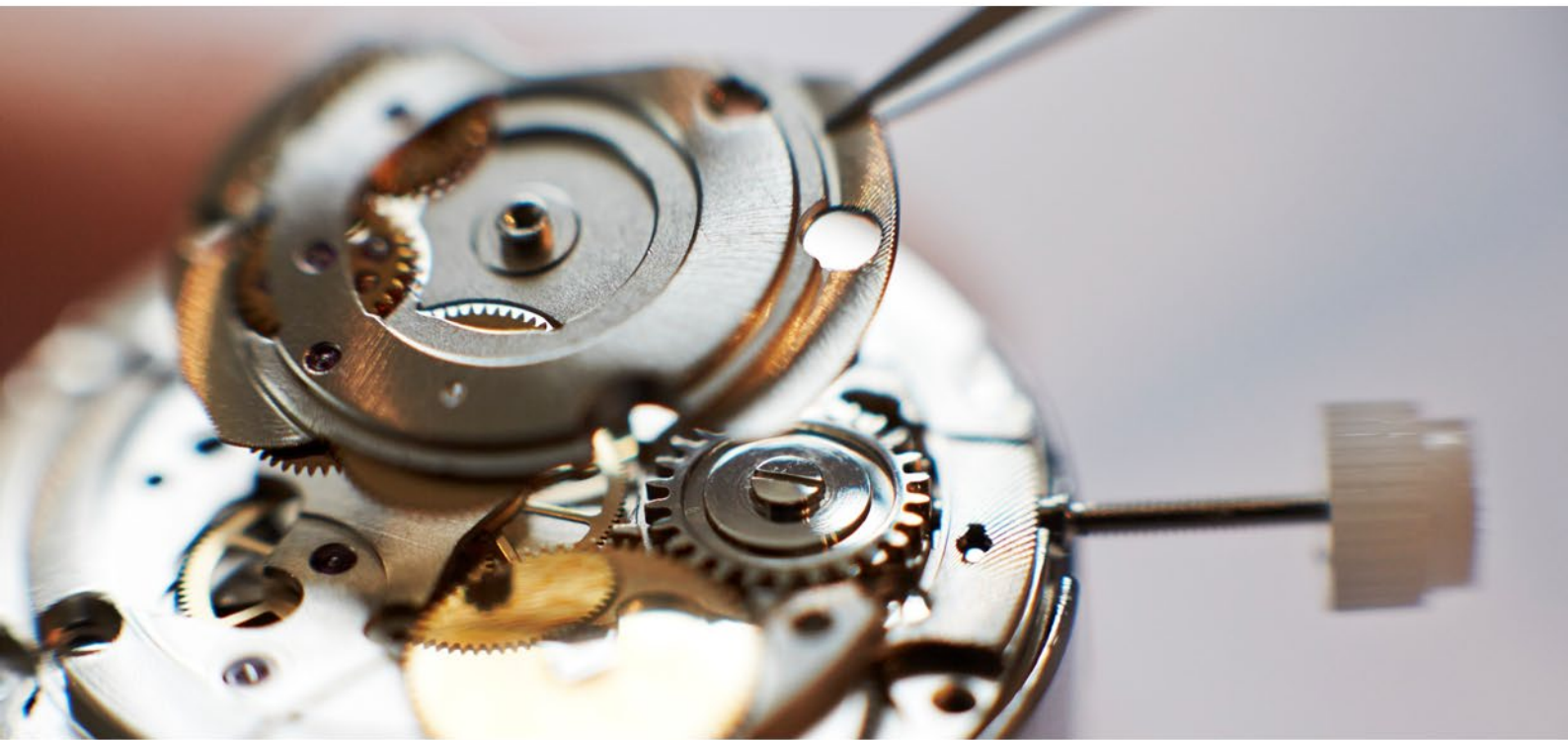




Disclosure of SIX x-clear AG regarding the CPMI-
IOSCO Principles for FMI
in accordance with "Disclosure framework and Assessment
methodology", December 2012

September 2021





Disclosure of SIX x-clear AG regarding the CPSS-IOSCO principles for FMI

in accordance with "Disclosure framework and Assessment methodology", December 2012

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1.0 Executive summary

SIX x-clear AG (SIX x-clear) is a wholly-owned subsidiary of SIX Securities Services Ltd, (SIX Securities Services), which itself is a wholly-owned subsidiary of SIX Group Ltd (SIX). SIX operates Switzerland’s financial market infrastructure and offers comprehensive services in the areas of securities trading, clearing and settlement on a global scale. The company is an unlisted public limited company domiciled in Zurich and owned by its users (over 100 national and international financial institutions of various size and orientation).

The two operational arms of SIX Securities Services, the Central Securities Depository (CSD), SIX SIS Ltd (SIX SIS), and the Central Counter Party (CCP), SIX x-clear, are authorized systemically important financial market infrastructures (FMI) subject to the supervision of the Swiss Financial Market Supervisory Authority (FINMA) and as relates to their systemically relevant services, to the Swiss National Bank (SNB).

SIX x-clear and its Norwegian branch are furthermore recognized by the European Securities and Markets Authority (ESMA) as a third country CCP under Article 25 of the European Market Infrastructure Regulation (EMIR) – a status with validity for the entire EU and EEA. Prior thereto, the European Commission declared the Swiss regulatory framework as equivalent to EMIR. In line with the amendments introduced by Regulation (EU) 2019/2099 of 23 October 2019 regards the procedures and authorities involved for the authorization of CCPs and requirements for the recognition of third-country CCPs (EMIR 2.2), SIX x-clear is currently undergoing a review of its recognition.

In order for SIX x-clear to be able to continue offering its services in the UK after the UK has left the European Union, SIX x-clear applied for third country recognition to the BoE. As a result, SIX x-clear is taken to be eligible for temporary recognition in the UK by virtue of the Temporary Recognition Regime established by the Central Counterparties (Amendments, etc., and Transitional Provision) (EU Exit) Regulations 2018 as amended (TRR) and pursuant to Article 25 of the European Market Infrastructure Regulation (as amended) (UK EMIR).

SIX x-clear is a CCP providing pan-European clearing services for equity market instruments, bonds and securities lending for a large number of European trade venues (e.g. Aquis UK/EU, Blockmatch, Cboe Equities UK/EU, Equiduct, Nasdaq – Copenhagen / Helsinki / Stockholm, Oslo Børs, SIX Swiss Exchange, the London Stock Exchange, GS Sigma-X, Traiana, Turquoise UK/EU and UBS MTF), to over 75 clearing members and for clearing and settling securities issued in over 18 jurisdictions in the EU/EEA. It cooperates closely with SIX SIS as an international CSD service provider to provide the safest collateral service setup for its Members as possible. This arrangement provides widespread experience in trading, clearing, settlement of securities and in controlling and mitigating the risks arising from these activities. In its capacity as a CCP, SIX x-clear interposes itself between trading counterparties so as to reduce the credit risk associated with trading, to allow for settlement netting as well as to assure post-trade anonymity.

The Principles for Financial Market Infrastructures (PFMI) set out international standards to foster effective risk management, strong governance and oversight of FMIs. As a systemically important CCP, SIX x-clear essentially has to comply with all PFMI contents that are addressed to CCPs. Through the publication of this document SIX x-clear intends to disclose the relevant information in order to enable its clearing members, indirect participants, authorities and the broader public



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to better understand SIX x-clear’s approach to observing the PFMI. The present disclosure basically provides:

1. a summary of the major changes since the last update of the disclosure (section 2.0);
2. a description of SIX x-clear’ services and markets, its organization and legal framework (section 3.0);
3. a comprehensive narrative disclosure for each applicable principle to enable the reader to understand SIX x-clear’s approach to observing the PFMI (section 4.0);
4. a list of publicly available resources that may help the reader to better understand the narrative disclosure (section 0)

The cut-off date for the data used in this disclosure is 31st May 2021.

2.0 Summary of major changes since the last disclosure update

This is the fourth issue of SIX x-clear’s assessment regarding the disclosure framework based on the CPSS-IOSCO Principles for Financial Market Infrastructures (PFMI 2012). It replaces the earlier version of 2019. The following major changes have been taken into account within the present disclosure document:

The services have been expanded with the following trade venues for which SIX x-clear offers cross-venue netting in context of Brexit: Cboe Europe (NL), Turquoise NL and Aquis (FR). Moreover, SIX x-clear is technically ready to clear on Euronext Oslo Growth market and is continuously looking to enhance the current trading venue scope with regards to the needs of its members.

The legal relationships with the clearing members under Swiss, German and English law have been updated and signed accordingly. The decisive element for the choice of the law is the member’s incorporation (i.e. UK members receive English law, Swiss Members Swiss law, and all other European members are accommodated under German law).

In addition, the Risk Management Framework was strengthened since the last report. The confidence level of the main clearing system was changed from 99% to 99.7%. Due to higher market volatility the risk buckets in SECOM were re-calibrated according to the predefined methodology in the risk systems. The margin rates for bonds were increased. Furthermore, the default risk bucket allocated to securities without sufficient price data was increased by one level in order to provide an adequate risk rating for securities that do not automatically adjust to elevated volatility.

SIX x-clear consolidated the previous two Default Fund Segments “Cash markets” and “Derivatives” into a new single Default Fund Segment “Cash market and Derivatives” thereby contributing to the diversification of the risks and lowering the members’ exposures.

In addition SIX x-clear changed the frequency of the Member Link Margin Element (LME) computation from a monthly to an intra-day or at least a daily distribution of the individual LME requirements as well as the respective collection of the necessary collateral.



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3.0 General background on SIX x-clear

3.1 General description of SIX x-clear and its services

As a clearing house and central counterparty (CCP), SIX x-clear occupies an intermediary position between the trading parties. Clearing is effected after a trade has been executed (matching) and before it is settled. The purpose of clearing is to efficiently handle the risks inherent in trading contracts that have been executed but are still unsettled. As a clearing house and CCP, SIX x-clear steps into the contracts as an intermediary and represents the buyer with respect to each seller and vice versa.

SIX x-clear clears multiple instruments in most European markets which span multiple exchanges and trading venues. It offers clearing services for cash equities, Exchange Traded Funds (ETFs) and fixed income.

As a CCP SIX x-clear undertakes the following principle tasks:

- Ensuring post-trade anonymity
- Eliminating bilateral counterparty risk between trade execution and settlement
- Settlement netting
- Risk management

SIX x-clear offers clearing services supported by close-to-real-time risk management and operational efficiency across multiple trading venues. The company automatically becomes the counterparty to the buying and selling parties through automatic novation. It runs a matched book – and thus does not actively take any trading positions – by securing itself through collecting collateral in the form of cash and securities of High Quality and Liquid Character (HQLA). SIX x-clear employs a unique real-time risk management model, where it combines both a Value at Risk (VaR) and a Monte Carlo simulation approach. Herewith it assesses the risk positions and corresponding required collateral values throughout the trading day. The risk positions are netted and offset across trading venues and products, with due regard of any correlations, so as to optimize the overall collateral requirements. SIX x-clear assumes some of this risk by contributing a share of its own assets as Skin-in-the-Game as per national and international regulations.

Trade acceptance

In its function as a CCP, SIX x-clear novates each trade automatically in real time as soon as it is accepted in the system for clearing. SIX x-clear interposes itself into a trade as the buyer to the seller and the seller to the buyer. In effect, one trade contract received from a trading venue is replaced with two contracts against the CCP. This ensures anonymity of the trade and that the counterparty risk of the clearing member is transferred to the CCP.

Interoperability

SIX x-clear is interoperable with EuroCCP and LCH for cash equities. These three CCPs are thereby able to offer competitive clearing across a number of Trade Venues. This allows credit institutions, investment firms and their clients to consolidate their equity trading on multiple trading venues to their CCP of choice.



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As per regulations, these arrangements have been approved by the relevant oversight authorities for each of the involved CCPs and major markets.

Trade date netting

SIX x-clear performs optional end-of-day trade date netting for a given trade date. In the process, novated trades are netted on a multilateral basis per member and on the basis of other parameters such as house or client account, International Securities Identification Number (ISIN), currency, or settlement details. Multi-lateral netting of the novated trades reduces the overall settlement volumes and the respective cost to the members.

Settlement

SIX x-clear effects settlements mainly in the issuer-CSDs of the security, via its sister company SIX SIS, the Swiss CSD. In some markets SIX x-clear is a direct local CSD participant, or otherwise operates via a settlement agent. Members of SIX x-clear have the option to issue a power of attorney (POA) to SIX x-clear to issue instructions on their behalf to the member's settlement agent or directly to the CSD.

Member reporting

SIX x-clear has developed a “member-centric” reporting structure that is focused on providing timely and accurate information to its clients. It provides report-based and message-based interfaces, which offer trade, settlement and clearing reporting. To support General Clearing Members (GCMs), SIX x-clear provides reporting in respect to their Non-Clearing Member(s) (NCMs). It offers both intra-day and end-of-day reporting of risk and trade details. In addition, SIX x-clear members can use a GUI for monitoring exposure through online queries.

SIX x-clear offers its members multiple communication channels, including the Internet, SFTP, CC link, and SWIFT, to receive reports and messages.

3.2 General organization of SIX x-clear

SIX x-clear governance

Due to the international nature of its business operations, SIX x-clear AG's corporate governance principles are aligned with international standards, such as the Principles for Financial Market Infrastructures of CPMI-IOSCO and European regulations (in particular EMIR).

SIX x-clear is a subsidiary of SIX Securities Services Ltd, which in turn is a subsidiary of SIX Group. The corporate priorities of SIX x-clear are laid down annually by the Board of Directors (BoD), as are the organization, delegations of responsibilities, policies and procedures as, per its documented charter.

SIX x-clear' activities are overseen by its Board of Directors (BoD), which is distinct from the SIX Group Board of Directors. The BoD of SIX x-clear operates as per the BoD charter, reflecting Swiss corporate law, applicable Financial Market Infrastructure (FMI) regulations as well as guidelines by CPMI-IOSCO. In this oversight function the BoD is supported by a Risk Advisory Committee. The CEO of SIX x-clear leads the daily management of the business activities as per the strategy and guidelines issued by the BoD, as well as the SIX policies.



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SIX and SIX x-clear disclose their organization, financial development and governance framework via their web-site (see e.g. <https://www.six-group.com/securities-services/en/home/clearing/about.html>).

Formal changes to SIX x-clear’ rules and regulations, as well as essential service or risk model changes are communicated through Clearing Notices. General information and stakeholder feedback is sought via issuance of the “Frontline” publication, and biannual Member Advisory Committee (MAC) meetings in a multitude of countries.

Where practical and feasible, SIX x-clear uses the services of other affiliated companies of SIX. All such outsourcing arrangements are governed by service level agreements (SLAs) in compliance with FINMA regulations.

Risk Framework

A “three lines of defense” model forms the basis of the risk governance framework. The SIX-wide standardized framework combined with the integrated risk management organization regulates the positioning of the risk management function at SIX and systematically defines responsibilities, methods, processes and reporting of the risks faced by SIX.

Senior executives of SIX x-clear, as the first line of defense, are accountable for managing the specific risks faced by business management. They maintain effective processes and manage their risk properly, including comprehensive controls and documented procedures.

The second line of defense is a SIX-wide unified organization consisting of a central risk management function headed up by the SIX Group Chief Risk Officer (CRO), together with dedicated risk management teams. The functionally structured risk management teams deal with financial and non-financial risks, Group-wide risk reporting, risk analysis and the central insurance portfolio. In addition, a dedicated Chief Risk Officer (CRO) for SIX x-clear is part of the Management Committee and responsible for the implementation of the SIX-wide risk management standards and management of the business-specific risks at SIX x-clear. Primary risks within SIX x-clear include strategic and business risks, reputational risks, operational risks, credit risks, liquidity risks and market risks (including interest rate risks and foreign exchange risks).

The BoD and the internal and external auditors constitute the third line of defense. They are responsible for independently monitoring and controlling this risk management organization and the risks faced by SIX.

The BoD have ultimate responsibility for approving and overseeing the risk management framework as well as related risk tolerance limits, risk definitions, stress test procedures etc. in consultation with the Risk Advisory Committee.

Further details can be found in the annual reports.

3.3 Legal and regulatory framework

SIX x-clear was authorized as a Central Counterparty (CCP) by FINMA in accordance with art. 4 Financial Market Infrastructure Act (FMIA) by decree of 28.03.2018. As such it has to comply with the following regulatory and supervisory structures, thereby providing a high degree of legal, operational and risk-technical certainty.



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SIX x-clear is authorized as a systemically important Financial Market Infrastructure (FMI) from the Swiss Financial Market Supervisory Authority (FINMA) and is subject to the Federal Act on Financial Market Infrastructures and Market Conduct in Securities and Derivatives Trading (Financial Market Infrastructure Act, FMIA) and the corresponding ordinance on Financial Market Infrastructures and Market Conduct in Securities and Derivatives Trading (Financial Market Infrastructure Ordinance, FMIO).

Furthermore to the Regulation and Supervision by FINMA, being a systemically important FMI, SIX x-clear is also according to art. 83 (1) in connection with art. 23 FMIA subject to the oversight by the Swiss National Bank (SNB) and certain parts of the National Bank Ordinance (NBO) are applicable to SIX x-clear (art. 21a (2) NBO).

Swiss legislation relevant for a CCP is deemed equivalent to Regulation No. 648/2012 on Over the counter (OTC) derivatives, central counterparties and trade repositories (EMIR) as stated in decision 2015/2042 of the EU Commission of 13 November 2015 (“EU equivalence decision”). Furthermore, Swiss settlement finality rules are in all respects materially identical with European standards and regulations. Swiss legislation has also integrated the Principles for FMIs by the Technical Committee of the International Organization of Securities Commissions.

ESMA, UK and German supervisory authorities have concluded cooperation agreements (Memorandums of Understanding) with the Swiss authorities for their oversight of SIX x-clear. In addition, they are being provided specific reports on a regular and/or ad hoc basis directly from SIX x-clear.

Based on the equivalence decision and supervisory cooperation agreements the European Securities and Markets authority (ESMA) recognized SIX x-clear as a third country CCP under art. 25 EMIR.

SIX x-clear’s contractual relationships with its members and Co-CCPs comprise the following binding legal agreements:

- Contract for Clearing Services (bilaterally agreed)
- Financial Collateral Agreement (bilaterally agreed) Rulebook (set forth by unilateral publication): versions under Swiss, English and German law
- Operational Manual
- Lending norms
- Master Clearing Link Agreements between SIX x-clear and its Co-CCPs (LCH Ltd and EuroCCP N.V.) with respective Pledge Agreements for collateralization.

All contracts and rulebooks are established in accordance with applicable laws (Swiss, English and German) as well as in accordance with European directives and international standards (in particular, principles of CPMI-IOSCO) and the relevant regulations from competent supervisory authorities). The contractual documents were reviewed by specialized Swiss, English, German and Norwegian external legal counsels.



