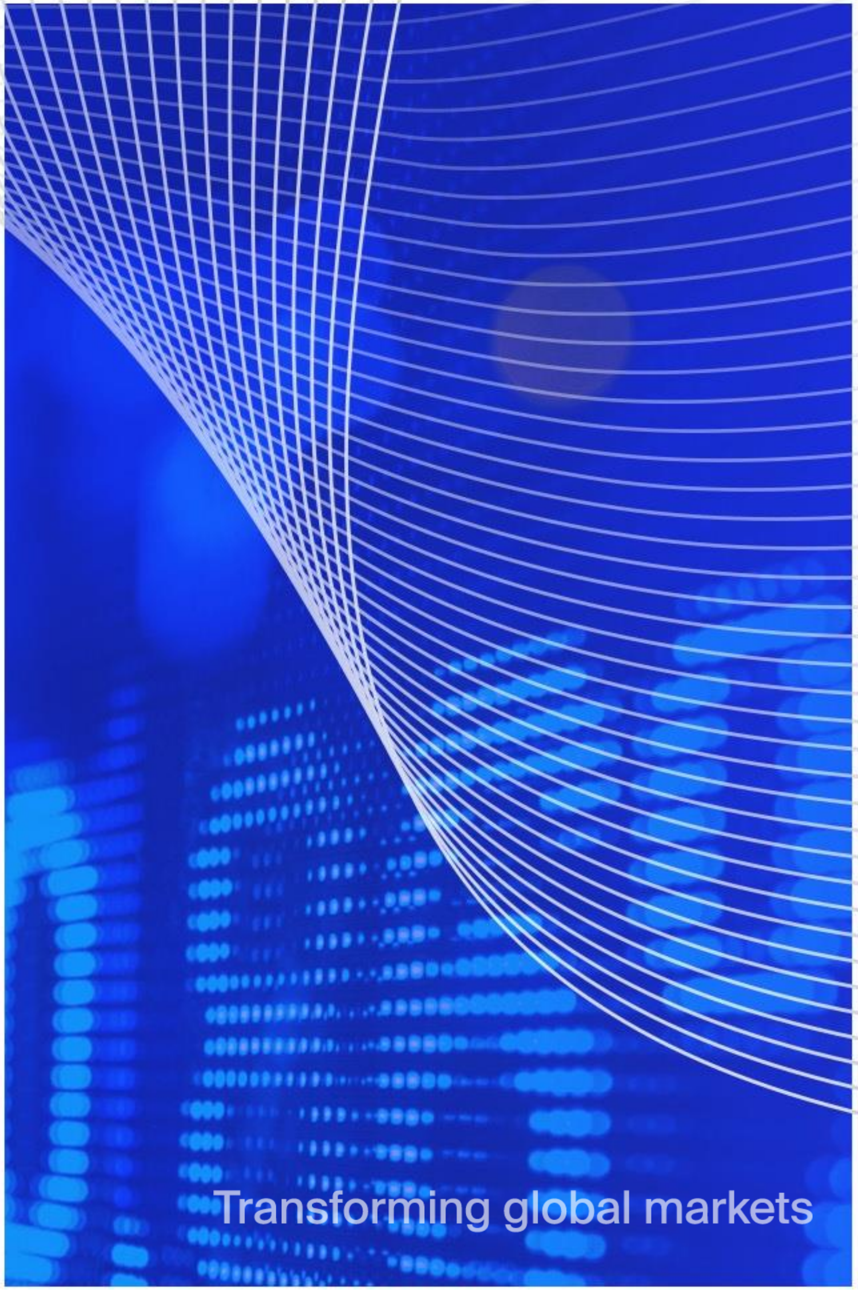
ICE CDS Clearing Margin Calculator

ICE LINK GUI

ICE CLEAR CREDIT
ICE CLEAR EUROPE



ICE CDS MARGIN SIMULATION CALCULATOR

OVERVIEW

- Buy-side institutions and their clearing counterparties may access the ICE Clear Credit LLC and ICE Clear Europe Limited ***margin risk tool*** to calculate clearing margin requirements in the ICE Link GUI
- Users can simply point and click which positions to calculate margin, whether it be ***pre-trade, hypothetical/what-if trades, or historical non-cleared trades***
- Users may also ***bulk upload*** hypothetical portfolios via spreadsheet upload for simulating different portfolio scenarios
- Single Name CDS contracts with offsetting Index contracts are calculated using the integrated spread response ***monte carlo*** risk framework
- Margin is always calculated at a ***portfolio level*** (e.g .fund/legal entity) per Clearing Broker / Futures Commission Merchant (FCM)
- The margin calculator provides users with detailed analysis of the margin details providing ***deeper transparency*** of the ICE margin methodology

