Policy Guideline of the Bank of Thailand
Re: Liquidity Risk Management of Financial Institutions

28 January 2010

BANK OF THAILAND

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Unofficial Translation
This translation is for the convenience of those unfamiliar with the Thai language
Please refer to Thai text for the official version

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1. Rationale

Pursuant to the Bank of Thailand's issuance of BOT Notification No. FPG. 41/2551 Re: Liquidity Risk Management of Financial Institutions that in line with the Sound Practices for Managing Liquidity in Banking Organisations issued by the Basel Committee on Banking Supervision (BCBS) in 2000.

BCBS later released a revised version of the Principles for Sound Liquidity Risk Management and Supervision in September 2008 by setting additional principles on liquidity risk management for financial institutions to supplement the original issue of the Sound Practices for Managing Liquidity. The improvement enables financial institutions to deal with developments in financial markets and technological advancement as well as crises, for example, identification of all risks, intraday liquidity risk management and public disclosure of financial institution's liquidity and so forth. These principles constitute qualitative principles in liquidity risk management and presently BCBS has been working to prescribe quantitative measurements and relevant details.

Hence, the Bank of Thailand issues Guidelines on Liquidity Risk Management of Financial Institutions so that financial institutions can use these guidelines for preparation, review and improvement of their policies and operating systems pertaining to liquidity risk management to cope with economic uncertainty and changing situations. These guidelines constitute qualitative principles which conform to BCBS's principles issued in September 2008. In the future, the Bank of Thailand will revise qualitative and quantitative principles in liquidity risk management for financial institutions when there is clearer standard approaches.

2. Scope of Application

This guideline shall apply to all financial institutions according to the laws on financial institution business except credit foncier companies.

3. Content

3.1 In this guideline,

"Financial institution" means a financial institution according to Section 4 of the Financial Institution Business Act B.E. 2551 (2008) except credit foncier companies.

"Subsidiary" means a subsidiary according to Section 4 of the Financial Institution Business Act B.E. 2551 (2008).

"Affiliate" means an affiliate company according to Section 4 of the Financial Institution Business Act B.E. 2551 (2008).

"Board of directors of the financial institution" mean the board of directors of the financial institutions, or an executive committee that has relevant authority, duties and responsibilities, in case of foreign bank branch.

"Sub-committees" mean a committee appointed by the board of directors of a financial institution to manage liquidity risk of the financial institution, such as the Asset and Liability Management Committee (ALCO). Such committee should consist of executive with decision-making power from liquidity risk related units, including units whose operation may affect liquidity and units which are responsible for liquidity risk management and control.

"Liquidity risk tolerance" means a level of liquidity risk approved by the board of directors of a financial institution commensurate with financial position, fund mobilization capability, business strategy, roles in the financial system as well as other risks and relevant factors. Such liquidity risk level is used to control liquidity risk at an appropriate level.

"Survival period" means a minimum period of time in which a financial institution can manage liquidity sufficiently in its business operation under a crisis that adversely affects liquidity and causes the most severe cash outflows. As such, a financial institution defines a survival period based on underlying assumptions in such scenario by itself. The determination of survival period depends on several factors, such as ability to access funding sources of financial institution.

"Liquidity cushion" means good quality, highly liquid and marketable assets which a financial institution should have in sufficient quantity to guard against liquidity risk under normal and stress scenarios. Liquidity cushion depends on financial institution's liquidity risk tolerance, stress testing, survival period and qualification of assets. Underlying assets that support short-term liquidity in a crisis should have the best quality and highest liquidity such as cash, government bond and securities that can be pledged as a collateral when borrowing from the Bank of Thailand. For assets supporting liquidity needs in a longer term, they may have lower quality, such as listed securities in the stock market and so forth.

3.2 Principle

Financial institutions should be able to manage liquidity risk efficiently to generate sufficient liquidity for debt repayment and obligations upon maturity or being called under normal and stress circumstances, in all currencies that the financial institution operates its business with and covering all financial business groups. Moreover, financial institutions should be able to manage and control such risk in accordance with its policy and strategy and maintain such risk within its liquidity risk tolerance approved by the board of directors of the financial institution.

3.3 Regulations

(1) Role and responsibility of the board of directors of a financial institution

In liquidity risk management, the board of directors of a financial institutions should have the following role and responsibility:

(1.1) Approve liquidity risk management policy and strategy including liquidity risk tolerance of the financial institution.

(1.2) Regularly review the policy and strategy including liquidity risk tolerance at least once a year or immediately when there are changes in the environment or business strategy, significant changes of assumptions of behavioral adjustment or stress testing in order to improve policy, strategy and practices commensurate with such changing situations.

(1.3) Control and ensure that senior management or delegated person implement such policy and strategy by setting procedures for measuring, monitoring,

controlling and managing liquidity efficiently as well as maintaining such risk within approved liquidity risk tolerance.

(1.4) Regular monitor liquidity position and liquidity management efficiency through the sub-committees' reports and contemplate corrective actions when problems or deficiencies are found.

Furthermore, the board of directors of a financial institution shall adhere to its authority and duties prescribed in the Bank of Thailand Notification Re: Authorities and Duties of the Board of Directors of Financial Institutions that the Bank of Thailand gives the Highest Importance and the Bank of Thailand Notification Re: Corporate Governance of Financial Institution as well as other relevant notifications and guidelines.

