part of eex group

European Energy Exchange AG

A Guide to Margining at ECC

September 2025

Agenda

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Margining Spot Market - Requirements

Risk

Current Exposure

Current Exposure Spot Margin (CESM)

The net value (payment amount) of all concluded transactions on the spot markets during the day that have not been settled.

+ Potential Future Exposure

Initial Margin Spot Market (IMSM)

Expected value of spot transactions for the time between last payment and the potential default of a counterparty (relevant for power and gas products). Acts as a buffer for the time of trading where no payments can be made (during nights and weekends) and helps to reduce intraday margin calls.

Margining Spot Market - Requirements

Risk

Current Exposure

Variation Margin

Daily mark-to-market value change of all open positions in futures using the latest market prices received from the markets.
The profit or loss of each future position will be paid-received by the trading participant daily.

Premium Margin

For the Premium Style options (no daily variation) Premium Margin has to be deposited for net short positions. For net long positions, credits are used to offset other margin requirements.

+ Potential Future Exposure

SPAN®[1] Initial Margin

ECC uses a statistical approach to calculate the potential changes in the value of a trading member's portfolio over a time horizon that is needed to liquidate the portfolio.

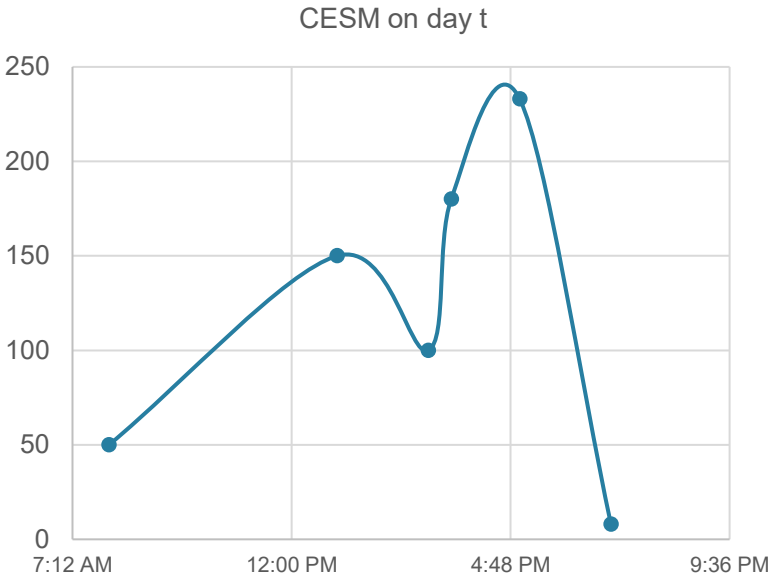
Delivery Margin

Delivery Margin covers the risk in positions in physically settled futures during the delivery period.

CESM Calculation

CESM = Maximum (Sum of (Product of Margin Parameters and Current Outstanding Payments); 0)

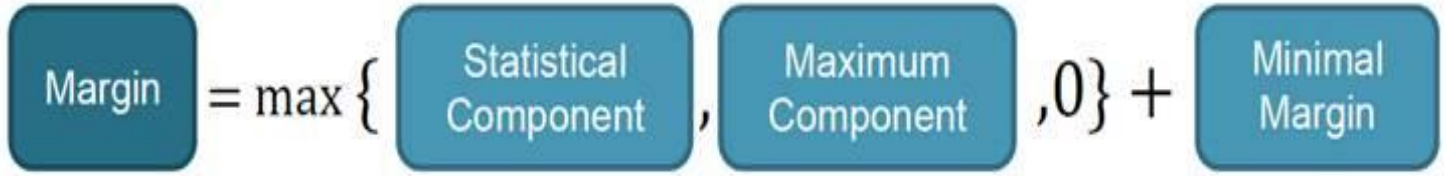
Transaction time	Product Group	Payment Amount[1] in EUR	Accumulated CESM in EUR on day t	Accumulated CESM Calculation
t, 08:00	EPEX_IT_POWER_ELEX	50	50	= MAX(1 x 50; 0)
t, 13:00	EEX_ST_NATGAS_PVB	100	150	= MAX(1 x 50 + 1 x 100; 0)
t, 15:00	EEX_ST_EUA4_DMS	-50	100	= MAX(1 x 50 + 1 x 100 + 1 x (-50); 0)
t, 15:30	EPEX_IT_POWER_ELEX	80	180	= MAX(1 x (50+80) + 1 x 100 + 1 x (-50); 0)
t, 17:00	EEX_ST_EUA4_DMS	60	192	= MAX(1 x 130 + 1 x 100 + 1 x (-50) + 0.2 x 60; 0)
t, 19:00	EPEX_IT_POWER_ELEX	-10	16.5	= MAX(0.2 x 60 + 0.45 x 10; 0)



- **Note:** CESM is reset to 0 (18:00 CET), **EXCEPT** for the EUA trades executed after 16:00 CET and deferred payments due to non-ECC business days (e.g. increased exposure during Christmas or Easter)
- No margin credit is granted to other margin classes;
- CESM is updated every 10 minutes;
- Margin parameters (MPs) = 1 for buy side and = 1 for sell side for power and gas products, **EXCEPT** MPs for the product groups listed in the Risk Parameters file.