ICE CDS MARGIN SIMULATION CALCULATOR

COMPONENTS – MARGIN RISK MODELLING APPROACH

		Related Exposure	Modelling Approach
Market Dynamics	Credit Spread Level Changes Recovery Rate Changes	▪ Credit spread term structure changes ▪ Recovery Rate changes	**Integrated Spread Response Risk Measures** ▪ Statistical modeling of credit spread fluctuations and recovery rate fluctuations via Monte Carlo Framework ▪ Full portfolio valuation at every simulated scenario
Market Dynamics	Interest Rate Sensitivity	▪ Interest rate term structure changes	▪ Stress loss in response to different discount curve scenarios
Market Dynamics	Basis Risk	▪ Trading behavior differences between Indices and constituents	▪ Statistical modeling of index-Single-Name basis fluctuations
Default Risk	Jump to Default	▪ Losses due to potential credit events	▪ Stress Loss-Given-Default in response to credit events related to Single Names with common majority ownership
Default Risk	Wrong Way Risk	▪ Losses due to highly (and positively) correlated potential credit events	▪ Stress Loss-Given-Default in response to credit events related to Single Names highly and positively correlated to Clearing Member
Liquidation Risk	Bid / Offer Charge	▪ Transaction costs associated with liquidation of positions/portfolios	▪ Instrument liquidation cost estimated at specific bid-offer widths ▪ Portfolio level costs estimated for hedged and directional positions
Liquidation Risk	Concentration Charge	▪ Transaction costs associated with liquidation of large positions	▪ Exponentially increasing liquidation cost with increasing position size and directionality

ICE CDS MARGIN SIMULATION CALCULATOR

MARGIN COMPONENTS – SPREAD RESPONSE RISK

- **Integrated Spread Response I**
  – Capital efficient portfolio approach to market dynamics via Copula-based Monte Carlo simulations[1,2]
  – 99.5% VaR measures[3] reflecting joint Credit Spread and Recovery Rate Profit/Loss moves
  – Margin Period of Risk (MPOR): at least 5 days
    - increased MPOR (up to 6 days) is applied to instruments/sub-portfolios that trade during market hours different from the clearinghouse's hours of operations

- **Integrated Spread Response (iSR) measures:**
  – $iSR^{(RF)}$: Associated with positions in instruments related to the same Risk Factor
  – iSR_{SP}: Associated with positions in instruments related to Risk Factors with common risk characteristics
    - NA Corporate sub-portfolio, European Corporate sub-portfolio, Western-European Sovereign sub-portfolio, Asia-Pacific sub-portfolio, etc.
    - Multi-currency benefits between NA and European corporate sub-portfolios are recognized
  – iSR_{P}: Associated with all portfolio positions introducing limits on portfolio benefits[4]
  – iSR_{IM} : Associated with all portfolio positions introducing anti-procyclical Initial Margin (IM) features[5]

(1) Stanislav Ivanov, "Initial Margin Estimations for Credit Default Swap Portfolios", Journal of Financial Market Infrastructures, Volume 5, Number 4, June 2017
(2) Andrew Patton, "A Review of Copula Model for Economic Time Series", Journal of Multivariate Analysis, Volume 110, April 2012
(3) In accordance with the Article 24 of the Commission Delegated Regulation (EU) No. 153/2013 of European Market Infrastructure Regulation (EMIR) Regulatory Technical Standards (RTS)
(4) In accordance with the Article 27 and (5) in accordance with the Article 28 of the Commission Delegated Regulation (EU) No. 153/2013 of EMIR RTS

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MARGIN COMPONENTS – SPREAD RESPONSE RISK - CONTINUED

- **Integrated Spread Response II**
  - Portfolio level iSR_{P} measure (offset benefits & limits) is computed as

$$iSR_{P} = 80\% \times \underbrace{\sum_{sP \in P} iSR_{sP}}_{\text{Full Cross-RF portfolio benefits are provided}} + 20\% \times \underbrace{\sum_{RF \in P} iSR^{(RF)}}_{\text{No Cross-RF portfolio benefits are provided}}$$

  - Final Initial Margin iSR_{IM} measure (anti-procyclical) is computed as

$$iSR_{IM} = 0.75 \times iSR_{P} + 0.25 \times \min\Big(\underbrace{iSR_{p}, SRP_{\text{Stress Events}}}_{\text{Portfolio responses to stress market events, e.g. LB default period}}\Big)$$