(2) Organisational structure, duty and responsibility and personnel

(2.1) Financial institution should have suitable organisational structure and competent personnel and should define clear roles and responsibilities so that liquidity risk can be managed efficiently in accordance with policy and strategy approved by the board of directors of the financial institution.

(2.2) Organisational structure should facilitate monitoring, controlling and examining the operation in accordance with liquidity management policy, strategy and practices of the financial institution. There shall be independent audit and internal control units that directly report to the board of directors of the financial institution through the audit committee (see details in attachment 2).

(2.3) The financial institution should set up a sub-committee such as Asset and Liability Management Committee (ALCO). Regarding the composition of such sub-committee, it is important that the sub-committee gives importance to involvement of all business units whose operation may adversely affect liquidity. The duties of the sub-committee in liquidity risk management include:

(2.3.1) Formulate liquidity risk management policy and strategy which includes determination of liquidity risk tolerance of the financial institution in order to submit to the board of directors for approval. Such review should be conducted at least once a year or immediately when there are changes in business strategy or the environment that significantly affect liquidity management in order to ensure that such

policy and strategy can be improved to accommodate changing situations and guard against existing risks.

(2.3.2) Implement liquidity risk management policy and strategy including liquidity risk tolerance approved by the board of directors of the financial institution by formulating suitable stipulations and practices for liquidity risk management as well as stipulating clear role, responsibility and reporting line of those who are involved in liquidity risk management in writing. All involved parties shall be informed for acknowledgement and observance; moreover, checks and balances should be arranged appropriately.

(2.3.3) Control liquidity risk management in accordance with approved policy and strategy including liquidity risk tolerance of the financial institution. Report liquidity position, management approach, identified liquidity-related factors and problems to the board of directors of the financial institution regularly or immediately after significant problems have been identified so that corrective approach could be determined in timely manner.

(2.3.4) Regularly review assumptions used in information adjustment in accordance with the behaviors of customers or counterparties' behaviors and the environment as well as stress test assumptions at least once every quarter or every time there are significant changes in the environment, business structure and strategy in order to revise assumptions accordingly and present revised assumptions in behavioral adjustment or stress testing to the board of directors of the financial institution for approval.

(3) Policy, strategy and procedure

Financial institution should formulate liquidity risk management policy, strategy and procedure including a contingency plan that is clear and appropriate to business strategy and consistent with business characteristics and complexity, financial position, fund mobilization ability, and roles of the financial institution in the financial system (see details in attachment 1).

(4) Liquidity risk management system

(4.1) The financial institution should have system that can efficiently identify, assess, monitor and control liquidity risk in forward-looking manner by projecting all cash inflows and outflows from assets, liabilities and off-balance sheet items as well as contractual and non-contractual obligations within a suitable time period, covering all currencies and particular currencies that has significant businesses, and liquidity risk of each juristic person in financial business groups which the financial institution shall provide liquidity assistance to such as subsidiary and Special Purpose Vehicle (SPV) and financial business groups in general (see details in attachment 3).

The financial institution should take into account the behaviors of customers or counterparties that affect assets, liabilities and off-balance sheet items as well as various circumstances which may cause discrepancy between actual cash inflows, outflows and contracts or the estimation. Therefore, the financial institution should revise the information in conformity with such circumstances and behaviors by referring to historical data, future outlook, financial institution's strategy, changing environment and relevant factors (see details in attachment 4-6).

(4.2) The financial institution should have a system that provides information on structure of funding sources and period of time in order to monitor disperse funding sources in accordance with approved strategy as well as information on concentration of funding sources relating to counterparties, types of financial tools and instruments, markets, currencies and location of funding source.

(4.3) The financial institution should have necessary infrastructure for facilitating the access to various funding sources under both normal and stress circumstances. Moreover the financial institution should closely monitor factors that may affect fund mobilization ability so as to assess and maintain fund mobilization and borrowing ability under both normal and stress circumstances.

(4.4) The financial institution should have a system to facilitate intraday liquidity management as well as payment and settlement risk management, which specifies and prioritizes significant intraday payments such as time-specific obligations. Also, the system should have suitable receipt and payment sequences in both Baht and foreign currencies; moreover, it should be able to support all businesses, including a business with irregular cash inflow and outflow that the financial institution must pay special attention and exercise extreme caution such as the case of custodian bank, correspondent bank or settlement bank. Furthermore, the financial institution should

consider seeking of loan sources, ability to access funding sources and allocation of assets used as a collateral for intraday borrowing in order to facilitate completely and timely payment and settlement process under both normal and stress circumstances.

(4.5) The financial institution should have a suitable early warning system (see details in attachment 3)

(4.6) The financial institution should have a stress test system.

(4.6.1) The financial institution should perform stress test regularly under various scenarios, including institution-specific crisis, market-wide crisis and combination of both. Such crises may occur for a long period of time or occur temporary. The purpose is to assess risks and impacts on liquidity position at all levels, both at the level of juristic person and financial business group, identify factors or weaknesses that may cause liquidity problem to the financial institution and assure that the current position is consistent with the stipulated liquidity risk tolerance (see details in attachment 5).

(4.6.2) For stress testing, the financial institution should use crucial information including assets, liabilities and off-balance sheet items with both contractual and non-contractual obligations to demonstrate potential impacts on cash inflow and outflow of the financial institution under different stress scenarios.

(4.6.3) Scope and frequency of stress testing depend on size and quantity of transactions that induce risks and the financial institution's roles in the financial system; however, the stress test should be conducted at least once every quarter. There must be stipulation of a suitable survival period under the most stress circumstances which coincides with a period of time in which the financial institution mobilizes funds during a crisis. However, the financial institution should conduct a suitable review on assumption setting and provide rationale for such stipulation.

