LCH

# CPMI-IOSCO PFMI Self-Assessment 2024

## LCH Limited

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| Assessor | In 2024, LCH Limited (LCH) has performed a self-assessment of its observance with the Principles for Financial Markets Infrastructures (PFMIs) issued by the Committee on Payments and Market Infrastructures and Organization of Securities Commissions (CPMI-IOSCO). |
| Objective of the assessment | LCH's self-assessment was undertaken in accordance with the PFMIs of April 2012, and supplementary guidance published thereafter, in order to demonstrate compliance with them. |
| Scope of the assessment | This self-assessment was made against all PFMIs and supplementary guidance published thereafter which apply to CCPs and covers all the clearing services of LCH. |
| Methodology of the assessment | LCH followed the disclosure framework and applied the assessment methodology recommended by CPMI-IOSCO. |
| Information sources | In making this assessment, LCH used a combination of public and non-public information, including LCH's policies, procedures, and management information. This was also supplemented with discussions with LCH staff responsible for the critical activities of the central counterparty. |
| Date of assessment | LCH's assessment was made using data available as of 31 March 2024. |

LSEG POST TRADE

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# 1.0 Executive summary

LCH has completed a self-assessment against the 24 Principles for Financial Market Infrastructures (PFMI[1]) and related guidance, as published by the Committee on Payment and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO). This assessment also has regard to the interpretive guidance published by the CPMI and IOSCO[2]. This self-assessment was completed using the recommended assessment methodology published by CPMI and IOSCO[3].

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Principles 11 (Central Securities Depositories) and 24 (Disclosure of market data by Trade Repositories) were deemed to be out of scope as they are not relevant to LCH as a CCP. In addition, Principle 12 (Exchange-of-value settlement systems) is not relevant to LCH as it does not operate such a system. All settlement of physically settled cleared securities transactions occurs as described under Principle 10 (Physical Deliveries).

All abbreviations and key terms in this report are defined under Appendix A.

[1] Principles for Financial Markets Infrastructures, April 2012, Principles for Financial Market Infrastructures (bis.org)
[2] Guidance on cyber principles for financial market infrastructures, June 2016, FR07/2016 Guidance on cyber resilience for financial market infrastructures (iosco.org)
Recovery of financial markets infrastructures, July 2017, FR11/2017 Recovery of financial market infrastructures and Cover Note (iosco.org)
Resilience of central counterparties (CCPs), July 2017, FR10/2017 Resilience of central counterparties (CCPs): Further guidance on the PFMI and Cover Note (iosco.org)
[3] Disclosure framework and Assessment methodology, December 2012, Principles for financial market infrastructure: Disclosure framework and Assessment methodology (bis.org)

# 2.0 Overview of LCH

LCH is a Central Counterparty (CCP) incorporated in the United Kingdom serving major international exchanges and platforms, as well as a range of over-the-counter (OTC) markets. In its role as a central counterparty LCH assumes counterparty risk between trading counterparties by becoming the legal counterparty to the trade and ensuring the financial performance of the trade.

In clearing a trade, LCH becomes counterparty to, and responsible for, trade obligations to clearing members. This principle is known as novation or registration. LCH does not in its normal course of business have any exposure to market risk in respect of the trades that it clears. LCH clears a broad range of asset classes including securities, interest rate swaps, inflation swaps, non-deliverable Foreign Exchange (FX) forwards, FX Options, bonds, and repurchase agreements (repo). LCH works closely with market participants and exchanges to identify and develop clearing services for new asset classes.

As of 31 March 2024, LCH had 185 clearing members consisting of banks, securities houses, investment banks and traders.

Below is a list of jurisdictions where LCH holds regulatory status

LCH is a Recognised Clearing House in the UK under the Financial Services and Markets Act 2000 (FSMA) and, as such, is approved by the Bank of England to clear a diverse range of asset classes.

LCH is a recognised Third Country central counterparty offering services and activities in the European Union (EU) in accordance with the European Market Infrastructure Regulation (EMIR) along with the related Regulatory Technical Standards (RTSs).

LCH is designated under the UK Financial Markets and Insolvency (Settlement Finality) Regulations 1999, which implemented Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems (the Settlement Finality Directive).

LCH is registered by the Commodity Futures Trading Commission (CFTC) as a Derivatives Clearing Organization to provide clearing services as part of the Listed Rates, SwapClear and ForexClear services in the USA, and futures and options contracts traded on or subject to the rules of a Designated Contract Market or a Foreign Board of Trade.

LCH is recognised as a Foreign Central Counterparty in Switzerland by the Swiss Financial Market Supervisory Authority.

LCH is designated as a systemically important central counterparty for the Swiss financial system by the Swiss National Bank.

LCH is recognised by the Ontario Securities Commission, Canada, pursuant to Section 21.2 of The Securities Act, R.S.O 1990, to provide the ForexClear, RepoClear and SwapClear clearing services in Ontario.

LCH is recognised by the Autorité des Marchés Financiers, Québec, Canada, pursuant to Section 12 of the Derivatives Act, CQLR to provide the ForexClear, RepoClear and SwapClear clearing services in Québec.

The SwapClear service is designated as systemically important by the Bank of Canada.

LCH is licensed by the Australian Government to provide the SwapClear service in Australia.

LCH is recognised by the Monetary Authority of Singapore to provide the ForexClear and SwapClear services in Singapore.

LCH is licensed by the Japanese Financial Services Agency to provide the SwapClear service (excluding Yen products) and ForexClear Non-Deliverable Forwards (NDF) in Japan.

LCH has been granted Automated Trading System--CCP authorisations by the Hong Kong Securities and Futures Commission for SwapClear and ForexClear to provide clearing services in Hong Kong and designated as a CCP in respect of SwapClear for the purposes of the Hong Kong mandatory clearing obligation for certain OTC derivative transactions. LCH is seeking to extend its authorisation in Hong Kong for its RepoClear service.

LCH has been recognised as a foreign central counterparty by the Banco De Mexico to provide the SwapClear service in Mexico.

LCH offers clearing for the products noted above through its clearing services as set out below:

LCH's SwapClear service clears interest rate swaps, forward rate agreements, overnight index swaps and variable notional swaps products in 19 currencies, as well as inflation swaps in four currencies and non-deliverable interest rate swaps in eight currencies.

LCH's RepoClear clears repos and cash bond trades of bonds issued by the UK government. RepoClear also offers membership to buy-side firms via its Sponsored Clearing service. Sponsored Members are supported by an Agent Member (sponsoring bank) that facilitates margin payments and provides default fund contributions for each sponsored transaction. LCH is also looking to introduce a new offering within its RepoClear service, Guaranteed Sponsored Clearing. This service builds on the existing Sponsored Clearing framework, where both the Sponsored Member and Agent Member are jointly and severally liable.

LCH's EquityClear service clears cash equities, cash equity equivalents and equity derivative products. LCH clears these products for participants of 16 exchanges and trading venues across Europe. As part of the EquityClear service, LCH has entered into interoperable arrangements with other CCPs, such arrangements have been approved by the appropriate national competent authorities.

LCH's ForexClear service clears NDFs in 25 non-deliverable forward (NDF) currency pairs, 9 non-deliverable option (NDO) currency pairs, and 8 deliverable currency pairs (spot, forward and options).

LCH is intending to re-launch its Listed Rates service in 2024. This service used to clear both short-term interest rates and long-term interest rate derivatives denominated in EUR and GBP listed on CurveGlobal, which closed in 2022. LCH plans relaunch with the Fenics Markets Xchange (FMX), part of BGC Group, as its exchange partner. The initial product scope is short-term interest rates futures linked to the Secured Overnight Financing Rate (SOFR) to be available at launch, with US Treasury futures to follow in early 2025.

# 3.0 Detailed assessment report

## 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** |
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| *The LCH Rulebook covers all material aspects of LCH's activities and aims to provide a clear and certain legal basis for its operations, as well as the rights and obligations of both LCH and its clearing members. The enforceability of the LCH Rulebook, the Clearing Member Agreement and LCH's charges over clearing member collateral is protected by UK legislation; and enforceability in other jurisdictions is underpinned by legal opinions from reputable external counsel based in those jurisdictions.* |

| Key consideration | Detailed assessment |
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| **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. | LCH is a wholly-owned subsidiary of LCH Group Holdings Ltd (LCH Group), a private company that is limited by shares and incorporated in the UK. As at the end of March 2024, LCH Group is 85.85 percent owned by London Stock Exchange (C) Limited, a wholly-owned subsidiary of London Stock Exchange Group plc (LSEG). The remaining 14.15 percent of the shares of LCH Group are owned by others, including clearing participants and interdealer brokers.<br><br>LCH Group has one other wholly-owned subsidiary that actively operates central clearing services: LCH SA. The CCPs are legally separate entities, each with separate financial resources. SwapAgent Limited, which offers processing, margining, and settlement services for non-cleared derivatives, is a separate subsidiary company, wholly-owned by LCH Group. LCH's activities are also separate to those of LSEG. However, LSEG's Business Services Limited (BSL) provides shared technology and support services across all LSEG entities, including to LCH.<br><br>The material aspects of LCH's activities (i.e., those which are fundamental to its safe operation as a CCP) which require a high degree of legal certainty are:<br><br>• Settlement finality<br>• Default of clearing members<br>• Netting arrangements in the event of clearing member and client defaults or upon commencement of recovery or wind down of LCH<br>• Porting of client positions |

- Enforcement of collateral

After LCH has accepted a trade for clearing, it is unable to reject such a trade. LCH can amend the terms for which it accepts trades for clearing but this would need to happen before registration.

To ensure legal certainty in connection with these activities, LCH obtains legal opinions as to the enforceability of the LCH rules in all relevant jurisdictions, performs due diligence, reviews applicable legislation, and procures local legal advice.

The LCH rules comprise the LCH Rulebook, the Sponsored Clearing Rulebook and the LCH Futures Commission Merchants (FCM) Rulebook (together "the Rulebook"). The LCH Rulebook and the Sponsored Clearing Rulebook are governed by the laws of England and Wales and the LCH FCM Rulebook is governed by New York law. Each prospective clearing member must enter into a Clearing Membership Agreement with LCH, this requires the clearing member to comply with the terms of the applicable requirements of the Rulebook.

To ensure that the Rulebook is enforceable in all jurisdictions in which services are offered, as part of the process of preparing to onboard a member in a new jurisdiction, LCH obtains a legal opinion from a reputable external counsel based in that jurisdiction before the new member is admitted. The Counsel opine on whether i) LCH can exercise its rights under the Rulebook and ii) the clearing members' obligations under the Rulebooks are enforceable.

The LCH Legal Opinion policy requires that LCH refresh its legal opinions, including those relating to cross-border clearing participants, every three years. In accordance with this policy, LCH's Head of Legal may determine that a legal opinion should be refreshed earlier or later than required by the three-year cycle. This may occur if new regulatory rules or legislation are issued that could affect the content of any of LCH's legal opinions.

The Settlement Finality Regulations contained within the Rulebook set out the conditions under which the settlement obligations in respect of registered exchange-traded contracts and OTC contracts are final and irrevocable.

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| **Key Consideration 2:** An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations. | LCH publishes the Rulebook on its website All proposed changes to the Rulebook are also published on the website or shared with clearing members on a secure area on the LCH website. If these changes are material, members are consulted before the changes are made live, and any member comments responding to such consultation are reviewed, considered, and incorporated, as appropriate.<br><br>The Rulebook and the procedures it comprises of cover all material aspects of LCH's activities and aim to provide a clear and certain legal basis for its operations and the rights and obligations of its clearing members. The Rulebook is consistent with the applicable law. Should any inconsistencies with applicable law arise, such as on implementation of new legislation in the relevant jurisdictions, LCH will remedy this through changes to the Rulebook or its operations. LCH monitors the |

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| | release of new legislation and changes to current legislation in relevant jurisdictions, as well as the release of international standards, through its in-house specialist functions.<br><br>LCH's Rule Change Committee oversees and approves changes to its Rulebook. The Committee includes representatives of the Legal and Compliance functions. The review and challenge by this Committee ensures that the proposed changes are clear, understandable and fit for purpose. The Committee may specify amendments to a proposed change which is necessary before a change is approved. Further, proposed changes are submitted, where required, to the relevant regulators of LCH. |
| **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. | LCH's Articles of Association are available to download from the UK company registrar, which is available to view at the following link: https://www.gov.uk/get-information-about-a-company. Key information related to the governance of LCH, including the composition and terms of reference of its Risk Committee, Audit Committee, Nomination Committee, Remuneration Committee and Operational Resilience Committee are available on its website.<br><br>LCH publishes key information about its regulatory status in relevant jurisdictions on its website and in its annual report. The details of the relevant regulatory frameworks under which LCH operates, including statutory instruments and stated policies, are publicly available on the regulators' websites.<br><br>The Rulebook and procedures cover all material aspects of LCH's activities and aim to provide a clear and certain legal basis for its operations and the rights and obligations of each of its clearing members.<br><br>To ensure the basis for LCH's activities is known, LCH publishes the Rulebook and the procedures on its website. The Rulebook refers to supporting legislative instruments where appropriate. LCH notifies or consults with its clearing members before implementing rule changes. LCH makes public disclosures in accordance with Article 39(7) of EMIR in respect to the level of protection offered under the different client account segregation models. |
| **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. | To ensure that the Rulebook is enforceable in all jurisdictions in which services are offered, LCH obtains, and publishes, a legal opinion for each new jurisdiction from reputable external counsel based in a jurisdiction before admitting clearing members established in that jurisdiction.<br><br>The opinions provide a high degree of certainty that there are no circumstances under which LCH's actions under its rules, procedures or contracts could be voided, reversed or subject to stays including in the unlikely event that LCH enters external administration or that one or more of its participants defaults or is suspended.<br><br>No court in any jurisdiction has ever held any of LCH's relevant activities or arrangements under its rules and procedures to be unenforceable. |