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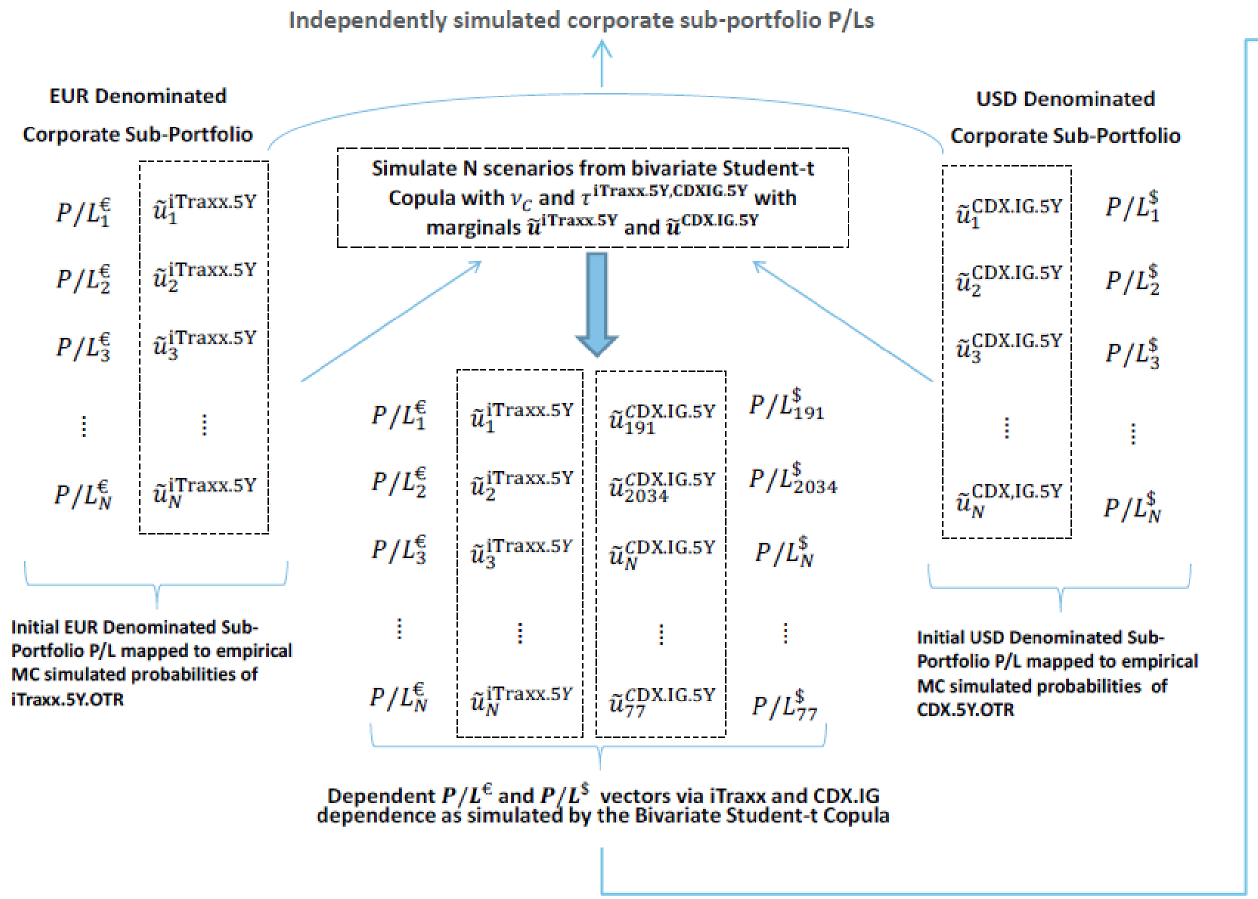
MARGIN COMPONENTS –MULTICURRENCY PORTFOLIO BENEFITS

- Multi-currency Spread Response Risk portfolio benefits among risk factor Profit / Loss vectors with applied FX conversion

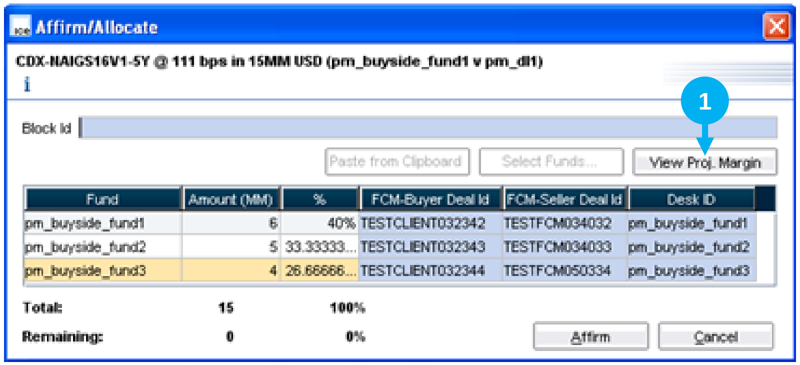


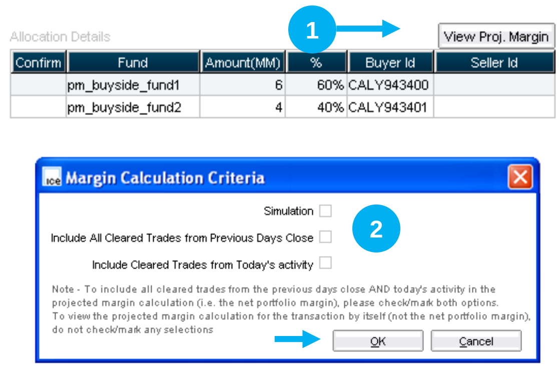
- Convert the EUR denominated P/L vector into USD denominated P/L vector and add the results to $P/L^{\$}$ vector.
- The resultant P/L vector is further used to estimate the risk measures for the EUR/USD combined portfolio of corporate instruments.
- The currency-specific $P/L^{€}$ and $P/L^{\$}$ vectors are used to estimate the risk measures for the currency-specific sub-portfolios of corporate instruments.