(4.6.4) The financial institution should use stress test results to improve liquidity position, liquidity risk management policy and strategy as well as the arrangement of contingency plan (see details in attachment 7) and determination of a suitable liquidity cushion.

(4.6.5) The Bank of Thailand may stipulate additional requirements for stress testing under certain scenarios, assumptions and frequency for some or all financial institution as set out by the Bank of Thailand where appropriate.

(4.7) The financial institution should properly manage assets or collaterals by maintaining sufficient amount of cash or good quality assets that can provide liquidity cushion under normal and stress circumstances which conforms to approved policy and strategy, business model, liquidity risk tolerance and survival period of the financial institution. In case where financial institution has insufficient quantity of high quality liquid assets to withstand stress circumstances in a tested scenario, it should have an action plan to improve liquidity position as well as policy and strategy immediately. The financial institution should regularly assess quality and liquidity of its assets. The assets used as liquidity cushion should have the following attributes:

(4.7.1) High liquid, no obligations, quickly convertible into cash. The financial institution should determine liquidity cushion's attributes which are suitable and can address various types of crisis, particularly market-wide crisis which may dry up liquidity in the market or cause market dysfunction. Liquidity cushion that is appropriate for such circumstance should be assets which can be used as a collateral when borrowing from the Bank of Thailand.

(4.7.2) Have suitable dispersion, for example, not highly concentrated in any single series of debt securities.

(4.8) The financial institution should have an efficient information system that supports liquidity risk management by reporting liquidity-related information, stress test results and relevant factors to senior management, sub-committees and the board of directors of the financial institution on regular basis. Hence, such information can be used for review and revision of policy and strategy or formulation of corrective approach in timely manner.

(5) Information disclosure

Financial institution should disclose liquidity-related information both qualitative and quantitative to the public regularly and adequately so that related parties can assess liquidity position and efficiency of liquidity management of the financial institution. In addition, information disclosure will also promote transparency and discipline in the financial institution system (see details in attachment 8).

(6) Operating system used in creation of report

Financial institution should develop an operating system that can create report that show net liquidity position or cash inflow and outflow for uses in its liquidity risk management as set out by the Bank of Thailand (see details in attachment 9).

4. Effective Date

This Guideline shall come into force as from 28 January 2010.

Attachments

1. Liquidity risk management policy and strategy
2. Internal control system pertaining to liquidity risk management
3. Liquidity risk management system
4. Data adjustment in accordance with customer or counterparty's behaviors under normal circumstances (behavioral adjustment)
5. Stress test
6. Haircut rate
7. Contingency plan
8. Information disclosure
9. Operating system in the creation of net liquidity position report

Attachment 1

Liquidity risk management policy and strategy

1. Formulation of policy and strategy

1.1 In the formulation of liquidity risk management policy and strategy which includes determination of liquidity risk tolerance, the financial institution should adopt a conservative approach and consider all factors which may affect liquidity risk management in every perspective. For example,

(1) Business size and characteristics, roles and importance of the financial institution in the financial system;
(2) Dispersion and volatility of funding sources as well as ability to access funding sources;
(3) Quantity and quality of existing assets;
(4) Reliability and ability to fulfill contractual obligations of existing funding sources and standby facilities;
(5) Constraints on legal and supervisory regulations of domestic, foreign and cross-border country where the financial institution operates its business in; practices and time period required for transferring liquidity and collateralized assets;
(6) Size and complexity of foreign currency transactions and ability to access foreign currency sources of fund;
(7) Business, transactions or off-balance sheet items that cause cash flow uncertainty such as collateral obligation, derivatives transaction or conduct of duties as correspondent bank or custodian bank;
(8) Financial institution’s obligations in the provision of liquidity support for a company in the financial business group or other related person such as subsidiary, affiliate and SPV;
(9) Various risk types that may affect the financial institution's liquidity such as credit risk, market risk, operational risk, legal risk, settlement risk and reputation risk.

1.2 The financial institution should convey and communicate the information to all levels of related management to ensure that they understand the policy and strategy which includes liquidity risk tolerance of the financial institution so that they can assess

and compare benefits received from the execution of transactions and potential liquidity risk and acknowledge and perform their duties and responsibilities pertaining to liquidity risk management under normal and stress circumstances.

2. Liquidity risk management policy and strategy

Liquidity risk management policy and strategy should be coherent and indicated in writing format. The information stipulated in liquidity risk management policy and strategy should at least include:

2.1 Liquidity risk tolerance consistent with business policy, strategy and complexity, financial position, fund mobilization ability and roles of the financial institution in the financial system under normal and stress circumstances.

2.2 Structure of assets, liabilities, obligations and off-balance sheet items, where there is a suitable distribution between sources of funds and uses of funds without overly depending on any single source, for example, no concentration among a few number of large creditors, investors or depositors. Accordingly, sources of funds and uses of funds should be identified in terms of time periods (short-term, medium-term and long-term), particularly valued source of fund such as focusing on small or large depositor, or relying on funding from its parent company in other country and valued use of fund, for example, focusing on approval of which type of loan. In this regard, relationship between source of fund or use of fund should be considered.

2.3 Coherent strategies for fund mobilization, access to funding sources, maintaining relationship with funding sources, and observing factors that may affect ability to access funding sources such as stability of the capital which should be closely monitored by the financial institution.

