JAPAN SECURITIES CLEARING CORPORATION

Outlines of Margin Calculation Method (VaR Method) for Futures/Option Contracts

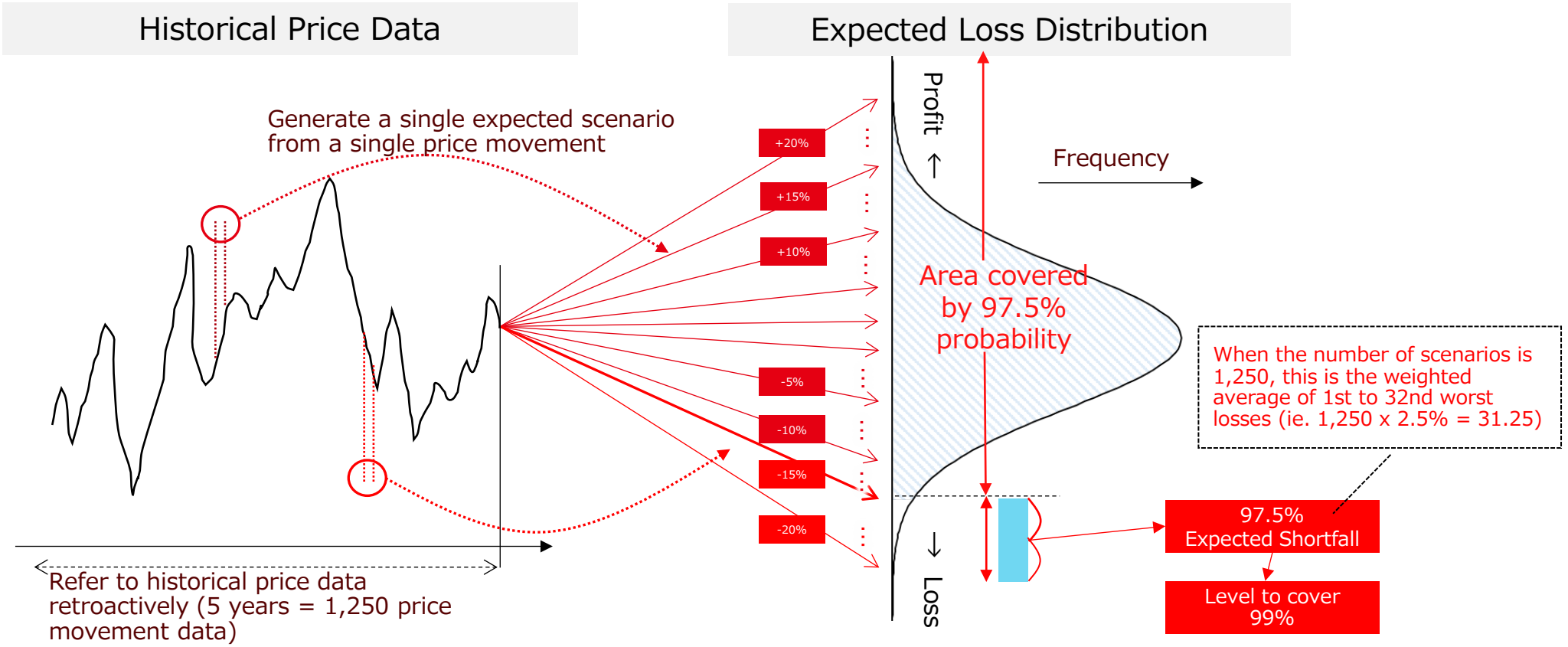
May 2025
Japan Securities Clearing Corporation

© 2025 Japan Securities Clearing Corporation

DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

1. Outline of VaR Method

- Under HS-VaR method, set Margin at the level to cover 99% expected loss calculated from historical data
- Adopt average of top 2.5% loss amount* calculated from each scenario (97.5% Expected Shortfall)
  * Assuming normal distribution, theoretically, almost equal to 99% coverage.
- In addition to Historical Scenarios in Lookback Period (past 5 years:1,250 days), Stress Scenarios are also considered.
  - Historical Scenarios will be adjusted to strongly reflect recent fluctuation.
- Points of attention: Margin changes daily, margin differs between long and short, as well as by contract month, even in a position of 1 contract of Futures



© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

2-1. HS-VaR: Scenario Generation

- Under HS-VaR, combine 1,250 Historical Scenarios and Stress Day-based Scenarios since 2008.
- Historical Scenarios capture recent fluctuations through volatility scaling using EWMA.
- Additionally, pick Stress Day-based Scenarios according to portfolio features from data of sufficiently long period in the past (10 years or more) to avoid recent fluctuations giving too much impact (deal with procyclicality).