[1]Payment Amount is the net value of all concluded transactions on the spot market during the day

IMSM Calculation



- the statistical component is the mean + alpha x standard deviation[1] of financial exposures of the past year
- financial exposures for IMSM calculation are split into T0 exposure and total exposure (see next slide)
- the maximum component is the multiple of beta of the maximum financial exposure of the last 30 ECC business days
- the minimal margin is a fixed value and can be found as an “Absolute additional minimum for IMSM in €” in the Risk Parameters file.
- Further parameters and values (e.g. alpha, beta) can be found in the Risk Parameters file.
- Note: IMSM calculation is amended to cover the risk during specific holidays such as Easter or Christmas, when the exposure can increase up to five days (more information in the Margining file)

[1]Exponentially weighted

Exposure Calculation Example 1-2

	Transaction Time	Settlement Member	ProductGroup	BuySell	Payment Amount
t - 1 →	05Jun2019 20:30:00	XXXXX	EEX_ST_NATGAS_OTE	B	50
Current day t →	06Jun2019 12:30:00	XXXXX	EPEX_ST_POWER_ELEX	B	100
	06Jun2019 14:45:00	XXXXX	EEX_ST_NATGAS_OTE	B	70
	06Jun2019 17:00:00	XXXXX	EEX_ST_NATGAS_OTE	S	-200
	06Jun2019 19:45:00	XXXXX	EPEX_IT_POWER_ELEX	S	-100
	06Jun2019 23:35:00	XXXXX	EPEX_IT_POWER_ELEX	S	-50
t + 1 →	07Jun2019 10:45:00	XXXXX	EPEX_IT_POWER_ELEX	B	30

Exposure Calculation Example 2-2

Two types of Exposures relevant for the IMSM calculation:

Exposure Current Day (T0) = „incomplete“ exposure on the current calculation day, sum of payment amounts x margin parameters for a certain product group from 16:00 CET t-1 to 14:00 CET t (relevant only for IMSM calculation)

Products group	Sum of Payment Amounts	Margin Parameter x Sum of Payment Amounts
EEX_ST_NATGAS_OTE	= 50	= 1 x 50 = 50
EPEX_ST_POWER_ELEX	=100	= 1 x 100 = 100
Exposure T0		**150**

Exposure t = sum of payment amounts x margin parameters for a certain product group from 16:00 CET t-1 to 12:00 CET t+1

Products group	Sum of Payment Amounts	Margin Parameter x Sum of Payment Amounts
EEX_ST_NATGAS_OTE	= 50+70+(-200) = -80	= - 0,25 x (-80) = 20
EPEX_ST_POWER_ELEX	=100	= 1 x 100 = 100
EPEX_IT_POWER_ELEX	= (-100)+(-50)+ 30 = -120	= (-0,3) x (-120) = 36
Exposure t		**156**

Note:

- t = ECC business day except ECC holidays
- The Margin Parameters (MPs) for the calculation of the Exposure = 1 for Buy side and = 1 for Sell side. Exceptions can be found in the Risk Parameters file. (For example, for the product group EEX_ST_NATGAS_OTE: MP = 1 for Buy side and MP = -0.25 for Sell side).
- Payment amounts in foreign currencies will be first converted into EUR at the prevailing exchange rates.

IMSM Calculation Example with 5 datapoints

Calculation of the Exponentially Weighted Standard Deviation

② Compute lambda factors for each datapoint (raise lambda = 0.99 of the number of datapoints = t)

④ Compute squared differences to mean

⑤ Multiply squared differences to mean with each lambda factor divided by the sum of lambda factors (weights)

Date	t	Exposure > 0 EUR	T0 Exposure > 0 EUR	Lambda^t (λ^t)	$(\mu - x(t))^2$	$\frac{\lambda^t}{\sum \lambda^t} \times (\mu - x(t))^2$
2022-04-28						
2022-04-27	1	187	150	0.99	576,384.64	117,605.64
2022-04-26	2	1939	1893	0.9801	985,651.84	199,101.47
2022-04-25	3	1694		0.970299	559,204.84	111,829.67
2022-04-22	4	455	455	0.96059601	241,277.44	47,768.11
2022-04-21	5	456		0.95099005	240,296.04	47,098.07
		$\text{Mean}(\mu) = 946.2$		$\sum \lambda^t = 4.852$		$\sum = 523{,}402.96$

① Calculate the mean of the sum of given exposures (for the current day t „incomplete“ T0 exposure is taken into account instead of t exposure)