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Contractual Relationships with Members (status as of June 2021)

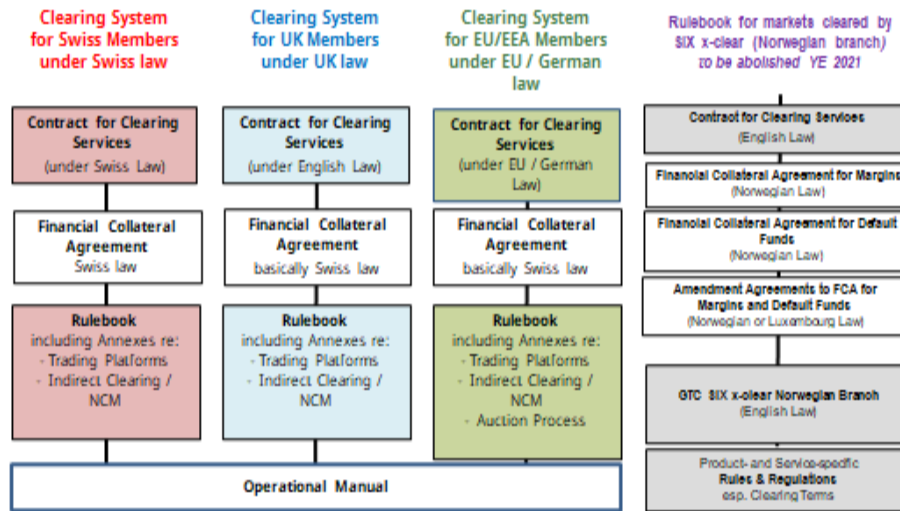


Figure 1: Legal and regulatory framework

Relevant jurisdictions:

In case of any lawsuits between SIX x-clear and its members or Co-CCPs regarding the performance or non-performance of its obligations in the context of the clearing services, Swiss, English, German or Norwegian (for collaterals only) law will apply. Correspondingly, the Commercial Courts in these countries shall have exclusive jurisdiction. This is regardless of whether claims are based on contractual agreements or are of a non-contractual nature.

4.0 Principle-by-principle summary narrative disclosure

4.1 Principle 1: Legal basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

4.1.1 Key Consideration 1

The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

SIX x-clear is a Swiss company, wholly owned by SIX, and as such organized and regulated primarily in accordance with Swiss law.

The following concepts are decisive for SIX x-clear's legal arrangements and operational functioning:

Open offer or novation

There are two legal ways to inter-act (and subsequently net and settle) as a central counterparty, namely open offers and novation. An open offer is a standing offer which SIX x-clear provides to its members for transactions concluded on SIX Swiss Exchange (SSX), Nasdaq Copenhagen /



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The legal basis should provide a high degree of certainty for each material aspect of an FMI’s activities in all relevant jurisdictions.

Helsinki / Stockholm, London Stock Exchange, Oslo Boers, and Oslo Connect [for securities lending and borrowing (SLB services)]. For transactions concluded on all the Multilateral Trading Facilities cleared by x-clear, the transfer to SIX x-clear is effected by novation. The relevant point of time for SIX x-clear’s entrance into a trading platform transaction under the open offer model is the confirmation of the matching of the selling and the buying offer on the respective trading platform. Under the novation model, the clearing contract becomes effective upon the issuance of a confirmation from SIX x-clear.

Netting arrangements

The netting mechanisms defined in the Rulebook of SIX x-clear are set forth in accordance with Art. 120 Swiss Code of Obligations and the UK statutory provisions acknowledging the netting ability or power of CCPs [Para. 6 of Schedule 1 of the Financial Markets and Insolvency (Settlement Finality) Regulations 1999 (SFR)].

The legal validity of such netting agreements or understandings concluded in advance concerning set-offs or concerning the disposal on the free market of collateral in the form of securities or other financial instruments traded on a representative market shall remain unaffected by all measures foreseen under Swiss insolvency law for banks and securities dealers (art. 90 FMIA).

Similarly, protection for CCP netting arrangements in the context of insolvency situations is covered under UK law in:

- Reg 14(1)(a) SFR: the default arrangements of a designated system (which in Reg 2 of the SFR is defined to include any netting arrangements) are not rendered invalid despite any inconsistency with the insolvency or bankruptcy laws.
- Reg 14(4) SFR: a debt/liability arising out of a transfer order as per any netting arrangements may not be proved in a winding-up or bankruptcy until said netting procedure is completed.
- Reg 15(1) SFR and sec. 163 Companies Act 1989: a debt or net sum payable in relation to any netting arrangements is unaffected by the winding-up or bankruptcy of a counterparty to a trade.

For the German set of Contractual Relationship the following provisions of German law are setting the legal basis:

- Bestimmungen der Insolvenzverordnung (InsO), des Einführungsgesetzes zur InsO (EGInsO), des KWG sowie des Depotgesetzes (DepotG): § 1 Abs. 17 KWG (Finanzsicherheiten), 21 Abs. 2 S. 2 InsO (Finanzsicherheiten im Falle vorläufiger Massnahmen), 61 Abs. 2 InsO (Finanzsicherheiten nach Verfahrenseröffnung), 96 Abs. 2 InsO (Finanzsicherheiten bei Aufrechnungshindernissen), 104 Abs. 3 InsO (Beendigung in Rahmenvertragswerken zentraler Gegenparteien), 166 Abs. 3 Nr. 1 InsO (Einschränkungen des Verwertungsrechts des Verwalters bei System-Sicherheiten), 223 Abs. 1 Nr. 1 InsO (Absonderungsrechte im Falle eines Systems), 340 Abs. 3 InsO (Geltung des Rechts des Systems im Falle des Ausfalls von Teilnehmern) sowie 102b EGInsO (Ausfallbestimmungen von zentralen Gegenparteien) und 17a DepotG (auf grenzüberschreitende Verfügungen anwendbares Recht).

Finality of transfers of funds and financial instruments

SIX x-clear is designated as a system under the Settlement Finality Directive (SFD) by the Bank of England as well as by the German Bundesbank.



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The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

Please refer to Principle 8.

Collateral arrangements

SIX x-clear covers the market and credit exposures to its participants (“members”) through the use of defense lines, which are currently applied in case of default of the member in the following order:

1. Collateral provided by the defaulting member to satisfy its margin obligations and equivalent obligations in respect of contracts subject to clearing by SIX x-clear;
2. Default fund contributions of the defaulting member to the relevant default fund;
3. A maximum of 25% of the required regulatory capital of SIX x-clear (in accordance with Swiss Law);
4. Default fund contributions made by non-defaulting members to the relevant default fund;
5. Additional collateral in the form of “Top-up Contribution” if a default exceeds the current size of the default fund segment concerned; and
6. The remainder of SIX x-clear's provisions and its capital and reserves.

Margins (including funds for the inter-CCP collateral requirement) and default fund contributions are to be pledged by members on a transfer-of-title basis for both cash and securities collaterals in accordance with Swiss law.

Members being served by the Norwegian branch of SIX x-clear have a distinct regime for the provision of cash collateral (whether as margin or as default fund contribution or any other component of security), i.e. collateral in the form of cash must be provided on a transfer-of-title basis whereas collateral in the form of securities are to be pledged on a regular basis.

The respective collateral arrangements (Financial Collateral Agreement) are either governed by Swiss or by Norwegian law depending on the place of the deposit or account (lex rei sitae principle), provided however that the obligations to furnish margin and / or default fund contributions, to enter into the Pledge Agreements and the grounds upon which margin or default fund contributions can be realized shall be governed by the base contract “Contract for Clearing Services” and the Rulebook which are subject to Swiss, English or German law depending on the member’s incorporation whose transactions are being cleared.

Default rules

SIX x-clear’s default provisions provide rules and procedural instructions to be pursued in case of default of a member, a co-CCP, or SIX x-clear’s own default. They comply with the requirements set out in art. 24a NBO, which are officially (by decision of the EU-Commission) considered equivalent to art. 42 (Default Fund), 45 (Default Waterfall) and 48 (Default Procedures) of EMIR.

Interoperability

SIX x-clear practices interoperable clearing with its co-CCP partners, LCH and EuroCCP, on almost all trading platforms served by it.

The respective contractual arrangements, as set forth in a Master Clearing Link Agreement (MCLA), separate Pledge Agreements and further procedural rules, have been consented (non-objection) by the Swiss authorities, the Bank of England (for LCH) and the Dutch regulator (for



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The legal basis should provide a high degree of certainty for each material aspect of an FMI’s activities in all relevant jurisdictions.

EuroCCP) and, if relating to Norway, the Norwegian authorities.

4.1.2 Key Consideration 2

An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

See also Key Consideration 1.1.

SIX x-clear has defined a procedure with its members to amend or further complement contractual arrangements (esp. the Rulebook) in accordance with the rules set forth in the Contract for Clearing Services (base agreement). Unless specific circumstances require otherwise (e.g. decrees by competent authorities) or changes are of minor importance, an interim period of 40 calendar days for consultation and co-determination of members is provided.

The inter-CCP agreements may be amended following the rules defined in the MCLAs.

If the envisaged changes are of material nature for the functioning of SIX x-clear (as defined by the law), regulators will be given advance notice to enable them to intervene and ask for SIX x-clear’s amendment (i.e. in case of any presumed conflict with laws or supervisory principles).

4.1.3 Key Consideration 3

An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants’ customers, in a clear and understandable way.

The relevant documents, except for the bilaterally agreed contracts, can be downloaded in the section Contractual Framework and the Info Center on SIX x-clear’s website.

Contracts which are concluded on a bilateral basis, such as the Contract for Clearing Services and the Financial Collateral Agreements (Pledge Agreements) are issued on request by applicants or regulators. Thus FINMA, SNB, ESMA, the Bank of England, the Norwegian FSA, and any other competent (European) authority can be given access to all actual documents.

Furthermore, SIX x-clear provides information on its company profile and governance, regulatory framework, products and procedures, business continuity measures, financials, and relevant developments / changes on its website and by way of ad hoc messages (“Clearing Notices”).

4.1.4 Key Consideration 4

An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

SIX x-clear is obliged by law to ensure that its contractual arrangements are sound and enforceable under the relevant jurisdictions. To this end, SIX x-clear has obtained legal opinions from local law firms on selected issues of its legal framework in the following jurisdictions: Switzerland, England, Norway, Germany, Sweden, France, and the Netherlands. The scope of such reviews encompassed the choice of law and the enforceability of default rules, of segregation and portability arrangements as well as of collateral setups.



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An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

As a single area where contractual arrangements of a CCP can be overruled, certain prerogatives in insolvency laws must be considered: in Switzerland it is provided that FINMA (as the official restructuring agent or liquidator of banks and securities dealers) has the right to temporarily order the continuation of certain banking services or the transfer of certain bank assets or contractual relationships to another legal entity, including a bridge bank (Art. 92 FMIA). Such a disposition may have precedence over contractual default rules of SIX x-clear. However, FINMA is obliged to inform SIX x-clear, if possible, in advance of ordering such measures to enable it to take precautions (in particular claim sufficient collateral). Similar measures are also at the disposition of insolvency authorities in other (European) jurisdictions.

4.1.5 Key Consideration 5

An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

As explained under Key Consideration 1.1, SIX x-clear is primarily subject to Swiss law as regards its governance, risk management, and operational procedures. Relationships with members are governed by Swiss, English or German law.

SIX x-clear (supported by its external legal counsels in the various jurisdictions where SIX x-clear provides its services to trading platforms and Members) has taken the best possible care to ensure the soundness, consistency and enforceability of its principles and procedural rules and other contractual agreements with its business partners. Agreements were reviewed by external experts and regulators in their essential parts (e.g. default rules).

All Swiss law that is relevant for a CCP according to EMIR (EU-Regulation 648/2012) is considered equivalent to European law. SIX x-clear is not aware of any conflicts in legal issues relating to its legal context and specific organizational and legal arrangements. The equivalence of the Swiss legal and supervisory regime with the European regulations and technical standards (EMIR regime) was officially acknowledged by the European Commission in its Implementing Decision 2015/2042 of 13 November 2015. As to the finality of securities and payment transfer orders and netting SIX x-clear was given a respective Designation Order by the Bank of England on 17 March 2015 and by the German Bundesbank on 29 January 2019. Thus SIX x-clear's system is deemed fully compliant with the rules of the EU's Settlement Finality Directive 98/26/EU.

4.2 Principle 2: Governance

An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

4.2.1 Key Consideration 1

An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.

SIX x-clear is a CCP incorporated under Swiss law. It is a wholly-owned subsidiary of SIX Securities Services Ltd, which itself is a wholly-owned subsidiary of SIX Group Ltd. The latter is



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the principal financial market infrastructure organization in Switzerland. Its shares are owned by a large number of the users of its services, i.e. approx. 125 financial institutions.

SIX x-clear, as is the case for all units of SIX, has established high standards of professional conduct that direct its ongoing activities. These standards are formalized in various policies and procedures applicable to employees, senior management, and directors.

4.2.2 Key Consideration 2

An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.

SIX's current governance structure is presented on its website .

The foundation of SIX x-clear's governance requirements is mainly set out in the Swiss Code of Obligations (art. 698 seqq.), art. 8 and 9 FMIA and art. 7 - 11 FMIO. SIX x-clear's articles of association and organizational rules are in line with these regulations. SIX x-clear has in place adequate processes for ensuring accountability to all its stakeholders (shareholders, regulators, members, and indirect participants) with a documented delegation of decision and financial discretionary rights. SIX x-clear and SIX publish relevant governance information via media releases and on their websites, including the annual reports.

Art. 9 (2) FMIA prescribes that the members of the BoD, which at SIX x-clear comprise also non-executive directors, and senior management have an impeccable reputation and possess the experience and skills to perform their mandate. FINMA has to give its consent to the members of both bodies (art. 10 (1) FMIO) and has done so.

The rules and procedures in case of failure of a member as well as the rules and procedures relating to the collection and realization or restitution of collateral of members are publicly available on the website of SIX x-clear (c.f. the Rulebook and the Operational Manual).

Accountability to members and customers is further ensured by the dispute resolution process which is regulated in the Rulebook. If arbitration of disputed issues by SIX internal bodies cannot resolve it, the matter shall be referred to the regular courts of justice.

4.2.3 Key Consideration 3

The roles and responsibilities of an FMI's BoD (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.

The BoD of a Swiss company has non-transferable and inalienable duties clearly specified by art. 716a (1) Swiss code of Obligations and art. 8 FMIA. In particular, the BoD is responsible for an appropriate risk and control environment and an effective Internal control system (ICS). It appoints and monitors the internal audit, commissions the regulatory audit firm and assesses its reports.

According to the articles of association, the management of the business of SIX x-clear and the execution of resolutions taken by the BoD are incumbent on the senior management (see art. 716a sec. 2 and 716b sec. 1 Swiss Code of Obligations).

The members of the BoD and the executive / senior management must perform their duties with all due diligence and safeguard the interests of the company in good faith (art. 717 sec. 1 Swiss Code of Obligations). Conflicts of interest are to be avoided and can lead to liability claims



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against the corresponding member of the BoD or senior management (see art. 754 Swiss Code of Obligations). The Legal & Compliance department has to intervene in cases of (potential) conflicts of interest.

In line with European law (art. 28 EMIR), SIX x-clear maintains a Risk Committee formed of SIX outside experts of the clearing business. This risk committee, which is chaired by an independent member of the BoD, holds at least four meetings yearly.

SIX x-clear has established the following rules and procedural guidelines for its corporate governance and administration:

- articles of association
- organizational rules
- order of competences
- charter of Risk Committee
- SLAs with other entities of SIX

In general, SIX has established high standards of professional conduct which shall direct the ongoing activities of its units. These standards are formalized in the Group Code of Conduct and in various policies and procedures applicable to directors, senior management and employees across the Group. Particular emphasis is given therein to the avoidance of conflicts of interest. The BoD of SIX x-clear has its work and performance reviewed on a biennial basis by an external independent consultancy firm (in accordance with art. 8 para. 3 FMIO).

Internal Audit reviews the implementation and effectiveness of the (operative) risk management rules and measures taken within SIX x-clear and the units of SIX supporting it.

4.2.4 Key Consideration 4

The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).

The BoD of SIX x-clear is constituted as per SIX policies and procedures. It is advised by a designated Risk Advisory Committee, chaired by an independent Chairman who also forms part of the SIX x-clear BoD.

According to art. 698 para. 2 (2) Swiss code of obligations, the shareholders’ meeting, i.e. the representatives of SIX as the sole shareholder, appoints the members of the BoD of SIX x-clear. Currently it consists of five members, of which three are Executive Management Directors of SIX and two are non-executive, external persons who are not employed by SIX but represent the customers’ side. Therefore, users’ interests and sensitivities are duly reflected in the management of SIX x-clear.

As of Q3/2021 the composition of the BoD of SIX x-clear AG is as follows: two Executive Board Members, two external/independent Board Members, one representative of the SIX Group BoD who will also act as the Chairman of the BoD of SIX x-clear AG.

Members of the BoD and the executive board must enjoy a good reputation and have the specialist qualifications required for their function, they also need to prove their theoretical and practical knowledge in the respective business area to be able to provide the guarantee of impeccable business conduct (pursuant to art.9 sec. 1 and 2 FMIA).



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The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).

All appointments and the composition of the BoD as well as the executive management of SIX and SIX x-clear as well as of its committees are in full compliance with Swiss law. Where the rules of Swiss law were less detailed than those of European regulation no. 648/2012 on OTC derivatives, central counterparties and trade repositories (EMIR), SIX x-clear chose the latter in its statutory provisions. Hence SIX x-clear has, in accordance with art. 27 (2) EMIR, more than one third independent board members (two of five) and the external advisory Risk Committee (in accordance with EMIR Article 28) is chaired by an independent member of the BoD.

FINMA approved the appointments of the members of the BoD and of the executive management (according to art. 10 (1) FMIO). Their assessments were based on detailed documentation (in particular other mandates) and proof of experience of the respective persons.

4.2.5 Key Consideration 5

The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.

The duties of the BoD, Risk Advisory Committee and Management are laid down in the documented charters, organizational rules and delegations of responsibilities and financial discretionary rights.

As outlined in Key Consideration 2.4, SIX x-clear operates under a two-tiered board structure comprising a BoD and an Executive Board. The BoD delegates the Executive Board with the management of the company and its daily operations within clearly defined responsibilities and competences (see art. 716a (2) and 716b (1) Swiss code of Obligations). As to its qualifications and appointment, the same conditions and procedures apply as for the BoD except that they are elected (or dismissed) by the BoD.

The members of the Board of Directors and third parties engaged in managing the company's business, e.g. the Executive Board, must perform their duties with all due diligence and safeguard the interests of the company in good faith (art. 717 (1) Swiss code of Obligations).

4.2.6 Key Consideration 6

The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.

Risk management

The normative, methodical, and organizational principles of the risk policy are pre-defined at the level of SIX Group. The risk management of SIX Group AG and its subsidiaries is executed in line with this policy under the functional responsibility of the CRO of the Group. He / she reports regularly to the BoD of SIX Group, in particular to its Risk Committee, and the senior management of the Group.



