

Outline of Structure Relating to Clearing of OIS and Expansion of TIBOR Tenors

September 10, 2014

Japan Securities Clearing Corporation

I. Purpose

The purpose of this Outline of Structure Relating to Clearing of OIS and Expansion of TIBOR Tenors is to implement required amendments of JSCC's existing relevant structure, such as addition of Overnight Index Swap ("OIS"), an interest rate swap exchanging Japanese Yen unsecured (overnight) call money rates for Japanese Yen fixed rates that has been traded to a certain extent in the market as Japanese Yen-denominated IRS, and Japanese Yen TIBOR-based IRS ("DTIBOR") as transactions eligible for clearing with a view to expanding the scope of JSCC's IRS clearing business, as well as revisions to its existing Initial Margin structure to increase the accuracy of its risk management system.

II. Overview

| Item | Description | Remarks |
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| 1. Clearing of OIS and expansion of TIBOR Tenors | | |
| (1) Trades to add or expand for clearing | <ul style="list-style-type: none">• As a new trade eligible for clearing, an interest rate swap with tenors of 40 years or less exchanging Japanese Yen unsecured (overnight) call money rates for Japanese Yen fixed rates (Overnight Index Swap, or "OIS") shall be added.• The scope of tenors for IRS trades linked to 3M and 6M Euroyen TIBOR ("ZTIBOR"), which are already eligible for clearing (hereinafter "ZTIBOR | <ul style="list-style-type: none">• Currently, the scope of tenors eligible for clearing is set to 5 years or less for clearing for 3M, and 10 years or less for |

| Item | Description | Remarks |
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| | <p>Swap”), shall be expanded to 20 years or less.</p> <ul style="list-style-type: none"> • As new trades eligible for clearing, IRS trades linked to 3M and 6M Japanese Yen TIBOR (“DTIBOR”) (hereinafter “DTIBOR Swaps”) shall be added, with the scope of tenors eligible for clearing set to 10 years or less. | <p>6M.</p> |
| (2) Variation Margin | <ul style="list-style-type: none"> • Variation Margin for OIS shall be calculated based on OIS yield curves. • Variation Margin for DTIBOR shall be calculated by requesting new quotes for use in the generation of DTIBOR yield curves and performing valuations using DTIBOR yield curves generated based on the submitted quotes. | <ul style="list-style-type: none"> • OIS yield curves shall be generated based on quotes that have already been submitted by Participants. • As there is almost no basis difference between ZTIBOR and DTIBOR at present, JSCC will request submission of ZTIBOR basis rates as quotes for DTIBOR and value positions based on such quotes. JSCC will ensure proper management of risks associated with DTIBOR. • Quotes for DTIBOR shall be submitted by Participants holding DTIBOR positions and Designated Clearing Participants. • Submission of quotes relating to grid points corresponding to a longer period of time than eligible tenors shall not be mandatory. Only Designated Clearing Participants will be requested to submit such quotes as reference values. • DTIBOR shall be exempt from additional charges, which is |

| Item | Description | Remarks |
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| | | a mechanism to ensure the reliability of quotes, for the first 9 months after the start of the service (“Dry Run Period”). |
| (3) Initial Margin | <ul style="list-style-type: none"> The required amount of Initial Margin shall be calculated on a portfolio basis, whether the trade is LIBOR, ZTIBOR, DTIBOR or OIS. | <ul style="list-style-type: none"> The method of calculating the required amount of Initial Margin shall reflect revisions currently in progress. Initial Margin for DTIBOR shall be calculated based on DTIBOR yield curves. |
| (4) Liquidity Charge | <ul style="list-style-type: none"> The Liquidity Charge structure shall be the same as the current one for IRS linked to LIBOR and ZTIBOR. | <ul style="list-style-type: none"> The method of calculating Liquidity Charge shall reflect revisions currently in process. Liquidity Charge for OIS shall be calculated taking into account basis risks associated with hedge transactions against OIS and 3M-LIBOR. Liquidity Charge for DTIBOR shall be calculated taking into account basis risks associated with ZTIBOR and DTIBOR. |
| (5) Management of a Participant’s Default (Auction) | <ul style="list-style-type: none"> An auction at the default of a Participant shall be held collectively for all positions, regardless of trade type. | |