2.4 Guidelines on liquidity risk management in Thai Baht and foreign currencies for internal units of the financial institution, between juristic persons in the financial business group or related juristic persons, which include obligations which require the financial institution to provide liquidity assistance to other juristic persons, for example, subsidiary and Special Purpose Vehicle (SPV), assistance method, credit line or constraints on the provision of assistance as well as relevant laws and rules. The financial institution should determine a ceiling for liquidity assistance between juristic persons in the financial business group or related juristic persons in order to prevent the spread of liquidity problems from one juristic person to another.

2.5 Tools, ratios or ceilings used by the financial institution to measure and control liquidity risk; degree of dependency on capital from various sources in terms of composition, characteristics, financial tools and maturity period (see details in attachment 3).

2.6 Level or quantity of each type of performing and highly liquid assets which the financial institution should have as liquidity cushion under normal and stress circumstances.

2.7 Operating units responsible for liquidity risk management under normal and stress circumstances.

2.8 Policy and process pertaining to the consideration of liquidity-related costs, benefits and risks and pertaining to the determination of internal pricing, performance appraisal, approval of crucial, new transactions. Objectively, each business group's operation emphasizes cost-benefit consideration and liquidity risk arising from various transactions at the same time.

2.9 Liquidity risk reporting system, frequency and scope of the report, and persons who receive the report.

2.10 Assumptions for data adjustment in accordance with customer or counterparty's behaviors and for stress testing under various scenarios; and a survival period that is suitable and consistent with time period required by the financial institution to mobilize funding during a crisis (see details in attachment 4-6).

2.11 Early warning system that identifies tools or indicators reflecting degree of liquidity irregularities which are used to gauge when a situation starts to signal a crisis alert and when to implement a contingency plan (trigger point) including to notify the Bank of Thailand immediately when alert signal is identified (see details in attachment 3).

2.12 Contingency plan, which is coherent and in writing form, supports various crisis conditions (institution-specific crisis, market-wide crisis and a combination of both) as well as details of process, procedure and method of liquidity crunch management any circumstances which are flexible and detailed enough for practical implementation (see details in attachment 7).

Attachment 2

Internal control system pertaining to liquidity risk management

1. Financial institution should have an internal control system which is consistent with liquidity risk management policy and strategy and a regular monitoring system which is to ensure the consistency between liquidity risk management and stipulated procedure.

2. In case a liquidity problem arises, a responsible person shall report the problem to a manager at a suitable level immediately after the problem is found and consider notifying the sub-committee and the board of directors of the financial institution about the problem, depending on degree of severity, in order to determine a corrective approach promptly. The financial institution should have clear stipulations that cover degree of severity, problem analysis, corrective approaches and certain responsible persons.

3. The financial institution should regularly conduct a back test to compare actual data and estimated data based on assumptions at least once every quarter to check the validity of assumption-setting and behavioral adjustment. The financial institution should keep actual data for a suitable period of time but no less than one year such as rollover of fixed deposit customers, maximum withdrawal amount per day in each month and drawdown under loan commitment. In addition, back test results or reports should also be kept for the Bank of Thailand's examination.

4. The financial institution should examine the correctness of liquidity risk management system; have regular reconciliation and review as well as data access security for its information system and reporting system. Moreover, it should oversee and examine liquidity risk management of companies in the financial business group which the financial institution must bail out or assist when such companies face liquidity problems. This also includes overseeing proper implementation of stress testing and scenario-setting as well as suitable development of contingency plans of the financial institution and juristic persons in the related financial business group.

5. The financial institution should perform an assessment of the effectiveness and productivity of the liquidity risk management system at least once a year. Such assessment must be conducted by an independent internal unit of the financial institution and reported to the board of directors through the audit committee in order

to determine a corrective approach and take corrective actions immediately when the problems or defects are identified. The designated operating unit should have suitable knowledge, competence and skills.

Attachment 3

Liquidity risk management system

1. Cash inflow and outflow management system

1.1 The financial institution should have a liquidity risk management system that is suitable with various circumstances which can show projected cash flow mismatch or liquidity gap so as to measure and analyze liquidity risk. The system includes projected cash inflow and outflow from assets, liabilities, off-balance sheet items and various obligations in each period time periods should be arranged properly supporting the financial institution to efficiently monitor short-term, medium-term and long-term liquidity management in accordance with the business model. Even though, liquidity management mainly focuses on short-term management, the financial institution should also monitor its medium-term and long-term capital needs in order to be able to recognise signs of problem at an early stage and consider improving and resolving the problem promptly.

1.2 During the first five business days or the first seven calendar days, the financial institution should have cash inflow and outflow management system that can present details on daily basis and frequency of such details may be reduced later. For financial institution that depends on medium-term funding sources more than short-term ones, it should have projected medium-term cash inflow and outflow to facilitate efficient liquidity management.

1.3 Projected cash inflow and outflow should show net liquidity excess or shortfall balances in each period and cumulative balances under normal and stress circumstances. Such projected cash inflow and outflow should have adjusted data that are consistent with customer or counterparty's behaviors based on suitable assumptions by adhering to a realistic and conservative principles (see details in attachment 4-6).

1.4 In case the financial institution engages in transactions in multiple currencies, it should have a work system that can manage liquidity in Thai Baht and significant foreign currencies individually.

1.5 The financial institution should have projected cash inflow and outflow by taking into consideration foreign exchange rates that may affect cash inflow and outflow as well as liquidity mismatch, conversion from one currency to another, ability to access market

or funding sources in such foreign currency, market liquidity and foreign exchange volatility.