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| **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. | LCH assesses the adequacy of its legal framework, as it applies to cross-border clearing members, by obtaining legal advice regarding the enforceability of the Rulebook, the jurisdiction of English courts over non-UK domiciled clearing members, and the circumstances and extent to which an English law charge will be enforceable under the laws of the jurisdiction. To date, LCH has obtained legal advice for Australia, Austria, Belgium, Canada (Ontario), Canada (Québec), Denmark, England and Wales, Finland, France, Germany, Guernsey, Hong Kong, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Poland, Portugal, Scotland, Singapore, Spain, Sweden, Switzerland, and the USA. LCH has a Legal Opinion policy which requires legal opinions to be refreshed as necessary, in particular if material amendments are made, either to foreign law and regulation or to the Rulebook that could affect the outcome of the opinion. In EU jurisdictions in which LCH has clearing members, which have applied the provisions of the Settlement Finality Directive to their domestic institutions participating directly in third country systems (as permitted under Recital 7 to the Directive), LCH is afforded protections as a third-country system equivalent to protections afforded to systems in the EU. In EU jurisdictions where LCH has members, which have not applied the provisions of the Settlement Finality Directive, in the same way, LCH has worked with the relevant regulators (with advice from external counsel) to ensure the necessary protections are in place.<br><br>For clearing members established in other jurisdictions, any action against LCH would need to be brought in an English Court, where LCH is designated under the Settlement Finality Regulations and has the benefit of statutory protection in the form of Part VII of the Companies Act 1989. |
| **Publicly available resources** | LCH Rulebook<br><br>LCH Proposed Rules<br><br>Legal Opinions<br><br>LCH Committees Terms of Reference<br><br>Annual Report and Financial Statements<br><br>LCH Collateral Account Segregation |

## 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.**

*LCH operates under robust governance arrangements which provide an explicit responsibility and accountability structure. The LCH Board and its Committees have representation of both executive and non-executive individuals who are appropriately skilled personnel. The Board Chair and the Chairs of the following Board Committees are among the independent non-executive directors: Risk Committee, Remuneration Committee, Audit Committee, Nomination Committee and Operational Resilience Committee. The LCH website publicly discloses the governance arrangements, including the ownership and company structure, composition of the Board and Board Committees, as well as their terms of reference.*

| Key consideration | Detailed assessment |
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| **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. | The objectives of LCH are clearly identified and publicly available on the group's website. LCH's objectives are:<br>• To provide market leading risk management and clearing solutions.<br>• To manage our members' and clients' risk by providing effective and efficient clearing services.<br>• To promote foremost a safe and stable financial market in all that we do.<br><br>Furthermore, LCH is committed to safeguarding its clearing members' interests and supporting general market and financial stability through its operations, including with respect to international and jurisdictional regulations regarding procyclicality.<br><br>The Company's board annually sets detailed corporate strategic objectives and uses these as a mechanism for monitoring and achieving the Company's objectives. The corporate strategic objectives focus on LCH continuing to offer its proven risk management capabilities across a range of asset classes with a commitment to partner with members to develop the services that make markets more efficient, resilient, and safe. The LCH Board has adopted a Risk Governance Framework, setting out the risks facing LCH, its appetite for these risks, the personnel with responsibility for each risk and has defined reporting requirements for each.<br><br>By including in its objectives the mitigation and reduction of risks and the safeguarding of the financial infrastructure in the markets it serves, LCH explicitly places a high priority on safety and efficiency as well as supporting financial stability in its public mission. |

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| **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. | LCH operates under robust governance arrangements which provide a clear organisational structure, and set out the composition, role, and responsibilities of the LCH Board and the LCH Board Committees. These arrangements also set out the process for ensuring accountability to stakeholders.<br><br>LCH provides accountability to owners, participants, and other relevant stakeholders by including user, clearing member and client representatives in governance forums. LCH runs Product Advisory Groups, Collateral Advisory Groups and Risk Working Groups where participants are able to comment on proposed changes to markets, products, and services, and to risk policies, models and frameworks. In addition, clearing members and clients of clearing members are represented on the LCH Board Risk Committee where all risk policies, and material new business proposals and service changes are reviewed before agreement to recommend them to the Board for approval and where all risk decisions made by the Executive under delegated authority of the Board are notified.<br><br>The governance arrangements of LCH are publicly available on the LCH website, including terms of reference of the LCH Board committees, their composition, and details of the Executive Delegation to the CEO. |
| **Key Consideration 3:** The roles and responsibilities of an FMI's board of directors (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 roles and responsibilities of the LCH Board are clearly specified through the company's Articles of Association and the LCH Board's Reserved Matters.<br><br>The LCH Board is responsible for the establishment of clear objectives and strategies, monitoring LCH's senior management, establishing appropriate remuneration policies, establishing, and overseeing the risk management function, overseeing the compliance and internal control function, overseeing outsourcing arrangements and providing accountability to shareholders, employees, clearing members, clients and other stakeholders.<br><br>As of 31 March 2024, the LCH Board comprised of 12 individuals: Five independent non-executive directors (INEDs), one of whom is the Chair; five non-executive directors (NEDs) (of whom two are LSEG directors and three are representatives of clearing members (User Representative); and two executive directors. At time of writing, there is currently a vacancy for a User Representative.<br><br>The LCH Board has established an Audit Committee, an Operational Resilience Committee, a Remuneration Committee, a Nomination Committee and, as an advisory committee, a Risk Committee. Further, the terms of reference for these Committees are reviewed at least annually. Any changes arising from the annual review are reported to the relevant Committee for recommendation to the Board, which is then asked to approve them.<br><br>**Overview of LCH Board Committees**<br><br>The LCH Nomination Committee is comprised of five individuals: Three INEDs, one of whom is the Chair, one User Representative and the LCH Group CEO. The Nomination Committee has the responsibility to nominate certain directors to |

the LCH Board, in accordance with its Terms of Reference, which include the requirement to consult the LCH Group CEO, the CEO of LSEG and the chair of LSEG (and other persons who are not members of the Committee as appropriate) as to the suitability of the short-listed candidates being considered by the Committee. The Terms of Reference also establish that the LCH CEO, in consultation with the LCH Group CEO, will be responsible for appointing the Management Team for LCH.

The LCH Remuneration Committee is comprised of five individuals: Three INEDs, one of whom is the Chair, a User Representative and an LSEG director. The Committee recommends the Broad remuneration policy and principles of LCH to the LCH Board. Its responsibilities include:

- Ensuring that the policy and principles are aligned with the company's risk tolerance and corporate strategy;
- Reviewing that management and employees are provided with appropriate incentives to encourage focus on risk management as the core purpose of LCH; and
- Reviewing that management and employees are, in a fair and responsible manner, rewarded for their individual contribution to the success of LCH.

The LCH Audit Committee represents the interests of the LCH Board in the sound financial management and internal control management of the company. Its responsibilities include:

- Assisting the LCH Board in fulfilling its responsibilities to review audited financial statements;
- Appointing external auditors;
- Reviewing the internal audit function;
- Reviewing regulatory compliance; and
- Reviewing the operational risk framework and reviewing the internal control environment.

The Audit Committee is comprised of five individuals: Three INEDs, one of whom is the Chair, a representative from LSEG and a User Representative.

The internal audit function prepares an annual audit plan, which sets out the timing and frequency of audits on various parts of LCH operations each year. The audit plan is approved by the LCH Audit Committee. The frequency of internal audits is determined through risk assessments, with higher risk areas subject to more frequent audits. LCH commissions an external audit for its annual financial statements. Other external reviews may be initiated where internal audit processes or internal controls identify potential areas that require additional external scrutiny and analysis.

The Risk Committee advises the LCH Board on the company's risk appetite, tolerance, and strategy. Its responsibilities include:

- Reviewing risk policies periodically;
- Reviewing membership criteria and reviewing decisions with regards to LCH membership;

- Considering risk controls designed or adapted for new contracts, product types or services which present new or novel risk(s) to the CCP; and
- Considering proposals to make significant amendments to margin methodologies.

In all cases, following their review the Risk Committee will make recommendations based on their findings to the LCH Board for approval. In the event the Board decides not to follow the recommendation of the Risk Committee, LCH is required to notify the competent authority promptly.

The Risk Committee is comprised of eight voting individuals: Three INEDs, one of whom is the Chair, three representatives of clearing members and two representatives of clients of clearing members. There are currently seven clearing member representatives, among whom three voting rights are rotated periodically. All clearing member and client of clearing member representatives attend and contribute to discussions at Risk Committee meetings.

The Operational Resilience Committee represents the interests of the Board in the sound management of operational resilience. The Committee determines whether the LCH management has put in place adequate strategies and plans, which include appropriate management of operational risk that provide reasonable assurance that LCH operates within its risk appetite and complies with regulatory requirements. The responsibilities of the Committee include:

- Reviewing LCH's operations and technology strategy and policies including application and infrastructure architecture;
- Reviewing and, as appropriate, making recommendations to the Board regarding significant technology investments to support the technology strategy; and
- Review any IT resilience, cyber and information security programmes, track progress in relation to such programmes and provide reports to the Board as appropriate.

Further, the Committee receives and, where appropriate, reviews, periodic reports including reports regarding LCH's Business Continuity Management planning; technology outsourcing; and Audit Committee's reports on the results of reviews and assessments of the operations and technology functions.

The Operational Resilience Committee is comprised of: Three INEDs, one of whom chairs the committee. The Chair of the Board is an observer.

**Conflicts of Interest Policy**

LCH is subject to the LSEG Conflicts of Interest policy which establishes a process for identifying and documenting actual and potential conflicts of interests. The policy requires all its employees to declare, upon joining any LSEG entity, including

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| | within LCH, and then annually, any potential or actual conflicts of interest. The Compliance function maintains a conflict of interest register that is updated when a potential or actual material conflict is reported and is reviewed every quarter.<br><br>The Articles of Association set out the obligations on LCH's Directors to disclose any potential conflicts of interest to other Directors, as well as the actions which may be taken to mitigate such conflicts as they arise. The LCH Board of Directors perform an annual declaration of potential or actual conflicts of interest. At the beginning of each meeting of the LCH Board the agenda is reviewed by the Board Directors and actual or potential conflicts are considered for each agenda item. The tools available to the LCH Board to mitigate conflicts of interest include Directors recusing themselves from discussions. If there is any doubt whether a conflict exists, a determination will be made by the INEDs in conjunction with the Chief Compliance Officer (CCO) as to whether a conflict exists. The INEDs' decision is final.<br><br>In addition, the LCH Board performs an annual self-assessment of its own performance.<br><br>Further, conflicts of interest at the Risk Committee are managed in several ways. The representatives of clearing members and their clients attend meetings as independent risk experts representing the clearing community as a whole, rather than the specific interests of their firms. This is stipulated in the terms of reference of the Committee and attendees are reminded of it at the beginning of each meeting. Members or attendees for whom it is decided that a given topic may give rise to a conflict of interest will be recused for that topic. Finally, Risk Committee members and attendees are invited to identify any conflicts at the start of each meeting. |
| **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 LCH Board is comprised of 12 individuals (see Key Consideration 3 above for further details). The LCH Board takes the advice of the LCH Nomination Committee before approving changes in its size, structure, and members. The Committee's Terms of Reference state that the Committee will need to ensure that its recommended candidates are respected for their competence and are of good standing in their field of business. Collectively the Board members have appropriate skills, including, but not limited to, accounting, operations, technology, and risk management.<br><br>A LCH INED must be independent in character and judgement and have no relationships or circumstances (including any with LSEG or any of its subsidiary undertakings and/or with any significant user or venue shareholder) which are likely to affect, or could appear to affect, his or her judgement. The identities of the INEDs are disclosed on the LCH website.<br><br>The independent members of the LCH Board receive a fee, which is fixed, and which is not linked to the business performance of LCH. Non-executive members of the LCH Board, other than the independent members, do not receive a fee. The non-executive members of the LCH Board represent the users of the CCP and the shareholders of LCH.<br><br>It is a responsibility of the LCH Board, through its Reserved Matters, to perform adequate succession planning for the LCH Board, thereby ensuring the LCH Board continues to have appropriately skilled members. |

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| **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 LCH Board delegates authority to the CEO to make decisions in all matters affecting the operations, performance and strategy of LCH's businesses. The CEO has the power to delegate such authority to such LCH employees as appropriate and necessary (the Executive Delegation), except for calling a clearing member into a default (only to the chief Risk Officer (CRO) in the event of an emergency). One of the responsibilities of the CEO is to ensure that the roles and responsibilities of senior management, including delegation of authorities, are formalised. LCH maintains a publicly available document, the Schedule of Matters Reserved to the Company's Board, including the Terms of Reference for Executive Delegation and a description of the responsibilities of the CEO and senior management.<br><br>LCH's senior management is responsible, in general, for ensuring consistency of LCH's activities with the LCH Board's objectives and strategy. LCH's senior management establish appropriate internal controls, which are subjected to regular review and testing, and ensure sufficient resources are devoted to risk management and compliance. LCH senior management remain actively involved in the risk control process and ensure risks posed to the CCP by its clearing activities and activities linked to clearing, are duly addressed.<br><br>LCH's management team is made up of experienced professionals, taking responsibility for distinct areas of the operation, risk management and controls of the CCP. In separating responsibilities, LCH has management in place with the necessary expertise for each area and maintains a mix of skills necessary for the operation and risk management of the CCP. LCH ensures that its management has the necessary expertise by following the LSEG Vetting policy and framework which sets rigorous pre-employment screening for all prospective LCH employees; the vetting process is carried out within industry benchmarks and according to the roles that the employees perform. The range of vetting required varies based on factors such as the risk level and grade level of the role that the individual is being offered. Additional vetting will be required for those performing senior management roles to ensure that they are of sufficiently good repute and have sufficient experience to ensure sound and prudent judgement within their roles. LCH also encourages employees to attain qualifications linked to their role and undertake training where desired, demonstrating its commitment to developing the skills of its employees.<br><br>The roles and responsibilities of senior management are determined on the needs of LCH and set out in individual job descriptions. Once in role, LCH's senior management is subject to at least annual performance management reviews against their objectives and the core competencies identified as essential for all LCH employees. LCH is committed to ensuring that its reward practices promote sound and effective risk management and do not create incentives to relax risk standards.<br><br>The annual performance review for members of the Management Team also includes assessments by the LCH CRO against the respective risk objectives of their respective business areas and by the LCH Head of Internal Audit in respective of internal audit reports and closure of internal audit actions of their respective business areas. Both the risk and the audit assessments are presented to the Remuneration Committee. |

