Resolution No. 8/15
of the KDPW_CCP S.A. Management Board
dated 19 June 2015

amending the Detailed Rules of Transaction Clearing (organised trading)

Pursuant to § 2 subpara. 1 and 4 of the Rules of Transaction Clearing (organised trading) and § 19 subpara. 2 of the Statute of KDPW_CCP S.A., the Management Board of KDPW_CCP S.A. resolves as follows:

§ 1.

The Detailed Rules of Transaction Clearing (organised trading) shall be amended as follows:

1/ Appendix 3 to the Detailed Rules of Transaction Clearing (organised trading) shall be replaced by Appendix 1 to this Resolution;

2/ Appendix 5 to the Detailed Rules of Transaction Clearing (organised trading) shall be replaced by Appendix 2 to this Resolution

§ 2.

This Resolution shall enter into force on 6 July 2015.

Dr Iwona Sroka	Sławomir Panasiuk	Michał Stępniewski
President	Vice President	Member
of the Management Board	of the Management Board	of the Management Board

Appendix No. 1 to the Resolution No. 8/15
of the Management Board of KDPW_CCP S.A.
dated 19 June 2015

Appendix 3 to the KDPW_CCP Detailed Rules of Transaction Clearing (organised trading)

Rules for calculating the minimum value of assets charged by participants to clients placing transaction orders in the derivatives market

1. Methodology used to set initial deposits by clearing members

KDPW_CCP approves the following methodologies to be used to set initial deposits for client portfolios:

1) SPAN® methodology;
2) Portfolio Risk Calculation Model (PRCM);
3) Other methodologies, following prior approval by KDPW_CCP.

1.1. SPAN® Methodology

The value of the initial deposit required to be paid by clients of clearing members may be determined using the SPAN® methodology using up-to-date risk parameters defined by KDPW_CCP. KDPW_CCP publishes a set of risk parameters at least once a day, or at the end of a stock exchange session. The new set of risk parameters remains in force until it is replaced by a new set.
The value of the required initial deposit is calculated on the basis of the margin securing the transaction price assigned to a given portfolio and the net value of options positions.
Where a client delivers new transaction orders, the required initial deposit will need to reflect the least advantageous effect of their execution on the value of the portfolio, arising respectively from the execution of all pending client orders, their partial execution, or failure to execute them.
Where a client delivers an order for the execution of an option sale transaction settled premium style, the value of the required initial deposit calculated using SPAN® methodology may be decreased by the value of the premium indicated in the order.
Where an investor declares that a position will be closed before the end of an exchange session, the initial deposit may be calculated using the price scan range parameter 'PSR intraday' provided in the risk parameter list message.

1.2. PRCM Methodology

1.2.1. Risk parameters

PRCM (Portfolio Risk Calculation Model, Polish name: MPKR) applies margin calculation parameters, with which the risk for a whole portfolio may be determined:

a. Level of initial deposit for a given class (Z_k),

b. Volatility of a given series of options in a year (VO_i),

c. Credit co-efficient for a given class of long positions in options and index participation units (CRT),

d. Parameter modifying the volatility for a given options class (VM_k),

e. Value of the parameter limiting the level of the risk for options positions in scenarios 15 and 16 ($SATLMT$),

f. Free of risk rate for trading currency defined for a given series of options (r),

g. Annual dividend rate set by the WSE for the underlying instrument for a given options series and, for currency options, the free of risk rate for the currency of the underlying instrument for a given series of options (q),

h. Parameters increasing the level of initial deposit for each type of derivative instrument: (B_{fut}) – futures contracts, (B_{ipu}) – index participation units, (B_{op}) – options.

In order to calculate margins, fundamental variables arising from transaction execution are also used, which relate to the contract settlement price, the premium, the number of options or contracts purchased:

i. Number of positions in futures contract of series "i" (negative number indicates short position)(L_i),

j. Settlement price for futures contract in series "i" or closing price for index participation units series "i" (C_i).