③ Compute the sum of lambda parameters

⑥ Compute the sum of the weighted differences

*__Parameters:__ lambda = 0.99, alpha = 2.9, beta = 1.7, minimum Margin = 50,000 (Current parameters can be found: the Risk Parameters file)

IMSM Calculation Example with 5 datapoints

IMSM calculation for 2022-04-28

Date	Standard Deviation	Mean + alpha x SD	beta x Max Exposure (T-30 to T)	Maximum rounded to the next 10,000	**IMSM Requirement**
2022-04-28	723.466	3,044.25	3,296.3	10,000	**60,000**

⑦ Calculate the standard deviation by taking square root of (6)

⑧ Compute statistical component = Mean + alpha x SD

⑨ Compute the maximum component = Beta x Maximum Exposure (T-30 to T)

⑩ Take the maximum from (9) or (10) and round it up to the next 10,000

⑪ Add the minimum amount of 50,000 to (11)

➡ Use the Initial Margin Spot Market Calculator on our website to compute IMSM Requirements.

*__Parameters:__ lambda = 0.99, alpha = 2.9, beta = 1.7, minimum Margin = 50,000 (Current parameters can be found: the Risk Parameters file)

Variation Margin Calculation Example

$$VM\ for\ a\ specific\ member = \sum Round[(Current\ Settlement\ Price - Last\ Settlement\ Price)\ x\ Contract\ Size;\ 2]\ x\ Net\ Quantity$$

VM > 0 is credited to the account, VM < 0 is debited from the account

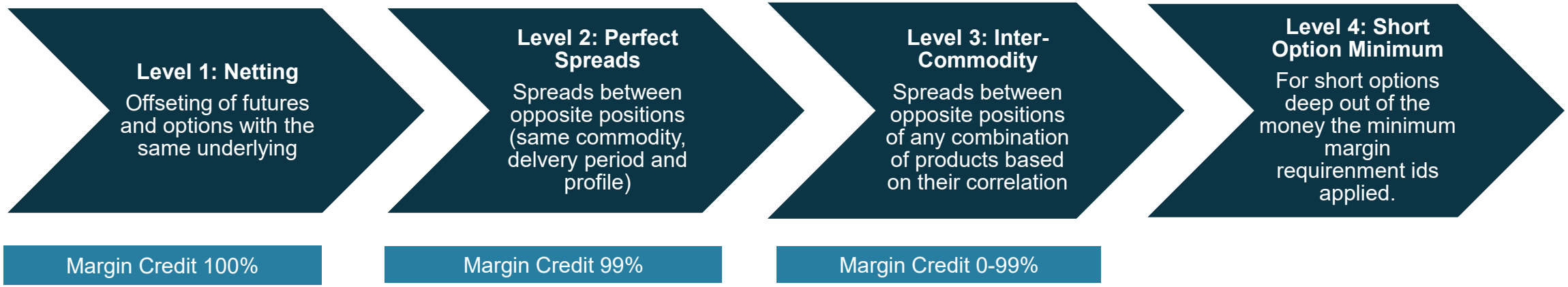
Settlement Member	Product	Expiry Month	Expiry Year	Net Quantity	Current Settlement Price	Last Settlement Price	Contract size	Variation Margin
XXXXX	FEUA	12	2019	-4851	20.42	19.50	1000	(20.42 – 19.5) x (-4851) x 1000 = -4,462,920
XXXXX	FEUA	3	2020	2750	19.61	21.23	1000	-4,455,000
XXXXX	FEUA	11	2019	1071	20.77	19.87	1000	963,900
XXXXX	FEUA	12	2020	-900	21.37	20.38	1000	-891,000
XXXXX	G0BM	10	2019	250	14.455	14.342	745	21,047.5
								Sum = -8,823,972.50

SPAN® Initial Margin

SPAN Margin methodology allows ECC to optimally align margin requirements with risk, thereby realizing efficient margining. The SPAN® is calculated as follows:

1. Calculation of the overall scan risk for each combined commodity[1]. Scan risk is the worst-case loss multiplied by the net position, using a configurable range of price and volatility movements.

2. The scan risk is then reduced by the intercommodity credits to reflect the reduced risk in portfolios with opposing positions. Spreading takes place in several steps (levels).