Historical Scenario

Sample	Latest 1,250 (5 years)
MPOR	2 days
Volatility Adjustment	Yes (EWMA) ・EWMA parameters (λ & HVS) to be decided considering IM level

Stress Day-based Scenario

Sample	JSCC to pick from data since 2008 ・Number of samples and setting method to be decided considering IM level
MPOR	Same as Historical Scenarios
Volatility Adjustment	No

Illustration of Scenario Generation under HS-VaR (example of Index/Value)

Historical Scenario PnL

Fluctuation Rate

Instrument	1	2	3	…	1250
NK225F 2009	-0.5%	+1%	-1.5%		+2.5%
TOPIXF 2012	+1%	-2%	+3%		-0.5%
:			:		

Calculate PnL by applying historical 1,250 fluctuation rates to today's price

【PnL】

	1	2	3	…	1250
NK225F 2009	-1	+2	-3		+5
TOPIXF 2012	+2	-4	+6		-1
:			:		

Stress Day-based PnL

JSCC to pre-define N stress days since 2008

Fluctuation Rate

Instrument	2020.3.x	…	2011.3.x	…	2008.10.x	…
NK225F 2009	-15%		-10%		-20%	
TOPIXF 2012	-10%		-15%		-25%	
:			:		:	

Calculate PnL by applying fluctuation rates on N stress days to today's price

【PnL】

	1	2	3	…	N
NK225F 2009	+5	+8	-4		-15
TOPIXF 2012	-7	-6	+2		+1
:			:		

© 2025 Japan Securities Clearing Corporation

DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

2-2. HS-VaR: Historical Scenario Generation (Reference)

- For Historical Scenario generation, calculate historical 1,250 returns as to risk factors defined for each product, and scale volatility using EWMA (EWMA parameters are to be decided considering IM level feel).
  - Key risk factor for Futures is Settlement Price, and return is calculated from historical data of Settlement Price based curve putting remaining period to maturity on the horizontal axis (Settlement Price Curve).
  - Key risk factors for OP are price of underlying asset and IV:
    - Price of Underlying Asset: If Futures with the same underlying asset exists, calculate return from Settlement Price Curve of the Futures (consider consistency with Futures). If no such Futures, use other data, such as spot price.
    - IV: Apply pre-defined function to IV curve putting standardized moneyness on the horizontal axis by contract month, then calculate return from historical data of IV surface so obtained.
- Particularly in case of less liquid OPs where reliable IV historical data are not available, define IV surface to be used as benchmark (NK225 for example), then adjust that level with recent HV ratio.
- Some Commodity Futures products have seasonality in Settlement Price Curve movements. Such seasonality will be eliminated

© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

2-3. HS-VaR: Stress Day-based Scenario Generation (Reference)

- Generate Stress Day-based Scenarios from return on the stress days designated for each silo (no volatility scaling).
- Stress days are designated from data since 2008 as shown below using representative risk factors:
  - To accommodate various types of portfolios, pick days with significant fluctuations not only for Up/Down of a single risk factor, but also Up/Down of a combination of risk factors.
    - Example of Index Silo:

(NK225 Futures, ATM IV of NK225OP)	Top 25 fluctuations
(NK225 Futures 1st and 2nd Contract Month)	Top 25 fluctuations
(TOPIX Futures 1st and 2nd Contract Month)	Top 25 fluctuations
(NK225 Futures 1st Contract Month, TOPIX Futures 1st Contract Month)	Top 25 fluctuations

  - Eliminate overlapping days from days picked under each pattern.

© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

3-1. HS-VaR: VaR Margin Calculation(No Offset Restriction)

- After adding up Scenario PnL generated for each issue by portfolio, calculate VaR Margin amount using Scenario PnL with some top losses.
  - Calculate using Expected Shortfall to avoid individual sample giving too much impact on change of IM level (set at 97.5% Expected Shortfall so that cover ratio will be about the same as 99%VaR).