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| | LCH monitors the performance of its senior management through regular reviews: in the case of non-performance, processes are in place to identify, escalate, remediate, and ultimately reprimand and remove management if necessary. |
| **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. | LCH's risk management is governed by the LCH Risk Governance Framework, adopted and reviewed annually by the LCH Board. This framework defines the list of risks faced by LCH, the Board's tolerance for each risk, the standards which the Board expects LCH to meet in managing those risks, and, in addition, identifies the personnel with responsibility for each risk and sets reporting requirements. The Risk Governance Framework requires that a comprehensive risk policy framework is maintained which identifies how each risk is managed to those standards and within the Board's tolerance levels. The policy framework comprises a suite of risk policies, each of which is annually reviewed. Policies related to financial, modelling, and operational risks are reviewed annually by the LCH Risk Committee and, where appropriate, the LCH Operational Resilience Committee, before being submitted for approval by the LCH Board.<br><br>The risk management function is responsible for putting the risk policy framework into practice and making reports to the Risk Committee and the Audit Committee.<br><br>The CRO reports directly to the CEO of LCH and makes independent reports to the Risk Committee, the Audit Committee and Board as necessary. The CRO is responsible for the management and control of risks within LCH pertaining to the risk types identified in the Risk Governance Framework. The CRO is supported by an effective team with the necessary authority, expertise, access and resource. The team comprises the LCH Deputy CRO, the Heads of Credit Risk, Market and Liquidity Risk and the Head of Risk Resilience (responsible for second line oversight of operational, technology, information security and cyber, default management, third party and business continuity risk).<br><br>The Head of Internal Audit reports directly to the Chair of the LCH Audit Committee. The Head of Internal Audit is responsible for providing objective and independent assurance to the Board of LCH on the effectiveness of risk management arrangements and activities across the company. The Head of Internal Audit is supported by a team with the necessary authority, expertise, access to material, and independence from ongoing processes.<br><br>The LCH Board ensures it has adequate governance surrounding the adoption and use of risk management models by setting policies and standards for the minimum level of review and governance steps which are required for margin models. The review steps culminate in evaluation by the LCH Risk Committee, which makes recommendations related to the models to the LCH Board.<br><br>New and changes to existing margin models and related methodologies are reviewed through internal committees and external participant working groups as well as being subject to independent validation.<br><br>To manage a crisis or default, LCH has established a Crisis Management Team (CMT) and a Default Crisis Management Team (DCMT), each working across all of the LCH services. Each works within regularly reviewed plans and procedures |

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| | ensuring that LCH's response to and management of a crisis or default is well co-ordinated and effective, minimising the impact on the company's clearing businesses and its clearing members. |
| **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. | LCH discloses, on its website, detailed information on its operations and risk management. When changes are made to clearing house operations these disclosures are updated and, where appropriate, circulars are distributed to clearing members. Further to this, LCH routinely makes public announcements of changes in its Board directors, and LCH Group (the sole shareholder of LCH) holds General Meetings for its shareholders. LCH business updates that may have broad market impact are published on the LCH website. As noted in Principle 1 (Legal basis), clearing members are also consulted ahead of the implementation of material changes to the LCH Rulebook.<br><br>The LCH Board includes in its membership representatives of clearing members, and shareholders, thereby allowing these groups of stakeholders to be part of decision making on the design of services, rules, overall strategy, and major decisions. Further to this, the LCH Risk Committee also includes in its membership representatives of clearing members and clients, thereby allowing these groups of stakeholders to be consulted on recommendations made to the LCH Board on risk matters. The Executive Directors of the LCH Board and Committee members provide feedback from market participants, based on their day-to-day interaction, as part of these forums.<br><br>LCH applies a number of tools to seek feedback from its user community, including formal consultations and clearing member and client advisory forums and working groups.<br><br>At a working level, LCH engages with its clearing members and clients of clearing members in a range of advisory and risk working groups to support product development, upcoming changes and major decisions. LCH also consults with clearing members about material changes to its Rulebook.<br><br>As noted above, LCH complies with the LSEG Conflicts of Interest policy which sets out the methods for identifying and managing potential and actual conflicts of interest, including those between LSEG entities and their respective stakeholders. LCH requires all its employees to certify annually that all potential or actual conflicts of interest have been disclosed. Where a potential conflict may arise, specific conflicts of interest management procedures are applied. Actions LCH may take include applying "need to know" information barriers and ultimately disclosing any conflict which it could not sufficiently avoid or mitigate. |
| **Publicly available resources** | LCH Corporate Objectives<br>LCH Board Composition<br>LCH Committees' Composition<br>LCH Limited Board Reserved Matters and Delegated Authorities |

## Principle 3: Management of Risks

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

*The LCH risk management framework reflects the LCH Board's risk appetite and any amendments to this framework are subject to review and approval by the Board to ascertain that such changes remain in alignment with the Board's risk tolerance. The risks identified within the framework and the risk management tools used to mitigate such risks are subject to ongoing and regular review, through a robust governance process. LCH maintains a recovery plan and a wind-down plan, which are reviewed annually by the Board.*

| Key consideration | Detailed assessment |
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| **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. | LCH's overarching approach to risk management is administered according to the LCH Risk Governance Framework. This framework comprehensively identifies the range of risks to which LCH is potentially exposed and designates responsibility for these risks. Through the framework the LCH Board defines tolerance levels for each category of risk and sets guidelines for internal reporting to provide assurance that the framework is observed.<br><br>There are 32 risks defined within the Risk Governance Framework approved by the LCH Board split into five categories:<br><br>**Financial and Model Risks**<br><br>1. Default Management Risk<br>2. Latent market Risk<br>3. Procyclicality Risk<br>4. Credit Risk<br>5. Investment & Liquidity Risk (inc. Corp Treasury)<br>6. Settlement, Payment and Custody Risk<br>7. Model Risk<br>8. Capital Risk<br>9. Pension Risk<br>10. Insurance Risk<br><br>**Operational Resilience Risks**<br><br>11. Technology risk<br>12. Business Continuity Management Risk<br>13. Information Security and Cyber Risk |

14. Physical Security Risk
15. Third Party Risk
16. Data Risk
17. Operational Processes

**Strategic Risks**

18. Business Risk
19. Transformation Risk
20. Reputational Risk
21. Sustainability (Environmental, Social and Governance) Risk
22. Geopolitical Risk
23. Tax Strategy

**People & Culture**

24. Risk Culture
25. People and Talent

**Regulatory Compliance, Legal, Corporate Disclosure**

26. Legal Risk
27. Regulatory and Compliance
28. Conduct Risk
29. Oversight & Governance Obligations
30. Financial Crime
31. Fraud Risk
32. Financial Reporting and Tax

The framework is given effect by targeted and detailed policies. The Risk policies cover:

1. Financial Resource Adequacy
2. Collateral Risk
3. Contract & Market Acceptability
4. Counterparty Credit Risk
5. Liquidity Risk
6. Settlement, Payment and Custody Risk

7. Investment Risk
8. Operational Risk Management
9. Model Governance, Validation & Review
10. Default Management
11. Procyclicality Risk
12. Information Security Risk
13. Business Continuity
14. Technology Risk
15. Physical Security
16. Third Party Risk Management
17. Reputational Risk

These risk policies are managed by the LCH second line risk management function. Ownership of the risks and the control environment is defined in the policies, including the responsibility to maintain procedures in support of each relevant function.

Risks in the other categories are managed by dedicated business functions. The thresholds for what constitutes Within, Near and Outside risk appetite are defined in the Board Risk Governance Framework.

The CRO is responsible for ensuring that an appropriate framework is in place to measure and monitor the status of each of the 32 risks against the Board's appetite, which is reported to the Board regularly.

LCH operates systems which facilitate the accurate measurement and monitoring of risk exposures for all clearing services and associated functions. The systems support the clearing process through the following steps: data collection, clearing and risk calculation, reporting, and collateral/finance management and enable the aggregation of exposures across clearing services, counterparties, and risk types.

- **Data collection:** Data collection modules collect and process appropriate price data from internal feeds and external providers in order to feed the risk calculation systems across clearing services. They are the central repositories for market data, complete data validation and enrichment including interpolation, currency conversion, calculation of average prices and publish data.
- **Clearing & Risk calculation:** On the back of the data feed, clearing and risk services perform three main functions: (1) positions calculation and settlement instructions, (2) margin calculations and (3) stress testing. The positions calculation and settlement instructions are performed by the operational clearing platforms of each clearing service. These platforms enable the calculation of updated margin requirements at the member account level. Whenever the calculation of margin requirements results in a margin level exceeding the margin available at the clearing member/client accounts, the systems instruct the Collateral Management System (CMS) in preparation for appropriate

margin calls. CMS provides support for collateral services functions across all business lines in LCH. Finally, cross-business operational modules perform and store results of regular stress test analysis and margins under a wide range of identified stress scenarios.

- **Reporting:** Once risk calculations are completed, an array of reporting and presentation modules enable an effective exchange of information and communication with clearing members over positions and exposures across all business streams. The report generation capability is complemented by reporting services with secure authentication mechanisms which are dedicated to storing and presenting reports to LCH's clearing members and clients.
- **Collateral/finance management:** Finally, a set of systems related to finance functions, including collateral management and invoicing, are in operation. The collateral management function is supported by CMS mentioned above, which handles interaction with clearing members, and by the banking system, which supports both back and front office functionality for collateral management. The banking system is used across LCH to support front office operations (i.e. the input of trade deals related to collateral management), treasury operations (for processing the back-office workflow related to these deals), and feeds into finance's system (for monitoring and accounting processes). Calypso also includes management of counterparty risk, Protected Payment System (PPS) payments and risk limit checks. It maintains the records of deals of Treasury investments throughout their lifecycle, applies the balances and checks within the system and processes settlement through its automated connections to the Swift systems.

The LCH Board ensures it has appropriate governance surrounding the adoption and use of risk management models by setting policies and standards for the level of review and governance steps that are required. The review steps include evaluation by the LCH Risk Committee, which makes recommendations related to the models to the LCH Board.

New models and material changes to existing margin models and related methodologies are reviewed through internal committees as well as being subject to clearing member review and independent validation, in line with Board approved policies and standards. Once the internal review has been completed, new models and material changes are then reviewed by the Board Risk Committee before Board approval.

The Risk Governance Framework specifies the LCH Board's standards and tolerance for each risk type; these underlie the principles and standards detailed in the risk policies. Risk indicators are used to monitor the effectiveness of the risk management framework. These indicators include back-testing of initial margins, Cover 2 stress testing of clearing member exposures against default fund sizes, aggregate exposure measures, counterparty credit scores, liquidity ratios, interest rate risk limits and operational risk assessments.

System performance is constantly monitored; methodologies for the calculation of key risk parameters, including margin levels, stress testing, collateral haircuts, liquidity ratios and counterparty credit scoring are independently reviewed at least annually, with a strict governance process in place for managing changes. The LCH Board reviews regular reports demonstrating

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| | compliance with the frameworks. The risk policies supporting the framework are also subject to review by the Board Risk Committee and approval by the Board at least annually, taking into account changes in market and regulatory environments. |
| **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. | Since initial margin and default fund requirements are proportional to risk, each clearing member has an incentive to manage and contain the risks it poses to LCH in order to reduce their financial obligations. LCH's application of margin multipliers which increase initial margin requirements with credit, liquidity, concentration, wrong way, and sovereign risks that exceed base assumptions, provides an additional incentive.<br><br>LCH's policies and systems are designed to allow clearing members to manage and contain their risks by applying industry standard techniques where appropriate, which can be understood and replicated.<br><br>In the event that LCH's routine risk monitoring identifies instances in which a clearing member's portfolio sensitivity to price movements exceeds acceptable tolerances, LCH informs these clearing members and may help organise voluntary, mutually risk-reducing trades between clearing members.<br><br>As noted under Key Consideration 1, LCH provides clearing members with reports including information on their positions and exposures across all business streams. Further, clearing members are provided with details of the margin and other default resource methodologies, in addition to a range of disclosures explaining LCH's risk management policies. Furthermore, LCH's clearing services provide tools enabling its clearing members to model the impact on their margin liabilities of new trades or adjusted portfolios.<br><br>LCH imposes financial obligations on clearing participants primarily in the form of margin requirements, and prefunded and unfunded resources, proportional to the scale and nature of a participant's activities.<br><br>Initial margin requirements for clearing participants are outlined in Principle 6 (Margin) and are a function of the size, volatility and correlations of a participant's cleared positions. Additional margin can be called from a participant if its positions become more concentrated or illiquid or are deemed to be riskier.<br><br>Default fund contributions are called from participants in proportion to their initial margin requirements or uncovered stress losses and therefore in proportion to the scale and nature of their activities. Default Fund Additional margin (DFAM) is called from participants with a stress test loss over initial margin (STLOIM) that exceeds a certain proportion of the Default Fund size, up to a maximum of 45 percent, based on the participant's creditworthiness. Consequently, participants that bring more risk to the CCP collateralise more of that risk bi-laterally.<br><br>Both unfunded contributions (that would meet uncovered losses if the default fund was depleted in the event of a clearing member default) and supplementary contributions (that would replenish the default fund once the service default management process had been completed) are calibrated according to participants' contributions to the default fund and are therefore |