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The BoD of SIX x-clear AG bears the ultimate legal responsibility for the supervision of the overall risk situation of SIX x-clear and regulates the basic principles of risk management. The board thus:

- acknowledges and supervises risk governance, organization and management and approves the adequacy of the internal control system upon request of the Audit Committee
- approves the risk policy and any other relevant policies
- acknowledges the risk appetite methodology and approves risk appetite limits
- acknowledges overall risk situation based on risk reporting from and the CRO
- acknowledges risk-based capital and liquidity requirements

SIX follows the model of three lines of defense as governance framework to ensure an effective management of its risks:

- The first line of defense is represented by the business line management and includes any function that directly assumes risks. It owns the risk and is responsible for the identification, assessment, daily management, monitoring and reporting of taken risks.
- The second line of defense refers to independent oversight functions. They are responsible for the development and proposal of risk governance, organization and methodologies as well as for ensuring their proper implementation within the first line of defense.
- The third line of defense provides independent and objective supervision and assurance of the overall risk situation enabling an effective risk management, control and governance.

SIX x-clear performs its own specific operative risk management as a core function. In particular, it manages and controls the market and credit risk of the daily clearing activities by monitoring and administering exposures and their sufficient collateralization.

Roles, responsibilities, and reporting lines are laid down in the order of competences of SIX and its subsidiaries. Decisions of substantial relevance are to be taken by a group of several persons (board or management team). When committing SIX x-clear to outside parties, a written document is to be drawn and signed by two signatories.

Crisis Management

SIX provides a crisis organization with which crisis situations at home and abroad can be dealt with effectively and on time. The crisis organization is responsible for crisis management until proper conditions are restored as soon as possible. The crisis management organization provides for the following management levels:

- Chairman of the Board of Directors;
- CEO;
- Head of Crisis Management;
- Chief of Staff Crisis Management;
- Management of emergency staffs.

The crisis organization at SIX forms the Group-wide link to the Interbank Alert and Crisis Organization (IACO) of the Swiss National Bank (SNB).



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Internal control system (ICS)

The ICS (as required according to art. 8 (3) FMIA) ensures compliance with statutory, regulatory and internal company rules and regulations. It is based on a systematic risk analysis and documents all business-relevant processes, risks, systems, and controls. It ensures that all identified risks are controlled according to the defined risk appetite and the defined risk tolerance and consequently are eliminated or are at least mitigated.

The tasks in connection with internal controls are executed by the following bodies:

- BoD of SIX x-clear (see above)
- Senior management of SIX x-clear. The senior management prepares monthly reports for the BoD and, if necessary, provides information to it on an ad hoc basis.
- Compliance – for reasons of independence, the Compliance function has been delegated to the Compliance department run by SIX Group Services, another company of SIX. They ensure that internal rules and proceedings are in accordance with regulatory requirements and that management and employees are informed and adhere to these rules. In case of infringements or conflicts, Compliance intervenes and supports management in solving the situation. Compliance maintains an inventory of legal and regulatory risks.
- Internal audit at SIX is independent from the senior management of SIX x-clear and reports directly to the Chairman and the Risk Committee of the BoD of SIX. It is equipped with sufficient resources and has an unlimited right of review as well as unrestricted access to all documentation, data carriers and information processing systems (see art. 9 (6) FMIO). The internal audit team cooperates with external audit. There is a coordinated schedule for the audits, audit reports are exchanged and, if necessary, ad hoc notifications of special findings are made.

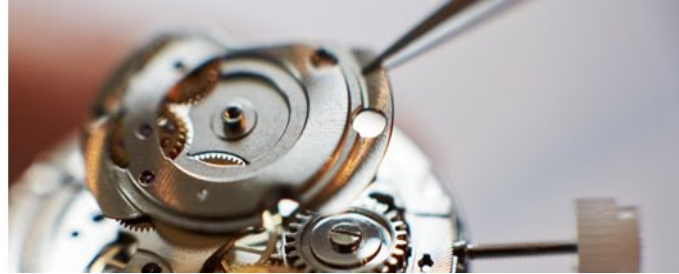
SIX's internal control functions have qualified personnel and sufficient resources to fulfil their tasks. Compliance and Internal Audit have an unlimited right of review and unrestricted access to all documentation, data carriers, and information processing systems in accordance with requirements of statutory law and best practice. Internal Audit coordinates (audit schedule) and shares its work (reports and ad hoc findings) with the external auditors. It takes a risk-based approach in defining specific areas to be audited.

4.2.7

Key Consideration 7

The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.

SIX's shares are mainly owned by users of the services of SIX x-clear. SIX x-clear is in turn fully owned by SIX and the board of SIX is composed of members drawn from these users. The SIX x-clear BoD is composed of a combination of independent Directors, and Group Executive Management. Both of these governance levels have designated Board Risk Advisory Committees, engaging users / members. Therefore, users' interests and sensitivities are



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The board should ensure that the FMI’s design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.

reflected in the activities of SIX x-clear.

SIX x-clear continuously enhances its products and services in line with client requirements and market opportunities. This is achieved through dialogue with clients as well as trading and matching venues that provide clearing flow to SIX x-clear.

In addition to the many bilateral meetings in the course of normal business, SIX x-clear provides an engagement and feedback channel through its Market Advisory Committees (MAC). All users / members are invited hereto, and they are held at least twice a year in all major financial centers which SIX x-clear serves.

SIX x-clear continuously enhances its offering, and apart from the aforementioned feedback channels, it utilizes a change procedure in which it presents users with any planned significant changes at least 40 days in advance, using a consultation procedure and inviting all users / members to comment, before enacting any such technical, agreement or service change.

In cases of conflicts of SIX x-clear with any of its stakeholders (that are not SIX x-clear members), the procedures as agreed in the respective contractual arrangements shall be observed by the parties. These proceedings have been defined with the members in the Rulebook, with the co-CCPs in the respective MCLA and with the trading platforms in the respective Clearing Service Agreements as “dispute resolution” rules.

Major decisions or changes to the regulatory framework are communicated to

- shareholders for the annual general meeting and for each extraordinary general meeting via the commercial account officers and through various publications (i.e. newsletters) and through user representatives in regular meetings of the MAC;
- members (users / shareholders of SIX) through Clearing Notices in the private part of the website of SIX x-clear;
- the public (only if deemed appropriate) through media releases and publication on the public part of the SIX x-clear website and / or the website of SIX.

4.3 Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

4.3.1 Key Consideration 1

An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.

The leading document of SIX x-clear with regards to risk management is currently the SIX Risk Policy (SRP). It defines the types of risk specific to SIX Group overall and the risk management principles for each risk type. SIX x-clear has adopted the relevant passages for its use (approved by the BoD of x-clear) and is overall fully aligned regarding risk types and methods/ tools with SIX Group Risk Management. SIX x-clear uses the Three Lines of Defense as governance



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approach to ensure an effective management of its risks.

In addition, SIX x-clear has implemented and maintained a risk appetite framework creating the strategic, organizational, methodological, and behavioral framework for managing risk. The risk appetite framework contains the main statements of SIX x-clear risk strategy, which are then further specified with the help of appropriate metrics (Key Risk Indicators & Information Only Indicators) and consistently operationalized through respective limits (Risk Appetite, Risk Tolerance & Risk-bearing Capacity).

Counterparty Credit Risk: SIX x-clear in its capacity as a CCP primarily takes on counterparty credit risk. It measures and monitors its credit risk exposures using a close-to-real-time margin-model and collateralizes its exposures continuously throughout the clearing day. The risk methodology of SIX x-clear is based on portfolio VaR models for margining and daily risk factor based stress tests. This ensures SIX x-clear has sufficient financial resources to sustain losses from the default of the two member groups with the potentially largest credit exposures under extreme but plausible market conditions. The methodologies are operated by customized systems. SECOM operates for those members connecting to SIX x-clear Zurich and CLARA for those connecting to the SIX x-clear Norwegian branch. In addition, a model validation Risk Management System (RMS) is run to assure the quality of the margins of SECOM. It may, under certain conditions, override the SECOM margin requirement.

Liquidity and market risk: The policies and procedures of SIX ensure the availability of sufficient liquid resources to cover all payment obligations when they fall due in the respective currency on a day-to-day basis. They also ensure sufficient resources under extreme but plausible market conditions. Lastly, they guarantee SIX' prudent management of its exposures to movements in FX rates, interest rates and security prices.

Reporting processes are aligned with the risk appetite framework. This creates a transparent information basis for business decisions and risk steering.

The primary accountability for risk management policies lies with the BoD of x-clear which approves the risk policies and (central) directives and ensures that procedures and systems are implemented correctly and effectively. The BoD is informed through regular reporting.

SIX x-clear is a separate legal entity with its own BoD. SIX x-clear has a Risk Committee that advises the BoD in matters as described in Key Consideration 6 of Principle 2.

Risk management policies are reviewed on a regular basis, at least annually, and are updated if necessary. The effectiveness of the risk management procedures and parameters is assessed through regular back-testing, sensitivity analysis, stress-testing and testing of the default management procedures. Furthermore, risk methodologies are regularly assessed.

Further information regarding the different risk types can be found in the respective answers to Principles 4, 5, 6, 7, 15, 16 and 17.



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4.3.2 Key Consideration 2

An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.

SIX x-clear enables participants to manage and contain their risks through online access to the clearing and risk management systems, with a suite of reports available to monitor exposures and collateral. Through the possibilities of the account set-up, participants are able to monitor exposures at a more granular level.

Moreover, SIX x-clear provides risk incentives to the clearing members in the following ways:

- Margin requirements of the clearing members are directly proportionate to exposures brought to SIX x-clear
- The members' margin requirements depend on their credit ratings by taking into account the creditworthiness of each Member in order to protect the community from poorly rated Members and SIX x-clear in addition.
- Loss sharing of the members in the default fund and through top-up contributions is proportionate to the exposures brought to SIX x-clear and the Member's credit ratings.
- Application of late settlement fees to members that fail to settle securities in a timely manner.

4.3.3 Key Consideration 3

An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.

SIX x-clear continuously assesses the legal, credit, liquidity, general business and operational risks that it bears and poses to other entities. In particular, SIX x-clear ensures that credit exposures from all participants are adequately collateralized. Additional measures are applied to manage large positions. Pro-cyclical effects are considered by factoring in stressed periods in the margin requirement, hence avoiding margin requirements becoming too low in periods of low volatility, and enabling SIX x-clear to increase requirements at a reasonable pace as market volatility spikes.

Pro-cyclical effects are also prevented by conservatively defined collateral haircuts, thus avoiding the collateral values becoming inadequate in periods of market volatility and creating an additional buffer for the participants.

Exposures towards Co-CCPs are fully collateralized, and link margins provided to the Co-CCPs are fully financed by the community of the SIX x-clear members.

A default waterfall is in place to protect the non-defaulting members in the case losses arising from the default of a member exceed the provided collateral.

The risk management tools used to measure, monitor and manage risks from interdependencies also include liquidity risk-management techniques, business continuity arrangements that allow for rapid recovery and resumption of critical operations and services in the event of disruptions as well as a recovery and wind-down plan.



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4.3.4 Key Consideration 4

An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

In line with art. 24 FMIA / art. 26 NBO SIX x-clear annually makes a dependency risk analysis and defines threshold values for recovery indicators which set out the recovery objectives for the business processes that are necessary for operations. In its recovery plan, SIX x-clear assesses various stress scenarios, going beyond the scenarios applied in business-as-usual risk management, specifically targeting risk indicators with respect to regulatory capital (e.g. fulfilment ratio and depletion of SIX x-clear’s default waterfall) and liquidity. In addition to the SIX x-clear specific stress scenarios like the default of the largest clearing members, placement banks or a collateral service provider, the impact of cybercrime, a financial crisis or the default of major clients of SIX SIS and SIX x-clear as a combined SIX Securities Services scenario is also analyzed.

The goal of the recovery plan is to ensure the continued service of critical operations in the event of financial resources falling close to being depleted or its viability otherwise being threatened. The recovery strategy shall therefore contribute towards maintaining the operations of systemically important processes for the Swiss financial market. It comprises several recovery options, which allow SIX x-clear to recover from potential severe crisis scenarios. Options foreseen by the recovery plan, like raise of equity, top-up contribution and broker-lien, significantly strengthen SIX x-clear’s capital and / or liquidity position.

The recovery plan is reviewed and submitted to FINMA on a regular basis (art. 24 FMIA / art. 26 NBO).



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4.4 Principle 4: Credit risk

An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.

4.4.1 Key Consideration 1

An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.

The SIX Credit Risk Policy contains the principles and guidelines that set the general framework applicable to the extension of credit or entering into counterparty risk at SIX. It forms the basis on which SIX x-clear measures, monitors, and manages its credit exposures towards its members.

Credit exposures at SIX x-clear arise from transactions submitted for clearing and credit risk in the form of current and potential future exposure is collateralized by cash or marketable securities. SIX x-clear is to some extent exposed to custody and investment risk. In accordance with its policy, the majority of its assets are kept at SIX SIS or the SNB, while a smaller part is held at highly rated financial institutions, in secured reverse repo investments or in highly rated repo eligible securities.

The credit risk policy as well as the regulations and work procedures governing the management of credit risk are reviewed annually and on an ad hoc basis when deemed necessary or imperative. They are approved by the respective bodies, including the risk committee of the supervisory board.



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4.4.2 Key Consideration 2

An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

Collateral requirements are calculated in close to real time during the clearing day and adjusted where applicable. Collateral values are assessed continuously and there are low thresholds for overexposures. Should the collateral values fall below the requirements, either to satisfy margin requirements or the default fund contribution, members are required to post additional collateral within 60 minutes. The size and composition of the default fund is assessed and adjusted if required, on a monthly basis.

SIX x-clear’s credit assessment and the risk coefficient assigned to the individual credit counterparty are key for the valuation of a member and to address large exposures to individual participants. SIX x-clear reviews the credit rating of every counterparty periodically according to its risk classification.

Both current and potential future credit exposures to the clearing members are continuously measured. SIX x-clear applies portfolio margining methodologies (incorporating sensitivities to risk factors and correlations across risk factors) to assess the potential future exposure at a confidence level of 99.7%. The performance of the model is validated through daily back-testing and sensitivity analysis. Collateral haircuts are also validated on a daily basis.

4.4.3 Key Consideration 3

A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.

Key Consideration 4.3 is not applicable as SIX x-clear is not a CSD and does not operate a Deferred net settlement (DNS) payment system.



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4.4.4 Key Consideration 4

A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

The margin requirements of the clearing members are calculated by means of Value at Risk (VaR) targeting a 99.7% confidence level. The VaR is based on a regression of historical time series of the cleared ISIN to the relevant risk factors and considers stressed risk factor scenarios in the look-back period as well as concentration add-ons. Moreover, there are additional margin add-ons beyond VaR, such as, but not restricted to, large exposure add-ons and stress margin add-ons.

Besides the margins of the clearing members, SIX x-clear has additional resources in place to sustain losses from the default of the two members and their affiliates that would potentially cause the largest aggregate credit exposure for SIX x-clear in extreme but plausible market conditions. This default waterfall notably includes a dedicated own capital contribution of SIX x-clear (skin-in-the-game), a mutually financed default fund and top-up contributions of the non-defaulting clearing members.

SIX x-clear assesses the size of its default fund and the key for distributing the funding requirement across the clearing members on a monthly basis. The total size is derived from the regular stress testing, while the distribution is determined by the individual risk contribution of each member, i.e. derived from the membership category (x-clear ICM or x-clear GCM) and from the median of the initial margin over the last 30 business days or over the last 90 business days (whichever is higher), and the credit rating of the member.

The principles for stress testing and the default fund, as well as the default waterfall are submitted to the Risk Committee of SIX x-clear and are approved by the BoD.



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in accordance with “Disclosure framework and Assessment methodology”, December 2012

4.4.5 **Key Consideration 5**

A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

SIX x-clear tests its total financial resources using a set of historical and hypothetical scenarios representing extreme but plausible market conditions. Stress tests are performed daily, assuming the default of the two financial groups which would create the largest aggregate credit exposure to SIX x-clear. The results are communicated regularly to senior management, to the Risk Committee of SIX x-clear, the SIX Executive Board, and the competent authorities.

Should any daily stress test result breach the 75% threshold of the default fund value, SIX x-clear will consider an increase of the size of the default fund or other mitigating measures.

On a monthly basis, SIX x-clear analyzes parameters and assumptions underlying the stress tests. Moreover, the stress test assumptions are revised on an ad hoc basis after large market movements.

The risk management model of SIX x-clear is assessed and validated annually by an independent entity, either within the SIX organization or externally.

4.4.6 **Key Consideration 6**

In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

The stress scenarios of SIX x-clear consider all relevant risks identified and involve both historical and forward-looking hypothetical scenarios. The historical scenarios reflect peak historical volatilities in the markets served by SIX x-clear. Because the relevant peak historical volatility might differ for different portfolios SIX x-clear uses a wide range of different historical reference periods. Hypothetical stress tests apply dedicated economic scenarios such as “financial crisis renaissance”, “natural disaster & terror” or a market-rebound scenario etc. These scenarios are translated into a set of risk factor shifts. The instrument returns are then stressed through a risk factor methodology considering the correlation structure across the overall risk factor set.

The scenarios and stress tests are reviewed and supplemented with additional tests and discussed with the Board of Directors on a yearly basis.



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4.4.7 Key Consideration 7

An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.

In the event of one or several clearing member defaults, the open offer / novation process will immediately be suspended and the close-out procedure will be initiated, as stipulated in chapter 19.0 of the Rulebook (Swiss Law, English Law and German Law) SIX x-clear, Zürich and in chapter 27 of General Terms and Conditions of Business (English Law) SIX x-clear AG for the Norwegian Branch.

Chapter 11.6 of the Rulebook and 18.2 of the General Terms and Conditions set out, how possible credit losses will be allocated, including the circumstances in which each layer of the default waterfall can be used:

Firstly, SIX x-clear applies the collateral that the defaulting member(s) provided as margin, link margin and default fund contribution.

Secondly, SIX x-clear applies its own available dedicated resources (skin-in-the-game) amounting to 25% of SIX x-clear's regulatory required capital.

Thirdly, the contributions of the non-defaulting members to the respective default fund segment(s) are applied.

In case of a full drawdown of the default fund segment(s), the non-defaulting members are subject to additional collateral requirements (top-up contributions).

In case all defense lines are unable to fully absorb the losses, the remainder of SIX x-clear's own reserves and capital will be used to cover any remaining losses. The use of the remaining reserves and capital of SIX x-clear may trigger additional prearranged recovery and resolution procedures.

According to chapter 11.8 of the Rulebook and 18.6 of the General Terms and Conditions, any drawdown, whether partial or full, of the respective default fund segments affected by a member default gives rise to an obligation on each non-defaulting member to replenish this default fund segment through supplementary contributions, thus restoring the default fund to the required level following a reassessment. SIX x-clear applies a cooling-off period of 20 business days before the non-defaulting members shall provide the requested financial resources.