ICE CDS MARGIN SIMULATION CALCULATOR

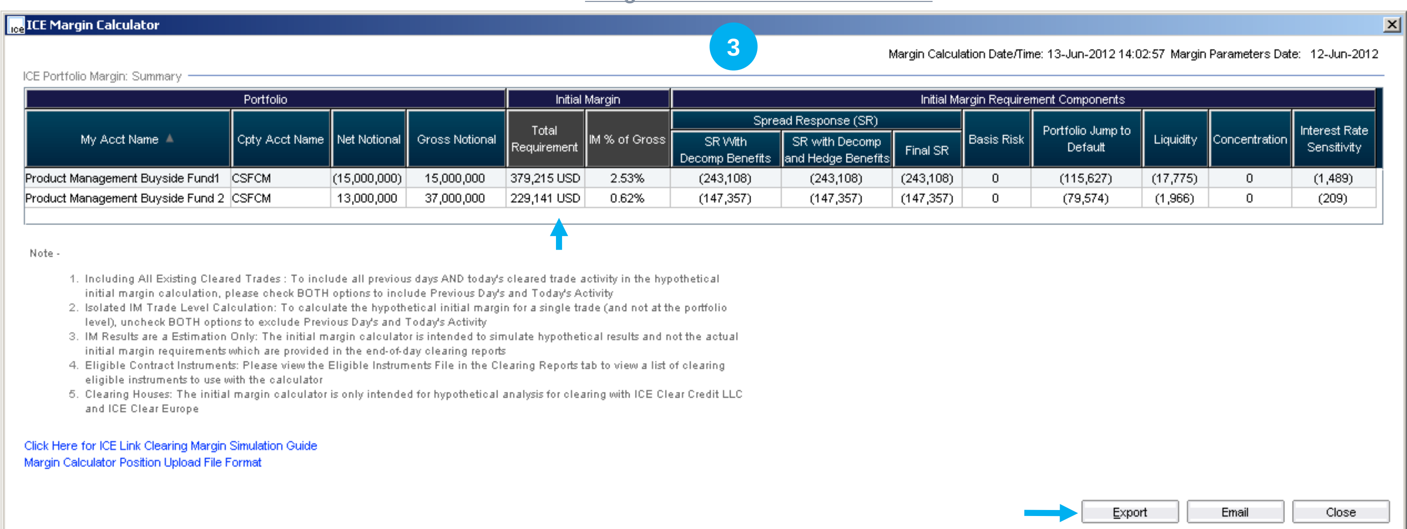
CALCULATE MARGIN PRE-AFFIRMED TRANSACTION

- ICE Link Affirm/Allocate screen; View Projected Margin





Margin Calculator Results Screen



The margin tool may be accessed pre-trade via the 'New Deal-Upload' option in the Menu (or) the Positions Blotter