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| | proportional to the scale of their activities. In addition, the requirement to participate in default management auctions is limited to the products and currencies in which the clearing member is actively clearing. |
| **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. | The LCH Risk Governance Framework is a policy document which helps LCH identify the risk types to which it may be exposed, as noted under Key Consideration 1. The policy also helps to assess the extent to which a risk type is acceptable to the LCH Board and sets out the responsibilities for measuring, monitoring and managing each risk type. By managing the risks posed to its own solvency and orderly operation, LCH limits the risks that it poses to other entities and financial markets.<br><br>The CRO is responsible for periodically assessing LCH against the risk tolerances identified in the framework and to report the findings to the Board. The framework itself is reviewed at least annually.<br><br>In terms of risks related to linked FMIs and settlement banks, LCH seeks to manage i) settlement risk, posed by a failure in the physical settlement process, ii) payment risk, arising from the default or operational failure of a PPS bank or concentration bank, and iii) custody risk, arising from a custodian's insolvency, negligence, misuse of assets, fraud, poor administration, or inadequate record keeping.<br><br>As explained further below, LCH has measures in place to mitigate the above risks, including a requirement that any concentration/custodian bank/business partner used by LCH meets a minimum level of internal credit score. In addition to continual monitoring of the performance of all FMI links that give rise to settlement, payment or custody risks, due diligence of all FMIs is performed at least every two years, or more frequently if there have been significant changes.<br><br>LCH conducts its money settlements in central bank money where possible; for all other money settlement LCH minimises and strictly controls the credit and liquidity risk arising. See Principle 9 (Money Settlement) for further detail.<br><br>LCH safeguards its own and clearing members' assets and minimises the risk on and delay in access to these assets arising from its custodian arrangements. LCH satisfies itself via the due diligence process and legal review that it would have access to these assets in the event of the custodian bank's default. In addition, LCH has in place metrics that monitor the settlement and payment process for fails and control issues intraday and has contingency plans for any disruption of payment flows/custodian arrangements. Where possible, LCH uses Delivery versus Payment (DvP) settlement models, or strictly ensures receipt of securities prior to payment. Further, investments are only permitted in instruments with minimal credit, market, and liquidity risks, in line with applicable regulatory requirements.<br><br>The LCH CRO, working together with the Collateral and Liquidity Management (CaLM) Risk Management function, is responsible for the monitoring of settlement, payment and custody risks. The risk monitoring aspect is covered in detail in the LCH Settlement Payment and Custody Risk policy. In accordance with this, LCH sets overnight and intraday exposure limits to intermediaries which are monitored by the Collateral Operations department; in addition, daily reporting of custodian exposures is prepared by CaLM Risk. Where cash balances are held on account at a commercial custodian bank temporarily in connection |

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| | with investment activity, LCH manages transactions throughout the day such that its intraday exposure to the custodian bank remains below 75 percent of LCH's own capital, a limit set in risk policy. Risk exposures to custodian banks are aggregated with risk exposures to the same entities arising from investment, clearing or payments activity and monitored against credit limits set per entity.<br><br>Clearing members' exposure to the performance of PPS banks is also monitored daily by the LCH Collateral Operations department – any delays in PPS payments greater than two hours will be escalated and investigated immediately.<br><br>LCH has interoperability arrangements with other CCPs through the EquityClear service. Interoperable CCPs are subject to the same risk management framework applied to LCH clearing members. In assessing the contagion risk from the default of a linked CCP, consideration is given to the strength of default resources and default management procedures within the interoperating CCP's rules and procedures, and that risk is fully collateralised through exchange of margin; such collateral is held in a bankruptcy remote structure. LCH also assesses the market and credit risk posed by interoperating CCPs, and ensures additional margin is called where necessary. Moreover, the Counterparty Credit Risk policy specifies that the factors, metrics and adjustments for interoperating CCPs are subject to review at least annually, and independently validated in accordance with the Model Governance Validation and Review policy. All new interoperating CCP arrangements are subject to internal governance processes and regulatory approval.<br><br>LCH maintains a Recovery Plan, which includes an analysis of the potential impact upon LCH, or linked FMIs, in the event of either party entering a recovery scenario. The analysis is based on consideration of the following factors: service received / provided; key risks / event; impact of risk event; back up / contingency available; mitigating factors; approach to recovery for each FMI. The Recovery Plan is reviewed and approved by the LCH Board annually. With respect to operational risk, LCH requires that the operational set up and performance of all intermediaries comply with the Operational Risk Management Policy.<br><br>All operational risks are scored using a risk severity matrix, which assess the likelihood (from remote to expected) vs impact (from limited to severe) of each risk. The risk assessment, when assessed against the Board's appetite for each risk, results in the risk status being Within, Near or Outside Appetite. This rating is derived by determining a set of key controls for each risk and checking the robustness/effectiveness of each individual key control. Principle 17 (Operational Risk) further describes how LCH manages the operational risks that its providers might pose to LCH operations, and how LCH identifies, monitors, and mitigates the operational risks LCH may pose to other entities. |
| **Key Consideration 4:** An FMI should identify scenarios that may potentially prevent it from being able to provide its | In accordance with the recognition requirements for CCPs contained in Section 29B of the FSMA 2000 (Recognition Requirements Regulations, as amended), LCH maintains a Recovery Plan. The Plan sets out the steps that LCH will take in order to maintain the continuity of the services that it provides and the activities that it carries out that are specified in its recognition order if such continuity is threatened. The LCH Recovery Plan considers the guidance on CPMI IOSCO Recovery of Financial Market Infrastructures. Additionally, as required by EMIR, LCH maintains a Wind Down Plan which describes the |

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| 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. | scenarios and events that may trigger the Wind Down Plan alongside the expected activities to wind down the clearing activities of LCH.<br><br>LCH operates a Risk Governance Framework, which has the objective of defining risk appetite, designating responsibilities for the measurement, monitoring and managing of risks and providing guidelines for assurance activities associated with the framework. Through the execution of this framework, LCH identifies scenarios that may threaten its ability to continue to provide critical clearing services. In addition to the embedded risk framework, specific Recovery and Wind Down planning exercises have taken place to document, for inclusion in the Plans themselves, high level scenarios that may threaten LCH's ability to provide clearing services. Scenarios used for the purposes of assessing the effectiveness of the recovery tools and to identify the actions required under the Wind Down Plan relate either to:<br><br>- Member default losses resulting in uncovered credit losses or liquidity shortfalls; or to<br>- Non-default losses that threaten LCH's solvency, arising from general business risks, custody and investment risks and uncovered liquidity shortfall associated with these risks.<br><br>The plans have been created with the objective of either ensuring continuity of critical services (Recovery Plan) or maintaining stability in financial markets by avoiding a disorderly failure of the CCP (Wind Down Plan). These objectives continue to be met by the comprehensive set of recovery tools available to LCH and the relevant wind down procedural steps and associated ring-fenced capital required to enable execution of the Wind Down Plan.<br><br>Reviews of both the Recovery and Wind Down Plans take place at least annually and are supported by testing conducted in annual market exercise regimes (e.g. default management fire drills where use of recovery tools may be tested) in order to simulate the implications of executing the Recovery and/or Wind Down Plans to ensure they remain relevant. Additionally, if the underlying business model of LCH is amended, the change framework ensures that the implications of a change to the business model are considered with reference to the Recovery and Wind Down Plans and any necessary updates are made. The LCH Board approves the Recovery and Wind Down Plans and is the final governance authority for updates to the plans. |
| **Publicly available resources** | Risk Management Overview<br><br>Margin Methodology<br><br>Default Waterfall |

## Principle 4: Credit Risk

**An FMI should effectively measure, monitor, and manage its credit exposure 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 include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.**

*The LCH risk management framework is designed to measure, monitor, mitigate and manage risks posed to LCH and its clearing members. LCH maintains financial resources sufficient to cover the default of the two member groups with the largest exposures under extreme but plausible conditions. LCH's overall risk management framework sets out internal policies, procedures and processes to identify and manage current and potential future credit exposures that arise as a result of LCH's business activities and operations. Policies require that variation margin is collected to manage current exposures; initial margin is collected to meet potential future exposures over conservative holding periods, at least a 99.7 percent level of confidence[4]; and default fund resources are sized based on covering the defaults of two member groups in a range of theoretical and historical stress scenarios. LCH assesses margin coverage, and calls margin where necessary, multiple times each day.*

| Key consideration | Detailed assessment |
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| **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, | LCH manages its credit exposures to clearing members through the maintenance of prefunded financial resources, the enforcement of participation criteria and regular monitoring. In addition, the LCH Rulebook allows LCH to call for additional funds from clearing members under certain conditions.<br><br>The prefunded financial resources include initial margin. As further explained under Key Consideration 4 and in line with the LCH Financial Resource Adequacy policy, the initial margin model for each clearing service is calibrated to the 99.7 percent confidence level. This ensures that enough margins are held to cover the potential loss from any member (including the clients of that member) to a 99.7 percent level under normal market conditions, should LCH need to close out that member's portfolio within the given holding period[5]. This standard is monitored at least daily in each clearing service through a clean profit and loss back-test, and the results reported periodically to the LCH Board Risk Committee and the LCH Board. |

[4] LCH's Listed Rates service is will to operate with a 99 percent confidence level, once re-launched in September 2024.
[5] The ForexClear, SwapClear, and RepoClear services apply a holding period of five days for clearing members. The EquityClear service applies a holding period of three days for clearing members.

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| potential future exposures, or both. | Initial margin, as well as additional margins which are collected to cover member specific portfolio risk arising from both house and client activity (e.g. concentration/liquidity risk; wrong way risk), are complemented by the default fund. This is a prefunded mutualised pool of resources available to cover any further potential losses to LCH in the event of a default during an extreme market stress. The default fund for each service is based on a Cover 2 standard, so that it must be enough to cover the potential losses from a close-out in an extreme event of the largest two clearing member portfolios and all clients of both these members. Stress tests to assess the adequacy of the default fund size are run daily. In addition, LCH has a Reverse Stress Testing Framework to ascertain adequacy of financial resources held against member positions. The financial resources in question include all margin coverage, default funds and liquidity resources.<br><br>LCH calculates Internal Credit Scores (ICS) for each clearing member and other counterparties to which LCH has an exposure through an assessment of both quantitative and qualitative factors. These ratings influence LCH's risk management function's response to more specific risks identified by daily monitoring, as well as determining the frequency of future assessments of each clearing member. These internal credit ratings are also considered by internal risk governance.<br><br>LCH's risk management function is responsible for reviewing each clearing member's creditworthiness and financial condition. Clearing members' positions are monitored continuously, with focus on the size of each clearing member's cleared positions relative to its capital and to the total open interest in a particular contract.<br><br>Further, all new products and product extensions are subjected to the risk governance process in order to ensure that all new or novel risks introduced by the product, market, maturity or currencies are appropriately assessed as to their impact on the current risk management practices. Where additional risk measures are required, such as amendments to existing margin calculations, these are proposed along with a formal application to clear the new products through the risk governance process.<br><br>LCH's credit scoring framework is reviewed at least annually, as part of the regular policy review. This review will take account of changes to the business and market environment, market practices and new products; the LCH Risk Committee will review and recommend a decision to the LCH Board, which will make the final approval decision. |
| **Key Consideration 2:** An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk- | LCH identifies sources of credit risk in the Counterparty Credit Risk policy, listing the following within scope: clearing members and (indirectly) their clients, interoperating CCPs, sovereigns and all other intermediaries. The latter group includes investment counterparties, concentration banks, central securities depositories, settlement agents and custodians.<br><br>Credit risk from clearing members arises from potential non-payment of monies due to LCH, e.g. settlement amounts, margins, default fund contributions and fees. Once a clearing member is placed into default, losses may be incurred during the liquidation/transfer of that clearing member's positions, including those of its clients. Risks are mitigated through the |

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| management tools to control these risks. | provision of collateral for margins which is monitored and can be adjusted intra-day, default fund contributions which are monitored daily and adjusted monthly, LCH's own capital and loss allocation measures provided for in the Rulebook.<br><br>Credit risk from interoperating CCPs arises from potential non-payment of monies due to LCH, e.g. settlement amounts and margins. If an interoperating CCP is placed into default, losses may be incurred during the liquidation/transfer of that CCP's positions. Risks are mitigated through the provision of collateral for margins which is monitored and adjusted intra-day and LCH's capital. Please see Principle 20 for more information on linked FMIs.<br><br>Credit risk from sovereigns (including government agencies and supranationals, where eligible) arises from investment of member cash margins or LCH's own capital in debt issued by or guaranteed by a sovereign. Credit deterioration of the sovereign may lead to the potential inability of LCH to realise the full investment amount including interest accrued.<br><br>Risks are mitigated through the application of a conservative investment risk policy, haircuts on securities and concentration limits on issuers, rules providing for loss allocation to members and LCH's own capital.<br><br>Credit risk from sovereigns (including government agencies and supranationals, where eligible) also arises from acceptance of debt issued or guaranteed by a sovereign as collateral from a clearing member to meet margin liabilities. Credit deterioration of the sovereign may lead to the potential inability of LCH to achieve sufficient value from sale of sovereign debt realised during liquidation/transfer of a defaulting clearing member's portfolio.<br><br>Risks are mitigated through haircuts on securities and concentration limits on issuers; the ability to call for other forms of member margin collateral, and default fund contributions which are monitored daily and adjusted monthly.<br><br>Credit risk to investment counterparties and concentration banks arises from the holding of unsecured cash deposits with credit institutions which may be lost in the event of such a credit institution's default. Risks are mitigated through credit criteria and limits, intraday monitoring and management, non-default loss allocation to members and LCH's capital.<br><br>Credit risk to Central Securities Depositories (CSD), including International Central Securities Depositories (ICSD), settlement agents and custodians arises from the holding of securities in the name of LCH and its members, and from time-to-time small cash amounts arising from settlement fails. Such fails also occasionally give rise to cash or securities being held at (I)CSDs, settlement agents or custodians overnight. Risks are mitigated through the legal segregation structure covering such assets, monitoring of limits, non-default loss allocation to members and LCH's capital.<br><br>Exposures to all these entities are calculated at least daily.<br><br>LCH has a number of tools to limit credit risks arising from investment, payment, settlement, and custody activities, including:<br><br>• Outright and concentration limits per counterparty and instrument type, scaled by ICS;<br>• Application of haircuts on securities received as collateral; |

- Intraday and overnight limits for intermediaries;
- Use of DVP where appropriate;
- Use of central bank facilities where available; and
- Preference for (I)CSDs over credit institutions.