Illustration of VaR Margin Amount Calculation via HS-VaR (Example of Index Futures/Value)

Historical Scenario PnL (by Portfolio)

Instrument	Qty.	1	2	3	…	1250
NK225F 2009	+10	-10	+20	-30		+5
TOPIXF 2012	-20	+20	-40	+60		-10
:	:			:		
NK225C 2112 22000	-5	+5	-2	+1		-10
Portfolio		**+210**	**-120**	**-160**	…	**+20**

Stress Day-based Scenario PnL (by Portfolio)

Instrument	Qty.	1	2	3	…	N*
NK225F 2009	+10	+50	+80	-40		-15
TOPIXF 2012	-20	-70	-60	+20		+10
:	:			:		
NK225C 2112 22000	-5	-15	-12	+5		-50
Portfolio		**-200**	**-320**	**+80**	…	**-120**

(1)	(2)	…	(1250)
-450	**-360**	…	**+250**

(1)	(2)	(3)	…	(n*)
-500	**-400**	**-300**	…	**+100**

Sort 1,250 Historical Scenario PnLs by loss amount from largest loss

Sort N Stress Day-based Scenario PnLs by loss amount from largest loss, and pick top n PnLs

S	H	S		H
(1)	(1)	(2)	…	(1250)
-500	**-450**	**-400**	…	**+250**

Due to calculation by 97.5%ES, adopt average of losses in top 2.5% of samples from 1,250+n losses as PFE

Portfolio PFE	**-300**

© 2025 Japan Securities Clearing Corporation

DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

3-2. HS-VaR: VaR Margin Calculation(With Offset Restriction)

- Create groups within a portfolio subject to HS-VaR, and impose certain offset restrictions between groups, as necessary.
- Calculate VaR Margin amount for the entire portfolio including the created groups through the process described in the previous slide. Based on this, start applying the offset restriction formula shown below from the lowest layer groups, and update portfolio VaR Margin Amount.
  Offset Restriction Formula: Max(Y−a(Y-X), X, bY)
  (a and b is defined in “Handling of Specifics Concerning VaR Method”. X is pre-update VaR Margin amount. Y is sum of updated VaR Margin Amount at lower layer groups under the tree)

Illustration of Group Creation and Offset Restriction (Energy Futures)