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4.5 Principle 5: Collateral

An FMI that requires collateral to manage its or its participants’ credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.

4.5.1 Key Consideration 1

An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

The acceptance of a specific asset as collateral is governed by the lending norms of SIX x-clear. In principle, SIX x-clear only accepts collateral in the form of cash in highly liquid currencies (CHF, EUR, GBP, USD, NOK, DKK, SEK, JPY, AUD, CAD, NZD) and securities mentioned in the list of collateral eligible for SNB repos (SNB GC basket). Such securities fulfil stringent requirements with regard to credit rating and liquidity.

To avoid wrong-way-risk, commercial bank guarantees and any security of which the issuer is a bank or other credit institution is in principle not accepted as collateral. However, bonds issued by supranational banks or development banks as well as covered bonds that have a low default correlation with the issuing bank may on a case-by-case basis be accepted as collateral. Moreover, SIX x-clear does not allow its members to provide their own issues as collateral. In addition, the required collateral cannot under any circumstances be placed in the same institution as the one providing it. The lending norms of SIX x-clear provide further details on eligible collateral and haircuts. They are reviewed at least annually and more often in volatile markets.

Collateral assets are considered at their lending value (market value minus a conservative haircut according to the collateral type). SIX x-clear has the right to recall the collateral eligibility of any single asset at any time even though the respective asset belongs to a generally eligible collateral type.

To ensure sufficient diversification of the collateral and thus allow its liquidation without significant market impact, SIX x-clear has established maximum concentration limits with regard to the issue volume of bonds.

4.5.2 Key Consideration 2

An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

The collateral revaluations (mark-to-market) are performed automatically multiple times a day in SIX x-clear’s collateral management system.

SIX x-clear has the discretion to decide which assets may be deposited as collateral and that certain assets may be excluded as collateral. So when – in the opinion of SIX x-clear – market prices do not represent the true value of the respective collateral, SIX x-clear is authorized to declare such assets as non-eligible or to set higher haircuts for them. SIX x-clear has the right to change its haircuts at any time and with immediate effect.

The haircuts of SIX x-clear are validated on a daily basis using risk-factor-based Monte Carlo simulations and stress tests. The validation technique takes into account the prevailing volatilities and correlations between the risk factors. It further reflects the residual intrinsic risk of the collateral securities. The objective of such validation is to test whether the haircuts applied



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An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

by SIX x-clear are sufficient to withstand the default of any participant on a 99% confidence level considering stressed market conditions in the look-back-period as well as potential market illiquidity. Besides Value at Risk, the haircut validation applies a couple of historical bond stress scenarios.

4.5.3 Key Consideration 3

In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

The haircuts of SIX x-clear consider stressed market conditions and are oriented towards the standard supervisory haircuts determined by FINMA in margin nos. 208-211 of the Circular 2017/7 Credit risk – banks.

The haircut calibration methodology of SIX x-clear consists of an exponentially weighted moving average (EWMA) VaR model on one hand, and a historical as well as hypothetical stress testing framework on the other. The inclusion of stressed market conditions in the calibration methodology ensures an adequate handling of procyclicality issues. Before setting the final haircuts in the lending norms, the calibrated haircut values are backtested against historical prices and a VaR measure, which includes a 25% stressed VaR component, in order to ensure that the set haircuts are conservative enough to withstand stressed market conditions and to comply with regulatory requirements. Additionally, the potential procyclicality of the haircuts is evaluated by means of the regular haircut validation. The results of these validations have shown that the haircuts of SIX x-clear are very conservative so that the issue of procyclicality is avoided.

4.5.4 Key Consideration 4

An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

Concentration risk in the collateral portfolios of all SIX x-clear members is measured by the liquidity adjustment of the VaR, which is used to validate the collateral positions of all clearing members.

In order to ensure that the collateral of SIX x-clear remains sufficiently diversified to allow its liquidation without a significant market impact, SIX x-clear has established issue-specific maximum concentration limits. Such concentration limits are applicable for all bond collaterals. They are based on the face value of a bond and set as a percentage of the respective issue size (total issued capital).

Collateral exceeding a concentration limit has to be replaced by the respective clearing member such that the concentration limit is met after the replacement.

The risk policies and procedures applicable to SIX x-clear, including those for collateral management, are regularly reviewed.



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4.5.5 Key Consideration 5

An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

In relation to cross-border collateral, SIX x-clear is exposed to market risk, country risk, issuer risk and legal risk. While margin collateral and default fund collateral of the members are mainly held at SIX SIS, SIX x-clear accepts collateral denominated in foreign currencies or collateral whose issuer is established abroad.

According to its lending norms, SIX x-clear only accepts securities denominated in jurisdictions with low country risks. In addition there is no obstacle to the availability and the timely currency conversion of the collateral. The potential foreign-exchange risk of collateral positions is taken into account through the application of adequate haircut increments.

SIX SIS and SIX x-clear have defined high standards when it comes to the choice of their sub-custodians. As part of the risk assessment SIX performs a financial analysis by use of a risk scorecard to determine a credit rating. As a minimum selection criterion, a custodian has to have a minimum credit rating of A-.

While a detailed risk assessment is performed for all new custodian relationships, SIX applies a risk-based approach when reviewing the risk profile of existing sub-custodians. For this purpose, each sub-custodian is allocated to one of two exposure categories A (low exposure) or B (high exposure). The classification ensures that sub-custodians with higher exposure for SIX are reviewed and monitored more frequently in order to ensure that any evolving risks are identified at an early stage.

Collateral for safeguarding against inter-CCP risks is deposited at Clearstream Banking S.A. Luxembourg (CBL) as the pledge holder (“Triparty Collateral Manager”).

4.5.6 Key Consideration 6

An FMI should use a collateral management system that is well-designed and operationally flexible.

Collateral management system design

The scope of the collateral management system of SIX x-clear comprises the connection to clearing members, Co-CCPs and external collateral locations, the assessment of collateral in relation to acceptance criteria, the deposit and substitution of collateral, the application of concentration limits, the automated calculation and validation of margin requirements, collateral valuation and the timely execution of margin calls. Furthermore, the collateral management system tracks the extent of reuse of collateral (both cash and non-cash).

Operational flexibility

The monitoring and management of collateral positions is performed in real time by the respective processing systems (SECOM, CLARA). The systems provide support for the timely deposit, withdrawal, substitution, and liquidation of collateral.

The collateral management is monitored by Risk Management Operations, whose staffing levels are regarded as adequate even in times of market stress.



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4.6 Principle 6: Margin

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

4.6.1 Key Consideration 1

A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.

SIX x-clear currently operates two separate clearing systems, SECOM and CLARA, with two different margin models.

Margin methodology in SECOM

Margins in SECOM are calculated for each asset class, using an individual margin methodology for the respective asset classes. The initial margin is calculated in real time based on the net exposure of all open contracts per security and currency combination held in the clearing account. The variation margin is computed every 90 minutes by marking-to-market the open positions of members based on the net positions of all open contracts per ISIN. It is computed based on either trade prices or bid/ask prices.

The risk rating coefficient represents an initial margin scaling factor, which is derived from the credit rating of the member. In the case of an increased net open amount of a member exceeding a pre-defined threshold, the member's existing risk coefficient is increased for the period in which the situation persists.

If, at any time, the collateral value of a member falls short of the margin requirement, SIX x-clear will automatically issue a margin call in real time. In case of pending margin calls, the respective members will be contacted by the Risk Management Operations team of SIX x-clear by e-mail or by telephone.

If the member is unable to cover the margin call in CHF or in a foreign currency, the amount owed can also be ensured by means of a corresponding delivery of securities in SECOM, where possible. The securities must meet the "collateral-eligible" criteria for margins.

If the cash currency deadlines are reached and the margin call cannot be satisfied on the same day, the margin call has to be fulfilled by 9:00 am CET on the next business day. If the member has opted for the OTC Extended Window Clearing Service, the member has to provide margin collateral due to a margin call in USD or securities by 9:00 pm CET on the same day.

Margin methodology in CLARA

The margin methodology applied to those members connecting to CLARA is based on a Monte-Carlo VaR approach, see also details in Key Consideration 4.6.3. The risk model in CLARA has continuous access to positions and price data. The pricing model for the cleared products are standard valuation models.

SIX x-clear has the capacity to issue intraday margin calls, and monitors the performance of its margin model, relying on backtests, sensitivity tests and liquidity tests. Risk Management performs annual reviews of the risk methodology and more frequently for imperative reasons. Margin results as well as all necessary input parameters are made available to members.

All members have access to a simulation tool enabling them to simulate margin requirement on potential changes to positions and/or prices on underlying instruments.

Failure to meet the margin requirement within the set time limit (11.00 CET for daily ordinary



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A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.

margin calls) is deemed an event of default. For intraday margin calls the time limit is 60 minutes. Upon member default, SIX x-clear shall initiate default procedures, where SIX x-clear ultimately closes out all outstanding contracts of the defaulted member and uses posted collateral.

4.6.2 Key Consideration 2

A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.

Data sourcing in SECOM

The initial margin model of SECOM uses the latest trade prices from the exchanges / trading venues on which the cleared ISINs are traded. End of day (EOD) prices and intraday FX rates are collected from SIX Financial Information. The latest trade price available is the latest of either

- a. the trade price of the latest clearing order that SIX x-clear has received for the perspective ISIN (this clearing order may come from any exchange on which SIX x-clear provides clearing services), or
- b. the previous EOD price of that ISIN.

Irrespective of whether the open position in the respective ISIN has changed, the position value is revalued hourly using the latest FX rate.

All position values are revalued at the end of each trading day using EOD prices.

Data sourcing in CLARA

The margin models exclusively use price data of the cleared instruments, equities, indexes, exchange rates and fixed income instruments from the market place. In addition to these data, all relevant master data are used to determine the margin requirement. The price feed enables the close-to-real-time pricing of cleared instruments and equity market collateral.

If prices are not readily available or in case of a failure of the price source, CLARA shall rely on the latest equity price received from the respective price source. In the case of stale prices, the last price received is calibrated against bid/ask quotes, and potentially adjusted if the last price is no longer within the range of the current bid/ask price.

The methods and principles for pricing, which form part of SIX x-clear’s margin model, are reviewed at least annually.



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4.6.3 Key Consideration 3

A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

The margin models in SECOM and CLARA are described in detail in the Operational Manual of SIX x-clear.

Margin model in SECOM

The calculation of the initial margin in SECOM is based on the 99.7% VaR of the underlying securities. VaR for bonds uses a time-horizon of 7 days and is derived on the basis of historic changes in bond yields and their modified duration. VaR for equities and ETFs is calculated for a two-day time horizon and is based on the historic price changes of the securities.

The VaR per ISIN is defined as $VaR = \text{Max}(\text{long-term VaR}; \text{short-term VaR})$.

The long-term VaR is based on the prices or yields of the past two years (approx. 500 trading days), whereas the short-term VaR is based on the prices or yields of the past three months (approx. 60 trading days) only.

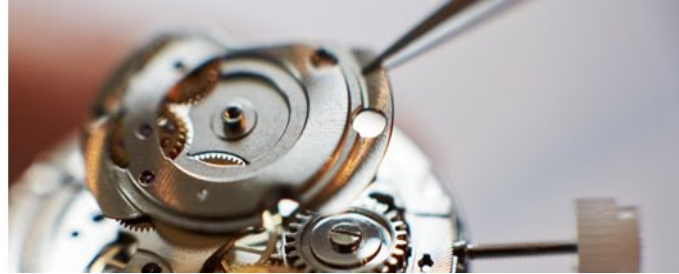
The initial margin is calculated in real time based on the net exposure of all open contracts per security and currency combination held in the clearing account. Each change in positions results in an automatic update of values. For the calculation of the initial margin, the cleared securities are allocated to different asset-class-specific risk buckets, depending on each security's VaR (as specified above). The initial margin model applied in SECOM features six different risk buckets per asset class.

For both equities and bonds, intra- and inter-bucket offsetting coefficients are used to net off opposing open positions.

The initial margin computation has been supplemented by margin validation and calibration software, RMS, which performs a daily risk-factor-based Monte Carlo simulation of the initial margin requirements. SIX x-clear adjusts the initial margin requirement based on the outcome of this margin validation process and on a comparison of the clean initial margin (computed by the real-time margining module) with the portfolio VaR resulting from the margin validation module.

Market liquidity issues during the close-out of open positions through SIX x-clear are taken into account by the liquidity adjustment of the VaR in the RMS. This component of the VaR takes into account the adverse price movements of large holdings in single securities within a clearing portfolio. The liquidity premium depends on

- the relative position size of the underlying instruments compared to their market capacity;



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and

- the current and simulated market risk of the underlying instrument and on its bid/ask spread.

The liquidity risk component of the margin validation and calibration module implements the liquidity uncertainty as a function of the simulated market scenario, which results in increased VaRs for the clearing portfolios.

The VaR calculated by the margin validation and calibration module to which the SECOM margin requirement is adjusted assigns a 25% weighting to stressed observations in the look-back period. In doing so SIX x-clear can avoid pro-cyclical effects in the margin methodology.

Margin model in CLARA, SXC NB

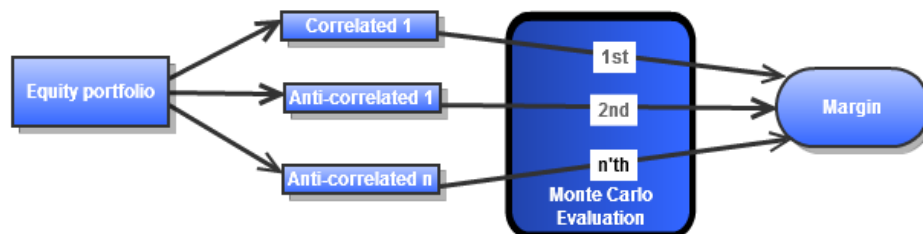


Figure 2: Portfolio margining at SXC NB conceptualised

The margin model calculates VaR on a portfolio level, and the underlying principle for the risk model is to focus on the risk characteristics of the instruments or products cleared. The common risk driver for equity market instruments and security loans cleared are the prices of the underlying instruments. The price behavior of the underlying instruments, which includes price relationships where applicable, is the rationale for applying one common model for all instruments, hence using portfolio techniques for margining. The margin is calculated at a confidence level of 99% using a uniform close-out period of 3 days for all underlying instruments. The total margin is aggregated from the margins calculated on sub-portfolios. One sub-portfolio will contain the positions, which allows for the use of a correlation matrix, while the other sub-portfolios will contain positions only for each of the individual instruments that shall not correlate with other instruments, i.e. so-called “anti-correlated” instruments (Figure 2). The first portfolio hence allows for correlation effects, while the latter portfolios do not. An underlying instrument is defined anti-correlated if it was traded on less than 5 of the last 60 days (or for any other reasons has been classified as anti- correlated). The p-quantile for each sub-portfolio is calculated individually, and subsequently aggregated for an estimate of the p-quantile of the portfolio. As a consequence, the model will assume the most conservative



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A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio’s distribution of future exposure. For a CCP that calculates margin at more- granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

interdependencies between the different correlation groups.

The margin model performs the close-to-real-time calculation of margins (or risk exposures) on members’ clearing portfolios.

4.6.4 Key Consideration 4

A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.

If, at any time, the collateral value of a member falls short of the total margin requirement (including both initial margin and variation margin) SIX x-clear will immediately issue a margin call. According to the Operational Manual, each margin call must be met within 60 minutes after the call is issued to the member. If the cash currency deadlines are reached and the margin call cannot be satisfied on the same day, the margin call has to be fulfilled by no later than 9:00 am CET on the next business day.

Variation margin in SECOM

The variation margin requirement covers market price fluctuations that impact upon open positions per security. The variation margin requirement is marked to market several times daily, normally every 90 minutes, according to the current market price- and FX-rate developments and based on the net position of all outstanding contracts of all members. The level of the variation margin depends solely on the market valuation. Positive and negative values (price gains/losses) are netted out across all securities. Based on these values, negative values are charged additionally while positive values offset initial margin requirements.

Variation margin in CLARA

The margin is calculated as the sum of the initial and variation margin as one process, i.e. the model for calculating the variation margin is incorporated in the general margin model; see Key Consideration 4.6.3. A separate process exists in CLARA to calculate the variation margin for participants that require this information.

Ordinary margin calls are issued every clearing day to each member connecting to CLARA, which shall be settled no later than 11:00 CET. Margins are continuously recalculated during the clearing day. An intraday margin call may be issued if the level of risk for any member becomes unacceptable at any time during the clearing day, or when considered necessary in view of the prevailing market conditions or for any other imperative reasons.



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4.6.5 Key Consideration 5

In calculating margin requirements, a CCP may allow offsets or reductions in required margin across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-margining, they must have appropriate safeguards and harmonised overall risk-management systems.

Margin model in SECOM

Securities eligible for clearing with similar risks (defined by the VaR) are allocated to the same asset- class-specific buckets and, for this purpose, the respective differentiated initial margin is calculated on the basis of the positions that have been netted per bucket. Opposing open positions within the same risk bucket (i.e. a net long position in one ISIN and a net short position in another ISIN of the same asset class) have the effect of reducing the market risk posed by such open positions. Thus having placed the position values of a member into the risk buckets of the different asset classes, opposing positions within the same risk bucket are partially netted off using an intra-bucket netting coefficient (intra BNC) of currently 0.6. The inter BNC of currently 0.4 is applied to net positions across risk buckets of the same asset class in case of opposing net positions across different risk buckets and has the effect of reducing the initial margin. The inter BNC is applied at the level of margins per bucket. Backtesting results support the chosen level of confidence for the margin model. Moreover, the VaR calculated by the RMS considers the correlations between all products of the clearing portfolios, and the relationship of dependency is indirect as it is mapped on to a defined set of the risk factors. The VaR computation assigns a 25% weighting to observations in periods with stressed market conditions.

Margin model in CLARA

The principles for applying correlations to allow for offsets between equity-market-related instruments in a cleared portfolio relies on their application in the scenario simulation, is described in Key Consideration 4.6.3. Not all instruments correlate as described in Key Consideration 4.6.3, and the correlation effects reside with the underlying risk factors (equity prices). The inherent properties of the different instruments, such as its linear properties are first taken into consideration subsequently for the full valuation process.

For underlying instruments classified as 'correlated', prices resulting from the multivariate simulation process for each scenario are subject to the applicable price model in order to perform a full portfolio valuation. Note that prices simulated for 'anti-correlated' instruments are also subject to the same price models. There are price models specifically for equities and loans, forwards and futures and options.

SIX x-clear has no cross-margining agreement with any other CCP.



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4.6.6 **Key Consideration 6**

A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily back testing – and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.

SIX x-clear performs daily backtests to assess whether the margin model achieves the chosen confidence level. Backtesting for the bond positions is performed independently as assumptions on close-out periods are materially different.