The continued appropriateness and effectiveness of these tools is monitored through daily exposure and limit reporting as well as part of the annual policy review.

LCH calculates internal credit ratings for each clearing member through an assessment of both quantitative and qualitative factors, on a review cycle based on ICS. These ratings influence LCH's risk management function's response to more specific risks identified by daily monitoring, as well as determining the frequency of future assessments of each participant. These internal credit ratings are also considered by the Executive Risk Committee.

LCH monitors all clearing members' compliance with LCH's net capital requirements on an on-going basis and clearing members are obliged to provide certain financial information for this purpose as set out in the LCH Rulebooks. All clearing members are also obliged to immediately notify LCH in the case of a significant reduction in their shareholders' funds or net capital as compared to their previous financial returns.

In the course of its monitoring of credit exposures, LCH may identify a risk not appropriately captured by its existing margin models. To cover this risk, LCH may at its discretion call additional margin not described in its policies.

**Key Consideration 3 is not applicable to CCPs.**

**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

LCH uses variation margin, initial margin, a dedicated portion of its own resources and four mutualised, service specific default funds to cover current and potential future exposures to its clearing members.

Variation margin is called at least daily to cover market price movements on each clearing member's positions. Initial margin is called at least daily and is calibrated to a 99.7 percent confidence level, assuming an appropriate holding period and using market prices from a sufficiently long lookback period.

Further margins (add-ons) are called from clearing members based on their credit scores, those that have large or concentrated positions or positions that are illiquid or exhibit correlation with the member itself; and in some circumstances where the clearing member has excessive exposures modelled under stress scenarios.

In order to cover potential future exposures to clearing members under extreme but plausible market conditions, clearing members contribute to the service specific default funds. LCH maintains additional financial resources sufficient to cover a wide range of potential stress scenarios that include, but are not limited to, the default of the two clearing members and their

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| 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 exposures 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 affiliate 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 | affiliates that would potentially cause the largest aggregate credit exposure for LCH in extreme but plausible market conditions. Therefore, the default funds are sized to meet the largest two member stress losses above margins (including those of clients and affiliates) and collateral positions, applying a set of scenarios of extreme but plausible market conditions. LCH introduced new stress test scenarios into its default fund framework during the review period, it now combines stress losses for margin collateral, liquidity costs, and cleared positions. This change is further described under Principle 5 (Collateral).<br><br>The first step in the monthly sizing process for a given default fund is to calculate each clearing member group's potential loss on their cleared portfolio under every stress scenario for each day in the lookback period (between 1 and 3 months depending on clearing service); no netting of client and house portfolios, nor across client accounts, nor affiliated entities is permitted. Secondly, the potential losses for each account are reduced by the margin liability for that account on that day. Negative outcomes (i.e. where the modelled portfolio loss exceeds margins held) are summed per stress scenario for each clearing member group. Thirdly, for each day and for each scenario, the largest two negative net stress outcomes are aggregated; these figures represent the daily Cover 2 requirement for each scenario. Finally, the default fund value is computed as the largest such Cover 2 requirement multiplied by 1.1, to include a 10 percent buffer. This process is performed separately for each of the clearing service specific default funds. In order to prevent a situation where large net stress losses modelled for a single clearing member distorts a service's default fund, where the loss of either of the two clearing members driving the monthly re-sizing exceeds 45 percent of the default fund value, an amount up to the difference between the clearing member's net stress loss and 45 percent of the default fund value may be deducted from the default fund value if such member contributes an equal amount in monthly DFAM.<br><br>The default funds' values may be subject to the application of a floor or cap, as prescribed in the service-specific Supplements to the LCH Default Rules. In such cases, the daily clearing limits described later in this section will apply.<br><br>The SwapClear and ForexClear Default Funds are augmented by a Trade Registration Fund (TRF). This is an additional pool of resources contributed to by SwapClear and ForexClear clearing members respectively to facilitate real time trade registration by permitting the acceptance of trades for which the clearing member has insufficient prefunded margins. The usage per clearing member at any time is strictly limited. In the event of a default, the TRF forms part of the mutualised respective SwapClear and ForexClear Default Funds available to LCH.<br><br>In its default waterfall, LCH places a portion of its own resources, an amount equal to 25 percent of its minimum net capital held in accordance with Article 16 of EMIR and Commission Delegated Regulation (EU) No 152/2013 RTS, as effective in EU EMIR and retained in the UK under the European Union (Withdrawal) Act 2018, ahead of all non-defaulting members' contributions to the mutualised default funds. |

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| total financial resources it maintains. | There are underlying procedures and model documentation for each of the services that outline the key principles adopted for the calculation of initial margin, variation margin and default funds to cover credit exposures to each clearing member. All such models are independently validated at least annually.<br><br>Variation margin liabilities must be covered by clearing members in cash. Liabilities for initial margin, contingent variation margin and further add-on margins may be met by clearing members either in cash, in a set of eligible currencies, or by pledge of securities issued or explicitly guaranteed by high quality sovereigns, supranationals and government agencies.<br><br>Contributions to default funds are only acceptable in cash, using prescribed currencies.<br><br>Margins are calculated separately for each proprietary account and for each client account. Default Fund contributions are calculated per clearing member.<br><br>Prompt access to these resources is ensured through the use of high-quality custodians for assets pledged and the investment of cash received according to the internal policy, which sets minimum standards for the security, quality and liquidity of assets and instrument type.<br><br>As described above, LCH's Risk Appetite and policies establish that a confidence level of 99.7 percent is used when assessing LCH's potential close-out losses in the event of a clearing member default in all but extreme market conditions. The sufficiency of these financial resources is evaluated daily via statistical test results and back-testing coverage ratios. A reduction in coverage would initiate further investigation which may lead to a formal model review in accordance with LCH's model validation governance. Interim measures include amending configurable model parameters and/or calling additional margin from affected members until model remediation is complete. LCH's risk controls include a range of financial resources to cover its credit exposures. These consist of: margin provided by clearing members in respect of their outstanding positions; capital contributions from LCH; and segregated, mutualised default funds of prefunded contributions from clearing members. These resources would be used in the following order to cover loss due to a clearing member's default: the defaulted clearing member's margin and default fund contributions; LCH's capital contribution; and contributions from non-defaulting clearing members to the relevant default fund.<br><br>The LCH Rulebook provides for the segregation of each of the EquityClear, RepoClear, ForexClear and Rates default funds from the financial resources of each other under a limited recourse structure; accordingly, the financial contributions of non-defaulting clearing members to each default fund cannot be utilised to meet losses arising from the default of clearing members in other services. Further, this segregation provides for the continuation of LCH's other services should any single service close.<br><br>Stress losses on each clearing member's positions and collateral portfolio, including those of its clients and affiliates, are modelled each day against the set of extreme but plausible stress scenarios used to size the default fund and netted against margins held. Their largest net stress loss is limited to a maximum of 45 percent of the relevant default fund (the daily |

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| | clearing limit); clearing members with weaker credit scores have lower limits. Any clearing member with a net stress loss above their limit is called additional margin to reduce their net stress exposure within limit; this is termed daily DFAM.<br><br>In addition to the daily stress testing of default fund adequacy, quarterly reverse stress testing is carried out to examine the stress testing results to determine whether there exists a combination of more than two clearing members defaulting under the same scenario which would result in the default fund being exhausted. The results, together with any recommended actions, are reviewed by internal risk governance and are reported to the Risk Committee quarterly.<br><br>The rationale for the financial resource sizing is documented in both the LCH Board's Risk Appetite statement and the LCH Board approved suite of risk policies. Risk Appetite is expressed in the Risk Governance Framework, issued by the LCH Board at least annually, which establishes the risk appetite and tolerance for each identified risk, and sets the high-level standards it expects LCH to adopt in managing such risks.<br><br>LCH maintains policies covering each of the risk types and detailing how each risk is managed according to the LCH Board's expectations. These policies are subject to a thorough review at least annually by internal risk governance and the Risk Committee and approved by the LCH Board. Financial resource holdings are covered by the Financial Resource Adequacy policy.<br><br>In addition, the LCH Rulebook sets out a variety of participation requirements (please see Principle 18 – Access and Participation requirements for further details) and defines the rights of LCH to impose credit risk controls on participants. The Counterparty Credit Risk policy describes the process by which credit risk controls are implemented. |
| **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 | LCH assesses the sufficiency of the default funds through daily stress testing. Sufficiency is assessed with reference to the sum of the two largest stress test losses under extreme but plausible scenarios, plus the stress test losses of the relevant members' affiliates and clients, and collateral portfolio. This process involves the daily revaluation of each clearing member's portfolio using a set of historical and theoretical stress test scenarios incorporating price and volatility shifts to estimate a worst-case loss in excess of that clearing member's initial margin.<br><br>Each month LCH performs a comprehensive analysis of the current stress testing scenarios against the latest decennial portfolio losses. This is documented in risk management function procedures. The analysis attempts to identify any portfolios that are prone to excessive historical loss scenarios not captured in the existing stress testing suite. The combination of unique portfolio effects and historical market movements provide an all-inclusive view of the credit exposures LCH may experience under stressed market conditions. The analysis complements the daily monitoring of member stress testing losses and the ad-hoc reviews in anticipation of known events such as national elections etc. |

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| 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 considering 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 | Stress test results are continually reviewed and monitored by the risk management function, with formal approval sought on changes to the framework as necessary from the LCH Board with recommendations made by the Risk Committee.<br><br>The LCH CRO is responsible for implementing and maintaining the framework, making recommendations as necessary to maintain a robust framework and reporting to, or seeking approval as necessary from, the LCH Board.<br><br>The stress testing framework is independently reviewed annually, with a full review of the coverage of the contracts cleared, model assumptions and parameters. This process also involves a review of stress test scenarios to ensure their plausibility and accuracy. In addition, ad hoc reviews are carried out when it is deemed that a change in the market may have a material impact on any scenario's plausibility, or on the launch of a new product.<br><br>Reverse stress testing is carried out regularly which examines whether plausible scenarios may exist which would produce more extreme results than those of the current suite of scenarios. The results, together with any recommended actions, are reported to the Risk Committee quarterly.<br><br>The Model Governance, Validation and Review policy sets out all the relevant steps relating to a new or changed model from initiation to independent validation, encompassing a regular model performance review and ensuring that any model changes are within the LCH Board's Risk Appetite. Independent validation is conducted by an LCH internal independent specialist team, the central LSEG model validation team, or by external specialist independent firms at least annually. The results of the reviews are analysed internally and shared with the LCH Board Risk Committee and regulators, together with recommendations of the independent teams and actions taken. |

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| be performed at least annually. | |
| **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. | LCH maintains a record of historical stress test scenarios covering financial crises and exceptional trading days in the last 30 years. These are a well-recognised set of past stresses in use today by most financial institutions. Any changes are subject to approval by the Executive Risk Committee and are reported to the LCH Board Risk Committee. Such changes will lead to the inclusion of scenarios covering new periods of increased market volatility which are added to the set of historical stress test scenarios as soon as practicable.<br><br>In addition, LCH maintains and regularly reviews a suite of theoretical scenarios which entail either a remodelling of historically observed scenarios, with more extreme movements and/or de-correlation, or hypothetical scenarios including for example a sovereign default, price changes and yield curve shifts.<br><br>Together, the scenarios suite covers historical, antithetic, theoretical, de-correlation and Portfolio Specific Liquidity (PSL) stresses. The PSL scenarios are stresses which seek to uncover hidden risks such as basis and spread risk specific to portfolio types. The PSL approach is well suited to generate distribution led portfolio dependent scenarios which complements the traditional risk factor push methods. These mechanisms ensure that the scenarios include extreme but plausible conditions for all clearing member portfolios.<br><br>The stress scenario suite, together with the default fund sizing methodology, is independently validated at least annually. |
| **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 | All clearing members of LCH are bound by the LCH Rulebook. If a clearing member defaults, then the Default Rules, particularly Rule 15 of the Default Rules and the provisions of each "Default Fund Supplement", establish a waterfall to allocate the losses arising from the default. The losses are allocated in the following order:<br><br>1. Defaulter's margin<br>2. Defaulter's contribution to all LCH default funds<br>3. A pro rata allocation of LCH's capital calculated in accordance with Article 35 of Commission Delegated Regulation (EU) No 153/2013 RTS supplementing EMIR, as effective in EU EMIR and retained in the UK under the European Union (Withdrawal) Act 2018. |

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 stress events, so that the FMI may continue to operate in a safe and sound manner.

4. Non-defaulters' funded contributions to the relevant default fund that covers the service(s) in which the defaulter has caused losses
5. An unfunded contribution from each non-defaulter equal to the non-defaulter's funded contribution to the default fund(s) in which the defaulter has caused losses. Only one unfunded contribution may be called per default, and no more than three unfunded contributions can be called in a six-month period
6. A daily loss allocation to non-defaulters based either on cumulative gains (SwapClear and ForexClear) or an allocation of the daily shortfall pro rata to the funded contribution to the relevant default fund (RepoClear and EquityClear[6]). This step may be subject to a cap.
7. In the cases of SwapClear and ForexClear, LCH may then invite non-defaulting clearing members to make voluntary contributions for service continuity. In RepoClear and EquityClear case[8], clearing members must pay a further amount equal to their loss allocation.
8. If there are further losses, open contracts of an affected service are closed out with any shortfall being allocated pro rata across those clearing members who are owed funds from the service.

The process outlined above applies to both a single default and the default of multiple clearing members. CCPs with which LCH has an interoperable link do not contribute to default funds; losses arising in excess of margins held from a defaulted co-CCP will be offset by the same waterfall of resources as with the default of a clearing member, including the relevant default fund.

If LCH borrows funds from a liquidity provider to manage a default, then the cost of funding and the repayment of the borrowed amount will be met through the resources in the default waterfall.