Projected Margin Calculator Steps

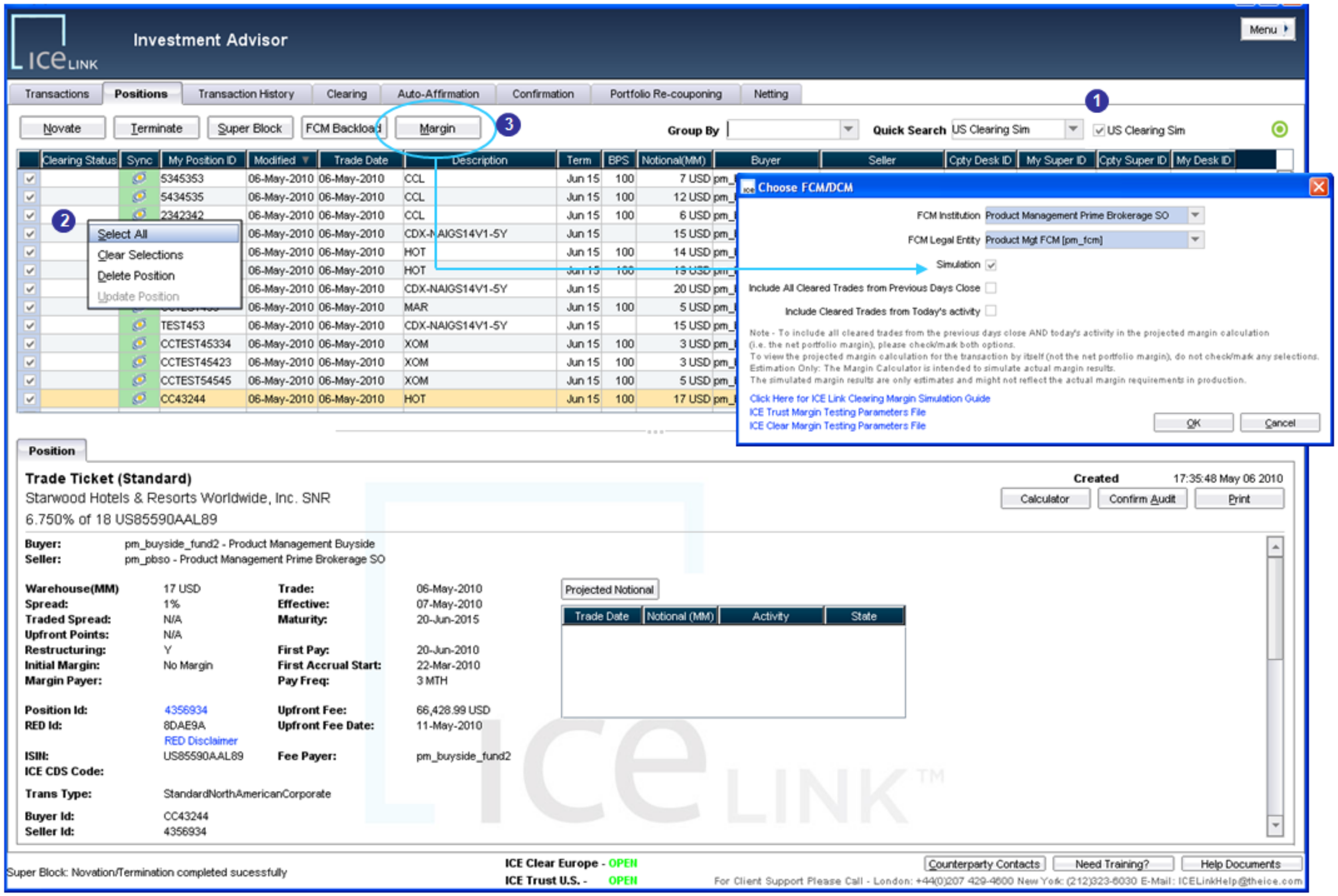
1. Prior to clearing a trade, any party to the transaction can calculate the clearing house projected initial margin by selecting the ***View Projected Margin*** button after providing FCM and allocation details
2. After selecting the ***View Projected Margin*** button, users may select to view the margin amount weighted against all existing cleared positions from ***yesterdays end of day***, only ***today's trades***, ***all trades*** (selecting both yesterday and today's trades), or view the isolated margin amount (deselecting yesterdays and today's trades) and select **OK** to run the calculations
3. The calculator returns the margin results for each fund/portfolio (separate row for each portfolio-FCM combination; users may optionally **email** the calculation results

Note: The 'Simulation' option is for future eligible instruments margin testing or for Self Clearing Participants for ICE Clear Europe

ICE CDS MARGIN SIMULATION CALCULATOR

CALCULATE MARGIN OPEN/HISTORIC POSITION

- ICE Link Positions Blotter; select positions and run Margin



* Note: Buy-side firms have the ability to upload positions for testing clearing house margin requirements by selecting the ***Upload*** feature in the GUI Menu, see the Help Documents screen for more details

Users may run hypothetical ***Margin*** calculations on non-cleared clearing eligible positions in the ICE Link Position Blotter to project the clearing house required minimum margin amounts

To calculate margin from the Position Blotter, users may:

1. **Filter positions eligible for margin simulation**
2. **Select All (or) Specific Positions**
3. **Click the Margin button and select a potential FCM**

Note:

A. ICE Link automatically synchronizes all client DTCC warehouse positions In the Position Blotter, simplifying margin calculations