For internal purposes, a statistical analysis based on the Kupiec test for single members is performed on a quarterly basis. The analysis compares the number of breaches per portfolio (or account) with the expected number of breaches in that time interval. Furthermore, SIX x-clear performs two clustering tests. The Christoffersen test measuring if the probability of a breach on any day depends on the outcome of the previous day, and an Autocorrelation test with a specified lag measuring if the probability of a breach on any day depends on the outcomes up to 5 previous days.

For the margin model in CLARA, a sensitivity analysis examining the impact of modifying model parameters on the initial margin is performed on a monthly basis. The report examines margin sensitivity with respect to margin volatility and correlation shifts.

4.6.7 **Key Consideration 7**

A CCP should regularly review and validate its margin system.

The risk management department performs an assessment of margin rates and other risk parameters regularly in order to be aligned with the current risk levels, but also any observed dependency between risk factors in the cleared markets. The regular reassessment of risk parameters is done to ensure that the margin model achieves its intended level of coverage. The process is performed at least monthly for the most traded instruments on the market place; however, all instruments shall be reviewed once per quarter.

SIX x-clear's risk models are validated by independent entities. An independent entity performs a validation of the entire risk model or of a particular model component on a regular basis.

Proposed amendments to the risk models shall be tested and validated before implementation, and material changes to the risk models shall be submitted to the Risk Committee and the BoD of SIX x-clear.



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4.7 Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.

4.7.1 Key Consideration 1

An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.

SIX x-clear manages its liquidity risks according to its liquidity concept, which determines the procedures and tools to identify, measure and manage liquidity risks. The liquidity concept defines relevant liquidity risks, available resources, monitoring tools and escalation procedures in case of liquidity stress phases including the default of the two member groups causing the largest payment obligation for SIX x-clear.

Liquid resources and liquidity demands are measured and monitored daily through SECOM / CLARA and by a liquidity risk module. The monitoring comprises all nostro positions at custodians and cash correspondent banks in all currencies, liquid securities collateral as well as the stressed liquidity demand arising from securities settlements. SIX x-clear also monitors all vostro positions from its members including cash collaterals in all currencies. SIX x-clear applies conservative haircuts on the liquidity positions to account for liquidity outflows in stress scenarios. The resulting liquidity position is monitored daily and measured against a pre-defined risk appetite limit and risk tolerance limit to be able to always have sufficient liquidity available to effect payments when due.

The selection of liquidity stress scenarios is not only based on the regulatory requirements, as stated in Principle 7 PFMI, Art. 52 FMIA and Art. 29 NBO, but also on a risk inventory that aims to provide a systematic and consistent reflection of the external counterparties the default of whom may potentially impose liquidity risks on SIX x-clear.

Liquidity stress test scenarios include the default of the two members or member groups causing the largest payment obligation for SIX x-clear under stressed but plausible market conditions as well as the default of the major liquidity providers in several currencies.

As a CCP SIX x-clear holds the corresponding buy side of every sell and the sell side of every buy it clears. So, in business as usual SIX x-clear's end-of-day liquidity demand is typically close to zero. Substantial liquidity needs can arise in case of poor settlement performance in the market or in case of member defaults. Both will leave SIX x-clear with unsettled delivery versus payments (DVP) trades and corresponding liquidity requirements.



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4.7.2 **Key Consideration 2**

An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.

The conceptual liquidity framework of SIX x-clear is supported by an operational liquidity planning tool at the treasury department and a liquidity risk module governed by the risk management department.

The liquidity planning tool allows SIX x-clear to monitor nostro positions at correspondent banks and settlement agents as well as vostro cash positions of SIX x-clear members. Moreover, the liquidity planning tool allows for a tracking of projected / planned cash flows up to T+4, which enables SIX x-clear to conduct efficient cash management and identify potential liquidity shortfalls at an early stage. The monitoring is not only limited to end-of-day liquidity but is also performed intraday. The Treasury department monitors cash accounts on an ongoing basis, ensuring sufficient settlement liquidity in all markets. The management of cash deadlines and settlement windows is key in this process.

The liquidity risk module used by the risk department performs daily liquidity stress testing to ensure sufficient resources are available to cover extreme but plausible market scenarios. The liquidity module also enables SIX x-clear to assess the value of its available liquid assets, considering appropriate haircuts on those assets.

4.7.3 **Key Consideration 3**

A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

Key Consideration 7.3 is not applicable to SIX x-clear as it is not an Securities Settlement System (SSS).



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4.7.4 Key Consideration 4

A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.

In order to have sufficient liquid resources in all relevant currencies during times of extreme but plausible market stress, such as the default of the two members with the highest payment obligations, SIX x-clear has established liquidity indicators with respective limits capable of identifying and measuring liquidity stress as well as a liquidity waterfall that comprises the following layers:

1. SIX x-clear’s own resources (e.g. own equity in the form of cash, margins, default fund contributions and overnight positions)
2. Liquidity demand reducing measures (e.g. pre-financing trades by settlement agent)
3. Instruments for receiving liquidity (Credit facilities, repos, FX facilities etc.)
4. SIX’s contingent cash position (operational reserve)

A daily liquidity stress test assesses the adequateness of these available liquidity resources in all relevant currencies and across settlement days to settle the securities related payment obligations on time assuming stress scenarios such as the default of the two participants and their affiliates that would generate the largest aggregate payment obligation for SIX x-clear in extreme but plausible market conditions.

The liquidity resources available at SIX x-clear have covered all stress scenarios simulated on clearing portfolios observed so far. Should the liquidity waterfall prove insufficient to cover the stressed liquidity demands in the future, the waterfall would be revised or other risk mitigating measures be taken.



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4.7.5 Key Consideration 5

For the purpose of meeting its minimum liquid resource requirement, an FMI’s qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

The main source of liquidity available to SIX x-clear (liquidity waterfall) is its equity capital, cash collateral, and securities collateral pledged by members under a full title transfer. Most cash and securities collateral is held at the local settlement agent and the CSD, SIX SIS, in exchange for a multi-currency credit line, ensuring ready access to liquidity. Cash which is not held at SIX SIS is placed at highly creditworthy institutions whereas CHF-cash is held at the SNB.

In respect of securities collateral, SIX x-clear only accepts highly liquid securities with low credit and market risk (detailed in the lending norms of SIX x-clear), which are collateral-eligible at SIX SIS, and which would further qualify for a timely swap into liquidity on the repo market and at the central bank.

Some custodians provide SIX x-clear with minor committed credit lines to facilitate settlement in local markets.

In its recovery plan, SIX x-clear outlines further liquidity recovery options to bridge any liquidity gap which might arise in extreme but plausible market conditions.

4.7.6 Key Consideration 6

An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

The liquidity concept of SIX x-clear considers a re-use of securities collateral for margins and the default fund to cover any liquidity need identified by the liquidity stress scenarios.

As mentioned above in Key Consideration 7.5, SIX x-clear applies a conservative collateral regime, allowing members only to pledge highly liquid collateral with low market and credit risk, which also qualifies as SNB repo collateral.

In general, supplemental liquidity resources will only be drawn in very extreme scenarios, i.e. where SIX SIS is no longer able to provide any liquidity against collateral.

The availability of emergency central bank credit is not considered in the liquidity stress test of SIX x-clear.



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4.7.7 **Key Consideration 7**

An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.

SIX x-clear and SIX SIS are managed under the same holding company (SIX Securities Services). In respect of qualifying liquidity, SIX x-clear has two main pre-arranged funding covenants. Under ordinary market conditions, SIX x-clear obtains liquidity through its settlement agent SIX SIS. Thus, SIX SIS serves as the main liquidity provider of SIX x-clear.

In addition, SIX x-clear has direct access to a central bank facility at the SNB. This arrangement allows SIX x-clear to pledge SNB GC collateral with the central bank and receive liquidity in return. This kind of liquidity drawing is only resorted to in extraordinary market situations. Information on available liquidity resources at SIX SIS is readily available. Besides the individual assessment of liquidity demands and resources in the context of liquidity stress testing, liquidity needs and risks of SIX SIS and SIX x-clear are also assessed and monitored at holding level.

4.7.8 **Key Consideration 8**

An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

For reasons of efficiency, SIX x-clear uses its sister company SIX SIS as the main settlement agent for domestic and international settlements, although SIX x-clear has access to an own central bank account with the SNB. Please refer also to Principle 9.

4.7.9 **Key Consideration 9**

An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

SIX x-clear assesses the adequateness of its liquidity resources in all currencies by means of daily liquidity stress testing, assuming the simultaneous default of the two member groups creating the highest liquidity demand under extreme but plausible market conditions. The stressed liquidity demand is calculated based on net RVP-settlements of the defaulting members per security, currency and settlement day. The stress tests are conducted under very



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conservative supplementary assumptions such as a liquidity demand markup of 25%, a DVP inflow markdown of 20%, a haircut on the overnight one-sided settled positions of 50%, an outflow factor of 100% for the defaulting member's excess collateral and an outflow rate of 10% on the non-defaulting members' total collateral.

Early warning indicators as well as limits and subsequent escalation procedures have been put in place. Breaches of early warning indicators are immediately escalated in accordance with procedures to respective decision makers, including a reassessment of the level of liquidity resources. The results of the daily liquidity stress tests are reported on a monthly basis being a part of the regulatory reporting to the SNB and FINMA and a part of the management reporting to decision makers such as the management committee and the risk committee.

A periodical risk inventory aims to provide a systematic and consistent reflection of the stress events that may potentially impose liquidity stress on SIX x-clear. In this context, SIX x-clear has considered some other stress scenarios (than member default scenarios) that might possibly threaten the viability of SIX x-clear in respect of liquidity. However, such other stress scenarios are of minor relevance and do not involve a level of liquidity risk that would justify a daily monitoring and the implementation of corresponding daily liquidity stress tests respectively.

The existing stress testing procedure is assessed daily by the financial risk management department. Breaches of liquidity indicators and limits trigger an immediate reassessment.

4.7.10 Key Consideration 10

An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

SIX x-clear has established internal default procedures outlining the plan of actions in a default event as well as the respective responsibilities. This also includes the establishment of contact with the national regulators.

The default procedures address any unforeseen liquidity shortfall aiming to avoid an unwinding, revoking, or delaying of payment obligations. The default procedures are regularly tested and assessed via test cases. Further information can be found in the answers to Principle 13.

In the event of uncovered liquidity shortfalls the recovery plan of SIX x-clear sets forth the procedures and measures to address such shortfalls and for replenishing the liquidity resources (e.g. make use of instruments for receiving additional liquidity etc.).

The established rules and procedures enable SIX x-clear to fulfil its payment obligations at all times when they are due, even in times of market stress scenarios, so that it can continue to operate in a safe and sound manner.



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4.8 Principle 8: Settlement finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

4.8.1 Key Consideration 1

An FMI's rules and procedures should clearly define the point at which settlement is final.

Rules regarding settlement finality are regulated by SIX x-clear in compliance with the rules and principles of the Settlement Finality Directive 2009/44/EC and 98/26/EC (SFD). They have also been incorporated into the statutory law of Switzerland. For contracts under Swiss law, settlement finality is based on the statutory provisions of art.62 par. 4 and 5 FMIA and art. 20 Federal Intermediated Securities Act (FISA). Art. 20 FISA correlates with art. 6 SFD. These provisions are considered equivalent to the rules of the SFD 98/26/EC and 09/44/EC. SIX x-clear's contractual arrangements under Swiss law refer to these provisions when defining the point in time of formation of rights and obligations of SIX x-clear and the member (chapter 31 Rulebook), unless the respective contract is void or cancelled pursuant to SIX x-clear's Rulebook.

For contractual arrangements under English law and German law the Settlement Finality Provisions are set forth in chapters 16 of the respective Rulebooks.

Accordingly, the instructions (orders) given by a member to a central counterparty, central depository, or payment system shall be legally enforceable and shall be binding on any third parties even in the event of winding-up or bankruptcy proceedings. If an insolvency measure has been imposed by the competent authority (FINMA) against the instructing member, orders to a clearing and settlement system shall be excluded (“carved-out”) and deemed binding and irrevocable (i.e. “final”) if they:

- a. were introduced before the measure was ordered and were unalterable in accordance with the rules of the financial market infrastructure; or
- b. were executed on the working day defined by the rules of the financial market infrastructure during which the measure was ordered and the financial market infrastructure proves that it was not and should not have been aware of the measure being ordered.

For contracts under English law, the provisions of the Rulebook were established based on Regulations 4 (1), 7 (4) and 8 (1) of the SFR 1999. The Bank of England has reviewed and endorsed the rules by declaring the SIX x-clear system as a “designated system” in the sense of the UK SFR.

As far as SIX x-clear uses SIX SIS as its settlement agent, settlements are executed in accordance with art. 34c of the General Terms and Conditions (GTC) of SIX SIS. The transfer of securities positions following an instruction is completed when a custody account has been credited accordingly. The transfer is final with the credit. As a selling party, SIX x-clear loses its rights in the intermediated security which was disposed (Art. 34c lit. a GTC SIX SIS). With regards to instructions concerning securities kept in final custody outside of Switzerland, revocability depends on the relevant market. If and as long as SIX SIS can revoke vis-à-vis a sub-custodian, SIX x-clear members can instruct a revocation (see Art. 34b lit. c GTC SIX SIS).

As regards money instructions, finality and revocability are governed by Art. 38 lit. e and f GTC SIX SIS. Payment instructions issued by SIX x-clear become irrevocable as soon as the payment amount has been debited to the instructing member's account. When the payment amount is



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An FMI’s rules and procedures should clearly define the point at which settlement is final.

then credited to the account of the payee participating in SIX SIS, the payment becomes final.

The finality of orders and transfers of funds and financial instruments is applied and ensured by the CSDs, which are involved by the settlement agents of SIX x-clear, i.e. SIX SIS (for all trades cleared by the main office) and VPS ASA (for trades cleared by the Norwegian branch). The settlement and finality rules of these CSDs are always based on the laws in their respective markets. No differentiation is made in relation to the incorporation of a member (Switzerland, EU, or Norway).

4.8.2 Key Consideration 2

An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.

SIX x-clear as a CCP adopts market rules in determining the intended settlement date (ISD) or intended value date (IVD). SIX x-clear extends real-time reporting to members to enable them to route the settlement instructions to the respective settlement location on trade date or trade date +1 in cases where SIX x-clear is not itself routing settlement instructions on behalf of members to the respective settlement location. SIX x-clear operational teams monitor the transactions on a daily basis to ensure timely matching and settlement.

On the ISD/IVD, the designated CSD, at the place of settlement, extends settlement services either by real-time settlement or by using a batch-cycle settlement approach. SIX x-clear receives instructions in real time or in batch mode based on the infrastructure available at that CSD. On the ISD, SIX x-clear’s operations team monitors the settlements and, in case of delays, contacts SIX x-clear’s counterparty to ensure the occurrence of settlements to the greatest possible extent. Failed settlements will be retried at the CSD level. Upon final settlement, SIX x-clear registers the settlement and the risk against the member/Co-CCP as closed.

To enable the best possible settlement rates, SIX x-clear participates in the failed-driven securities lending and borrowing services at the designated CSD (as available) and is thus able to fulfil its DVP obligations. Correspondingly, members are charged fines when they do not honor their settlement obligations. In case of an ongoing failure by a member to fulfil its settlement obligations, SIX x-clear initiates a buy-in process pursuant to the rules defined in its “Late settlement and buy-in rules” as set forth in the Rulebook and Operational Manual.

4.8.3 Key Consideration 3

An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

As a matter of principle, members are not entitled to revoke instructions unilaterally once entered into the clearing system (SECOM or CLARA; as of 2/2022: New Clearing Platform “NCP”). However, under specific circumstances (specified in chapter 10 Rulebook) and as set forth in its chapter 16 the Rulebook defines the revocability of securities transfer orders for SIX x-clear as a CCP more extensively; in particular clause 16.5.1 states:

- Securities transfer orders may be revoked during the period prior to the end of the business day following the trade date of the transaction by way of the contracts being void according to the Rulebook or the Inter-CCP Contract becoming automatically void or rendered void ab initio under any similar ground under the applicable Link Agreement. Thereafter a securities



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An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

transfer order shall be irrevocable and may not be revoked by either SIX x-clear or a member or a Co-CCP.

Payment transfer orders may be withdrawn until the payment bank debits the account of the member or Co-CCP.

4.9 Principle 9: Money settlements

An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risks arising from the use of commercial bank money.

4.9.1 Key Consideration 1

An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.

SIX x-clear performs settlement using central bank money in Switzerland and Norway. For the Swiss market, settlement is performed using SIX SIS as the settlement agent using central bank money. In Norway, SIX x-clear uses a settlement account at the Central Bank of Norway.

For other currencies, SIX x-clear does not have access to central bank money. Settlements in all other markets are performed by SIX SIS as the settlement agent, with the exception of the Czech Republic, Denmark, Finland, Hungary, Italy, Spain, Sweden and the UK, where SIX x-clear uses BNP Paribas, Citibank Europe, Euroclear Finland and Euroclear Sweden, respectively, as settlement agents.

4.9.2 Key Consideration 2

If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.

SIX x-clear has appointed SIX SIS as the settlement agent and relies on the strict selection criteria of SIX SIS for its choice of local correspondent banks in the markets where SIX x-clear settles. The same criteria apply to the custodians directly appointed by SIX x-clear for Italy and Finland. SIX SIS performs regular reviews of its network of correspondent banks and custodians.

SIX x-clear conducts its money settlements mainly through SIX SIS. For international settlements SIX SIS uses Euro SIC, TARGET2 and commercial bank money held with CSDs and custodians which are themselves regulated and are subject to strict selection criteria as well as regular checks of creditworthiness conducted by SIX SIS.

For the selection criteria in respect of sub-custodians, see Key Consideration 5.5.

In addition, there are operational and qualitative selection criteria such as the range and quality of services of the custodian, technical standards, or fees. For further information, refer to the replies to Principle 16 of the Disclosure of SIX SIS Ltd's compliance with CPMI-IOSCO principles for FMIs.



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4.9.3 Key Consideration 3

If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.

SIX x-clear has outsourced the main parts of its custody and asset management activities to other legal entities belonging to SIX. The responsibilities and relationships are managed through separate SLAs.

Liquidity is managed in accordance with Principle 7 and relies on SIX SIS and the treasury of SIX Securities Services to ensure SIX x-clear is not exposed to any potential loss or liquidity pressure should any settlement bank default.

SIX x-clear uses SIX SIS with its custodian network as its main settlement agent. Risks arising from the use of settlement banks is limited through a strict selection and review process. Before selecting a custodian, an initial credit review is performed by Risk Operations SIX SIS, the results of which are reviewed by the Risk Management in the second line of defense. The custodians are subject to ongoing or at least annual credit verification procedures.

As a CCP, SIX x-clear assumes the risk on the buy/sell side and is liable towards the respective members for the fulfilment of obligations arising from (exchange) trades. SIX x-clear guarantees the fulfilment of these obligations.

4.9.4 Key Consideration 4

If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.