| Item | Description | Remarks |
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| (6) Clearing Fund | <ul style="list-style-type: none"> • Stress scenarios relating to OIS used to calculate the required amount of Clearing Fund shall be generated based on OIS yield curves in the same way as they are now. • Stress scenarios relating to DTIBOR Swaps used to calculate the required amount of Clearing Fund shall be generated based on DTIBOR yield curves. | <ul style="list-style-type: none"> • When Phase 3.5 goes live, the required amount of Clearing Fund shall be basically calculated using the currently adopted Clearing Fund calculation method. Discussions will be held continuously on revising the calculation method. |
| 2. Improvement in clearing procedures | | |
| (1) Post-Clearing Procedures | | |
| A. Real-time Processing of Voluntary Termination | <ul style="list-style-type: none"> • JSCC will introduce a structure to determine whether to approve voluntary termination on a real-time basis during the hours for Clearing Procedures per Trade (CPT), as described in (i) to (iii): <p>(i) Hours for voluntary termination (Hours for CPT)</p> <ul style="list-style-type: none"> A 9 : 00-11 : 00 B 11 : 00-12 : 00 C 13 : 00-16 : 00 <p>(ii) Completion of voluntary termination</p> <ul style="list-style-type: none"> ✓ Voluntary termination shall be allowed if the applicant holds the balance of collateral greater than or equal to the required amount of margin (equivalent to Initial Margin and Variation Margin) ^(*) | |

| Item | Description | Remarks |
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| | <p>calculated on the assumption that voluntary termination was approved for every application during the hours listed in (i).</p> <p>(*) If there is a shortfall in cash for fund settlement between 9:00 and 11:00, the shortfall should be added to the required amount of margin.</p> <p>(iii) Where there is a shortfall in the balance of collateral</p> <p>✓ If there is a shortfall in the balance of collateral, the application for voluntary termination shall be rejected.</p> | |
| <p>B. Processing of Transfer of Clearing Contracts (Customer Account) (Position Transfer) on the Same Day</p> | <ul style="list-style-type: none"> ▪ JSCC will introduce a structure that would complete position transfer on the day of application, as described in (i) to (iii): <ul style="list-style-type: none"> (i) Application for position transfer <ul style="list-style-type: none"> ✓ Application for position transfer shall be made by 13:00 on the day. (ii) Completion of position transfer <ul style="list-style-type: none"> ✓ Position transfer is completed if the balance of collateral, for both Receiving and Transferring Customers, is equal to, or greater than, the required amount of margin (equivalent to IM and VM) which is calculated based on the positions as of EOD (16:00), on the assumption that the position transfer had been completed. (iii) Where there is a shortfall in the balance of collateral | <ul style="list-style-type: none"> • Position transfer will probably be completed at around 17:30. |

| Item | Description | Remarks |
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| | <ul style="list-style-type: none"> ✓ Positions are not transferred if there is a shortfall in the balance of collateral for either Receiving Customer or Transferring Customer or, both of them. In that case, the required amount of margin shall be recalculated for both Receiving and Transferring Customers based on the positions as of EOD before position transfer. | |
| (2) Clearing Procedures | | |
| A. Improvement of Clearing Procedures for Bulk Backload Transactions | <ul style="list-style-type: none"> ▪ JSCC will introduce a new clearing structure relating to backload transactions, in addition to the normal clearing procedures, as described in (i) to (iii): <ul style="list-style-type: none"> (i) Cut-off time for application for clearing of backload transactions <ul style="list-style-type: none"> ✓ If a Participant desires to perform clearing of a backload transaction under this clearing structure, the Participant must apply for clearing between 16:00 and 20:00. (ii) Approval of clearing during hours for backload clearing procedures <ul style="list-style-type: none"> ✓ JSCC will determine whether a trade applied for clearing, as mentioned in (i), is eligible for clearing from early in the morning through 8:00 a.m. (hereinafter referred to as backload clearing hours). ✓ In determining the eligibility for clearing, the required amount of | |