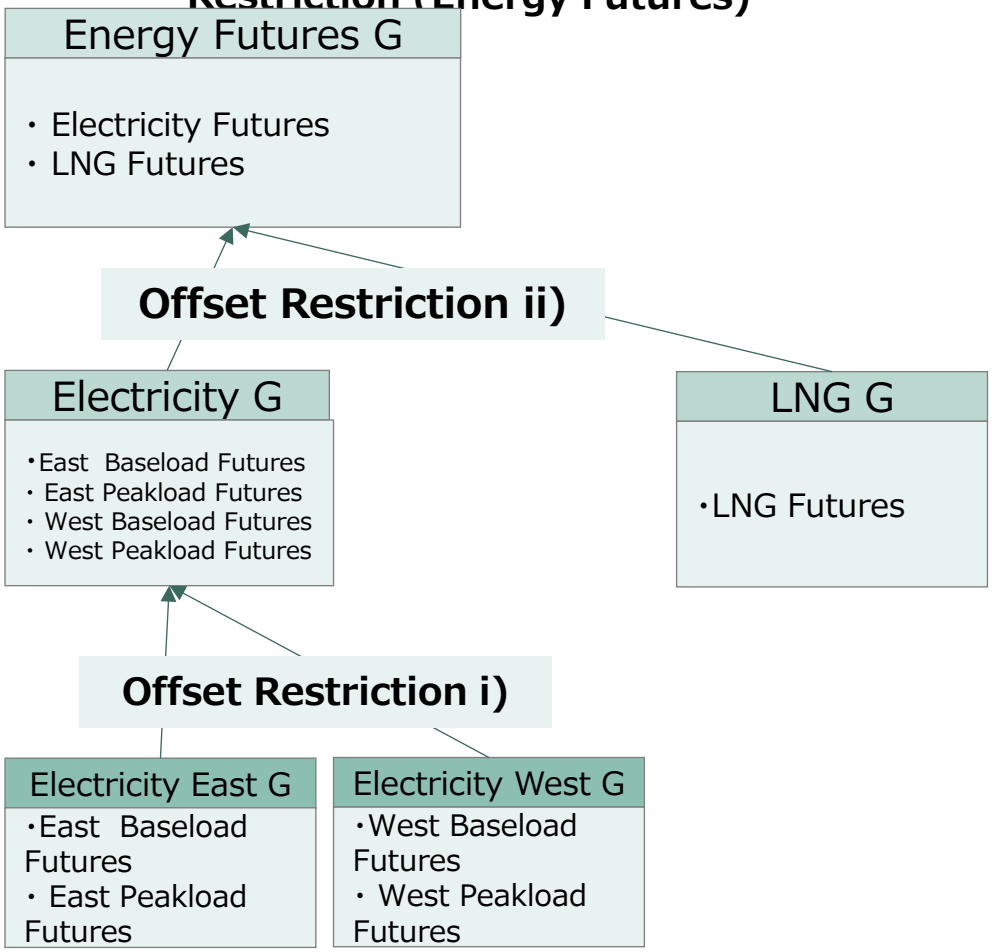
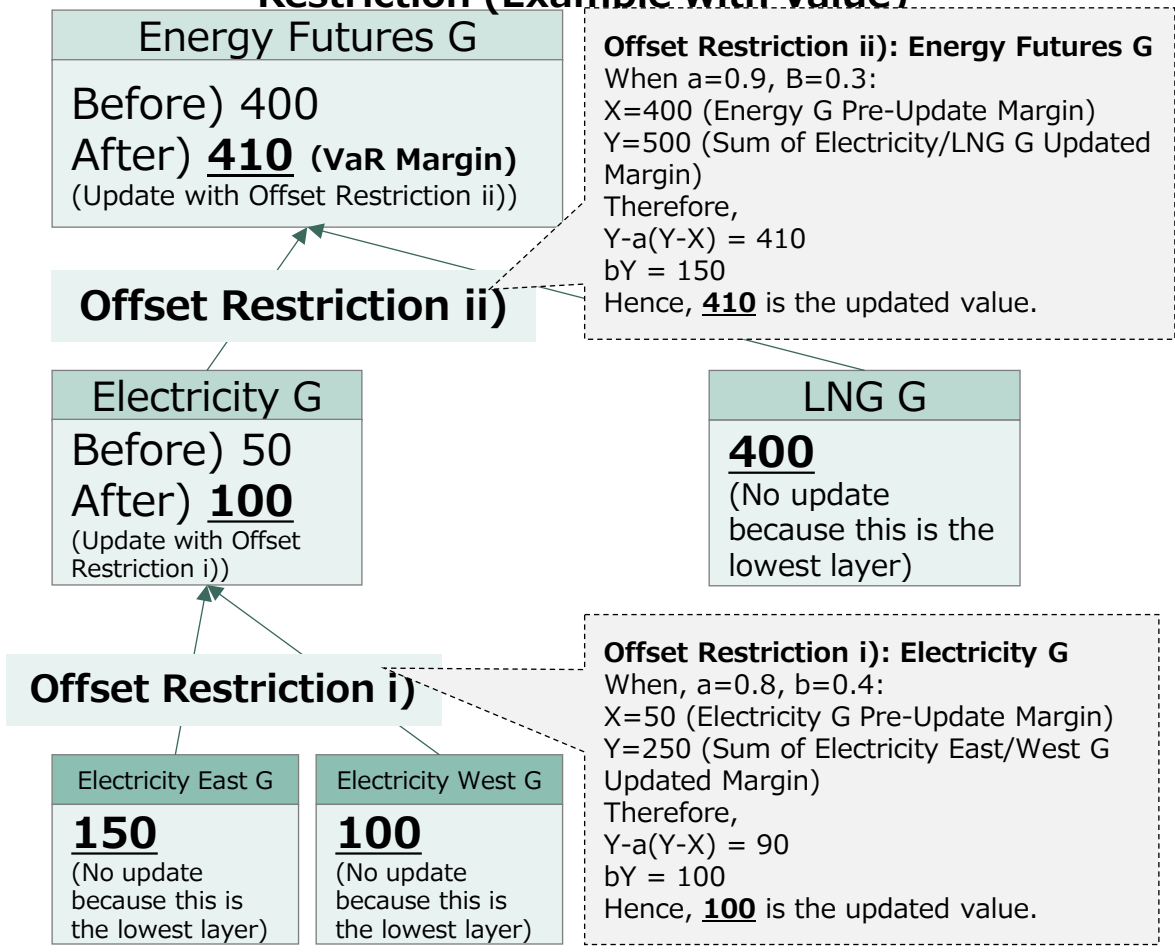