B. Additional positions may be manually entered or uploaded via spreadsheet *

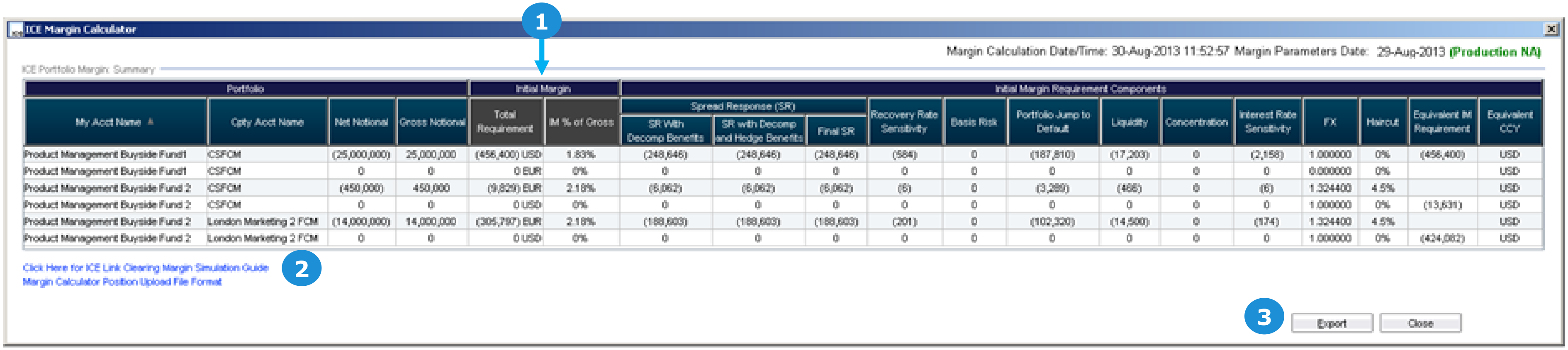
C. Select 'Include Cleared Trades' to automatically include open cleared trades into the calculation

D. The Simulation checkbox is only for ICE Clear Europe calculations for Self Clearing members or for testing with new instruments with ICE Clear Credit

ICE CDS MARGIN SIMULATION CALCULATOR

CALCULATE MARGIN – MARGIN CALCULATION RESULTS

- ICE Link Margin Results screen



Portfolio				Initial Margin		Initial Margin Requirement Components													
						Spread Response (SR)													
My Acct Name	Cpty Acct Name	Net Notional	Gross Notional	Total Requirement	IM % of Gross	SR With Decomp Benefits	SR with Decomp and Hedge Benefits	Final SR	Recovery Rate Sensitivity	Basis Risk	Portfolio Jump to Default	Liquidity	Concentration	Interest Rate Sensitivity	FX	Haircut	Equivalent IM Requirement	Equivalent CCY
Product Management Buyside Fund1	CSFCM	(25,000,000)	25,000,000	(456,400) USD	1.83%	(248,646)	(248,646)	(248,646)	(584)	0	(187,810)	(17,203)	0	(2,158)	1.000000	0%	(456,400)	USD
Product Management Buyside Fund1	CSFCM	0	0	0 EUR	0%	0	0	0	0	0	0	0	0	0	0.000000	0%		USD
Product Management Buyside Fund 2	CSFCM	(450,000)	450,000	(9,829) EUR	2.18%	(6,062)	(6,062)	(6,062)	(6)	0	(3,289)	(466)	0	(6)	1.324400	4.5%		USD
Product Management Buyside Fund 2	CSFCM	0	0	0 USD	0%	0	0	0	0	0	0	0	0	0	1.000000	0%	(13,631)	USD
Product Management Buyside Fund 2	London Marketing 2 FCM	(14,000,000)	14,000,000	(305,797) EUR	2.18%	(188,603)	(188,603)	(188,603)	(201)	0	(102,320)	(14,500)	0	(174)	1.324400	4.5%		USD
Product Management Buyside Fund 2	London Marketing 2 FCM	0	0	0 USD	0%	0	0	0	0	0	0	0	0	0	1.000000	0%	(424,082)	USD

1. View all portfolios with summary margin information per portfolio
   - 6 key risk components: Spread, Basis, Jump-to-Default/Health, Liquidity, Concentration and Interest Rate Risk
   - FX Rate, Haircut, Equivalent IM Requirement and Equivalent Currency for multi-currency portfolios
2. Access Margin Simulation Guides in the results screen
3. Export results to spreadsheet/file