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| | <p>margin (equivalent to IM and VM) (+shortfall in cash for fund settlement) shall be calculated based on the positions in each backload transaction combined with those in cleared trades. Clearing of the trade applied shall be allowed if the balance of collateral is equal to, or greater than, the required amount of margin.</p> <p>(iii) Where there is a shortage in the balance of collateral during the backload clearing hours</p> <ul style="list-style-type: none"> ✓ Even if there is a shortfall in collateral, the application will not be rejected during backload clearing hours and the eligibility determination process shall be performed several times. ✓ This enables clearing of backload transactions during the relevant hours if they can be covered with the remaining collateral posted by the parties. | <ul style="list-style-type: none"> • If clearing of a backload transaction is not approved during the backload clearing hours, it will be rejected once. However, the rejected trade can be approved for clearing immediately by posting necessary collateral during the ensuing CPT hours. |
| B. Extension of CPT Hours | <ul style="list-style-type: none"> ▪ A new time slot from 9:00 to 11:00 shall be set up for CPT to extend the CPT hours in the morning. ▪ With regard to determination on the eligibility for clearing, clearing of an applied trade shall be allowed if the balance of collateral is not short of the required amount of margin (equivalent to IM and VM) (plus a shortfall in cash for fund settlement, if any) which is calculated based on the positions in | |

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| | each newly applied trade combined with those in cleared trades at the time. | |
| (3) Extension of Cut-Off Time for Cash Withdrawal Application | <ul style="list-style-type: none"> ▪ JSCC will change the cut-off time for cash withdrawal application to 11:00. | <ul style="list-style-type: none"> ▪ Under the current structure, the cut-off time for cash withdrawal application is set at 10:00. |
| 3. Revision of Initial Margin Structure | | |
| (1) Initial Margin | | |
| A. Introduction of Expected Shortfall Method | <ul style="list-style-type: none"> ▪ The Expected Shortfall method will be introduced to calculate the required amount of Initial Margin before extra charges are added (“Base IM”) (For details, see (2) Details about Calculation Methodology.) | <ul style="list-style-type: none"> ▪ With the current Worst Case Loss method, Base IM is the maximum amount of losses over the past 1,250 days (reference period). If a different scenario is applied, Base IM may change greatly. JSCC will revise the current structure to prevent such extreme changes. |
| B. Details about Calculation Methodology | <ul style="list-style-type: none"> ▪ Historical scenarios shall be generated based on changes in market data during a stress event scenario period (for details, see (3) Treatment of Stress Event Scenarios), in addition to the 1,250-day reference period used under the current structure. JSCC will apply the market data of the day to each scenario to calculate changes in net present value (“NPV”) and Base IM shall be the amount that will cover the average value of top ranked losses, | <ul style="list-style-type: none"> ▪ Specifically, Base IM shall be the amount that will cover the average value of top 1% losses. JSCC will verify the validity of the level through regular monitoring of the operation of the risk management structure. The level may be changed temporarily, if necessary as a result of such verification, by referring |

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| | <p>which are calculated based on the changes of NPV.</p> <ul style="list-style-type: none"> ▪ As to changes in market data for each period, scenarios shall be generated based on a 5-day fluctuation, which is the same as the current practice. | <p>the matter to the IRS Management Committee.</p> |
| <p>C. Treatment of Stress Event Scenarios</p> | <ul style="list-style-type: none"> ▪ Stress event scenarios should reflect interest rate fluctuations that were actually observed in past market events. ▪ The period for stress event scenarios shall be the year of the Lehman Crisis (April 2008 to March 2009) and the year of the Bank of Japan's Quantitative and Qualitative Monetary Easing (October 2012 to September 2013) when interest rates fluctuated particularly sharply. ▪ Five scenarios with the five largest losses over the period will be added as stress event scenarios. ▪ Stress event scenarios shall be generated based on interest rate fluctuations at the time, rather than the EWMA method. | <ul style="list-style-type: none"> ▪ JSCC will verify the validity of the period for stress event scenarios and the number of additional scenarios through regular monitoring of the operation of the risk management structure. They may be revised temporarily, if necessary as a result of such verification, by referring the matter to the IRS Management Committee. ▪ Stress event scenarios will differ depending on the portfolio because changes in NPV are calculated for each portfolio. ▪ In ordinary scenarios, market data are adjusted by using EWMA (Exponentially Weighted Moving Average) in order to reflect the latest volatility level. For stress event scenarios, however, EWMA will not be used to directly reflect interest rate fluctuations observed at the time. |