Illustration of VaR Margin Amount with Offset Restriction (Example with Value)



© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

4. AS-VaR: Scenario Generation, VaR Margin Calculation

- Under AS-VaR, scenarios to be used for PFE calculation are combination of fluctuation range and direction (Up/Flat/Down) of risk factors.
  1. “Fluctuation range of risk factors” to be generated from historical data of risk factors.
  2. As to “fluctuation direction,” 30 combinations for each issue: i.e., price (up, ½ up, flat, ½ down, down), IV (up, flat, down) and interest rate (up, down) (5 x 3 x 2).
  3. Spread between contract months will be set.
  4. Risk offset considering correlation coefficient is implemented across commodities specifically permitted.
- PFE is the largest loss among PnLs calculated for each scenario.

AS-VaR PFE Calculation Example (example of PME)

GOLD Futures

Instrument	Qty.	1 (uuu)	2 (udu)	3 (suu)	…	30 (ddd)
GOLDF 2210	+10	+10	+10	0		-10
GOLDF 2212	-20	-20	-20	0		+20
Spread	10	-2	-2	-2		-2
Portfolio		**-12**	**-12**	**-2**	…	**+8**

PLATINUM Futures

Instrument	Qty.	1 (uuu)	2 (udu)	3 (suu)	…	30 (ddd)
PLATF 2210	+20	+20	+20	0		-20
PLATF 2212	-10	-10	-10	0		+10
Spread	10	-2	-2	-2		-2
Portfolio		**+8**	**+8**	**-2**	…	**-12**

1 (uuu)	2 (udu)	…	30 (ddd)
-12	**-12**	…	**+8**

1 (uuu)	2 (udu)	…	30 (ddd)
+10	**-20**	…	**-5**

1 (uuu)	2 (udu)	…	30 (ddd)
+8	**+8**	…	**-12**

i) Select largest loss out of 30 scenarios

ii) PFE shall be simple total of largest loss of each product (when no risk offset between commodities)

© 2025 Japan Securities Clearing Corporation

DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

5. AS-VaR Method: Various Parameters

- Shown below are parameter information related to AS-VaR Margin Calculation.
  1. Price(BPL), Volatility(VFR), Interest Rate Fluctuation Risk(RFR)
     - Used to obtain Risk Amount under 30 scenarios
     - Price fluctuation risk parameter is equivalent to Margin per futures contract
  2. Cross-Contract Month Fluctuation Risk(SFR)
     - Used to obtain cross-contract month fluctuation risk within the same Commodity Group using delta for each of 30 scenarios
  3. Aggregation Code by Layer, Intercommodity Position Adjustment Ratio by Layer(Correlation-Price Multiplier)
     - Used to obtain intercommodity spread credit to which risk offset is permitted

Please refer to “Handling of Specifics Concerning VaR Method” for details.

Item	Description	Remarks
File Format	CSV	
Recorded Data	Information of parameters used for AS-VaR Margin calculation	
Posting Location (URL)	https://www.jpx.co.jp/jscc/datafeed/derivatives/reference/	
Posting Time	Last Business Day of every week around 17:30	There may be an ad hoc revision at a time of sudden market fluctuation.

© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

6. AS-VaR : Scenario Generation, VaR Margin Calculation

- Shown below are details of 30 scenarios used for PFE calculation under AS-VaR method.