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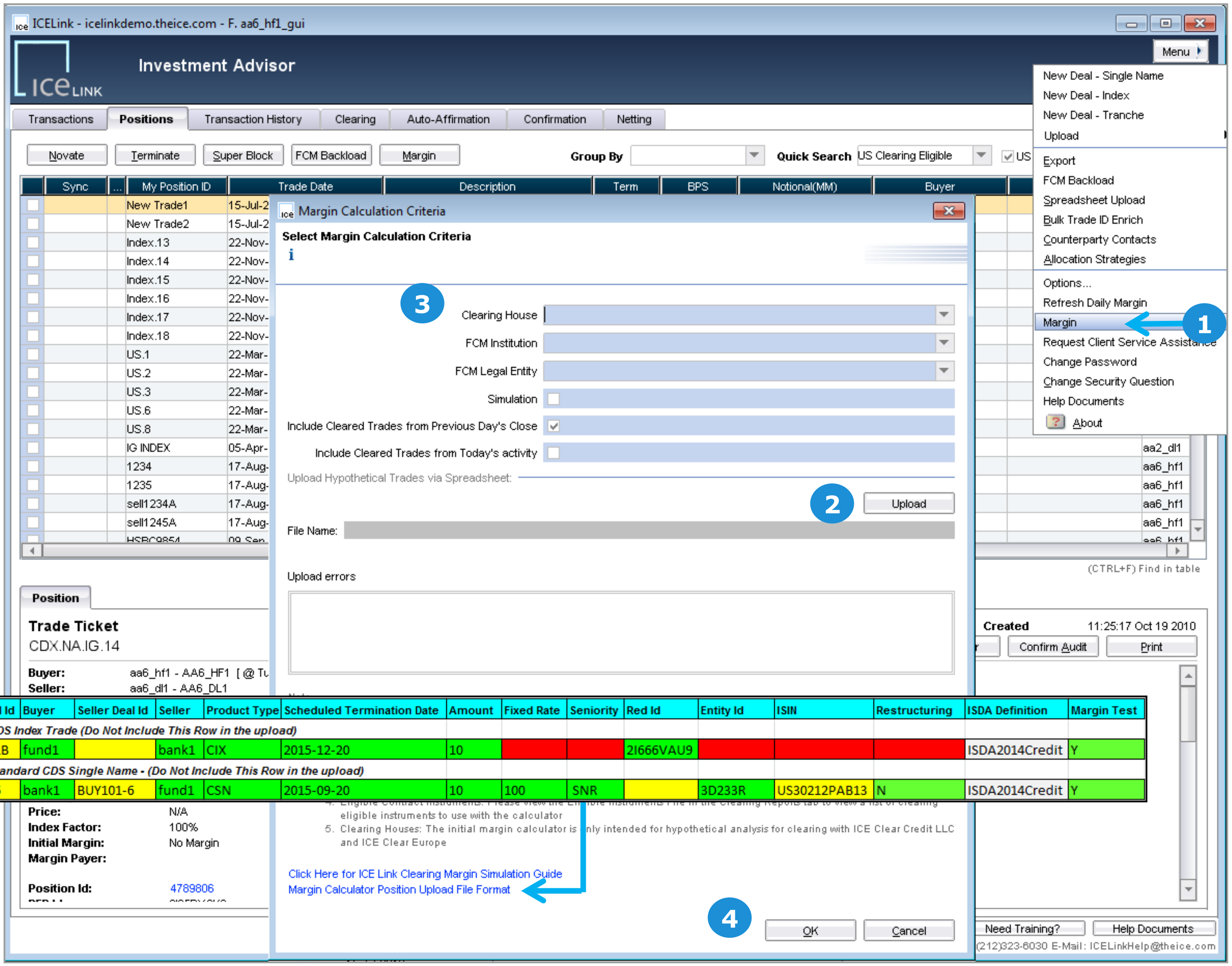
CALCULATE MARGIN – SPREADSHEET UPLOAD FOR MANY “WHAT-IF” TRADES



Buyer Deal Id	Buyer	Seller Deal Id	Seller	Product Type	Scheduled Termination Date	Amount	Fixed Rate	Seniority	Red Id	Entity Id	ISIN	Restructuring	ISDA Definition	Margin Test
Sample CDS Index Trade (Do Not Include This Row in the upload)														
BUY101-1B	fund1		bank1	CIX	2015-12-20	10			2I666VAU9				ISDA2014Credit	Y
Sample Standard CDS Single Name - (Do Not Include This Row in the upload)														
BUY101-6	bank1	BUY101-6	fund1	CSN	2015-09-20	10	100	SNR		3D233R	US30212PAB13	N	ISDA2014Credit	Y

1. Hypothetical trade positions may be ***uploaded directly*** to the Margin Calculator ***via spreadsheet*** (CSV file) for testing; the ***upload template*** and template instructions are available in the ***Help Documents screen***

2. After selecting ***the ‘Margin’ option in the menu***, select ‘Upload’ in the Margin Calculation criteria screen, select the spreadsheet file (CSV) and the Open button to upload (any upload displayed in the errors window).

3. Select the ***Clearing House*** the hypothetical portfolio will be cleared to.

4. Select ***OK*** to run the calculation

   Note: ICE Clear Credit and ICE Clear Europe trades must be uploaded separately; calculations can be mixed with existing non-cleared, cleared, and hypothetical trades

- Note: The ‘Simulate’ option is only applicable for self-clear ICE Clear Europe parties; to include pre-existing cleared trades from yesterday’s end of day or for today’s activity (or both for all), select the ‘Include Cleared Trades’ options