3. The resulting amount per portfolio is called SPAN® initial margin.

[1]Combined commodity represents products with the same underlying, load profile, delivery period and maturity

SPAN® Initial Margin

$$SPAN\ Initial\ Margin\ for\ a\ futures\ contract$$
$$= Price\ Scanning\ Range\ (see\ \underline{Scan\ Ranges\ File})\ x\ Number\ of\ Lots$$

Example 1: Position = Long 5 Lots in DEBM 09-2019

SPAN Initial Margin = 2851.20 (Price Scanning Range for DEBM 09-2019 as of 14.08.2019) x 5 = 14,256 Euro

Product_I	Expiry_Ye	Expiry_Mo	ClearingC	PriceScan	Volscanra
DEB1	2019	9	EUR	952,56	0,2
DEB2	2019	9	EUR	650,16	0,2
DEB3	2019	9	EUR	648,48	0,2
DEB4	2019	9	EUR	1.039,92	0,2
DEB5	2019	9	EUR	1.039,92	0,2
DEBM	2019	9	EUR	2.851,20	0,2

[1]Combined commodity represents products with the same underlying, load profile, delivery period and maturity

SPAN® Initial Margin

$$SPAN\ Initial\ Margin\ for\ a\ portfolio\ =\ M_x + M_y - 2\ \times\ IC\ \times\ \min(M_x\,;M_y)$$

where M_x = Price Scan Risk$_x$; M_y = Price Scan Risk$_y$; IC = Intercommodity Credit (all updated parameters are available on the ECC website)

Example 2:

SpreadID	Combined	ExpiryYea	ExpiryMo	Combined	ExpiryYea	ExpiryMo	TierNumb	TierNumb	RatioA	RatioB	Credit
106596	DEBM	2019	9	G3BM	2019	9			2	4	0.49

Product	Expiry Year	Expiry Month	Lots	Scanning Range
DEBM	2019	9	5	2851.20
G3BM	2019	9	-5	1375.20

Intercommodity Credit = 0.49

$$Price\ Scan\ Range\ M_i = |Lots| \times Scanning\ Range$$
$$M_{DEBM} = |\ 5\ | \times 2851.20 = 14256$$
$$M_{G3BM} = |-5\ | \times 1375.20 = 6876$$

$$SPAN\ Initial\ Margin = 14256 + 6876 - 2 \times 0.49 \times \min\ (14256;\ 6878) = 14393.52$$

SPAN® Initial Margin

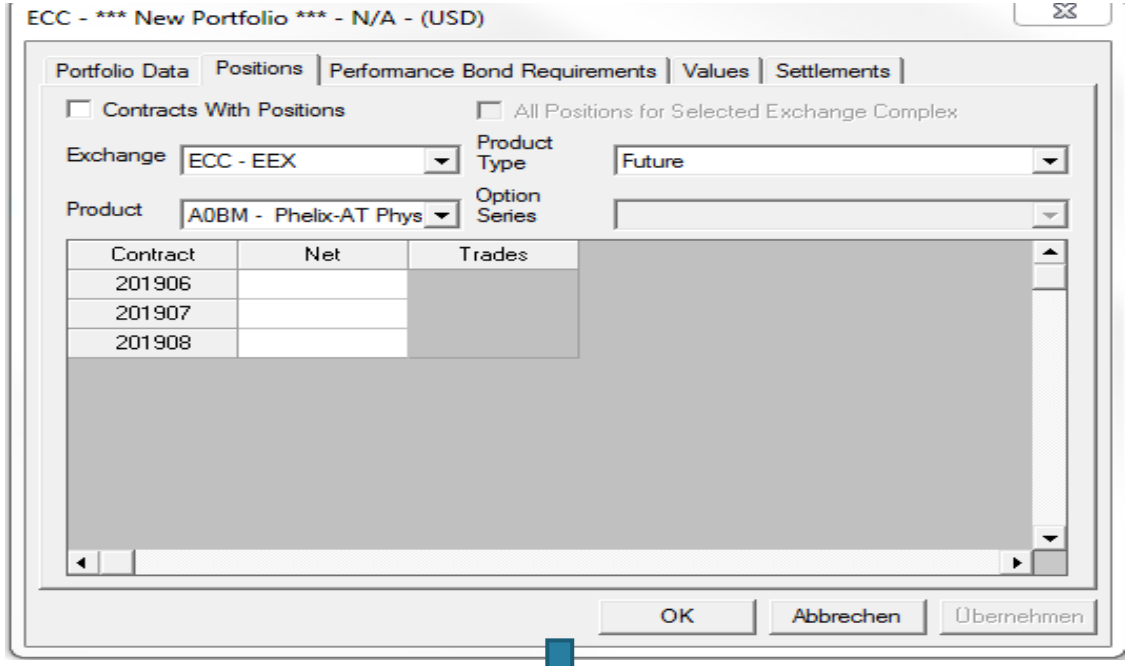
To estimate the SPAN-Margin for your portfolio, the PC-SPAN® tool is used. You can download single copies of PC-SPAN® directly from CME Group Website for free. The instructions for the download, prerequisite files, precise formulas and steps for the calculation can be found in the margining document.