1.6 Projected cash inflow and outflow should show information at the levels of financial institution and overall financial business group both domestic and international levels.

2. Early warning system

2.1 The financial institution should have an early warning system by using tools or indicators that can identify increasing risk stemming from liquidity position, capital needs, emerging dysfunction or looming crisis so that the management can assess situation and consider approaches to deal with the problems. Key elements of an early warning system include:

2.1.1 Stipulation of definitions and indicators that give various levels of indicative signal by using qualitative and quantitative approaches, for example, downgrade of credit rating, decline of stock price, higher outflow rate of retail depositors, decline of long-term borrowing capacity or changes in ratios that reflect irregularities. In addition, alert levels and trigger points must be identified.

2.1.2 Stipulation of clear roles and certain responsible persons who deal with every critical issue, such as monitoring and reporting changes in the indicators and coordination between various sections.

2.1.3 Review and improve the indicators to ensure that they are suitable with situations and circumstances.

2.1.4 Regular monitor and maintain system to be up-to-date (system monitoring and maintenance).

2.1.5 When there are liquidity irregularities or emerging crisis which may affect liquidity position and liquidity risk management of the financial institution, for example, when reaching an alert level or a trigger point, designated persons with assigned responsibilities of the financial institution will coordinate with and notify the Financial Institutions Monitoring and Analysis Department, Supervision Group (Center Point of Contact - CPC), Bank of Thailand via telephone immediately after irregularities or a crisis have emerged. In addition, a written report in a form of letter, email or fax must also be submitted on the same business day.

3. Examples of ratios and indicators that identify a liquidity risk level

The financial institution should choose ratios and indicators of liquidity risk that are suitable with its business (internal limits) so that they can be used as tools to measure and control liquidity risk as well as an alert signal and a trigger point. For example,

(1) Cumulative cash outflows

(2) Concentration in assets or liabilities

(3) Daily withdrawal ratio

(4) Loans to deposits ratio

(5) Borrowed funds to total assets ratio

(6) Commitments to lend to total assets ratio

(7) Liquid to illiquid assets ratio

(8) Borrowed funds to deposits or liabilities ratio

(9) Short-term mismatch size and cumulative gap in subsequent period as well as mismatch size to liquidity cushion ratio

(10) Short-term borrowed funds to total liabilities ratio (in a form of direct loan or issuance of securities) to support mismatch size in different periods

(11) Liquid assets to short-term liabilities ratio

(12) Loans to capital ratio

(13) Some types of high risk liabilities to total liabilities ratio

(14) Degree of capital dependency from large depositors or target groups

(15) Aging structure of each item of assets, liabilities and obligations

(16) Level of short-term liquidity for daily transactions

Attachment 4

Data adjustment accordance with customer or counterparty's behaviors under normal circumstances (behavioral adjustment)

1. The financial institution should adjust data regarding projected cash inflow and outflow in accordance with customer or counterparty's behaviors and circumstances which affect cash inflow and outflow of assets, liabilities and off-balance sheet items because some types of asset may not receive contractual settlement; or depositors that have a redeemable deposit may not redeem the entire amount; or depositors exercise rollover when term deposits mature; or in case the financial institution grants draw down under loan commitment but the customer has not withdrawn, and so forth. The data adjustment in accordance with customer or counterparty's behaviors and circumstances in each financial institution may differ, depending on its nature of business and operational structure, volume and complexity of transactions as well as other relevant factors.

2. The determination of assumptions for data adjustment in accordance with customer or counterparty's behaviors in the projection of cash inflow and outflow should be sensible and reflect the most realistic liquidity risk. The financial institution should be able to explain underlying reasons and provide adequate information to support assumption-setting that conforms with existing behaviors by using historical cash flow patterns in combination with careful examination of probable projections and future trends. The behavioral adjustment methods for each item may differ, depending on the nature of such item and each financial institution's scrutiny. Key principles for assumption setting are as follows:

2.1 Consistency and suitability, justifiable and adequate support evidences.

2.2 When using historical data to support assumption setting, there should be adequate historical data which are statistically sound. Historical data should be at least one year. In case that new transactions lack in historical data, assumption setting approach and rationales should be reliable and acceptable.

3. The financial institution should examine appropriateness of assumption setting based on actual data. The assumptions should be reviewed regularly at least once every quarter or every time there are significant changes in the environment and business structure, strategy and operation in order to revise the assumptions where appropriate. The financial institution should keep documents that show calculation methods and contain information used in assumption setting for the Bank of Thailand's examination.

4. The financial institution should review internal and external factors that may require revision of assumptions.

4.1 Internal factors, e.g. structure, business strategy, financial soundness, etc.

4.2 External factors, e.g. economic conditions, market liquidity, market competition, interest rate, exchange rate, public sector's borrowing, etc.

5. Examples of key issues that create discrepancy between actual cash inflow and outflow and contractual obligation.

5.1 Customer or counterparty behaviors that affect cash flow in balance sheet items, such as rollover and increased deposit amount. The financial institution should update information on every type of deposit to reflect customer behaviors.

5.2 Customer or counterparty behaviors that affect off-balance sheet items, such as collateral obligation, unused credit line or derivatives transaction.

5.3 Items that customer or counterparty can promptly withdraw, transfer or exercise the right to execute a transaction promptly; as a consequence, the liquidity of the financial institution is reduced. For example, the withdrawal of committed lines and the exercise of the right on put option.