1.2.2. Risk scenarios

In the PRCM model, simulations are carried out using 16 scenarios to verify how the value of the portfolio will change with the impact of variation in the price of the underlying instrument and changes in volatility.

Figure 1

Scenario no. [j]	Scenario	Range of price change [u_j]	Probability [w_j]	Direction of volatility [k_j]
1	Const range, volatility ceiling	0.0	1	1
2	Const range, volatility floor	0.0	1	-1
3	Range 1/3 ceiling, volatility ceiling	1/3	1	1
4	Range 1/3 ceiling, volatility floor	1/3	1	-1
5	Range 1/3 floor, volatility ceiling	-1/3	1	1
6	Range 1/3 floor, volatility floor	-1/3	1	-1
7	Range 2/3 ceiling, volatility ceiling	2/3	1	1
8	Range 2/3 ceiling, volatility floor	2/3	1	-1
9	Range 2/3 floor, volatility ceiling	-2/3	1	1

10	Range 2/3 floor, volatility floor	-2/3	1	-1
11	Range 3/3 ceiling, volatility ceiling	1.00	1	1
12	Range 3/3 ceiling, volatility floor	1.00	1	-1
13	Range 3/3 floor, volatility ceiling	-1.00	1	1
14	Range 3/3 floor, volatility floor	-1.00	1	-1
15	Range 2 x ceiling, const volatility	2.00	0.5	0
16	Range 2 x floor, const volatility	-2.00	0.5	0

The value of margin S_j in a given scenario "*j*" and for a given class of instruments (typified by the same underlying instrument) is calculated as the sum:

$$S_j = \sum_{i=1}^{n} S_{ij}$$ (Formula No. 1)

where:

S_{ij} is the value of the margin for derivatives instrument of series "i" in scenario "j",

n number of series in a given class of derivatives.

1.2.3. Principles of correlation

The level of the margin calculated for each of the 16 scenarios is the starting point for calculating margins for client portfolios.

When applying the portfolio risk calculation model, correlation of positions may take place for derivatives positions based on the same underlying instrument (in the same class).

1.2.4. Calculating margins for each scenario

A. Futures contracts

The value of margin S_{ij} for a given futures contract of series "i" in scenario "j" is calculated according to the following formula:

$$S_{ij} = L_i \times C_i \times Z_k \times B_{fut} \times u_j \times w_j$$ (Formula No. 2)

where:

$u = \left\{0,0;0,0;\frac{1}{3};\frac{1}{3};-\frac{1}{3};-\frac{1}{3};\frac{2}{3};\frac{2}{3};-\frac{2}{3};-\frac{2}{3};1;1;-1;-1;2;-2\right\}$

$w = \{1;1;1;1;1;1;1;1;1;1;1;1;1;1;1;0,5;0,5\}$

B. Settled long position in index participation units

A settled long position in index participation units forms the margin for other positions based on the same underlying instrument. The value of the margin at the close of the day is equal to the reference price with a correction for a potential one-day change in the price of the index participation unit, multiplied by the credit co-efficient (CRT). The value of the margin for index participation units of series "i" in scenario "j" is calculated according to the following formula:

$$S_{ij} = L_i \times \left(C_i + Z_k \times C_i \times B_{ipu} \times u_j \times w_j\right) \times CRT \qquad \text{(Formula No. 3)}$$

C. Settled long position in put and call options

A settled long position in put and call options forms the margin for other positions based on the same underlying instrument. The value of the margin is calculated using the Black-Scholes model, based on Formulas 12 and 13, and is equal to the value of the option premium multiplied by the value of the credit co-efficient CRT.
The value of margin S_{ij} for options of series "i" in scenario "j" is calculated according to the following formula:

$$S_{ij} = \begin{cases} L_i \times P_{ij}^{c} \times CRT \\ L_i \times P_{ij}^{p} \times CRT \end{cases} \qquad \text{(Formula No. 4)}$$

where:

P_{ij}^{c} - Value of the call option premium calculated using Formula No. 12

P_{ij}^{p} - Value of the put option premium calculated using Formula No. 13

D. Settled short position in index participation units

For a short position in index participation units where financial settlement has taken place, the value of the margin is calculated using the current value of the premium and the risk of price change of the index participation unit.
The value of the margin for a short position in index participation units of series "i" in scenario "j" is calculated according to the following formula:

$$S_{ij} = L_i \times \left(C_i + Z_k \times C_i \times B_{ipu} \times u_j \times w_j\right) \qquad \text{(Formula No. 5)}$$

E. Settled short position in put and call options

Margin calculated for short positions in put and call options:

$$S_{ij} = \begin{cases} L_i \times \left(P_{ij}^{c}\right) \\ L_i \times \left(P_{ij}^{p}\right) \end{cases} \qquad \text{(Formula No. 6)}$$

where:

P_{ij}^{c} - Value of the call option premium calculated using Formula No. 12

P_{ij}^{p} - Value of the put option premium calculated using Formula No. 13

F. Unsettled short position in index participation units

For unsettled short positions in index participation units, a margin is calculated to secure any daily change of unit price. The value of the margin for a short position in index participation units of series "i" in scenario "j" is calculated according to the following formula:

$$S_{ij} = L_i \times C_i \times Z_k \times B_{ipu} \times u_j \times w_j \qquad \text{(Formula No. 7)}$$

G. Unsettled short position in options

For unsettled short positions in options, the margin is calculated according to the following formula:

$$S_{ij} = \begin{cases} L_i \times \left(P_{ij}^{c} - P_R^{c}\right) \\ L_i \times \left(P_{ij}^{p} - P_R^{p}\right) \end{cases} \qquad \text{(Formula No. 8)}$$

where:

$P_R^{c}; P_R^{p}$ - Option (call or put, respectively) market price multiplied by the multiplier

P_{ij}^{c} - Value of the call option premium calculated using Formula No. 12

P_{ij}^{p} - Value of the put option premium calculated using Formula No. 13

H. Closing short positions in options and index participation units

In instances where an investor holds short positions in index participation units or in options (settled positions) within the portfolio and the investor has concluded a purchase transaction

in the same series of index participation units or options (unsettled positions), the number of closed short positions is deducted from the balance of settled short positions.

$$L_i = \min\left\{L_i^{r-} + L_i^{n+};0\right\}$$ (Formula No. 9)

where:

L_i^{r-} - Number of settled short positions in index participation units or options of series "i"

L_i^{n+} - Number of unsettled long positions in index participation units or options of series "i"

The value L_i is then used in Formula No. 5 of Formula No. 6, respectively.

I. Closing long positions in options and index participation units

In instances where an investor holds long positions in index participation units or in options (settled positions) within the portfolio and the investor has concluded a sale transaction in the same series of index participation units or options (unsettled positions), the balance of positions is calculated according to the following formula:

a) Balance of unsettled short positions

$$L_i = min\left\{L_i^{r+} + L_i^{n-};0\right\}$$ (Formula No. 10)

The value L_i is then used in Formula No. 7 of Formula No. 8, respectively.

b) Balance of settled long positions

$$L_i = \max\left\{L_i^{r+} + L_i^{n-};0\right\}$$ (Formula No. 11)

The value L_i is then used in Formula No. 2 of Formula No. 3, respectively.

L_i^{r+} - Number of settled long positions in index participation units or options of series "i"

L_i^{n-} - Number of unsettled short positions in index participation units or options of series "i"

J. Making an options purchase order creates an obligation derived from the premium that is equal to the number of purchased options or index participation units multiplied by the value of the premium arising from the concluded transaction.

K. Margin for an intraday position, i.e., a position to be closed before the end of an exchange session

Where an investor declares that a position will be closed before the end of an exchange session, the margin is calculated using the formulas above with the value of the intraday initial margin replacing Z_k.