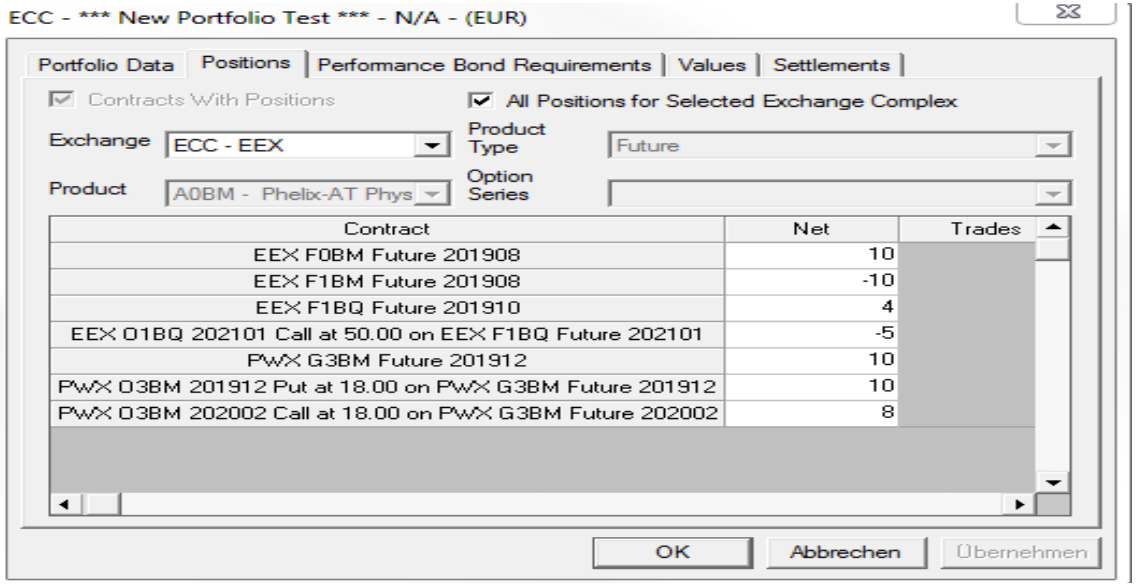
Steps:

1. Load the Parameter File into the tool via “File > Load File (s)”

2. Load your portfolio. There are two options:

2.1 Load your portfolio manually via “File > New Portfolio” by choosing products from the available exchanges. After selecting positions in the Positions Tab > place checkmarks for “Contracts with Positions” and “All Positions for Selected Exchange Complex” for the summary of your portfolio





SPAN® Initial Margin

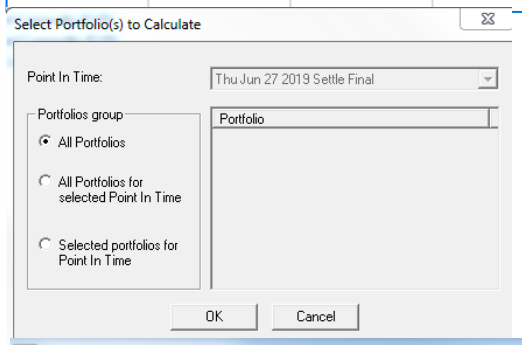
Steps cont.:

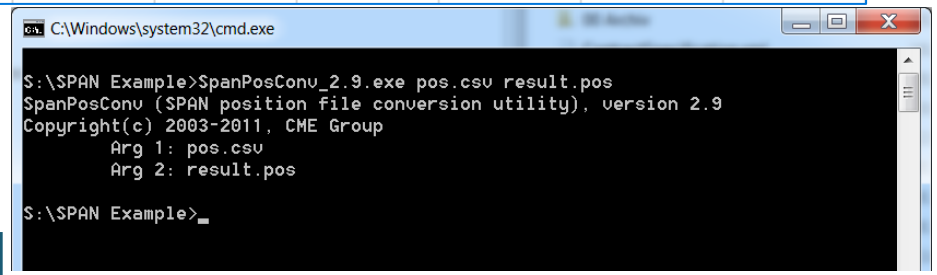
2.2 Import your .pos file via “File > Open Portfolio” You can enter your portfolio positions manually into the SPAN Tool or build a portfolio as a simple Excel file and convert it to the .pos file via SPANPosConv Tool. The User Manual for it can be found here. Excel sample portfolio:

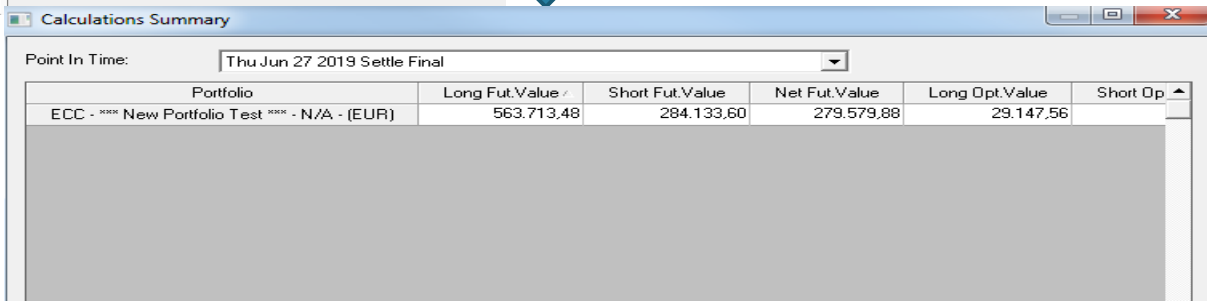
3. Calculate positions requirement via “File > Calculate Portfolio(s) Requirement” either for all portfolios or for a selected portfolio > Pop-Up Window shows the calculated requirements

