#)

### Short Position

A term used to describe an open sold futures or options position. Also used to describe someone who sells a cash asset not previously owned. Contrast with Long (Position).
[Back](#)

### Spot Month Charge

Volatility can increase when a contract approaches the last day of trading or the day of delivery of the underlying instrument. The Clearing House covers this risk by building an additional spot month charge into London SPAN.
[Back](#)

### Underlying Futures Contract

The specific futures contract that is bought or sold by exercising an option.

### Volatility

A measure of the amount by which an underlying asset has moved or is likely to move.