5.4 Seasonal fluctuation, for example, during Chinese's New Year, a large amount of money may be withdrawn; or after harvest season, a large amount of money may be deposited.

5.5 Repercussions from asset and liability management policy of the financial institution itself.

Attachment 5

Stress test

1. Aside from data adjustment in accordance with customer or counterparty behaviors under normal circumstances (behavioral adjustment), the financial institution should regularly perform stress testing of liquidity risk at least once every quarter by reviewing assumption setting to ensure that assumptions are consistent with the environment, business strategy and relevant factors. The financial institution should keep documents that show calculation methods and contain information used in assumption setting for the Bank of Thailand's examination.

2. The financial institution should perform stress testing under predetermined scenarios and assumptions. Such scenarios should be diverse and at least cover institution-specific crisis and market-wide crisis and a combination of both, including transient, short-term and long-term crisis, which the financial institution assesses that they may be a severe case and affect the financial institution tremendously. Assumption-setting method used in the adjustment of the same items under each scenario may be different.

3. To ensure that such scenarios cover liquidity risk that affects the financial institution, in assumption setting the financial institution should consider the followings:

3.1 Business characteristics and weaknesses of the financial institution as well as transactions which customers or counterparties can promptly cancel, withdraw or transfer cash

3.2 Relationship and linkage between other risks and liquidity risk

3.3 Linkage between market liquidity and fund mobilization of the financial institution

3.4 Conservative approach

4. Information from financial institution's past experiences alone may not be sufficient for assumption setting. The financial institution should use a variety of information in assumption setting, such as information of other domestic financial institutions that have similar size and nature of business operation, information of foreign financial institutions or using projection methods under various assumptions.

5. Determination of stress test scenarios in liquidity stress testing

5.1 Institution-specific crisis

This type of crisis which is caused by poor management affects its position severely and shakes confidence of depositors, creditors and counterparties. Moreover, other financial institutions may also lose confidence. For example, the downgrade of credit rating over two notches that affects the outflows of deposits, the rollover of borrowings and the cost of borrowing of the financial institution. In addition, a situation where a financial institution must shore up liquidity of other juristic person, which shakes confidence in the financial institution's liquidity.

Branch of a foreign commercial bank should use a stress test scenario in case where institution-specific crisis may occur at Bangkok branch and its head office.

5.2 Market-wide crisis

This crisis refers to macroeconomic crisis or a situation where several financial institutions have liquidity problems, causing a dramatic decline in market liquidity. Such crisis may happen in the country or both domestic and international that affects the country in widespread and multifold simultaneously. Such crisis may originate in the financial institution system before spreading or may be caused by other macro factors such as foreign exchange system, regulatory changes or repercussions from a crisis in other countries which later affects the financial institution.

5.3 Combination of both

The financial institution should stipulate assumptions based on a combination of institution-specific crisis and market-wide crisis; for example, a case when systemic liquidity crisis occurs at the same time as the financial institution's credit rating is downgraded.

6. Examples of factors that should be considered in assumption setting by the financial institution

(1) Declining market liquidity of assets or reduced asset value - forced sale price may be lower during crisis compared to normal circumstances. Therefore, when performing a stress test, a higher haircut rate should be applied

(2) Deposit drain, especially from customers who can promptly make withdrawal under no conditions and transactions that may induce liquidity drain, such as drawdown of approved credit line or customer exercises the right in put option transaction

(3) Contractual obligations under a committed credit line with other financial institutions

(4) Margin calls and collateral requirement

(5) Source of funds in various periods

(6) Diminished ability to access a large source of funds or the money market

(7) Good relationship with funding sources and degree of commitment and certainty of sources of funds from other financial institutions, such as the downgrade of the financial institution's credit rating may entail reduced credit line obtained from a funding source

(8) Provision of liquidity assistance to a company in its business group or an affiliate and granting of a committed credit line to other persons

(9) Capability, constraints and time period in the transfer of liquidity between operating units, juristic persons and across borders

(10) Reduced liquidity due to complex transactions

(11) Functions of foreign exchange market

(12) Impacts from credit rating

(13) Readiness of the system and infrastructure to convert assets into cash

(14) Estimated future growth of balance sheet items

(15) Repercussions from reputation risk of the organisation

Attachment 6

Haircut rate

In the valuation of investment in securities, the board of directors of the financial institution shall approve a haircut rate to reflect changes in asset price in the future in accordance with market conditions and holding period before converting it into cash. Therefore, such haircut rate should be reviewed regularly to reflect changing market conditions. Accordingly, a haircut rate determined by the financial institution for each type of asset should not be lower than haircut rates stipulated by the Bank of Thailand, whereby forced sale price during crisis may be lower than normal price. Hence, when performing a stress test, a higher than usual haircut rate should be used.

1. Tier 1 instruments

Tier 1 instruments are financial instruments that are unencumbered and transferable without any limitation, and have low liquidity risk and credit risk (credit risk is on par with that of Thai government). They can be used as a collateral in buy-sell transaction of bonds or debt securities in accordance with the Bank of Thailand Regulation Concerning Money Market Services Pertaining to Buy-Sell of Debt Securities with Repurchase Agreement and Sale of the Bank of Thailand's Debt Securities with Primary Dealers or other repo style transactions executed with the Bank of Thailand, such as Thai government bond and Bank of Thailand bond.