A	B	C	D	E	F	G	H	I
date	isSetl	firm	acctID	acctType	isCust	seg	currency	ec
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC
20190701	1	XXXXX	Test	M	1	N/A	EUR	ECC

J	K	L	M	N	O	P	Q	R	S
cc	exch	pfCode	pfType	pe	undPe	o	k	net	
F1BM	EEX	F0BM	FUT	201908				10	
F1BM	EEX	F1BM	FUT	201908				-10	
F1BQ	EEX	F1BQ	FUT	201910				4	
F1BQ	EEX	O1BQ	OPT	201910	201910	C	50	-5	
G3BM	PWX	G3BM	FUT	201912				10	
G3BM	PWX	O3BM	OPT	201912	201912	P	18	10	





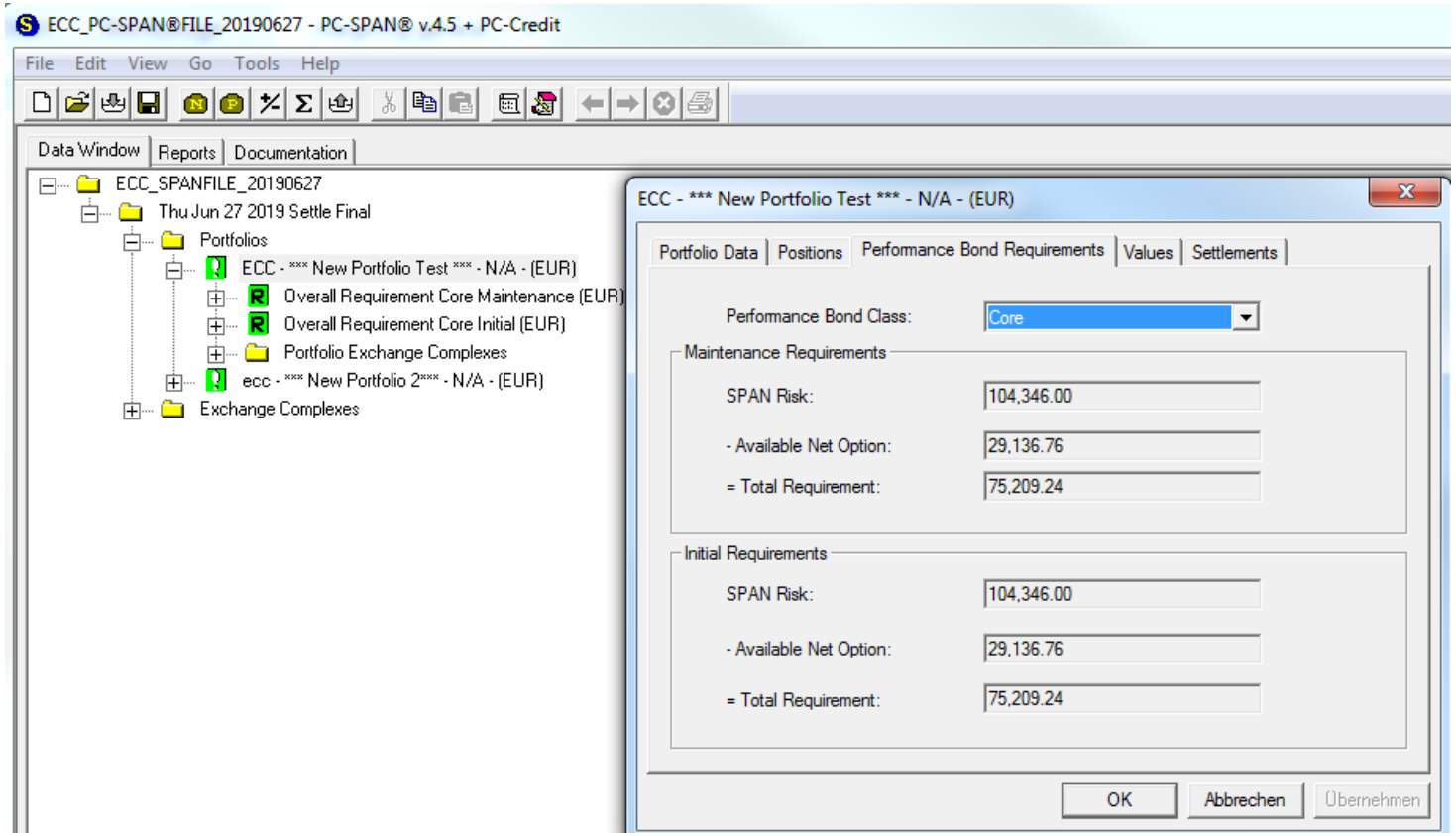


SPAN® Initial Margin

Steps cont.:

The calculated requirements can also be accessed by double-clicking on the portfolio and selecting the “Performance Bond Requirement” tab. SPAN Risk corresponds to ECC SPAN Margin. The Net Option value is not used.