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| | | Therefore, different scenarios will be generated even if the period is the same as normal scenarios. |
| (2) Raising Required Amount of IM relating to Liquidity, etc. (Liquidity Charge) | <ul style="list-style-type: none"> JSCC will revise the current structure for increased IM relating to liquidity, etc. in order to reflect risk offset between tenors more precisely. | <ul style="list-style-type: none"> It is pointed out that effects of risk offset between tenors are not considered well under the current structure, resulting in a Liquidity Charge level that is excessively higher than it should be. In addition to Liquidity Charge, JSCC will continue discussions on a separate extra charge for Clearing Participants holding so large positions as to make hedge transactions difficult. |
| A. Basic Idea | <ul style="list-style-type: none"> Assuming that the cost relating to liquidity, etc. is equal to the risk of divergence of positions from the Mid value (standard deviation), the extra charge (“Liquidity Charge”) shall be the risk calculated on a portfolio basis. More specifically, the calculation methodology shown on the right shall be used on the assumption that the correlation of costs relating to liquidity, etc. between tenors is based on the correlation of past interest rate fluctuations between the tenors. | <p><Liquidity Charge (LC)></p> $LC = \sigma(X) = \sqrt{V(X)}$ $= \sqrt{\sum_{i=1}^d (Q_i C_i)^2 + \sum_{j \neq i} (Q_i C_i)(Q_j C_j) \rho_{ij}}$ |

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| | | <p> $X =$ Fluctuation in amount of risks associated with portfolio $P_i =$ PV01 of Participant's position (i=1,...,d) $Q_i = \begin{cases} P_i - Threshold & (P_i \geq 0) \\ P_i + Threshold & (P_i < 0) \end{cases}$ (excess PV01) $C_i(P_i) =$ Critical Basis Point, which varies according to PV01 of Participant's position $\rho_{ij} =$ Correlation Coefficient of Interest Rate Fluctuations </p> <ul style="list-style-type: none"> The amount of risk for each tenor shall be calculated, after a market survey, by multiplying excess PV01 of Participant's position for each tenor (Q) by Critical Basis Point (C). |
| B. Details about Calculation Methodology | | |
| a. Calculation of Correlation Coefficient | <ul style="list-style-type: none"> Correlation coefficients, which are used as a basis for the calculation of Liquidity Charge, shall be calculated based on the daily fluctuation of interest rates over the past six months (125 business days). In addition to the correlation coefficients of the day, JSCC will reflect correlation at the end of each month during the year of the Lehman Crisis (April 2008 to March 2009) and the year of the Bank of Japan's Quantitative and Qualitative Monetary Easing (October 2012 to September | <ul style="list-style-type: none"> JSCC will verify the validity of the period for correlation through regular monitoring of the operation of the risk management structure. The period for |

| Item | Description | Remarks |
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| | 2013) when correlation fluctuated particularly sharply. | correlation may be revised temporarily, if necessary as a result of such verification, by referring the matter to the IRS Management Committee. |
| b. Calculation of Liquidity Charge | <ul style="list-style-type: none"> ▪ The Liquidity Charge for each portfolio shall be the maximum amount of Liquidity Charges calculated based on the correlation coefficients at the above-mentioned points of time (a total of 25 points of time). | |
| C. Application Level (Base PV01) | <ul style="list-style-type: none"> ▪ JSCC will conduct a survey the tolerable maximum risk without changing the Mid price (having any impact on the Mid price), which is the level for starting to apply Liquidity Charge to cover the expected costs relating to liquidity. JSCC will apply Liquidity Charge to the portion exceeding that level. | <ul style="list-style-type: none"> ▪ Under the current structure, Liquidity Charge is applied only when ask-bid spreads exceed the risk level (Base PV01) of 3bp, or 5bp for 6M-LIBOR, in the market survey. |

III. Timing of implementation (Tentative)

This structure will come into effect on November 4, 2014. However, the revision relating to DTIBOR will be implemented on December 15, 2014 on condition that a reliable DTIBOR broker screen is established. (Both scheduled dates require permission from the Commissioner of the Financial Services Agency.)

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