LCH has four default funds. Each default fund is established via a "Default Fund Supplement" contained in the Default Rules.

Following the completion of the default management process, the relevant default fund enters a 30-calendar day "cooling off period". During the cooling off period, each default fund may be replenished to the level of its floor, within two days, but it is otherwise held at its post-default level until the end of the cooling off period. During this time DFAM is called to ensure that the waterfall is fully funded and meets the Cover 2 standard. At the end of the cooling off period, the relevant default fund is subject to a full recalculation, and it is funded up to its recalculated level.

At all times, each non-defaulting clearing member is appropriately margined and a non-defaulter's margin is not used for default management.

[6] This will also be applicable to Listed Rates once re-launched.

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| | The clearing limits described under Key Consideration 4, whereby clearing members whose net stress losses exceed 45 percent of the default fund value are required to post daily DFAM, are always applied including during the management of a member default when the default fund value may be decreasing.<br><br>Any capital expended by LCH as part of the default management process would be replenished from its own resources, as described in the Recovery Plan.<br><br>Stress testing is incorporated as part of the routine oversight and monitoring of clearing members. For example, the stress test loss over total margin (STLOTM) for the two participants giving rise to the largest exposures in the SwapClear service are included in a daily report that is distributed to the LCH Management Team. Additionally, a summary of the stress test results, and accompanying analysis is presented to the LCH Risk Committee for review on a quarterly basis.<br><br>The LCH services call monthly DFAM from the largest participant group whose stress test loss over additional margin (STLOAM) over the past 30-90 days business days (dependent on service) exceeds a specified threshold, determined by its ICS, relative to the default fund. LCH also calls daily DFAM from any participant with STLOAM in excess of a predefined proportion of the default fund. The predefined proportion ranges from zero to 45 percent, depending on the participant's ICS. On the morning of each business day, LCH notifies participants of any daily DFAM due. A clearing member's PPS bank must provide LCH with confirmation that it will pay the amounts required within one hour of receiving the notification. The purpose of daily DFAM is to ensure participants with outsized exposures collateralise more of their own risk.<br><br>If more than two members were being called monthly DFAM due to exposures above the cap for the default fund for a sustained period (e.g. three months+) LCH would look to review the appropriateness of the level of the cap. |
| **Publicly available resources** | LCH Rulebook (inc. the Default Rules)<br><br>Risk Management Overview<br><br>Default Waterfall<br><br>Acceptable Collateral<br><br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*Only financial instruments that are of high quality, highly liquid, and with low credit and market risk can be considered for LCH's eligible collateral list. LCH's risk policies take such criteria into consideration and set the standards for the acceptance of collateral. This policy framework, along with underlying procedures, incorporates development of appropriate haircuts, addresses procyclicality considerations and the application of concentration limits and monitoring, and provides for responsive and comprehensive operational systems and processes.*

| Key consideration | Detailed assessment |
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| **Key Consideration 1:** An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks. | LCH has a Collateral Risk policy in place that sets out the types of acceptable collateral and the criteria for determining eligibility. For instance, to ensure LCH considers the broad effect on the market, acceptable collateral must be in a currency in which LCH clears and which is commonly accepted in the relevant jurisdictions in which LCH operates, and for which there is an FX market with a published FX rate, financial instruments must be high quality, highly liquid, with low credit and market risk – there must be sufficient market liquidity, and it must be possible to establish mark-to-market value daily using observed process from published sources. For financial instruments the issuer must meet a minimum ICS, described in Principle 4, and be approved through appropriate LCH risk governance processes. Further, any exceptions to the policy require a formal request for approval to the Executive Risk Committee.<br><br>If the Executive Risk Committee pre-approves the exception, this decision is notified to the LCH Board Risk Committee. However, to date, there have never been any exceptions granted to the collateral policy for LCH. Exceptions are available as a contingency measure and only to be used in exceptional circumstances. The Collateral Risk policy is reviewed annually, and any revisions are subject to LCH Board approval.<br><br>To provide flexibility in collateral eligibility, LCH accepts a range of currencies and traded securities as initial margin. LCH maintains a list of collateral eligible for use in its services on its website, including details of haircuts. Typically, LCH engages with its participants in advance of changes to collateral eligibility to minimise any disruption from such changes.<br><br>LCH operates and maintains CMS through which requests by clearing members to deposit or release collateral are made. CMS lists only LCH eligible collateral, thereby preventing the submission or receipt into the CCP of ineligible collateral. |

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| | LCH maintains a framework for the monitoring and identification of wrong-way and other concentration risks. The collateral risk framework covers several risks, including wrong-way and concentration risk, that require review and escalation when breaches of concentration limits occur, along with mitigation steps.<br><br>LCH's risk policies are reviewed on an annual basis. |
| **Key Consideration 2:** An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions. | LCH marks its collateral holdings to market daily using observed market prices from published sources in accordance with internal LCH policy. LCH introduced additional checks during the review period, whereby it tests its ability to stand up an alternative price data source for collateral valuation using an additional vendor. This ensures LCH is able to mark-to-market collateral on a real time basis, even in the event its main data provider is unavailable.<br><br>LCH is entitled to give any instrument or security lodged as collateral a zero value if it is found in any way to be unacceptable. Further, if, in the opinion of LCH, any asset that has been transferred to it by a clearing member as collateral is no longer either of sufficient value or otherwise acceptable to LCH, it shall be entitled to demand further collateral from such member, in keeping with the LCH Rulebook provisions.<br><br>LCH's internal policy defines its collateral haircut framework; the framework includes regular monitoring and review of haircuts, and a stress testing regime that contains extreme but plausible scenarios. Collateral haircuts are made up of a base haircut as well as add-ons, and cover market risk, credit risk, wrong-way risk and FX risk in addition to concentration and liquidity risk. The methodology used takes into consideration various factors including the ability to realise the value of a piece of collateral, appropriate lookback periods, attributes of issuers and price correlations. Haircuts must also comply with the internal policy on procyclicality. FX haircuts are determined based on the historic volatility of the relevant currency pair and are applied consistently across all collateral, cash or securities. |
| **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. | During the routine review of haircuts in normal and stressed market conditions, LCH may defer or phase in changes to haircuts, if deemed necessary, to avoid excessively procyclical effects in accordance with the LCH Procyclicality policy. LCH internal policies require that a 10-year price history, plus a stress period, is to be used in haircut calibrations thereby reducing the need for procyclical adjustments.<br><br>During the review period, LCH introduced new stress test scenarios into its default fund framework. These stress test scenarios are used to size the default fund, monthly Default Fund Additional Margin (DFAM) and daily DFAM. LCH will do this by enhancing its collateral stress test framework by combining stress losses for margin collateral, liquidity costs, and cleared positions. Before this initiative, margin collateral, liquidity costs and cleared positions were stressed and monitored separately. Combining them together when calculating financial resources was intended to enhance the protection against stressed market conditions. These changes were implemented at the end of June 2024. |

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| **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. | LCH monitors clearing member collateral holdings for concentration risk. Internal risk policy and the LCH Rulebook allow LCH to place concentration limits on particular asset types, and to manage specific concentrations within collateral portfolios. LCH also takes into consideration the ability to realise the value of a piece of collateral during normal and volatile market conditions. For securities collateral that is delivered via either bilateral or triparty mechanisms, LCH specifies concentration limits on issuers in line with internal risk policy. |
| **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 timely manner. | Where a clearing member delivers securities, including cross-border delivery, the securities are held in accounts in the name of LCH at the relevant (I)CSD or custodian, under a deed of charge in favour of LCH, and in some cases through the sub-custody arrangements of an (I)CSD. LCH takes legal opinions in relation to the jurisdictions in which collateral assets and their issuers are located, and on the enforceability of the LCH Rulebook, on a 2–3-year cycle, unless there is a change that requires additional legal advice in the intervening period. LCH holds non-cash collateral in accounts in its name at CSDs to enable it to access such collateral in a timely manner.<br><br>LCH only applies securities to clearing members' collateral accounts when the (I)CSD or custodian has confirmed settlement has occurred. This process is the same for both domestic and cross-border delivery of securities. LCH performs due diligence of its (I)CSDs and custodians to ensure ongoing compliance with its settlement finality rules and segregation requirements.<br><br>LCH aligns its cut-off times with respect to receipt of securities with the cut-off times of the relevant (I)CSDs and custodians. See further discussion under Principle 17 and Principle 20. |
| **Key Consideration 6:** An FMI should use a collateral management system that is well-designed and operationally flexible. | CMS provides clearing members with a real-time view of collateral balances on relevant accounts at LCH and provides functionality that allows clearing members to instruct movements of collateral to or from LCH and between the accounts of a clearing member, in line with LCH's cut-off times and thresholds. CMS also provides information to clearing members on its securities valuations, including haircuts, FX, and price data; liability data, i.e., initial margin obligations for each clearing member account, and excess collateral valuation.<br><br>The LCH Rulebook and charge document do not provide for re-use of clearing member non-cash collateral, except in the event of default of that clearing member. In the event of the default of a clearing member, LCH may appropriate or sell the non-cash collateral of that defaulting clearing member and apply the proceeds to that clearing member's liabilities. Where a right of use exists (in relation to the Sponsored Clearing service's members) under a Title Transfer Agreement, LCH does not exercise this right. |

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| | CMS is integrated with the back-office systems of LCH and can instruct changes to collateral balances upon external provision of settlement data from (I)CSDs. CMS is also able to instruct movements of cash to and from clearing member nostro accounts at designated banks, while other LCH systems perform tasks that include maintenance of books and records, carrying out the required checks and balances, and production of regular reports and management information (MI) required for the ongoing monitoring and management of collateral. CMS and associated systems are subject to periodic functional reviews and upgrade programmes as necessary to ensure they stay fit for use. They are also subject to a review process to ensure that they are adapted to new monitoring and management functions.<br><br>LCH Collateral Operations, responsible for managing CMS, operates from 6am to midnight (London time) and has staff in London, New York, and Sydney. |
| **Publicly available resources** | Acceptable Collateral and Haircuts<br><br>Collateral Management System<br><br>Collateral Account Segregation<br><br>LCH Rulebook<br><br>Legal Opinions<br><br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*The LCH risk management framework incorporates policies which set out risk-based standards for margin models, as well as procedures and processes to calculate a clearing member's risk position and initiate margin calls. The framework requires monitoring of clearing member positions, in addition to mark-to-market calculations and the collection of margins intraday if necessary. Margin levels are back-tested daily, to assess whether the models are performing at the desired level of confidence (99.7 percent[7])*

| Key consideration | Detailed assessment |
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| **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. | LCH's general framework of margining consists of the calculation and collection of intraday and end-of-day initial margin and variation margin. Initial and variation margin is collected from LCH's clearing members to cover the risk that clearing members are unable to fulfil their obligations as set out within the LCH Rulebook and Clearing Member Agreement.<br><br>Initial margin performance is assessed daily through clearing member portfolio backtesting. LCH's margin models must pass both the regulatory defined minimum backtesting threshold and the thresholds established by LCH's Risk policies and procedures.<br><br>Credit exposures arise from latent market risk. Adverse changes in the value of the contracts and products can be attributed to a wide range of risk factors such as interest rates, FX rates, equity prices, credit spreads and implied volatility. Further credit exposures can arise from the cost of securing liquidation for concentrated positions and/or illiquid contracts.<br><br>LCH's margin models are specifically designed to capture the key risk factors that affect the value of the contracts. The changes in the values of each risk factor and combinations of risk factors are assessed over a wide range of possible outcomes. The initial margin reflects the worst of these outcomes given a pre-defined confidence interval and holding period. |

[7] LCH will re-launch its Listed Rates service with the trading venue FMX later in 2024. As noted throughout this assessment, this service was previously live with the trading venue CurveGlobal but ceased in 2022. This service will have a confidence interval of 99.0 percent.

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| | In instances where it is not possible to model all the risk factors that contribute to the potential adverse change in the value of a contract or product, an additional margin will be applied to mitigate this risk. For example, LCH can apply liquidity and concentration risk margin for large positions.<br><br>LCH has processes in place to calculate and make regular margin calls. By having regular intraday margin calls, the period for which there is an uncovered exposure is minimised and therefore the risk of a clearing member payment failure leading to a large margin shortfall is mitigated.<br><br>Clearing member payment failure is, prima facie, an event of default. This is likely to trigger LCH's default management process which entails a wide range of measures that not only prevent the risk increasing but reduce and eliminate all open positions of defaulting member. The default management process is regularly rehearsed through default fire drill exercises.<br><br>LCH has fully documented the margin methodology for all its clearing services. In addition, as required by LCH's risk policies, all margin models are annually reviewed by independent model validation specialists, as well as following either material changes or the introduction of a new model.<br><br>The results of the respective independent margin model validation, including any actions that LCH may undertake, are subject to a review by LCH's internal risk governance, including an annual review by the LCH Board Risk Committee.<br><br>LCH discloses key components of the respective margin model on its public website. In addition, further information is made available to clearing members and is routinely discussed at the LCH Board Risk Committee or in Product Advisory or Risk Working Groups, which have clearing member participation. |
| **Key Consideration 2:** A CCP should have 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. | LCH uses prices from public venues or exchanges for exchange-traded products. For clearing services where price discovery is based on reliance on broker-dealer quotes in OTC markets, such quotes are obtained both directly and via published composite or multi-contributor sources.<br><br>The same sources are used to build price history data that comprise the market input for the margin models.<br><br>LCH has policies and procedures that require prices to be available both intraday and at end of day and set out criteria for the quality and reliability of price sources used. There are price validation controls in place to identify when prices have become stale, changed value excessively or the provider ceases to publish price information.<br><br>Where a price is not readily available or reliable, LCH will utilise an alternative price source. In the event all sources become unreliable, and as set out in LCH's Rulebook, the last known price will be used as the input into the margin |