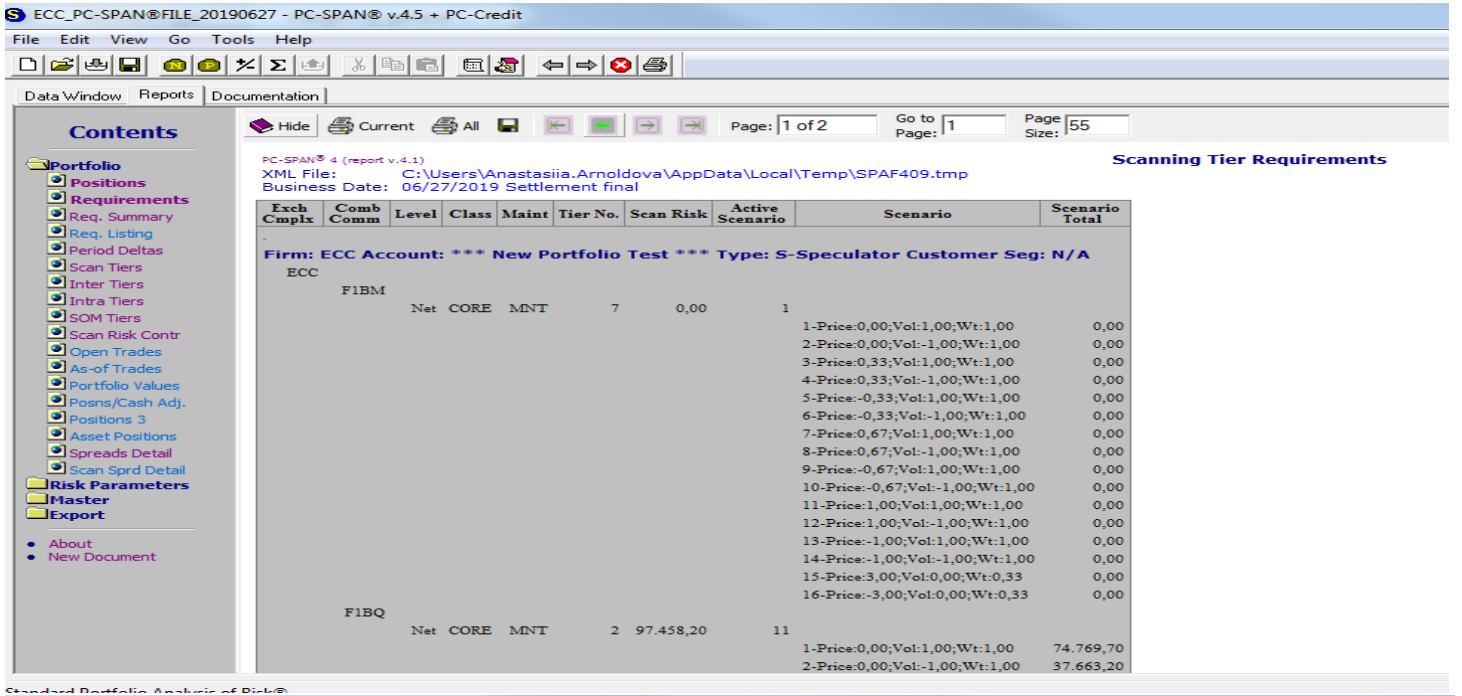
4. In order to access a detailed margin calculation select “Reports” Tab instead of the “Data Window” Tab.