Accordingly, discount rate is related to the securities' residual life according to the Bank of Thailand Regulation Concerning Money Market Services Pertaining to Buy-Sell of Debt Securities with Repurchase Agreement and Sale of the Bank of Thailand's Debt Securities with Primary Dealers issued by Financial Markets Operations Group, Bank of Thailand and amendments. Financial institutions should continually keep abreast of amended notification regarding such matter.

2. Tier 2 instruments

Tier 2 instruments are financial instruments that are unencumbered and transferable without limitation, and have higher liquidity risk and credit risk than that of Tier 1 instruments. Under normal circumstances, Tier 2 instruments may be considered as highly liquid instruments and can be converted into cash in high amount without entailing much changes in their market prices. However, if a crisis occurs, these

instruments may not be liquid and can be converted into cash at a lower price. For example,

(1) Debt securities not classified as Tier 1 instruments;
(2) Debt securities issued by a government of OECD countries;
(3) Common or preferred stocks traded in the Stock Exchange of Thailand;
(4) Investment units of mutual funds.

Refer to minimum haircut rates for Tier 2 instruments as shown in the table below:

Instrument	Residual maturity	Issuer	
		Government[1]	Others
Credit rating AA- or equivalent and above	≤ 1 year	0.5	1
	> 1 year but ≤ 5 years	2	4
	> 5 years	4	8
Credit rating BBB- to A+ or equivalent	≤ 1 year	1	2
	> 1 year but ≤ 5 years	3	6
	> 5 years	6	12
Rating BB- to BB+ or equivalent	All maturity	15	100
Equity securities in SET 100		15	
Other equity securities in SET		25	
Investment units of mutual funds		Maximum haircut of securities which funds can invest	
Foreign currency securities		Add 8 percent to haircut rate	
Other securities not classified above		100	

Source: haircut rate for financial guarantee valuation based on a comprehensive method set out in BOT Notification Re: Regulations on the Calculation of Credit Risk-Weighted Assets for Commercial Banks under the Standardised Approach (SA)

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[1] Debt instruments issued by Thai government, state enterprises or state organisations not classified as Tier 1 instruments and debt securities issued by a government of OECD countries

Attachment 7

Contingency plan

1. The financial institution should have a contingency plan which elaborates strategies and practices for various crisis situations under stress test scenarios used by the financial institution in stress testing in accordance with the Bank of Thailand's regulations stipulated in this policy guideline. Such contingency plan should be in writing format, coherent and flexible enough for practical implementation.

2. The financial institution should develop a contingency plan for varying levels of crisis, depending on nature and severity of situations such as mild event which can be resolved with interbank borrowing on the same business day or a more severe event. The financial institution should keep a contingency plan at the financial institution for the Bank of Thailand's examination.

3. A contingency plan should specify a method for fund mobilization (Contingency Funding Plan: CFP) which is consistent with financial position, the financial institution's roles in the financial system, business strategy, transaction complexity and risks, including liquidity risk stemming from both the financial institution's transactions and customers'. In case the financial institution has a funding plan which depends on its parent company to improve its liquidity, there should be a distinct approach such as a letter that grants a committed credit line issued by its parent company. However, such approach must not be used as a contingency plan for institution-specific crisis stemming from its parent company or in case there is a likelihood that its parent company cannot provide assistance by using such committed credit line.

4. A contingency plan should be consistent with the organisation's business continuity plan so that the financial institution's business operation can return to normal quickly after its contingency plan has been implemented.

5. A contingency plan should be tested, reviewed and improved properly and regularly at least once a year, thus assuring that such plan is suitable, personnel understand the plan and the plan can be practically operated in a crisis situation.

6. When developing a contingency plan, the financial institution should consider:

6.1 Stress test results under various scenarios and potential impacts on its ability to access funding sources under each scenario

6.2 Linkages between method of liquidity arrangement and existing assets, linkages among market liquidity, fund mobilization of the financial institution, ability to access funding sources, and borrowing relationship with each funding source during a crisis

6.3 Limitations, opportunities and capability in terms of liquidity and collateral assets transfers between juristic persons in the business group, other juristic persons or across borders, rules and legal constraints, procedures, time zone and other relevant factors

6.4 Characteristics of collaterals used to seek a loan from the Bank of Thailand according to the present regulation, provided that it is not expected that the Bank of Thailand will consider granting additional assistance

6.5 Obtaining liquidity quickly and in time, especially when market liquidity has dried up, such as obtaining liquidity in a foreign currency when the swap market cannot function normally

6.6 Tools and indicators in the early warning system;

6.7 Repercussions on the organisation's reputation after its contingency plan has been implemented.

7. Information in a contingency plan should at least include:

7.1 Situations in which a contingency plan is used, clear procedure and work process relevant to varying crisis situations. Clearly identify responsible persons and their roles and responsibilities. Designate a coordination team and provide emergency contact information of each responsible person. Operating procedure and process should be described in detail, including notifying the Bank of Thailand about emergency situation, specifying duration or situations for various actions, formulating decision-making process to deal with each issue which should be specifically executed in each period or each situation. In addition, such plan should be flexible enough for practical implementation.

7.2 Situations in which a contingency funding plan will be used. Identify short-term, medium-term and long-term sources of funds; projecting amount that will be obtained from each funding source, such as sale of securities without obligation or borrowing from

a committed credit line of other financial institution, swap transactions; and specifying types of asset that will be used as loan collateral as well as sequence of usage of Thai Baht and foreign currencies.

7.3 A contingency plan to deal with urgent intraday settlement and liquidity crunch. Specify how to boost intraday liquidity and seek funding source. In addition, specify types of asset used as loan collateral in Thai Baht and foreign currencies.