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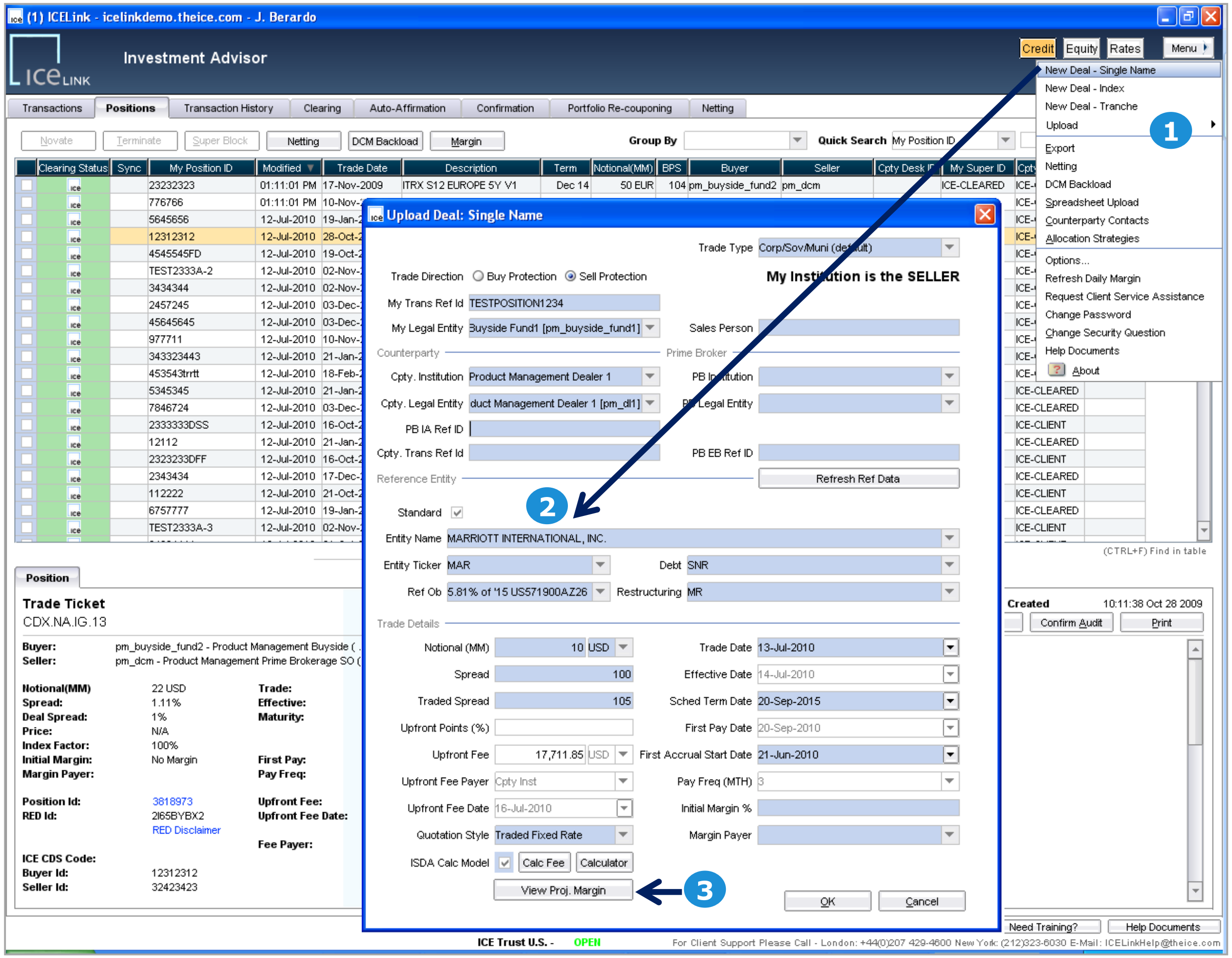
CALCULATE MARGIN – SINGLE “WHAT IF” PRE-TRADE POSITION IN GUI



Note: A list of clearing instruments are available in the Margin Upload file in the help documents screen or on the internet at https://www.theice.com/publicdocs/clear_credit/ICE_Clear_Credit_Clearing_Eligible_Products.xls

Manual Position Upload (Margin Testing)

1. To manually calculate margin on a single hypothetical /pre-trade position for margin calculation, **select the *New Deal-Single Name* or *Index* option** in the GUI menu

2. In the trade entry screen, **select a *counterparty*** (‘Clearing Executing Broker’) and a ***clearing eligible instrument*** with a notional amount, scheduled termination date, and fixed rate (spread)

3. On a Pre-trade basis, users may select the ‘***View Proj. Margin***’ button without actually uploading the trade to run the margin calculation

4. On the margin calculation selection screen, select the ***Clearing House*** ‘***Include Cleared Trades***’ options if calculating against existing trades and select OK to perform the calculation

ICE CDS MARGIN SIMULATION CALCULATOR

SUPPORT, SALES, WEB INFORMATION

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ICE Clearing House **https://www.theice.com/clear-credit**
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ICE Link web information page https://www.theice.com/technology/ice-link

ICE Link Documentation Portal https://community.theice.com (requires registration)