The majority of SIX x-clear's settlement obligations are settled via SIX SIS. The latter provides SIX x-clear with credit facilities (credit lines) for settlement purposes. In addition credit lines are available with other cash providers to ensure smooth settlement operations.

4.9.5 Key Consideration 5

An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.

The legal agreements established by SIX x-clear with its settlement banks and the laws of the European jurisdictions in which they are domiciled support the finality of payment transfers (in line with Directive 98/26/EC as amended by Directive 2009/44/EC).

Payment transfer orders become irrevocable at the moment that the payment bank debits the account of the member or co-CCP, or debits the account of SIX x-clear (or SIX SIS on SIX x-clear's behalf). Thereafter, neither SIX x-clear, nor a member, nor a co-CCP, nor a payment bank shall be able to revoke that payment transfer order.

Provisions about the timing of money settlements are primarily governed by local market



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An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.

practice and the rules of the payment system in the respective jurisdictions. Within the opening times of the various national payment systems, the money transfers of SIX x-clear (and SIX SIS, respectively) can basically be conducted at any time, which means that – except for the effect of time zone differences – money transfers can always be conducted intraday.

4.10 Principle 10: Physical deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

Principle 10 does not apply to SIX x-clear because its service offering comprises clearing of dematerialised instruments only.

4.11 Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

Principle 11 does not apply to SIX x-clear because it is not a CSD.

4.12 Principle 12: Exchange-of-value settlement systems

If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

4.12.1 Key Consideration 1

An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.

The settlement of equity market instrument transactions involves a cash component and a securities component. The operator of a financial market infrastructure for the settlement of mutual obligations allows its participants to avoid their fulfilment risks by ensuring that the settlement of an obligation occurs only if the settlement of other obligations is ensured.

Through an open offer or novation, SIX x-clear interposes itself into the purchase and into the sale transaction of the contracting parties as a new counterparty and essentially assumes the rights and obligations of the buyer or the seller.

SIX x-clear does not operate an exchange-of-value settlement system but manages the instruction flow towards CSDs and ICSDs to achieve settlement at the intended day. In Switzerland, the cash versus securities settlement is assured by the joint use of the SECOM



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An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.

system by the Swiss CSD (SIX SIS) and SIX x-clear. In the Nordic markets, SIX x-clear settles directly via the local CSDs in each of the Nordic countries, and for other markets it relies on SIX SIS as a general settlement agent or account operator. The chosen final settlement locations provide elimination of principal risk by delivery-versus-payment / receipt-versus-payment settlement mechanism.

4.13 Principle 13: Participant default rules and procedures

An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

4.13.1 Key Consideration 1

An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

SIX x-clear’s default management procedures are established in accordance with the Swiss legislation on Financial Market Infrastructures and are fully compliant with international standards (CPMI-IOSCO).

SIX x-clear guarantees the fulfilment of cleared transactions in every market for which clearing services are provided. To ensure a proper risk management framework, SIX x-clear has a default waterfall in place. To cover potential losses arising from the positions of member(s), defense lines start on the individual layer with the initial and variation margin and default fund contribution of the defaulting member, which follows the “defaulter pays principle”, see also Key Consideration 4.4.

SIX x-clear’s default rules and procedures define certain events of default which are the trigger points to either mandatorily or discretionarily set a member in default due to assessment of its financial and operational ability for clearing.

SIX x-clear’s internal directives and written arrangements as listed below describe the default rules and procedures in detail:

- Rulebook, chapters 3, 4, 19, 20 and 21
- Operational Manual, chapter 10, 11, 12, 13 and 14

The default procedures of SIX x-clear in general encompass the following events and procedural steps:

1. Occurrence of a default event
2. Authorization of the suspension of the open offer / novation
3. Execution of the suspension in SECOM / CLARA
4. Default declaration / information for third parties
5. Close-out of the open positions of the defaulting member and realization of the defense lines
6. Final report

The Management Board of SIX x-clear has responsibility for the overall process. A designated



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An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

Default Management Committee consisting of the CEO SIX x-clear Head SIX Risk Management and CRO SIX x-clear steers the default procedure. Additional representatives can be invited to join the Default Management Committee where special input or knowledge is needed.

Occurrence and Authorization

Depending on whether the Default is initiated as a mandatory or as a discretionary act, the member is deemed in default automatically from the occurrence of such an event or as of the Default declaration by the competent Default Management Committee of SIX x-clear. The Default enters into effect at the time the Default Notice is sent to the address of Contact for Clearing Services.

Suspension

In order to suspend the open offer or novation process, the clearing accounts of the defaulting member are deactivated in SECOM / CLARA by the authorization of the Head of Clearing or the Head Risk Management. As a result, no more trades are accepted for clearing and all further clearing transactions of the defaulting member to be routed to SIX x-clear are rejected.

Information

Relevant third parties, in particular, the competent regulatory authorities, the exchange(s) involved, the Co-CCPs as well as EACH and the approved settlement system will be informed about the issuing of a Default Notice. The management of SIX x-clear is in charge of such notifications.

Close-out procedure

After the suspension of the open offer or novation process, the open positions of the defaulting member are closed out via a buy-in/sell-out, if necessary. For that purpose, SIX x-clear has made arrangements with brokers, who would act as an agent of SIX x-clear. A potential net loss is covered by the defense lines, i.e. the proceeds of selling the contents of the collateral accounts and, if necessary, the (liquidated) default fund contribution of the defaulting member, SIX x-clear’s own resources and the solidarity part of the default fund. The management of SIX x-clear is responsible for monitoring this process. The CEO SIX x-clear and the SIX Executive Board are kept informed about the actual state of affairs.

SIX x-clear’s contractual framework defines clearly how financial resources provided by a member can be used in case of a member’s default.

For Swiss and UK-based trading venues, SIX x-clear uses SIX SIS as its collateral location for cash equities and fixed income clearing by placing collateral in the form of cash or securities. SIX x-clear (through SIX SIS) supports segregated and non-segregated cash or securities collateral accounts for each collateral type (margin, default fund and inter-CCP fund).

In the case of the Norwegian-based trading venue Oslo Børs, members of SIX x-clear can provide cash as collateral by posting cash to a designated cash account with a cash collateral bank in the name of SIX x-clear by way of transfer of title or by pledging securities to SIX x-clear with an appointed CSD/ICSD.

SIX SIS is also used as the main liquidity provider for SIX x-clear in case of a member default. SIX x-clear has established a liquidity plan to receive the required liquidity in the requested time to fulfil all its obligations in due time.



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4.13.2 Key Consideration 2

An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

See Key Consideration 13.1.

In the event of a default of a General Clearing Member of SIX x-clear (GCM), the same process as described above applies. However, SIX x-clear shall simultaneously initiate the process of porting the segregated Non-Clearing Member (NCM) accounts to the back-up GCMs (see Principle 14).

SIX x-clear performs a yearly test of the default procedures by testing the decision-making processes, the internal default procedure steps (particularly also the internal and external communication protocols) as well as the performance of external broker banks.

The default procedures are reviewed annually.

4.13.3 Key Consideration 3

An FMI should publicly disclose key aspects of its default rules and procedures.

SIX x-clear has disclosed the key aspects of its default rules and procedures with regards to processes, timing, responsibilities and information / communication in the Rulebook and the Operational Manual on its website.

4.13.4 Key Consideration 4

An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

SIX x-clear performs regular testing of its default procedures. The tests are performed in accordance with the default procedures (see Key Consideration 13.1) based on hypothetical default scenarios.

4.14 Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

4.14.1 Key Consideration 1

A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.

SIX x-clear is subject to the Swiss rules and requirements with respect to its account segregation and asset protection offerings. This regime ensures full compliance with CPMI-IOSCO. Swiss



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A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.

legislation is also considered materially equivalent to the regulations of the European Union (EMIR). Given the importance of its international clientele and within the Swiss regime, SIX x-clear has therefore also consistently aligned its offerings with the European standards.

According to Swiss and international legislation, SIX x-clear must ensure that every NCM is given the choice to hold its positions and collateral with the CCP either in individual account segregation or in omnibus account segregation, unless such segregation from the GCM's positions and assets is already undertaken in the GCM's account structure (see art. 54 FMIA). A GCM is therefore required to inform each of its current and potential NCMs about the different options for account segregation and prearranged solutions in case of default (and termination) of the GCM.

In case of a GCM default, SIX x-clear will carry out the prearranged solution selected by the GCM and/or the NCM within 48 hours of the declaration of default if the requirements as described in clause 20 of the Rulebook and clause 12 of the Operational Manual are met. In the process, SIX x-clear will strictly act according to the applicable laws and the instructions received from the respective GCM, the NCM, and the back-up GCM (if any).

SIX x-clear provides its account segregation and its prearranged solution offerings (i.e. portability, establishment of a self-standing membership and close-out) irrespective of the legal arrangements between the GCM and the NCM. SIX x-clear requires that the GCM/NCM agreement shall contain the elements and regulations as per Annex 2 Rulebook.

In particular, it is the GCM's and its NCMs' concern how they ascertain the provision of collateral of the NCM to the GCM – as a transfer of title (ownership) or as a security interest (pledge) arrangement. Under an omnibus or mini omnibus client account segregation, SIX x-clear will not bear any responsibility for an NCM's rights and remedies to individually exclude or reclaim its interest in positions transacted by it and its collateral given to the GCM from the estate of a defaulting GCM. Under an individual client account segregation, protection of the NCM's rights will be individually ensured by SIX x-clear within the prearranged solution chosen.

SIX x-clear offers the three options with regards to segregation and portability to ensure consistent processing of cleared transactions. These options are further described in the Operational Manual.

Soundness and enforceability

Portability to a back-up GCM and the close-out procedure (as provided by SIX x-clear) of NCMs' positions and collateral were examined and deemed sound and enforceable by legal opinions from reputable local law firms in the case of default of GCMs domiciled in England, Germany, France and the Netherlands. Further countries might be evaluated in cooperation with the potential SIX x-clear member.

In Switzerland, the legal basis for portability is provided for in art. 90 of FMIA.

For the Nordic markets, SIX x-clear offers full segregation of accounts, in compliance with EMIR.



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4.14.2 Key Consideration 2

A CCP should employ an account structure that enables it readily to identify positions of a participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.

As required by article 54 and 55 FMIA, SIX x-clear provides transparency to its members and their clients on its rules and procedures to separately keep, record and transfer the collateral and positions of direct and indirect participants. These disclosure requirements correspond to the respective obligations in European law according to article 39(7) EMIR.

SIX x-clear's account segregation options are contractually regulated by chapter 20 of the Rulebook and in the Operational Manual. The following common features apply to all account segregation options:

- Segregation of a member's positions and collateral is always ensured against positions and collateral of the CCP itself and those of other members. The differentiation therefore relates to the separation of accounts of the GCM versus the accounts held by the GCM on behalf of NCMs and accounts held by the GCM on behalf of other NCMs.
- SIX x-clear does not offer any safeguards for an NCM's contribution to the GCM related to the pledges of its GCM to the default fund or any other security. Only an NCM's margin contributions can be segregated and protected.
- It is the responsibility (and right) of the GCM to decide whether it only offers omnibus solutions or whether it also offers individual client account segregation for NCMs. If an individual solution is offered, the NCM's choice shall be respected.

The options differ in their levels of protection in case of default and/or termination of membership of the GCM as they entail different approaches in insolvency proceedings. Consequently, the availability of prearranged solutions is also limited under the omnibus segregation structures compared to the individual segregation.

Individualization means that positions and collateral can be properly allocated to the account holder and/or to the account's beneficial owner, and then treated separately according to its instructions.

SIX x-clear takes into consideration the specific constellations and requirements of its members, especially its GCMs with their NCMs, and offers them the segregation options described below for their clearing accounts (positions) and their collateral accounts.

SIX x-clear offers the three options with regards to segregation and portability to ensure consistent processing of cleared transactions. These options are further described in the Rules and Regulations SIX x-clear (Termination and Suspension Procedures for Members, SIX x-clear Clients and Co-CCPs).

4.14.3 Key Consideration 3

A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.

The purpose of portability is to transfer positions (in the Rulebook referred to as “outstanding contracts”) and collateral (margins) related to an NCM to a back-up GCM. This not only ensures that the economic interest in the positions related to the NCMs is protected but also that they remain in the clearing process and continue to be processed via the back-up GCM. This also



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A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.

minimizes any delays in the trading and clearing business to the greatest degree possible.

The causes for portability not only include events of insolvency, but also any reason that leads to a default pursuant to the contractual agreements between the GCM and SIX x-clear in accordance with the Rulebook – in particular the loss of licenses, disciplinary proceedings, significant payment difficulties etc. Porting is contractually regulated in the Rulebook and the Operational Manual.

In the case of execution of a portability process, a confirmation from the back-up GCM concerning its unconditional agreement to the porting must be on hand. This confirmation must be issued within 8 business hours of the back-up GCM being informed by SIX x-clear of the occurrence of the default of the SIX x-clear GCM and the amount of the outstanding claims and liabilities as well as the margins that must be transferred in the form of permissible collateral.

Alternative prearranged solutions

If portability is not possible, SIX x-clear is obliged, in the event of default of a GCM, to also offer alternative measures for the protection of positions and collateral related to the NCMs. The following solutions are available as alternative processes with a comparable level of protection:

Self-standing membership (only for individual client segregation)

An NCM can apply for its own membership and – provided that SIX x-clear's admission requirements are met – receive the full status of an Individual Clearing Member (ICM), even if it intends to continue carrying out some or all of its clearing activities via its GCM. In the case of default of the GCM, the positions and collateral related to such an NCM will be transferred as quickly as possible to its own account structure at SIX x-clear, and such an NCM will henceforth act as an ICM.

Close-out

Close-out is contractually regulated in the Rulebook and the Operational Manual.

If – due to a selection not being made or for legal, technical or any other reasons – neither porting nor a transfer to its own account structures can be carried out, or cannot be implemented in time, the positions and collateral referable to NCMs will be subject to the close-out procedure of the defaulting GCM. The proceeding is similar to the procedure defined in the Rulebook, except under ICS where a positive close-out settlement amount and any unrealized collateral resulting from the NCM's clearing and collateral accounts will not be credited to the defaulting GCM, but directly to the NCM. If the close-out settlement amount is negative, the negative amount is netted against the realized value of the collateral which was provided by the GCM and relates to the NCM, and if the collateral is not sufficient to offset the negative close-out settlement amount, the remaining value will be invoiced to the defaulting GCM's estate.

4.14.4 **Key Consideration 4**

A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.



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As mentioned in Key Consideration 4.14.3 various information related to segregation and portability is an essential part of the Rulebook and the Operational Manual:

- SIX x-clear’s account segregation options and models are contractually regulated by chapter 20 of the Rulebook and in the Operational Manual
- Porting is contractually regulated in chapters 5 and 28 and Annex 2 of the Rulebook and in the Operational Manual
- Close-out is contractually regulated in clause 27.5 and 29.3 Rulebook and in the Operational Manual.

4.15 Principle 15: General business risk

An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

4.15.1 Key Consideration 1

An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

The BoD of SIX x-clear is responsible for the entity’s risk management, with due consideration of the SIX Board of Director’s risk management framework and principles. The Risk Advisory Committee of the BoD of SIX x-clear, as well as the Risk Committee of SIX help oversee the entity’s risk management. It is further supported by corporate functions, such as Legal, Compliance as well as Finance & Services. The risk control measures are independently assured by the SIX Risk Management department. Risk Management and Financial Controlling are further overseen by internal and external auditors. SIX x-clear’s general business risks – especially legal, strategic, operational, and project-related risks – are identified in relevant risk inventories. They are measured, controlled and monitored by the Risk Management as well as the Legal and Compliance department. SIX x-clear has arranged SLAs with these corporate functions to ensure that its risks are monitored by specialists (see art. 21a (2) in conjunction with art. 27 (1) NBO.

The scope of SIX x-clear’s risk policy is established by its BoD, as advised by the Risk Advisory Committee of SIX x-clear, and in line with the risk policy of SIX. Herein the principles, taxonomy and tolerance levels and risk model framework are set out. The risk policy defines the organization, structures, competencies, and responsibilities and provides the basis for dealing with different kinds of risk. It outlines the readiness to assume risk. The risk policy constitutes the central framework for regulations and directives of the individual companies and for the risk categories.



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4.15.2 Key Consideration 2

An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

Swiss regulation requires SIX x-clear to hold sufficient equity and liquid net assets to cover losses from business risks (see art. 51 FMIA).

Any collateral assigned in accordance with a member default according to art. 28 and 29 of the NBO with regard to credit and liquidity risk cannot be used to cover additional general business risks. Such a ruling also applies to associated own funds of 25% of the SIX x-clear required capital in accordance with NBO art. 28b para. c, which are used as a part of the default waterfall for loss coverage in case of a member default (skin-in-the-game). Other financial means have to be used to cover general business risks.

SIX x-clear therefore operates with a substantial amount of additional capital resources, above the minimum threshold of 110%.

The FMIA specifies in art. 51 in conjunction with art. 48 83) FMIO the terms of minimum specification requirements regarding capital and net liquidity to cover losses from general business risks and thus provides a capital adequacy as well as a liquidity requirement to ensure both the solvency of the operator as well as the financing of its ongoing operating expenses. As per regulations and for financing an orderly resolution or recovery SIX x-clear's own funds and net liquidity are to be sufficient to cover the ongoing operating expenses for six months (see art. 48 (3) FMIO).

4.15.3 Key Consideration 3

An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.

SIX x-clear has established a recovery plan, the objective of which is to ensure the survival of SIX x-clear and the ability to continue to provide its critical processes and services. Recovery options were evaluated in terms of feasibility and the financial, regulatory, operational and external impact in order to identify potential barriers that could prevent SIX x-clear from successfully implementing the respective recovery option in a crisis situation. SIX x-clear identified a number of options which are deemed feasible in respect of timing of implementation and the impact they pose. The options include strengthening the capital base as well as options to improve the liquidity position of SIX x-clear. SIX x-clear holds liquid net assets funded by equity equal to more than six months of current operating expenses.

The recovery plan has been shared and submitted by SIX x-clear's supervisory authorities.



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4.15.4 Key Consideration 4

Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.

SIX x-clear’s capital is invested as per its investment policy and therefore restricted to central bank money, cash at highly rated counterparties, secured reverse repos or investments in highly liquid securities which are repo-eligible.

4.15.5 Key Consideration 5

An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the BoD and updated regularly.

Please refer to the replies under Key Considerations 3.4 and 15.3. SIX x-clear is a subsidiary of SIX Securities Services, which in turn is a subsidiary of SIX. In order to strengthen the capital of SIX x-clear, the BAU capital was increased by CHF 8 million and an increase in recovery capital of CHF 50 million was conducted in 2021.

The ring-fenced recovery capital of CHF 50 million at SIX x-clear level mainly serves to cover the capital requirements resulting from the stress scenarios described in SIX x-clear’s recovery plan. In addition CHF 50 Mio. recovery capital at SIX Securities Services level will remain temporarily in place to cover the capital needs until all recovery measures presented in the recovery plan have been put in place.