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| | requirement until a suitable replacement is found. If no suitable replacement exists, the contract may no longer be eligible for clearing and can be suspended.<br><br>LCH's polices define the approach to ensuring the presence and coverage of price sources. If reliable price sources are not readily available this may constitute a barrier to enabling clearing for the respective product.<br><br>If reliable prices are available but not historically, for example a new issue that has not traded before, a proxy price will be used to generate the risk factor estimate required for the margin model. LCH's risk policy on contract and market acceptability describes the principles and factors to be considered prior to the acceptance of any new contract or market. For new cleared contracts which are already traded, historical price moves, and volatility should be assessed to ensure the product can be adequately valued, margined, and subjected to stress testing. Where a new contract is added to a group of similar contracts that fall into an existing margin class the historical price assessment will be that of the existing margin class. Where this is not the case, new margin calculations may be introduced to manage this risk, or margin may be set in line with a similar highly correlated product. It must be demonstrated that any new margining methodology provides coverage in line with that expected of existing cleared markets.<br><br>The use of proxy data series must adhere to the above. Usually such an initiative will require regulatory approval and therefore the proxy data methodology would form part of that application and subsequent review. Finally, all margin models are subject to independent review by an LCH internal independent specialist team, the LSEG model validation team, or by an external specialist independent firm at least annually, and reported to the Executive Risk Committee. The review scope includes an evaluation of pricing models, market data and the use of proxies should they be used. The findings of the review are subject to LCH's risk governance review. |
| **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 | LCH's initial margin models are analytical (Value-At-Risk (VaR)-like) models. The confidence interval and minimum level of coverage is determined by the LCH Board Risk Appetite and is set at 99.7 percent. The key assumptions under the analytical models include a combination of the following:<br><br>• Return assumptions<br>• Holding period assumptions<br>• The empirical distribution of historical returns of each individual risk factor reflects a reasonable and likely distribution of potential outcomes over the holding period<br>• Scaling of returns improves predictive power of the history |

percent with respect of 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 sub-portfolio 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 exposures 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 choice of Exponentially Weighted Moving Average decay factor represents the most appropriate speed of adjustment to changes in market volatility
- There is equal probability of scenario occurrence; and
- The defaulter's portfolio is held constant over the chosen holding period

Analytical models are listed as follows:

| Market | Margin Method Used | Look-back Period | Holding Period |
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| SwapClear | Portfolio Approach to Interest Rate Scenarios (historical simulation with volatility scaling) | 10 years** | 5 days (7 days for client positions) |
| ForexClear | Foreign Exchange Portfolio Analysis and Risk (historical simulation with volatility scaling) | 10 years** | 5 days (7 days for client positions) |
| RepoClear | Historical simulation with volatility scaling | 10 years | 5 days (no client positions) |
| Listed Rates[8] | Historical simulation with volatility scaling | 10 years | 2 days for members and clients |
| EquityClear | Historical simulation or flat percentage* | 4 year | 3 days |

*Flat percentage is applied to relatively illiquid securities or securities with a limited history of trading.
**Anti-procyclicality features include 10 year look back plus a separate model featuring unscaled 99.5 percent VaR margin floor (and including a defined crisis period).

[8] As noted in other sections of this assessment, the Listed Service is intended to be re-launched in September 2024.

LCH additionally applies margin requirement 'multipliers' by clearing member to cover further credit, liquidity, concentration, sovereign and other idiosyncratic risks that exceed the assumptions of the base calculation.

The EquityClear service amended its initial margin model in May 2024. The service introduced four changes: two new add-on components (for settlement and de-correlation risk); alignment of the lookback period for flat rate initial margin; recalibration of the liquidity and concentration risk margin bucket factors; and rationalisation of the holding period from a range (of two to seven days) to three days.

Procyclical margining changes are mitigated through features such as averaging the largest losses, the application of counter-cyclicality buffer and the use of long-term margin floor. For example, the risk of overly procyclical margining in the Foreign Exchange Portfolio Analysis and Risk and Portfolio Approach to Interest Rate Scenarios models is mitigated through features such as the averaging of the largest simulated losses; the use of a relatively long look-back period; the use of exponentially weighted moving average volatility scaling; and the use of a long-term quantile margin floor.

LCH has a margin model anti-procyclicality standard, whereby initial margins should not increase significantly (by more than 25 percent) over the holding period during a replay of history model test. The natural length of time to consider in assessing this standard is a 10-year market history, as this is then compatible with the EMIR standard on procyclicality. Implicitly, this formally recognises that a 10-year period is enough to capture the full economic cycle. The 25 percent jump over the holding period is suggested by the European Systemic Risk Board standard of 25 percent for a procyclical buffer.

Procyclical margining changes in other models with a lookback period of less than 10 years are mitigated through features such as the application of a counter-cyclicality buffer and the use of long-term, unscaled VaR metric as a margin floor.

For all models:

Margin rates may be adjusted to account for risk factors which are affected by external events in the period under review, such as political, seasonal, and economic. All material adjustments to margin rates must be approved by the Executive Risk Committee and will be notified to the LCH Board Risk Committee.

The additional margins such as concentration and liquidity margin are threshold based. The thresholds are calibrated using market data such as observed volumes and open interest on public exchanges or using survey derived data from participants in OTC markets. Thresholds derived from surveys are benchmarked to internal cleared trading data and subjected to regular review by the respective Default Management Groups (DMG).

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| | The following factors are considered when determining the appropriate close-out period:<br>• Duration to formally execute the default notice, inform stakeholders, remove market access and initiate the DMG<br>• Duration to agree exit strategy, hedge trades and auction portfolios<br>• Duration to execute the exit strategy in a normal market or stressed market; and<br>• Duration to initiate and complete the client porting process<br><br>LCH's Default Management Process does not seek to maintain open positions in a default beyond the holding period. Therefore, adverse price effects are assumed when closing out large or illiquid positions.<br><br>Key model parameters are determined by calibration to backtesting performance, margin stability, reactivity and decay metrics, liquidity thresholds, historical volatility, and benchmarking.<br><br>In general, at least 10 years of data is obtained for the historical sampling period. This ensures at least one economic cycle is captured. Where 10 years of data is not available or is unreliable or creates excessive data overhead, a shorter sample is used, either five years or one year. The shorter samples are subject to a long term (10 year) floor which limits how far margins can reduce when recent volatility is trending lower, thereby ensuring model coverage, and reducing procyclicality.<br><br>Two types of wrong-way risk have been identified. Firstly, specific wrong-way risk arises where a member has exposure in collateral provided in the form of its own securities or affiliates' securities. This type of wrong way or self-referencing risk is not permitted, i.e., clearing members cannot post collateral in their own name. In the case where it does arise in the clearing exposures, such as a member trading in its own name, then the margin requirement is a flat 100 percent of the specific wrong way exposure. Secondly, general wrong-way risk arises when a member's portfolio is highly correlated to the country of domicile or the member's creditworthiness, or that the assets and liabilities in the member's portfolio are highly correlated. The general wrong-way risk charge is calculated as the Basel Advanced Internal Rating-Based (AIRB) capital required to support a loan to the Sovereign via the bond market. If the member defaults LCH has effectively lent money to the Sovereign as a bond holder. The framework utilizes the closed-form Vasicek asymptotic risk factor model underlying the AIRB charge. This is an asymmetrical charge to mitigate correlation in the credit risk of the member and the country of its base revenue (Unexpected Loss). That charge is not captured in the initial margin parameters which only consider historical volatility. The charge grows naturally as the probability of default increases. |
| **Key Consideration 4:** A CCP should mark participant positions to | LCH marks clearing members' positions to market and collects variation margin for all clearing services every day. |

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| 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. | Variation margin for exchange-traded contracts is defined as:<br><br>(today's closing price - yesterday's closing price) x number of contracts x contract size<br><br>The closing price is sourced from the relevant exchange.<br><br>Variation margin for OTC contracts is defined as:<br><br>(today's net present value - yesterday's net present value)<br><br>For the SwapClear service, the net present value is the sum of the discounted cash-flows and follow the respective industry-standard methodology, market quotes are obtained for instruments to define the curves. The pricing curves are constructed using a bootstrapping approach using a cubic spline interpolation to derive the discount factors and forward projections required to value the instruments. For ForexClear, net present value is the sum of the discounted cash-flows, converted to variation margin currency for FX spot, forward and non-deliverable contracts. FX options contracts use the industry-standard Garman-Kohlhagen equation. For RepoClear, the net present value is the sum of discounted present value cash obligations at the future settlement date. The value of the future bond obligations is calculated by moving forward the current bond market value with the forward repo rate.<br><br>LCH has the authority and operational capability to make intraday margin calls for each clearing service. All intra-day margin calls account for adverse changes in both variation margin and initial margin. Margin calculations are based on intraday positions and valuations. |
| **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 | LCH does not permit offsets between itself and other CCPs or between the default funds within LCH. The purpose of this restriction is to avoid any potential contagion risk between different default funds or CCPs.<br><br>LCH does permit offsets within certain classes of products within a common default fund. In order to permit offsets or reductions in required margins, LCH must be satisfied that the following conditions are met:<br><br>i) The price risk of one financial instrument or a set of financial instruments subject to an explicit discrete offset is significantly and reliably correlated or based on equivalent statistical parameter(s) of dependence, with the price risk of other financial instruments. When the financial instruments are subject to implicit combined offsets the price risk is sufficiently reliable to the extent that it does not create statistically significant model error.<br>ii) The economic offset cannot be based purely on a (potentially spurious) mathematical correlation, but the rationale must be supported on risk and economic grounds such as commonality of underlying risk drivers for the products in question, or the existence of a traded product linking the products for which the offset is sought. |

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| harmonised overall risk-management systems. | iii) The economic offset must be demonstrably resilient during stressed market conditions and must be subject to a stress test regime.<br>iv) Where multiple instruments are involved, the margin reduction can be no more than 80 percent of the sum of the margins for each instrument calculated on an individual basis.<br>v) Financial instruments margined jointly with offsets must be default managed jointly.<br><br>In the instance where implicit offsets lead to disproportionate model uncertainty, LCH will require a margin add-on which addresses the amount of allowable offset.<br><br>The robustness of LCH's portfolio margin methodologies is measured daily through margin erosion and back-testing analysis. Model performance is assessed at member portfolio level, risk factor level and stylised portfolio level. The stylised (hypothetical) portfolios check margin performance for positions that contain a high degree of price dependency such as stylised calendar spreads and relative value positions. Regular sensitivity testing evaluates changes in recent correlations. |
| **Key Consideration 6:** A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting – 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 | Initial margin coverage is backtested on a daily basis by comparing the portfolio initial margin with ex post clean profit and loss. The back-test results are reviewed daily by the LCH risk management function with quarterly summaries shared at the LCH Executive Risk Committee and at every Board Risk Committee. If backtesting suggests the margin coverage target cannot be met, LCH will conduct further investigation into the performance of the margin model. Additional analysis is performed on a monthly basis to investigate underlying causes of margin coverage breaches and identify any model weaknesses with respect to specific products, risk factors and market conditions.<br><br>LCH performs a number of different sensitivity tests depending on the model type. The tests for the analytical models examine sensitivities to certain portfolio types, volatility scaling assumptions, risk factor return assumptions, risk factor level dependence, Exponentially Weighted Moving Average decay factor sensitivity and correlation changes. The tests for the empirical models examine sensitivities to certain portfolio types, scanning ranges and the sensitivities to changes in contract offsets.<br><br>Potential shortcomings may arise for a number of different reasons such as that the model does not capture all the risk factors, the model is overly procyclical, the model does not respond to new volatility and correlation, the model exhibits excessive ghosting effects, model backtesting breaches are excessive or clustered, or market conditions breach the model assumptions.<br><br>LCH will call additional margin for portfolios exhibiting excessive margin erosion until the model is updated and performance issues are addressed. |

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| and extreme changes in the correlations between prices. | Backtesting results by service are disclosed on the LCH website as part of the quarterly CPMI-IOSCO quantitative disclosures. |
| **Key Consideration 7:** A CCP should regularly review and validate its margin system. | LCH's margin models are validated on an annual basis. The independent review of margin models considers all available backtesting and stress testing results. In addition, LCH's risk policies and outcomes are reviewed on an annual basis by the LCH Board.<br><br>The model review evaluates the validity of the margin model in theory and its performance in practice, and also appraises its parameters and assumptions. The review considers any changes in market practice and recent market conditions.<br><br>Material changes to margin methodology are subject to LCH's internal risk governance process, which includes both internal review and independent validation of the model and must receive approval from the Executive Risk Committee.<br><br>The model validation report and recommendations, for each LCH clearing service, are notified to internal risk governance, and to relevant regulators. |
| **Publicly available resources** | Margin Methodologies<br><br>Risk Management Overview<br><br>LCH Rulebook<br><br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*LCH has robust arrangements for the management of liquidity risk during business-as-usual and in a default situation. An operational liquidity target is set and closely monitored by LCH, and stress testing is performed using conservative assumptions, including the default of the two member groups that would generate the largest liquidity need, to determine the adequacy of its liquid resources. LCH does not rely on supplemental liquid resources or any assumption of the provision of central bank credit in meeting its stressed liquidity needs.*

| Key consideration | Detailed assessment |
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| **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. | LCH's framework for the management of liquidity risk is a constituent of the wider LCH Risk Management Framework which is described in detail in the assessment of Principle 3. LCH's Liquidity Risk Management Framework encompasses all currencies managed by the CCP and comprises of the Liquidity Risk policy, which sets the standards, and supporting detailed procedures, such as the Liquidity Plan.<br><br>The Liquidity Risk policy is reviewed by the LCH Board Risk Committee and approved by the LCH Board; it sets out the parameters within which liquidity risks must be managed, including sources of liquidity and liquidity needs, the nature and frequency of liquidity assessments, limits and stress testing. The Liquidity Plan is also approved by the LCH Board and sets out the principles and procedures for liquidity management, this includes details of liquidity tools available to LCH and the assumed availability of each tool in both normal and market stressed conditions.<br><br>LCH's Liquidity policy considers two key sources of liquidity needs, as well as other potential outflows that might further deplete liquidity resources. The two main sources of liquidity needs are:<br><br>(i) outflows that arise in the normal course of operations (i.e. not due to clearing member default), such as repayment of excess cash upon clearing member request, overall reduction in initial margin resulting from clearing members' reduction or close-out of positions, clearing member request to substitute non-cash collateral for cash collateral or to facilitate settlement (including for settlement fails); and<br><br>(ii) the potential liquidity needs in the event of clearing member default(s), thereby requiring LCH to:<br><br>(a) fulfil the settlement obligations of the defaulting clearing member(s) and, |