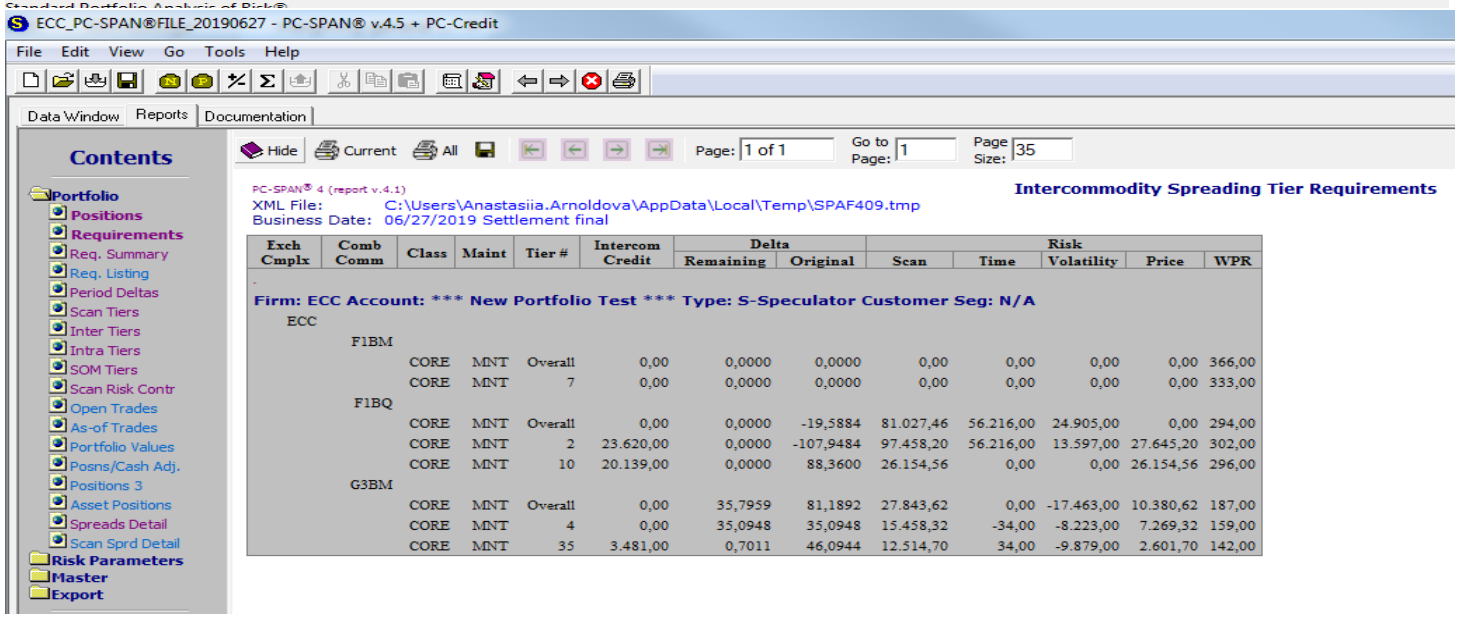


SPAN® Initial Margin

Steps cont.:

For example, a more detailed SPAN Risk calculation can be found under “Reports > Scan Tiers”. In order to access inter-commodity credits per combined commodity go to “Reports > Inter Tiers” etc.





Premium Margin for Options

ECC Options are not subject to the Variation Margin, but instead to a premium margin. For short options, the premium margin is called daily: for long options, the premium is credited to the member's account but not paid out.

$$Premium\ Margin = \sum Net\ Position \times Contract\ Size^{1} \times Current\ Option\ Settlement\ Price$$

Clearing Member	Non-Clearing Member	Product	Expiry Month	Expiry Year	Exercise Price	Option Type	Current Settlement Price	Net Quantity	Contract Size	Premium Margin
XXXXX	YYYYY	O1BY	1	2020	28.00	C	24.26	100	8784	= 24.26 x 100 x 8784 = 21,309,984.00
XXXXX	YYYYY	O1BY	10	2019	50.00	P	3.71	-30	8760	= - 974,988.00
XXXXX	YYYYY	O2BY	1	2020	32.00	C	0.45	50	8784	= 197,640.00
XXXXX	YYYYY	OEUA	12	2019	14.00	P	14.92	-20	1000	= - 298,400.00
									Premium Margin	**= 20,234,236.00**

[1]Contract size can be found in the ECC Clearing Specification file.

Delivery Margin

Delivery Margin (DM) is called for positions in physically-settled power and natural gas futures and for net short positions in storable commodities during the delivery period on the day after the expiry of the contract. The Delivery Margin for power and natural gas futures is included in the SPAN® Margin Requirement. Expiry Month Factor and Haircut can be found in the Risk Parameters File. The Expiry Month Factor (EMF) is required for the adjustment of the single margin parameter in the case of delivery risk for physical futures, which results only in areas where ECC's nomination has no priority and therefore ECC could be imbalanced in the default of a trading participant.
The Scan Range for the Front month can be found in the Scan Range File.

$$Delivery\ Margin_{\ Power-Gas} = |Net\ Position| \times Scan\ Range_{Front\ Month} \times Expiry\ Month\ Factor$$

$$Delivery\ Margin_{Storable\ Commodities} = |Uncovered\ Net\ Short\ Position| \times Last\ Spot\ Price\ \times (1 + \text{Haircut}) \times \text{Volume}$$

For example, as of March 2022 the Delivery Margin for a member with the expected balance of -10,000 units of FEUA (net position x contract size) equals :

Product	Last Spot Price	Net Short Position	Contract Size	1 + Haircut	Delivery Margin
FEUA	76.02	-10	1000	1.35	$= \|-10\| \times 1000 \times 76.02 \times (1 + 0.35) = 1{,}026{,}270.00$

Further questions?

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