4.16 Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants’ assets and minimize the risk of loss on and delay in access to these assets. An FMI’s investments should be in instruments with minimal credit, market, and liquidity risks.

4.16.1 Key Consideration 1

An FMI should hold its own and its participants’ assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

SIX has governance documents in place to describe the selection procedure, under which a provider is selected for all or some services in connection with securities settlement and/or cash transactions, custody and asset servicing, and to ensure its uniform application in line with objective quality standards and benchmarks in all cases. The selection procedure is executed in stages pursuant to internal guidelines.

SIX x-clear holds members’ assets only with regulated and supervised entities that have to fulfil minimum criteria (e.g. minimum long-term rating of A-, domiciled in OECD country). In case of Swiss clearing, the members’ and SIX x-clear’s own assets are held with SIX SIS. SIX SIS is the operator of the systemically important real-time custody and settlement systems (SECOM) in Switzerland of which SIX x-clear’s clearing system is a part. SECOM is a systemically relevant IT system which is subject to dedicated IT audits performed by the SNB and by external auditors. For the markets served by the Norwegian branch (SIX x-clear NB), SIX x-clear has placed its members’ assets with Nordic commercial banks and VPS, the Norwegian CSD. The members’ collateral for the inter-CCP links is placed at CBL. SIX SIS, VPS, and CBL are known as



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An FMI should hold its own and its participants’ assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

conservative financial market service providers and fulfill high quality, business and regulatory standards.

SIX x-clear NB’s collateral is maintained as regularly pledged securities in deposits held at in Norway (VPS) and Clearstream Banking Luxembourg (CBL) and as cash positions deposited with commercial banks.

4.16.2 Key Consideration 2

An FMI should have prompt access to its assets and the assets provided by participants, when required.

SIX x-clear ensures that it has prompt access to its assets and the assets provided by members through only maintaining securities and account arrangements with high quality banks and custodians. Most of the assets are held with its sister company SIX SIS and the Swiss National Bank located in Switzerland.

SIX x-clear has established a sound legal basis to support portability (to a back-up GCM) of the members positions and collateral as well as to execute a close-out procedure for members and indirect members. For further clarity of access and management, a segregated account structure is introduced where the house account of a GCM is clearly separated from the accounts of its NCMs. The respective legal arrangements of SIX x-clear have been examined and deemed sound and enforceable (as to account segregation and porting under EU and national insolvency procedures) by reputable local law firms in respect of a default of GCMs and ICMs domiciled in the following jurisdictions:

- Switzerland
- Norway
- England
- Germany
- France
- Netherlands

4.16.3 Key Consideration 3

An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

Please refer to Key Consideration 16.1.

4.16.4 Key Consideration 4

An FMI’s investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

SIX x-clear has a conservative investment policy in accordance with the overall risk policy of SIX. Its investment policy defines the parameters for managing and investing its own funds, which includes capital provided by both SIX x-clear and its members. It designates the types of



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An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

investments SIX x-clear is allowed to make and the relevant regulation to be observed. SIX x-clear only holds cash or invests in highly liquid financial instruments with minimal market, credit and liquidity risk.

Cash deposits are mainly held at SNB or SIX SIS and with some highly rated commercial banks in the Nordic region for the clearing activities of the Norwegian branch. As a principle, own funds in cash of SIX x-clear and the cash placements of participants at SIX SIS are invested in a conservative manner in overnight repos whenever possible.

4.17 Principle 17: Operational risk

An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.

4.17.1 Key Consideration 1

An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

The operational risks at SIX x-clear are identified according to the Basel Framework definition and structured accordingly. There are no single points of failure identified. Any potential single point of failure would be eliminated through mitigating actions.

SIX x-clear has adopted a conservative approach to operational risk management outlined in an operational risk framework with clearly specified principles, roles and responsibilities. The operational risk framework defines the operational risk management at SIX x-clear according to the SIX Risk Policy. This includes the risk appetite and risk limits on Group level that are approved by the ExB and the SIX BoD.

The operational risk framework considers international standards, such as

- CPMI-IOSCO – Principles for financial market infrastructures
- Basel Committee of Banking Supervision – Principles for the Sound Management of Operational Risk
- ECB/CESR – Recommendations for securities settlement systems and recommendations for central counterparties in the European Union.

Potential risks posing a threat to SIX x-clear are periodically identified and (re-)evaluated in a systematic process, or may be triggered through an event (e.g., significant changes, incidents, audit results or information obtained from supervisory authorities). Risk identification is proactively performed along the processes within the responsible organizational unit and considers internal and external incidents, fraudulent or unlawful activities as well as violations of regulations. Particular attention is paid to risks with a potentially severe impact ('Material Risks').

In a systematic review, risks are identified in line with the business processes within the



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responsible organizational unit. Processes and controls are constantly reviewed for potential weaknesses or deficiencies that might pose a possible risk on SIX x-clear. The results of the identification and review process are documented in the Risk Inventory.

The Internal Control System (ICS) of SIX x-clear documents all business-relevant processes, risks, systems and controls and ensures the adequacy and effectiveness of controls via at least yearly ICS Control Assessments. It is reviewed and periodically updated in a systematic process or is improved from experiences of a specific event (e.g. significant changes, new products, risk incidents or audit results). Please also refer Key Consideration 2.6 for further details regarding the ICS.

The monitoring and supervision of operational risk management is performed through reporting along the following instruments that address the need for a proactive management:

- Risk inventory
- Operational Risk incident database
- Key risk indicators
- Internal Control System (ICS)
- Business Continuity Management (BCM)

4.17.2 Key Consideration 2

An FMI's BoD should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

The BoD exercises oversight through at least yearly reviews and approvals of the operational risk framework to ensure the safety and solidity of the legal entities. This includes the definition of risk appetite and tolerance, the principles of operational risk management, functions and responsibilities and key processes. The BoD oversees senior management to ensure that the policies, processes and systems are implemented effectively at all decision levels.

The operational risk framework is regularly reviewed and adjusted in a timely manner in case of significant changes of the risk situation or in case of changes of markets, economic environment, new products, new activities or new systems. The operational risk framework as well as all respective policies and procedures are reassessed, updated and tested also on a regular basis (at least yearly).

Therefore, the operational risk framework is subject to the following periodical events:

- Internal and external audit reviews
- Assessments of all operational risks
- Assessments of the ICS
- Reviews of the adequacy and effectiveness of internal controls
- Assessments of the operational risk status
- External reviews in accordance with the SNB



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4.17.3 Key Consideration 3

An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

The core systems of SIX x-clear are fully automated. Their guaranteed recovery times in case of a site disaster according to the Business Impact Analysis of SIX are less than two hours. SIX operates redundant processing systems to guarantee high availability of services in the case of disaster. In this context, SIX also operates a warm (ready-to-use) contingency site. The full workload capacity is covered at both sites.

The different services offered by SIX x-clear are classified in terms of business criticality (documented in the SLAs). This classification serves as the basis for respective reaction and recovery times. The SLAs contain target values specifying the agreed level of availability of a service at a particular time. If a malfunction occurs in a system or infrastructure relevant to production, the response time starts as soon as the malfunction is detected.

All critical locations and business functions have been identified and contingency arrangements are in place. SIX x-clear ensures that its services operate in accordance with their availability objectives. For services with very high availability requirements, the necessary organizational and technical prerequisites are put in place according to the Business Continuity Strategy of SIX to ensure their availability even in emergency and crisis situations.

4.17.4 Key Consideration 4

An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

The Corporate Function IT (CIT) at SIX guarantees a certain level of capacity to the business units. For projects, capacity requirements are discussed and defined between the business unit and the IT department. If the capacity utilization is close to the limit, additional capacity is discussed and agreed between the business unit and the IT department in regularly scheduled service meetings.

4.17.5 Key Consideration 5

An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

SIX has established a Physical Security Policy, which covers the protection of persons, access, assets and buildings/production. Compliance with the protection of business secrets and personal data is laid down and verified in cooperation with the Group Compliance Officer.

The protection of SIX staff and customers on SIX premises is guaranteed. In the event of an incident swift assistance is assured.

At SIX, standardized, re-usable security processes, methods, architecture and solutions are implemented, i.e. the ISO/IEC 27000 family of standards: "Information technology – Security techniques", and in particular standards 27001, "Information security management systems – requirements" and 27002, "Code of practice for information security management" are of key importance.



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An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

The Information Security regulation and its annexes as established by SIX cover all relevant areas of information security such as:

- Risk management
- Use of IT services, end-user guidelines etc.
- Data classification
- Authorization and authentication
- Security for the development and operations of IT systems.

4.17.6 Key Consideration 6

An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

SIX operates a Business Continuity Management (BCM) program, which makes a significant contribution to the stability, reliability and availability of SIX x-clear’s services. BCM is designed for extreme events, such as natural disasters (e.g. earthquake, flooding), technology-related disasters (e.g. black out, explosion, systems malfunction) or man-made, society-related disasters (e.g. sabotage, cyber-attack, pandemic).

These types of events all have in common that they provoke incapacitation or even the loss of critical resources such as buildings (e.g. data centers, production facilities, administration and office buildings), staff (e.g. single key persons, all workforce), system/IT (e.g. IT, telephony, building technology/services) and service providers / suppliers (e.g. IT providers, telecommunication providers, utilities providers, outsourcing partners).

The BCM framework of SIX covers all elements of the generic model as suggested by:

- BS EN ISO 22301:2019 and BS EN ISO 22313:2014;
- the BCI Good Practice Guidelines (GPG), 2018;
- the Standard of Good Practice for Information Security (ISF), 2018.

The primary goal of SIX BCM (where SIX x-clear is included) is to protect time-critical processes and functions from negative impacts (i.e. prevention), to alleviate the consequences of negative impacts and to allow recovery of the business (i.e. preparedness) in case of a disaster. This means that all actions necessary are to be taken to ensure that SIX x-clear fulfils legal and contractual obligations, and that reputational damage is minimized in case of a disaster or crisis.

In the Business Impact Analysis (BIA) of SIX criticality of the SIX x-clear business processes and their resources (e.g. applications needed) are determined. This classification serves as the basis for the respective reaction and recovery times. In the Business Continuity Strategy of SIX the business continuity options for restarting time-critical SIX x-clear processes are described; risk mitigation measures for all loss scenarios are implemented where necessary.

To be able to react quickly and consistently in the case of a disaster, SIX x-clear is embedded in the SIX-wide response structure (emergency and crisis management organization) and is incorporated in the BC plan of SIX as well as in the IT disaster recovery plans and the



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An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

coordination plan to support SIX-wide outages.

In order to ensure successful appliance of the BC plan and IT recovery plans in the event of a disaster, critical staff and managers of SIX x-clear as well as the emergency and crisis management organization are trained. Additionally, the functionality of the plans is validated through tests and exercises (plan reviews, table top/simulation/full exercises, emergency/crisis management exercises, unit tests, end-to-end tests), as this is an essential part of the recovery response. The exercises and tests are carried out under realistic conditions.

SIX regards ITSCM as an independent, complementary discipline due to its subject-specific characteristics and complexity. The BCM and ITSCM lifecycles are closely interlinked. ITSCM is based on the requirements that are identified in the BIA. While BCM considers business-related solutions of an IT failure, ITSCM focuses on scenarios of unavailability of data centers.

SIX operates redundant production data centers at different locations, designed to act as mutual fall-backs, and a warm (ready-to-use) contingency site to guarantee high availability of SIX x-clear services in case of disaster. All data is mirrored in real time on a 24-hour basis, 7 days a week. This setup ensures that the full range of services offered by SECOM can continue to be provided. SNB has approved the SIX x-clear contingency concept and locations. Tests are conducted yearly and the SNB is informed about the results.

SIX Emergency and crisis management forms a central part of the response structure and applies the plans created in BCM and ITSCM when an event occurs. So, if one of the systems within SIX x-clear fails and Incident Management is not able to remedy the fault, the matter will be escalated via the emergency and crisis organization. SIX x-clear will initiate the necessary measures, and further steps will be defined within the Emergency and Crisis Organization.

In the event of an exceptional situation or crisis SIX x-clear immediately notifies its customers and business partners. This information process is subject to the defined Crisis Management guidelines and processes. Customers are also notified of individual service disruptions in accordance with a defined severity and impact classification.

4.17.7 Key Consideration 7

An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.

Potential risks caused by key members are mainly due to operational problems of the key member itself and have no significant impact on SIX x-clear but may pose significant risks to their counterparts and the efficiency of the settlement system. Risks caused by key members are mitigated through the following:

- Clear criteria for admission and maintaining membership
- Satisfying technical and operational requirements
- Continuous monitoring of system usage and the settlement ratio
- Detailed Market Guides documenting the established rules for the members



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- Deterrent regime for failed settlement (i.e. encouraging a high settlement ratio)
- Offering the option between a proprietary messaging system or SWIFT
- Clear release notes for system changes with client impact and the possibility of front-to-back testing in the integration system.

Potential risks caused by other FMIs and correspondent banks are explained under Principle 20.

Wherever possible, SIX x-clear uses the services of other affiliated companies of SIX. The risk management 2nd line of defense is performed by SIX Group Services in the CRO department (however retaining the operational management of collateral / margin calls in SECOM in its own entity). SIX x-clear outsources the operation and maintenance of the data center to SIX Services. These outsourcing arrangement are governed by SLAs in compliance with FINMA regulations.

The risk inherent in relying on information technology is addressed by SIX x-clear's business continuity planning, a segregation of duties represented in access rights and in control mechanisms within the systems, IT general controls and a system design that ensures a high degree of security and operational reliability and an adequate, scalable capacity.

SIX x-clear provides infrastructure services to participants located across the European continent and has been deemed systemically important. Hence, SIX x-clear strives to provide its services securely, reliably, and efficiently. The impact that a potential risk may pose to SIX x-clear's clients or to other FMIs forms part of the risk assessment in the process of risk management.

SIX x-clear is represented in the national interbank alarm and crisis organization and in national working groups regarding BCM. It participates actively in exercises in alarm and crisis organizations. The BCM at SIX is coordinated closely across all legal entities with a specific focus on the FMIs.

4.18 Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

4.18.1 Key Consideration 1

An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.

In line with art. 18 FMIA (equivalent to art. 35 MiFIR), SIX x-clear ensures fair and open access to its services. The participation requirements are governed by art. 2 Rulebook “Membership”. There are various categories of participants for which the participation requirements may vary to a certain extent due to the different legal backgrounds of the participants. Within a category, all participants are treated in the same way subject to reasonable justifiable differentiation.

Members of SIX x-clear are legal entities which shall not be a companies that are controlled by an individual on the basis of a majority of capital or voting rights. Members of SIX x-clear are commercially active in securities trading or settlement for themselves or third parties and are participants of the trading platforms to which SIX x-clear provides clearing services, such as (see



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art. 2.2 Rulebook):

- a. Swiss Banks as defined in the Swiss Federal Banking Act;
- b. Swiss securities firms as defined in the Swiss Financial Institutions Act;
- c. Companies approved by a regulatory authority in the EU, the United Kingdom, Norway, Liechtenstein or Island with a license as a bank or securities firm;
- d. Banks or securities firms not falling under literae a. to c. which, in the view of SIX x-clear, are subject to an adequate level of regulation and supervision that is equivalent to a bank or securities firm in Switzerland.

In addition, each member must be subject to either Swiss anti-money laundering (AML) legislation or equivalent anti-money laundering legislation. To this end, SIX x-clear performs an independent examination of applicants in the access process which it repeats in regular intervals during the time of membership. Members of SIX x-clear need also to sign a service contract for clearing services (Swiss law) and the pledge agreement for margins and for the default fund. They also have to confirm the monitoring and the existence of the technical and operational requirements (see art 2.3 Rulebook).

With respect to the risk assessments of the members see the respective principles (e.g. principle 4 regarding credit risk).

For more details on operational, financial, technical and legal requirements see chapter 2 of the Rulebook.

4.18.2 Key Consideration 2

An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.

The principles set out for membership at SIX x-clear and as outlined in Key Consideration 18.1 are justified in terms of safety and aim to limit specific risks, including financial, operational, and legal risks. They have to be fulfilled by all members.

SIX x-clear basically distinguishes between two categories of members: Individual Clearing members (ICMs), who have their own trades cleared, and General Clearing Members (GCMs), who – besides having their own trades cleared – may offer clearing services to other Non-Clearing Members (NCMs) of the trading platforms (regular exchanges or Multilateral Trading Facilities (MTFs)), who do not have SIX x-clear membership. Different minimum default fund requirements apply depending on the type of membership (ICM/GCM only).

The application for membership with SIX x-clear must be submitted in written form, together with a declaration issued by the respective trading venue confirming the admission as a trading venue member. Necessary information to assess the member have to be provided regularly to fulfil the information duties outlined in SIX x-clear's Rulebook.

Potential members need to demonstrate their ability to comply with the SIX x-clear requirements for collateral in order to satisfy margin calls, default fund contributions and any other pre-defined collateral component (esp. Top-up Contribution). Every applicant also has to comply with the technical and operational requirements as prescribed and set out in the Rules



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An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.

and Regulations. It must also prove that it has the necessary facilities, equipment, operational capability, personnel, hardware, software, communication systems, and IT links to SIX x-clear, which enable it to perform its business as a member.

Every member shall demonstrate and warrant from the first day of membership and on a continuous basis throughout the duration of its membership that it meets all of the membership criteria.

4.18.3 Key Consideration 3

An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.

A detailed set of rules and procedures has been defined for the efficient suspension and termination of a member relationship and the closing out of its open transactions when required. They are laid down in the Rulebook, chapters 3 and 4, and the Operational Manual for members (chapters 11,12 and 13) and Co-CCPs (chapter 14).

SIX x-clear is entitled to suspend or terminate the membership of a member with reference to membership criteria for such period of time as it deems necessary if:

- the member was granted membership on the basis of inaccurate information;
- the member no longer satisfies the membership criteria or any particular membership criterion as prescribed by SIX x-clear;
- the member is obliged to make a notification as separately described (e.g. change of control or regulatory status) and has failed to do so;
- a margin call or a credit call is not satisfied;
- the clearing services agreement between the trading platform and SIX x-clear has been terminated; or
- the member does not agree to a proposed amendment to the contractual relationship which SIX x-clear deems relevant and indispensable.

In order to be compliant with the membership criteria, SIX x-clear's members are assessed as part of the regular risk assessments on an ongoing basis. The risk assessments are also part of internal and external audit reviews.

A member is entitled to terminate its membership with immediate effect if an event of default should occur on the part of SIX x-clear (as defined in chapter 4 Rulebook).

In order to ensure that SIX x-clear does not suffer any harm from suspension or termination, a former member remains subject to certain relevant financial obligations and consequences (as detailed in clauses 3.2, 3.3 and 4.5 Rulebook).