7.4 Accurate and timely report of information by specifying types of information, reporting procedure and information report channels which responsible person in each level can use for decision-making.

7.5 Order of priority and how to treat customers and related parties in each group such as debtor, creditor and shareholder.

7.6 Quick respond plans for communicating and managing rumors as well as maintaining reputation of the financial institution. Coherent communication both inside and outside of the organisation such as customer, employee, creditor, shareholder and media, including reporting to the regulator.

Attachment 8

Information disclosure

The financial institution should disclose information about its liquidity sufficiently and regularly in the financial position statement or financial reports as frequently as financial reporting, of which disclosed information includes both qualitative and quantitative information. Objectively, related parties can be informed of degree of liquidity risk, liquidity risk management and various liquidity-related factors; and are able to assess liquidity risk and efficiency of liquidity risk management of the financial institution. Disclosed information should be easy-to-understand.

1. Qualitative information

Minimum information that should be disclosed by the financial institution includes:

- Organisational structure and liquidity risk management policy and strategy of the financial institution which should describe roles and responsibilities of each committee and operating unit involving in liquidity risk management of the financial institution;
- Centralized or decentralized liquidity management structure of the financial business group or a combination of both, policies on granting of credit and liquidity assistance for juristic persons in the financial business group or other juristic persons. In addition, specify types of obligation in liquidity risk management or liquidity assistance provided to other juristic person;
- Structure of sources of funds and uses of funds;
- Policy on possession of highly liquid assets;
- Limits tools as well as systems and methods used in measuring, monitoring, and controlling liquidity risk;
- Summary of stress test method and results;
- Frequency and types of internal liquidity reporting.

2. Quantitative information

The financial institution should disclose adequate quantitative information to related parties to review its liquidity position. The financial institution should determine suitability of information disclosure by itself, for example:

- Size or amount of liabilities as per residual maturity

- Size or quantity of liquid assets (liquidity cushion)
- Composition of liquid assets
- Internal ratios and metrics used by the financial institution to measure, monitor and manage liquidity risk

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Attachment 9

Operating system in the creation of liquidity position report

The financial institution should have an operating system that can create net liquidity position report that show cash inflow and outflow to present to the personnel who are responsible for liquidity risk management, the sub-committee and the board of directors of the financial institution. Such report form should present accurate, adequate, timely information on regular basis and should be prepared for the Bank of Thailand's examination or sent to the Bank of Thailand immediately upon request.

Such operating system and report should have detailed requirements as follows:

1. The operating system can present information of net liquidity position that shows cash inflow and outflow. The detailed information is shown in different time periods – short-term, medium-term and long-term, and during the first five business days or the first seven calendar days on a daily basis.

2. Information in the aforementioned report should include the financial institution’s all key items in terms of assets, liabilities and off-balance sheet items, such as derivatives transactions and collateral obligation as well as liquidity assistance provided by the financial institution to other juristic person, regardless of contractual obligations, with exception of insignificant items. The financial institution should have documents to prove such insignificance. Nevertheless, the Bank of Thailand’s supervisor may review suitability of information present in such report and order any revision as deemed appropriate.

3. The classification of assets, liabilities and obligations in the report for each period adheres to the followings:

3.1 Consider assets, liabilities and obligations based on residual contractual maturity

3.2 Perform adjustment by recognising customer or counterparty behaviors that affect cash inflow and outflow of various items so that cash flow can reflect real liquidity position under normal circumstances (behavioral adjustment) and stress scenarios

4. Besides preparing net liquidity position report that includes all currencies, the financial institution should prepare net liquidity position report for each significant currency. If any financial institution has prepared a report for any currency, it should continue to produce such report.

5. The report prepared by the financial institution should be ready for the Bank of Thailand's examination or sent to the Bank of Thailand immediately upon request.

5.1 The monthly net liquidity position in normal scenario report form that already adjusted information according to customer or counterparty behaviors and various circumstances and has evidences that explain underlying assumptions of behavioral adjustment. The information as of the last day of each month is used and such information may be divided into two formats as follows:

5.1.1 Short-term cash inflow and outflow during the next five business days or seven calendar days

Example of time period classification

Period	Calendar day									Total
	T	T+1	T+2	T+3	T+4	T+5	T+6	....	N	

5.1.2 Liquidity mismatch/cash flow projection

Example of time period classification

Period	at call - 1 day	2-7 days	8 days – 1 month	1-3 months	3-6 months	6-12 months	>12 months	Total

The report format shown in 5.1.1 and 5.1.2 may be consolidated into a single report format.

5.2 The quarterly net liquidity position in stress scenario report form based on the information as of the last day of each quarter is subject to testing under various stress scenarios. Additionally, the report form should have evidences that explain such scenarios and underlying assumptions.

Example of time period classification

Period	T	T+1	T+2	T+3	T+4	T+5	T+6	8 days - 1 month	1-3 months	....	Total

6. Conversion from foreign currencies into Thai Baht uses average rate between average buying rates -Telex transfer and average selling rates as of the date of information used in the report which published on the Bank of Thailand's website (www.bot.or.th). However, if there is no information for such currency, the financial institution will use cross rates that are exchange rates from other currencies to US dollars, emailed to financial institutions by the Data Management Department, the Bank of Thailand every morning on the next business day. Then, the amount is converted into Thai Baht using average US dollar exchange rates between average buying rates for telex transfer and average selling rates announced on the Bank of Thailand's website.