#	Price	Volatility	Interest Rate
1	Up 2/2 of BPL	Up	Up
2	Up 2/2 of BPL	Up	Down
3	Up 2/2 of BPL	Flat	Up
4	Up 2/2 of BPL	Flat	Down
5	Up 2/2 of BPL	Down	Up
6	Up 2/2 of BPL	Down	Down
7	Up 1/2 of BPL	Up	Up
8	Up 1/2 of BPL	Up	Down
9	Up 1/2 of BPL	Flat	Up
10	Up 1/2 of BPL	Flat	Down
11	Up 1/2 of BPL	Down	Up
12	Up 1/2 of BPL	Down	Down
13	Flat	Up	Up
14	Flat	Up	Down
15	Flat	Flat	Up

#	Price	Volatility	Interest Rate
16	Flat	Flat	Down
17	Flat	Down	Up
18	Flat	Down	Down
19	Down 1/2 of BPL	Up	Up
20	Down 1/2 of BPL	Up	Down
21	Down 1/2 of BPL	Flat	Up
22	Down 1/2 of BPL	Flat	Down
23	Down 1/2 of BPL	Down	Up
24	Down 1/2 of BPL	Down	Down
25	Down 2/2 of BPL	Up	Up
26	Down 2/2 of BPL	Up	Down
27	Down 2/2 of BPL	Flat	Up
28	Down 2/2 of BPL	Flat	Down
29	Down 2/2 of BPL	Down	Up
30	Down 2/2 of BPL	Down	Down

© 2025 Japan Securities Clearing Corporation
DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.

7. AS-VaR Method: Risk Offset

- Offset of Risk Amount under AS-VaR Method will be implemented via the flow described below:
  1. Identify instrument to be the basis for offset within the aggregation group subject to the offset (Base Instrument);
  2. Obtain adjusted position quantity of instruments subject to offset (Instruments subject to Conversion) by using intercommodity position adjustment factor; and
  3. Out of adjusted position quantity of Base Instrument and Instruments subject to Conversion, implement risk amount credit for Base Instrument for the overlapping short/long.

Offset Calculation Example under AS-VaR (Example using OSE Precious Metals)

Deduct the margin for the overlapping number of contracts from the short-side/long-side of each group.
※- Assuming Margin per Gold Standard Futures Contract is 0.5 mil yen and Platinum Standard Futures Contract is 0.1 mil yen

Gold Standard Group

Instrument	Qty.	Factor	After Adjust-ment
Gold Standard 2506	-20	1	-20
Gold Standard 2508	+10	1	+10
Gold Mini 2506	+10	0.1	+1
Portfolio (after conversion to size of Gold Standard)			**-9**

OSE Gold Rolling-spot Futures Group

Instrument	Qty.	Factor	After Adjust-ment
Gold Rolling-spot	+50	0.08	+4
Portfolio (after conversion to size of Gold Standard)			**+4**

Platinum Standard Group

Instrument	Qty.	Factor	After Adjust-ment
Platinum Standard 2506	+20	1	+20
Platinum Standard 2508	-10	1	-10
Platinum Mini2506	+50	0.2	+10
Portfolio (after conversion to size of Platinum Standard)			**+20**

OSE Platinum Rolling-spot Futures Group

Instrument	Qty.	Factor	After Adjust-ment
Platinum Rolling-spot	-100	0.18	-18
Portfolio (after conversion to size of Platinum Standard)			**-18**

Gold Standard Group	short	long	Over-lap
Portfolio (after conversion to size of Gold Standard)	-9	+4	**4**

Platinum Standard Group	short	long	Over-lap
Portfolio (after conversion to size of Platinum Standard)	-18	+20	**18**

Credit Amount	**4 contracts×2(short･long)×0.5mil yen＝4.0 mil yen**

Credit Amount	**18 contracts×2(short･long)×0.1 mil yen＝3.6 mil yen**

OSE Precious Metals Group

OSE Precious Metals Group	Qty.	Factor	After Adjust-ment
Gold Standard Group	-5	1	-5
Platinum Standard Group	+2	0.15	+0.3
Over-lap			**+0.3**

Credit Amount	**0.3 contracts×2(short･long)×0.5 mil yen＝0.3 mil yen**

Sum of Credit Amount	**4.0 mil yen＋3.6 mil yen+0.3 mil yen＝7.9 mil yen**

© 2025 Japan Securities Clearing Corporation

DISCLAIMER: This is the reference translation of the original Japanese document. Japan Securities Clearing Corporation shall accept no responsibility or liability for damage or loss caused by any error, inaccuracy, or misunderstanding with regard to this translation. This document may not be reproduced or redistributed in whole or in part without the permission of Japan Securities Clearing Corporation.