SIX x-clear has disclosed its procedures for managing the suspension or the exit of a member in the Rulebook and from a procedural point of view in the Operational Manual. The suspension can be requested by the trading venues, by the member itself or by SIX x-clear. The Rulebook as well as the Operational Manual of SIX x-clear are published on the website of SIX x-clear and are



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An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.
thus accessible to members.

4.19 Principle 19: Tiered participation arrangements

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

4.19.1 Key Consideration 1

An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.

SIX x-clear maintains a principal-to-principal relationship with its members (ICM, GCM, SIX x-clear clients). The legal framework does not establish a contractual relationship between SIX x-clear and the NCM. In case of non-segregated positions, the ownership of NCM positions and collateral will neither be identified, nor recorded in the positions and collateral accounts. They are therefore considered in the context of the respective overall risk position of the GCM against SIX x-clear. If the NCM is set up with its own segregated positions and collateral account structures, the ownership of positions and collateral is recorded.

For the SIX x-clear clients of the Norwegian Branch only, the operational part is performed by the appointed clearing administrator (ICM or GCM), but the legal relationship remains established between SIX x-clear and the SIX x-clear client (relating to its own accounts).

The solutions in place for segregation and porting (see Principle 14) potentially enables access to more detailed information with respect to the relationship with SIX x-clear’s NCMs.

SIX x-clear requests additional information for those NCMs opting for segregated positions and collateral accounts in order for SIX x-clear to become able to execute the portability options chosen by the NCM when required. Due to the fact that an NCM will need to have a backup GCM in case of portability, all necessary accounts and technical setups have to be in place in advance.

4.19.2 Key Consideration 2

An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

With regard to dependencies between direct and indirect members, SIX x-clear verifies the structure of a company during its regular member risk assessments by taking into account the legal ownership structure and by looking where voting rights and capital dependencies are 50% or higher as well as if the significant control influence at BoD level exists.

The respective entities are clustered and grouped to represent the risk in the RMS and to monitor the inherent risks out of such dependencies accordingly. Members are not allowed to provide collateral whose issuer refers to the member itself.

Groups based on material dependencies are considered in the whole waterfall concept (e.g., lines of defense) with regard to the identity of the two highest member group risk exposures of SIX x-clear. Therefore, indirect participants will implicitly be part of the whole exposure of a



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clearing member or the respective identified parent group. Additionally, the risk of the indirect members of a GCM is measured against the GCM's equity capital to identify potential impacts of indirect members on the respective GCM.

SIX x-clear's monitoring activities are outlined in Key Consideration 19.1.

4.19.3 Key Consideration 3

An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.

SIX x-clear's account segregation model enables the monitoring of positions and collateral by differentiating between direct and indirect member transactions and by distinguishing between principal and agent transactions. The margin requirements calculated by SIX x-clear have to be covered by collateral from clearing members (and their clients). The risk management model applied by SIX x-clear allows higher margins to be requested in case of a net open amounts exceeding CHF 750 million. Moreover, as mentioned under Key Consideration 19.2, the risk of the indirect members of a GCM is measured against the GCM's equity capital to identify potential impacts of indirect members on the respective GCM.

SIX x-clear applies collateral concentration risk limits, as well as Wrong Way Risk restrictions, according to the lending norms and policies of SIX x-clear, to avoid collateral concentration at credit group level also taking into account the risk exposures from indirect clients in case of a GCM.

4.19.4 Key Consideration 4

An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

The risks from tiered participation arrangements and the arrangements which form part of SIX x-clear's legal framework, are reviewed regularly and can also be reviewed on an ad-hoc basis if necessary. SIX x-clear mitigates risks arising from tiered participations through monitoring and by managing them at the level of the member.

4.20 Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

4.20.1 Key Consideration 1

Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.

SIX x-clear maintains link arrangements with other CCPs as well as direct links with the SNB, selected CSDs and ICSDs and dedicated agents (tax, cash). SIX x-clear and a dedicated team at SIX SIS is responsible for link arrangements (Network Management), review the relationships



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and contracts in place with FMIs regularly to ensure consistency with internal and external business, legal, and regulatory requirements.

With respect to new links and financial market infrastructure service providers, SIX has set in place directives and procedures for the selection of FMIs as service providers and to fulfil its risk and quality standards. Therefore, prior to establishing a link with another CCP or CSD stringent selection guidelines are applied and risks from a market, credit, and operational perspective are thoroughly evaluated. SIX x-clear conducts credit risk assessments and performs due diligence reviews regularly with interoperating Co-CCPs too to ensure a mutual understanding of risk management methodologies and the economic situation of SIX x-clear’s link partners. Clearing and settlement risk exposures from SIX x-clear’s links are tracked in close to real time within SIX x-clear’s clearing system, allowing it to operate a state-of-the-art RMS with regard to market, credit, and liquidity risk.

4.20.2 Key Consideration 2

A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.

SIX x-clear is linked in first priority with its sister company and main settlement agent SIX SIS and with Euronext VPS, its CSD for the Norwegian market, with regard to the services offered to deposit posted margins and default fund contributions and settlement services of financial instruments. SIX x-clear relies on the FMI links of SIX SIS to other CSDs by using the settlement network offered by SIX SIS for the European market. It does, however, maintain direct links with the following CSDs/ICSDs:

- Clearstream Banking S.A. (CBL)
- Euroclear Finland
- Euroclear Sweden
- Euroclear UK & Ireland
- Iberclear
- Monte Titoli
- Euronext VPS
- VP Securities
- KELER Ltd
- Central Securities Depository Prague (CSD Prague)

Respective links are subject to the CSDs and ICSDs admission and general terms and condition legal framework.

SIX x-clear also has documented and approved link agreements with LCH.Clearnet and EuroCCP established in the United Kingdom and in the Netherlands. These Master Clearing Link Agreements also set out rules for inter CCP operational procedures, schedules per trading venue as well as pledge agreements covering collateralization between the CCPs. These agreements are based on English law.



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4.20.3 **Key Consideration 3**

Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.

Key consideration 20.3 is not applicable to SIX x-clear because it is not a CSD.

4.20.4 **Key Consideration 4**

Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.

Key consideration 20.4 is not applicable to SIX x-clear because it is not a CSD.

4.20.5 **Key Consideration 5**

An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.

Key consideration 20.5 is not applicable to SIX x-clear because it is not a CSD.

4.20.6 **Key Consideration 6**

An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.

Key consideration 20.6 is not applicable to SIX x-clear because it is not a CSD.

4.20.7 **Key Consideration 7**

Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

SIX x-clear operates and competes in markets where more than one active CCP is permitted. SIX x-clear has established links with different co-CCPs in order to provide its clearing services to its members on several trading venues, supporting the clearing of pan-European equities and derivatives trades.

The legal contracts which also cover the default of a co-CCP are agreed in bilateral MCLAs, which set out the rights and obligations between the interoperating CCPs. Additionally, provisions relating to the default of a co-CCP are defined in detail in the inter-CCP operational procedures. The link agreements have received the non-objection from the competent authorities of all interoperating CCPs.

SIX x-clear performs regular credit risk assessments and due diligence reviews on its co-CCPs. This is done to ensure the understanding of risk management methodologies and the economic situations of these linked CCPs.



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4.20.8 **Key Consideration 8**

Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.

The interoperating CCPs and SIX x-clear calculate their current and potential future exposures and provide margin collateral based on the respective CCP's risk management methodology and systems in place on a daily / intra-daily basis. However, no interoperating CCP with a link to SIX x-clear contributes to SIX x-clear's default fund and vice versa.

SIX x-clear covers inter-CCP margin requirements with additional financial resources, which are collected from its members via the Link Margining Element.

4.20.9 **Key Consideration 9**

A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

Key consideration 20.9 is not applicable apply to SIX x-clear because it is not a trade repository (TR).

4.21 **Principle 21: Efficiency and effectiveness**

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

4.21.1 **Key Consideration 1**

An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.

SIX and thus SIX x-clear are owned by a majority of their users (see ownership listing) and all user groups are represented throughout all governance bodies. This allows SIX x-clear's users to define and design the services SIX x-clear offers according to their needs. It also allows them to establish monitoring facilities and processes to guarantee the effectiveness and efficiency of these services.

SIX x-clear interacts with its users through formal panels on three decision levels to ensure proper service provision and alignment: strategic, operational, and technical. All panels are jointly comprised of representatives from SIX x-clear and its owner banks, providing design, communication, and feedback channels for users.

- Strategic: The Strategic Advisory Board (comprised of the Management Committee of SIX and the Heads of Operations of represented banks) ensures that SIX x-clear develops its strategy and service spectrum according to its users' requirements and needs and in line with the Swiss banks' strategies. As a basis, the Strategic Advisory Board is provided with the management's yearly strategy assessment (assessments of markets, clients, competitors and regulation; SWOT analysis, financials etc.).
- Operational: User Groups (comprised of operational representatives from both sides) serve as the means for technical reconciliation, project coordination, service quality assurance, and



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An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.

the resolution of technical questions.

- Technical: Technical working groups (comprised of subject matter experts) for the definition and elaboration of details and definitions.

These panels guarantee the effectiveness and efficiency of SIX x-clear functions and that their design meets user requirements and needs.

SIX x-clear maintains its Member Advisory Committee (MAC) to proactively provide information to and receive feedback directly from its members with regard to product development and enhancements as well as risk management changes, regulatory information and other relevant issues.

SIX x-clear’s advisory Risk Committee comprises representatives from its direct and indirect members. The Risk Committee gives advice to SIX x-clear on key management issues in relation to risks and their management.

In addition, SIX x-clear conducts several client surveys and meetings every year.

4.21.2 Key Consideration 2

An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.

SIX x-clear’s goals and objectives are part of the overall business strategy of SIX and SIX Securities Services, and are reflected in a clearly defined clearing strategy for SIX x-clear set up by SIX x-clear’s BoD. The clearing strategy defines and prioritizes the long-term objectives in detail with regards to business, service and financial goals. The objectives and goals are tracked through an extensive system of Key Performance Indicators (KPIs) on an ongoing basis to ensure correct and efficient execution by the responsible management body.

SIX x-clear’s core clearing system SECOM has a target availability of 99.8%, which has been exceeded consistently with an actual availability of 99.99% throughout the past years.

To measure overall customer satisfaction, SIX x-clear conducts an annual survey supported by an independent third party. The overall satisfaction of SIX x-clear users with SIX x-clear services as well as participants’ loyalty has been consistently high for years. The survey results are reported to the Strategic Advisory Board and thus transparently communicated to all users.

SIX x-clear also maintains a comprehensive cost management system to monitor operational effectiveness and a comprehensive operational Risk Management Tool to manage operational risks as well as to ensure compliance with internal processes, controls, and regulatory requirements.

The core and peripheral systems’ reliability is monitored by the management of SIX on a regular basis. In addition, a Security Board supervises IT and physical security with a cyber-security monitoring team working around the clock.

SIX x-clear processes are reviewed periodically, internally and externally (e.g., by the SNB).



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4.21.3 Key Consideration 3

An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

As an authorized Financial Market Infrastructure, SIX x-clear is subject to the FMIA and the respective ordinance as well as to specific rules of the NBO. In order to ensure full compliance with these requirements SIX x-clear has implemented the SIX-internal regulation governing the Internal Control System (ICS) to ensure effective controls and efficient processes, which are reviewed periodically by internal and external audit.

This ICS is based on a systematic risk analysis. It documents all business-related processes, risks, systems and controls, and thus ensures the adequacy and effectiveness of controls. The ICS promotes and facilitates the analysis of dependencies between processes, risks and controls. It supports the reliability of financial reporting and protection of the assets. It also aims to mitigate all identified risks according to the defined risk appetite and the defined risk tolerance. The ICS is an integral part of daily business and ensures compliance with all relevant internal and external regulations. Internal audit reviews the effectiveness of measures taken in the business areas and also assesses the effective operation of the ICS.

The ICS also includes the internally outsourced functions / processes and continuously monitors the observance of the specifications and directives imposed on the internal service providers.

The efficiency and effectiveness are measured at different levels. SIX x-clear uses a balanced scorecard approach to measure quantitative and qualitative topics such as financial performance, customer satisfaction, project performance, strategy, and risk exposure. The senior management’s remuneration is linked to the balanced scorecard.

SIX Securities Services and SIX x-clear have implemented performance management processes which align overarching company goals and operative KPIs on all levels with individual and function-specific performance goals.

4.22 Principle 22: Communication procedures and standards

An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

4.22.1 Key Consideration 1

An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

Data transfers between SIX x-clear’s member application and SIX SIS’s SECOM system must be executed via the following carriers:

- Finance IPNet of SIX Interbank Clearing Ltd. (SIC) and SIX SIS (Virtual Private Network; VPN)
- BT Radianz (VPN)
- SWIFTNet
- Internet (e.g., with SIX SIS Web Services)



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4.23 Principle 23: Disclosure of rules, key procedures, and market data

An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.

4.23.1 Key Consideration 1

An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

SIX x-clear publicly discloses key aspects of all information relating to its services as CCP on a regular basis and in accordance with art. 21 FMIA and art. 19 FMIO and standards set by other relevant international bodies (see art. 19 lit. i FMIO).

Such disclosure includes information regarding its design and operation as a CCP (see art. 21 FMIA and Art. 23a (1) lit. a NBO). SIX x-clear and its parent company SIX each publish an annual report. These reports present the essential activities of SIX x-clear and the relevant Group companies. Information regarding the offered and ancillary services is available on the website of SIX (for instance under the category “Products & Services”). Information regarding the organizational structure of SIX x-clear (see art. 21 (1) lit. a FMIA) can be found in its annual reports. In particular, these reports include information about the financial situation of the company and the principles of its risk management.

The rights and obligations of the members (art. 21 (1) lit. c FMIA) are defined in the bilateral contracts and in the Rulebook of SIX x-clear. The Rulebook and its supplementing Operational Manual are published on the website of SIX x-clear. For members of the Norwegian branch of SIX x-clear the bilateral contracts are supplemented by the GTCB (English Law) and the Rules & Regulations both of which are published on the website of SIX x-clear.

4.23.2 Key Consideration 2

An FMI should disclose clear descriptions of the system’s design and operations, as well as the FMI’s and participants’ rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.

Please refer to Key Consideration 23.1 and Principle 1.

4.23.3 Key Consideration 3

An FMI should provide all necessary and appropriate documentation and training to facilitate participants’ understanding of the FMI’s rules and procedures and the risks they face from participating in the FMI.

(New) members receive introductions and training. A test system is provided so that operational procedures may be tested before going live. Members can contact their Relationship Manager of SIX x-clear with any query they have. Further teams in the organization provide second- and third-level support.

Due to the constant contact with Relationship Managers, the involvement in various bodies and (partly) their function as owners of SIX (see Key Consideration 21.1), it is ensured that members may have a good understanding of their membership with SIX x-clear.



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An FMI should provide all necessary and appropriate documentation and training to facilitate participants’ understanding of the FMI’s rules and procedures and the risks they face from participating in the FMI.

Should SIX x-clear become aware of problems with the operational processes of a member, it will provide training to such member in an appropriate way.

4.23.4 Key Consideration 4

An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.

SIX x-clear discloses its prices and fees in the Info Center on its website (in accordance with art. 21 let. b FMIO). The price schedule applies to all members of SIX x-clear.

4.23.5 Key Consideration 5

An FMI should complete regularly and disclose publicly responses to the CPMI-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

As mentioned in Key Consideration 23.1, SIX x-clear publicly discloses key aspects of all information relating to its services as a CCP on a regular basis and in accordance with FMIA and FMIO and the standards set by the relevant international bodies (as required by art. 21 FMIA and art. 19 FMIO).

Quantitative information (e.g. the amounts and volumes of clearing transactions) is published quarterly in the CPMI IOSCO quantitative disclosure template as well as on a yearly basis in the annual reports of SIX x-clear and SIX (see art. 19 lit. g and h FMIO).

SIX x-clear publishes its updated CPMI-IOSCO qualitative disclosure every second year or earlier if material parts of the disclosure change.

Please refer to Key Consideration 23.1 for further details.

4.24 Principle 24: Disclosure of market data by trade repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

Principle 24 is not applicable to SIX x-clear because it is not a TR.



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5.0 References

Operational Manual of SIX x-clear

<https://www.six-group.com/dam/download/the-swiss-stock-exchange/post-trade/clearing/download-center/operational/clr-xcl-510-en.pdf>

Contractual Framework and Rulebook of SIX x-clear (Swiss, English and German law)

<https://www.six-group.com/de/products-services/the-swiss-stock-exchange/post-trade/clearing/info-center.html#scrollTo=contractual-framework>

SIX Governance

<https://www.six-group.com/en/company/governance.html>

SIX website

<http://www.six-group.com/en/home.html>

SIX Securities Services website

<https://www.six-group.com/en/products-services/the-swiss-stock-exchange/post-trade.html>

SIX x-clear Annual Reports

<https://www.six-group.com/en/products-services/the-swiss-stock-exchange/post-trade/clearing/info-center.html#scrollTo=annual-reports>

SIX x-clear Price List

<https://www.six-group.com/en/products-services/the-swiss-stock-exchange/post-trade/clearing/info-center.html#price-list>

SIX x-clear website

<https://www.six-group.com/en/products-services/the-swiss-stock-exchange/post-trade/clearing.html>

SNB web page on FMI oversight

http://www.snb.ch/en/iabout/finstab/finover/id/finstab_oversight

Please note that references to external sources, e.g. to websites or links of third parties, are provided solely for information purposes and do not imply any recommendations whatsoever. SIX x-clear AG has neither provided nor processed the contents of the sources in question. Furthermore, SIX x-clear AG has not verified, reviewed or updated the contents of these sources and therefore disclaims all liability for the information contained therein.



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6.0 Glossary

BCM	Business Continuity Management
BAU	Business As Usual
BoD	Board of Directors
CCP	Central Counter Party
CEO	Chief Executive Officer
CPMI	Committee on Payment and Market Infrastructure
CRO	Chief Risk Officer
CSD	Central Securities Depository
DVP	Delivery Versus Payment
FINMA	Swiss Financial Market Supervisory Authority
FISA	Swiss Federal Intermediated Securities Act
FMI	Financial Market Infrastructure
FMIA	Financial Market Infrastructure Act
FMIO	Financial Market Infrastructure Ordinance
FX	Foreign Exchange
GC	General Collateral
GTC SIX SIS	General Terms and Conditions of SIX SIS
ICS	Internal Control System
ICSD	International Central Securities Depository
IOSCO	International Organization of Securities Commissions
ISIN	International Securities Identification Number
KPI	Key Performance Indicator
NBO	National Bank Ordinance
Repo	repurchase agreement
RVP	Receive Versus Payment
SIC	SIX Interbank Clearing Ltd
SIX	SIX Group Ltd
SIX Group Services	SIX Group Services Ltd
SIX Securities Services	SIX Securities Services Ltd
SIX SIS	SIX SIS Ltd
SIX x-clear	SIX s-clear Ltd
SLA	Service Level Agreement
SLB	Securities Lending and Borrowing
SNB	Swiss National Bank

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