1.3. Options pricing model – calculating the risk value of options

Theoretical value of a call option

$$P_{ij}^{c} = m \times \left(K^{'} \times e^{-q \times T} \times N\left(d\ \right) - X \times e^{-r \times T} \times N\left(d\ - V \times \sqrt{T}\right)\right) \quad \text{(Formula No. 12)}$$

Theoretical value of a put option

$$P_{ij}^{p} = m \times \left(X \times e^{-r \times T} \times N\left(V \times \sqrt{T} - d\right) - K^{'} \times e^{-q \times T} \times N\left(-d\ \right)\right) \quad \text{(Formula No. 13)}$$

$$d = \frac{\ln\left(\frac{K^{'}}{X}\right) + \left(r - q + \frac{V^{2}}{2}\right) \times T}{V \times \sqrt{T}} \quad \text{(Formula No. 14)}$$

a) Theoretical value of the premium for a call option of series "i" in scenario "j" (P_{ij}^{c}),

b) Theoretical value of the premium for a put option of series "i" in scenario "j" (P_{ij}^{p}),

c) $K^{'} = K \times (1 + Z_k \times u_j \times B_{op})$ - Price of the underlying instrument in scenario "j",

d) Annual dividend rate set by the WSE for the underlying instrument for a given options series (q),

e) $u = \left\{0;0;\frac{1}{3};\frac{1}{3};-\frac{1}{3};-\frac{1}{3};\frac{2}{3};\frac{2}{3};-\frac{2}{3};-\frac{2}{3};1;1;-1;-1;2;-2\right\}$,

f) Co-efficient increasing level (Z_k) for option (B_{op}),

g) Level of the initial margin or the intraday initial deposit for a given class (Z_k),

h) Underlying instrument closing price (K),

i) Option exercise price (X),

j) Multiplier (m),

k) Time to expiry expressed as a fraction of the year (number of days to option expiry divided by 365)_(T),

l) Direction of volatility $k = \{1;-1;1;-1;1;-1;1;-1;1;-1;1;-1;1;-1;0;0\}$,

m) $V = \max\{VO_i + k_j \times VM_k;0{,}001\}$,

n) Volatility for a given option series expressed as an annual figure (VO_i),

o) Parameter modifying volatility for a given option class (VM_k),

p) Free of risk rate (r),

q) Euler number (e),

r) Standard deviation in normal distribution ($N(x)$),

s) Parameter limiting risk in scenarios 15 and 16 (SATLMT).

Notes

t) For scenarios 15 and 16, the values P_{ij}^{c} and P_{ij}^{p} are multiplied by the value of the parameter (SATLMT).

u) For derivatives until the execution of the first transaction:

i. The settlement price of futures contracts is calculated using the reference price determined by the market operator multiplied by the multiplier,

ii. The closing price of index participation units is the reference price calculated by the market operator,

iii. The closing price of options is the reference price calculated by the market operator.

1.4. Calculating the margin of an instrument class

The required margin for an instrument class reflecting the margin securing the delivery is calculated using the following formula:

$$S_k = \min(S_j;0) - Sd$$ (Formula No. 15)

where:

S_k - Value of margin for a given class of instruments

Sd - Value of margins securing delivery by class

In relation to positions in futures contracts which are settled by delivery of the underlying instrument, a margin posted for a duration of several days will be required to secure delivery, which will not be subject to correlation. The margin will be required from clients holding open positions during the delivery period, i.e., from T (following the end of the session) until T+4. For clients holding short positions during the delivery period, this margin is required until the time when the securities intended for the settlement of the transaction are blocked.

$$Sd = \sum_{i=1}^{n} \left| L_i \times C_i \times Z_k \times B_{fut} \times \sqrt{dd} \right|$$ (Formula No. 16)

where:

L_i Number of positions in instruments of series "i" (a negative number indicates a short position)

Z_k - Level of initial margin for a given class of instruments

B_{fut} - Increase parameter for futures contracts

C_i -

dd - Day indicator, however:

- for a long position $dd = 4 \Leftarrow \langle T; T+n \rangle$

- for a short position $dd = \begin{cases} 4 \Leftarrow \langle T; T+3 \rangle \\ 4+y \Leftarrow \langle T+4; \infty \rangle \end{cases}$

$y = \{1,2,3,\ldots\}$

2. Calculating the required margin for a client portfolio – PRCM

The value of the margin charged to clients by clearing members is the sum total of the calculated margin at the level of the client account (portfolio).

$$S = \sum_{i=1}^{g} S_k$$ (Formula No. 17)

where:

S - Value of margin by portfolio

g - Number of different classes within the portfolio

S_k - Value of margin for a given class of instruments

The value of the margin calculated using Formula No. 17 is the minimum value which the participant is obliged to charge the client to secure the client's open derivatives positions.

3. Methodology used to calculate initial margins, prepared by the clearing member

Clearing members may apply other principles to calculate margins to secure their clients' positions, which will differ from SPAN® and PRCM methodology. These principles will need to be approved by KDPW_CCP.

Appendix No. 2 to the Resolution No. 8/15
of the Management Board of KDPW_CCP S.A.
dated 19 June 2015

Appendix 5

to the KDPW_CCP Detailed Rules of Transaction Clearing

SPAN® risk parameters message schema (PS)

The PS message provides details of SPAN® algorithm risk parameters and is distributed to clearing members as an MS Excel electronic file under the name YYMMDDKM.ZRS.

The details of SPAN methodology risk parameters are presented in three separate sheets: PKAS_PL (cash market risk parameters), PTER_PL (derivatives market risk parameters) and PSTR_PL (stress test parameters, used to calculate contributions to the Clearing Fund).

The PS message is distributed to clearing members via the electronic communication system ESI and is also published on the KDPW_CCP website.

KDPW_CCP
ul. Książęca 4
00-498 Warsaw
Poland

Message PS no.: NN/PS/YY
Dated: YYYY-MM-DD

I. Information on SPAN® risk algorithm parameters for the cash (spot) market

Parameter definitions

x – specific risk parameter
y – market risk parameter
LQ - liquidity class in the cash market
DR - duration class in the cash market
crt – credit coefficient for spread between liquidity classes
n – number identifier

1.1 Liquidation risk

Algorithm parameters for shares
Liquidation risk parameters

Liquidity class	x%	y%
LQ	...%	...%

Algorithm parameters for bonds
Liquidation risk parameters

Duration class	x%	y%
DR	...%	...%

Margin for inter-duration class spread

Duration class	Margin
DR	...%

1.2 Marking-to-market

Algorithm parameters for shares

Parameters used in large price volatility scenarios

Liquidity class	Threshold of approved price volatility	Co-efficient modifying the purchase price cd_1	Co-efficient modifying the sale price cu_1
LQ	...%	...%	...%

Parameters used in scenarios where there are no listings

Liquidity class	Co-efficient modifying the purchase price cd_2	Co-efficient modifying the sale price cu_2
LQ	...%	...%

Algorithm parameters for bonds

Parameters used in large price volatility scenarios

Duration class	Threshold of approved price volatility	Co-efficient modifying the purchase price cd_1	Co-efficient modifying the sale price cu_1
DR	...%	...%	...%

Parameters used in scenarios where there are no listings

Duration class	Co-efficient modifying the purchase price cd_2	Co-efficient modifying the sale price cu_2
DR	...%	...%

1.3. Inter-class spread

Inter-liquidity class spread credit

Priority	crt	Liquidity class 1	Market side 1 (A/B)	Liquidity class 2	Market side 2 (A/B)
n	...%	LQ	...	LQ	...

Inter-duration class spread credit

Priority	crt	Duration class 1	Market side 1 (A/B)	Duration class 2	Market side 2 (A/B)
n	...%	DR	...	DR	...

II. Information on SPAN® risk algorithm parameters for the derivatives market

Parameter definitions

PSR – price scan range

PSR intraday – price scan range, parameter used to calculate margins for positions opened and closed within the same day

VSR – volatility scan range

KL – derivatives market class

n – number identifier

2.1 Index derivatives

Main parameters

Class	PSR	PSR intraday	VSR	Minimum margin for options short position
KL	...%	...%	...%	...

Detailed parameters for index options

Class	Expiry date	Risk-free interest rate	Dividend rate
KL	yyyy-mm-dd	...%	...%

Definition of levels

Class	Level	Instruments
KL	*n*	
	n	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	…	…	…	…	…	…	…
	n	…	…	…	…	…	…	…

2.2 Stock derivatives

Main parameters

Class	PSR	PSR intraday	VSR	Minimum margin for options short position
KL	…%	…%	…%	…

Definition of levels

Class	Level	Instruments
KL	*n*	
	n	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	…	…	…	…	…	…	…
	n	…	…	…	…	…	…	…

2.3 Currency derivatives

Main parameters

Class	PSR	PSR intraday	VSR	Minimum margin for options short position
KL	…%	…%	…%	…

Definition of levels

Class	Level	Instruments
KL	*n*	
	n	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	…	…	…	n	…	…	…
	n	…	…	…	n	…	…	…

2.4 Inter-class spread

Inter-class spread credit

Priority	crt	Class1	Market side 1 (A/B)	Class2	Market side 2 (A/B)
n	…%	…	…	…	…

III. Information on stress-test risk parameters used to calculate contributions to the clearing guarantee fund

Parameter definitions

PSR – price scan range

VSR – volatility scan range

KL – derivatives market class

LQ - liquidity class in the cash market

DR - duration class in the cash market

crt – credit coefficient for spread between liquidity classes

n – number identifier

3.1 Cash market

Stress-test parameters for shares

Liquidation risk parameters

Liquidity class	x%	y%
LQ	...%	..%

Stress-test parameters for bonds

Liquidation risk parameters

Duration class	x%	y%
DR	...%	...%

Margin for inter-duration class spread

Duration class	Margin
DR	...%

3.2 Derivatives market

Index derivatives

Main parameters

Class	PSR	VSR	Minimum margin for options short position
KL	...%	...%	...

Definition of levels

Class	Level	Instruments
KL	*n*	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	…	…	…	…	…	…	…

Stock derivatives

Main parameters

Class	PSR	VSR	Minimum margin for options short position
KL	…%	…%	…

Definition of levels

Class	Level	Instruments
KL	*n*	
	n	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	…	…	…	…	…	…	…
	n	…	…	…	…	…	…	…

Currency derivatives

Main parameters

Class	PSR	VSR	Minimum margin for options short position
KL	...%	...%	...

Definition of levels

Class	Level	Instruments
KL	*n*	
	n	

Intra-class spread definition

Class	Priority	Level – leg 1	Delta number	Market side 1 (A/B)	Level – leg 2	Delta number	Market side 2 (A/B)	Margin
KL	*n*	...	...	...	...	...	...	...
	n	...	...	...	...	...	...	...

3.3 Inter-class spread

Inter-liquidity class spread credit

Priority	crt	Liquidity class 1	Market side 1 (A/B)	Liquidity class 2	Market side 2 (A/B)
n	...%	LQ	...	LQ	...

Inter-duration class spread credit

Priority	crt	Duration class 1	Market side 1 (A/B)	Duration class 2	Market side 2 (A/B)
n	...%	DR	...	DR	...

Inter-class spread credit in the derivatives market

Priority	crt	Class	Market side 1 (A/B)	Class	Market side 2 (A/B)
n	...%	KL	...	KL	...