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| | (b) pay variation margin to non-defaulting clearing members on the positions held by the defaulting clearing member(s).<br><br>There may also be hedging costs and potential losses due to the liquidation of the defaulting clearing member(s) cleared positions and/or collateral lodged with respect to those cleared positions.<br><br>Other potential liquidity needs may be generated by payment delays or disruptions, or the failure of an investment counterparty to return cash at the maturity of an investment.<br><br>The size of LCH's liquidity requirement is an aggregate of the sources of liquidity needs which are assessed on a daily and intraday basis. Liquidity risk is managed on a centralised basis taking into consideration the aggregate liquidity needs across all services. In its quarterly PFMI quantitative disclosure, LCH publishes the size and composition of its qualifying liquid resources, including the estimated and actual largest same-day, and where relevant intraday and multiday payment obligation in total.<br><br>LCH's Liquidity Risk Management Framework recognises the multiple roles clearing members or their affiliates may also play as custodians, settlement banks or investment counterparties, and so such exposures are assessed and monitored daily (including intraday) against defined limits in accordance with the Liquidity Risk policy. |
| **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. | LCH's collateral and liquidity management system is used to manage all payment flows, including intraday, in respect of margin, settlement, funding and investment flows, and is the record source for all such activity. All investment activity by the CaLM Front Office team is entered into and recorded by this system. Additionally, the Collateral Operations team use it to generate payment instructions, monitor incoming payments and reconcile account balances for all settlement and custodian banks, and (I)CSDs. This team monitors all settlement for finality to ensure sufficient liquidity exists for timely settlements. To comply with the limits set out in the LCH Settlement Payment and Custody Risk policy, intraday exposures are reported to commercial banks on a daily basis. The report also details the reason for any identified breaches and is circulated internally to recipients including the Head of Collateral Operations, CaLM Front Office team, Group Risk functions and Compliance. |
| **Key Consideration 3** is not applicable to CCPs | |
| **Key Consideration 4:** A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related | LCH's liquidity risk management framework is designed to ensure sufficient liquid resources are maintained in order to meet its payment obligations on time. LCH estimates the size of the liquidity requirement across all currencies in which it incurs settlements (including variation margin payments where applicable). LCH's monitoring considers the liquidity need that could be generated in the event of default of the two largest clearing member groups (including affiliates and investment exposures), in extreme but plausible market conditions. For each of EUR, USD and GBP individually, and separately for all |

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| 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 | currencies in aggregate, LCH models its Cover 2 liquidity profile out to 30 days to ensure sufficient liquidity cover and performs daily liquidity stress tests based on both business-as-usual and stressed market conditions. For EUR, GBP, and USD, LCH makes no assumption about accessing the foreign exchange market.<br><br>In addition to the Cover 2 liquidity stress tests, LCH also runs several additive extreme but plausible stress test scenarios that target events which are considered to have a probability of up to once in 30 years. These scenarios model the impact of restricted access to liquid resources due to i) closure of certain parts of the repo market, ii) the impact of regional economic crisis and iii) the default of multiple clearing participants. The results of these additional stress tests are used to determine the sufficiency of LCH's liquidity resources. As part of LCH's liquidity risk management framework, monitoring, including estimating the largest aggregate payment obligation occurs on a daily basis. LCH also carries out intraday liquidity monitoring which encapsulates a conservative set of assumptions about intra-day sequencing between inflows and outflows<br><br>The level of complexity of LCH is in reference to the multiple jurisdictions where it holds a license and the broad range of asset classes it clears, rather than on the acceptance for clearing of financial instruments that are characterised as complex. LCH adopts the most rigorous of the applicable regulatory regimes as a minimum standard when setting the standards for its liquidity risk management framework. |

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| extreme but plausible market conditions. | |
| **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 | LCH's primary liquid resources consist of cash and highly marketable securities (including those provided by a defaulted clearing member as collateral and received as settlement of the defaulter's cleared positions). The LCH quarterly PFMI quantitative disclosure contains data related to the size and composition of its qualifying liquid resources.<br><br>LCH's liquid resources are managed in compliance with its internal investment and liquidity policies to ensure capital preservation and availability of liquidity to meet stressed liquidity requirements. Investments are managed such that maturing investment cash flows each day are sufficient to cover estimated operational needs. A further proportion of the portfolio is maintained in highly liquid government securities that can be sold or used as repo collateral to generate further liquidity as required.<br><br>LCH has processes that can be invoked in stressed environments to raise liquidity. These processes make assumptions around some activities which are not utilised in a business-as-usual environment, and hence care must be taken to ensure that these assumptions are realistic. To ensure that this is the case, LCH undertakes an exercise of 'War Games' to test the assumptions at least twice a year and undertakes testing as part of any new clearing service initiative, if relevant. The War Games test market/counterparty appetite for securities that LCH does not actively invest in or sizes/concentrations of exposures that are outside the day-to-day activity.<br><br>LCH has prearranged funding arrangements in the form of completed Global Master Repurchase Agreement with a large number of high-quality counterparties, including counterparties with particular expertise and capacity in specific collateral markets. LCH engages in reverse repurchase transactions for investment purposes. LCH also has prearranged funding arrangements with major (I)CSDs. For certain currencies, LCH has routine access to central bank facilities, but it does not rely on these facilities when considering its qualifying liquid resources.<br><br>LCH's Liquidity Risk policy requires that a minimum buffer be maintained above the stress tested liquidity resource requirement on a cover two basis and remedial action be taken if the buffer is eroded. |

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| relevant central bank. All such resources should be available when needed. | |
| **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. | LCH does not count non-qualifying liquid resources as being available to meet liquidity outflows in its liquidity stress testing.<br><br>LCH does not rely on supplemental liquid resources, or any assumption of the provision of central bank credit, in meeting its stressed liquidity needs. |

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| **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. | LCH does not rely on specific liquidity providers to meet its minimum required qualifying liquidity resources. The cash margin and default fund contributions LCH receives from clearing members, plus the securities of any defaulting clearing member are sufficient to meet the minimum required qualifying resources. These resources are cash, readily available through the use of central bank accounts and highly liquid, marketable collateral held in custody, which is readily convertible into cash, utilising prearranged and highly reliable funding arrangements with a large number of counterparties, many of whom have access to central bank liquidity.<br><br>LCH maintains a Liquidity Plan that describes the tools that would be used to fund liquidity to meet operational or default liquidity needs. The plan considers that where there is an actual or perceived risk of any cash shortfall, this will be deemed a 'liquidity event'. Some of the tools LCH would use to address a liquidity shortfall are applied on an ongoing basis as part of LCH's standard investment and liquidity management activities e.g. maturing investments, and the purchase and sale of securities. To ensure that it could access liquidity through using the tools that are not used on a day-to-day basis (e.g. repo, borrowing, FX swaps), LCH conducts regular 'War Games'. As part of the 'War Games', LCH can also simulate the liquidation of a defaulting clearing member's collateral.<br><br>LCH carries out appropriate ongoing due diligence on counterparties as required by its Counterparty Credit Risk policy. |
| **Key Consideration 8:** An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to | LCH's internal risk policy sets a preference for the use of central bank services where available.<br><br>Practical considerations are, for example, the existence of policy determinations by the central bank of the currency or local legal frameworks that do not permit access to central bank accounts by CCPs, or else restrict the provision of such accounts to domestic CCPs or those deemed to be systemically important in that jurisdiction. |

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| enhance its management of liquidity risk. | LCH maintains accounts for concentration and payment services provided with several central banks. |
| **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. | LCH carries out daily and intraday liquidity stress testing which compares stress needs for liquidity against the stressed resources available.<br><br>Daily reports of the results of the stress testing results include RAG ratings (i.e. traffic light rating system of red/amber/green) to highlight any issues for review or breaches of policy and are provided to senior risk management including the CRO. The results are also circulated to the CaLM team, Compliance, Finance, and Operations functions.<br><br>As mentioned above (see response to Key Consideration 4), in addition to Cover 2 liquidity stress tests, LCH utilises stress scenarios that model for the default of multiple clearing participants, the impact of regional economic crisis and closure of some markets.<br><br>The stress tests take a conservative set of assumptions about potential outflows and the ability of LCH to liquidate assets and assume the default of the two largest clearing member groups (along with their affiliates and clients), that have the largest liquidity requirements. In addition to the Cover 2 liquidity stress tests, LCH also performs several additional extreme but plausible stress test scenarios, which target events that are considered to have a probability of up to once in 30 years. These scenarios model the impact of restricted access to liquid resources due to closure of certain parts of the repo market, the impact of a regional economic crisis and the default of multiple clearing participants. As the severity of these additional scenarios are more akin to reverse stress test scenarios and push the boundaries of plausibility, they are performed alongside LCH's reverse stress tests rather than included as part of the extreme but plausible scenarios for Cover 2 stress tests. The results of these tests are also a component in distributed MI.<br><br>The liquidity risk management framework takes into account liquidity risks arising from the different relationships LCH has with entities, and/or members of the same group (for instance as a clearing member, investment counterparty, custodian or settlement bank), and assumes that they may simultaneously default. Based on the relationship(s), the stress tests take into account LCH's payment and settlement structure, thus seeking to ensure that LCH is able to settle its payment obligations on time. Further, as part of the quarterly liquidity reverse stress testing scenario suite, both the availability of the liquid assets and the size of the liquid liabilities are stressed in different ways to determine whether it would be plausible to be left with a liquidity deficit (i.e. the Liquidity Coverage Ratio falls below 100 percent).<br><br>The liquidity risk management framework is subject to an annual independent validation, and where changes are identified these must be approved by the Executive Risk Committee and notified to the Board Risk Committee. The Liquidity Risk policy which sets the liquidity risk standards, and the Liquidity Plan which describes the liquidity tools available to LCH are |

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| 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. | also subject to annual review by the Board Risk Committee, which in turn makes recommendation to the LCH Board for approval. |
| **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 | LCH maintains arrangements for ensuring settlement finality as described in the assessment of compliance with Principle 8. These arrangements along with its liquidity risk framework (see above - Key Consideration 1) provide the structure for ensuring LCH can settle payment obligations on time even in the event of participant(s) default. LCH's Liquidity Risk policy requires and sets parameters for a minimum liquidity buffer over and above the total liquidity requirement.<br><br>The liquidity risk framework has key tests which are used to determine the liquidity requirement in the event of member default(s): the intraday liquidity stress test and the 30-day liquidity stress test. The 30-day liquidity stress test forecasts liquidity requirements that arise over the next 30 business days under stressed market conditions and assumes the default of the two member groups with the largest liquidity requirements, plus a stressed business-as-usual target.<br><br>Consequently, LCH's Liquidity Risk Framework ensures that it maintains significant excess liquidity to meet intraday and daily liquidity needs following the default of the two clearing members (with their affiliates and clients) with the largest liquidity requirements. The LCH Liquidity Plan and the Recovery Plan describe the actions that LCH could take to address any uncovered liquidity shortfall and the replenishment of its liquidity resources. For example, the Liquidity Plan incorporates the |

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| 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. | tools that can be used to fund operational and default liquidity needs and assesses all the available tools under various scenarios including during periods of market stress or a 'liquidity event' (defined as a situation where there is an actual or perceived risk of a shortfall). Restricted access to liquidity sources is also incorporated in LCH's liquidity stress testing. |
| **Publicly available resources** | LCH Rulebook<br><br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*LCH's arrangements for ensuring settlement finality are founded on the designation of LCH under the UK Financial Markets and Insolvency (Settlement Finality) Regulations 1999 (UK SFR); Rulebook provisions; and the commissioning of legal opinions in support of the applicable provisions within its Rulebook. The UK SFR protects certain actions performed pursuant to the default rules of LCH as it has been designated as a system in the UK. In accordance with local legal opinions, protections also apply in each relevant jurisdiction where LCH is licensed or suitable mitigation are in place, including in the European Union (EU) following the UK's withdrawal on 1 January 2021.*

| Key consideration | Detailed assessment |
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| **Key Consideration 1:** An FMI's rules and procedures should clearly define the point at which settlement is final. | Cash settlements occur via LCH's proprietary direct debit system, PPS, and Settlement Service Providers, as referred to in the LCH Settlement Finality Regulations. For more information on PPS see Principle 9. Securities settlements occur via Securities Systems Operators, as referred to in the LCH Settlement Finality Regulations.<br><br>The conditions under which settlement obligations in respect of registered contracts are final and irrevocable are set out in the Settlement Finality Regulations section of the publicly available Rulebook. Under LCH's Settlement Finality Regulations:<br><br>• A Payment Transfer Order becomes irrevocable once the PPS bank, Member Settlement Bank, Concentration or central bank or Settlement Services Provider, as applicable, has confirmed the commitment via SWIFT message or otherwise confirms that such payment will be made; and<br>• A Securities Transfer Order becomes irrevocable at the time prescribed by that Securities System Operator.<br><br>The legal basis for the framework with respect to settlement finality is found in the Rulebook along with the legal agreements between LCH and its clearing members or Settlement Services Providers. This framework is supported by:<br><br>• The designation of LCH, including the PPS, under the UK SFR 1999. The UK SFR aims to reduce the risks associated with participation in payment and securities settlement systems by minimising the disruption that may be caused by insolvency proceedings brought against a participant in such a system; and<br>• Legal opinions for each relevant jurisdiction where clearing members are incorporated. These are commissioned by LCH and seek to confirm that the LCH Settlement Finality Regulations (which form part of the Rulebook) are enforceable. These legal opinions are published on the LCH website. |

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| | The UK SFR protects certain actions performed pursuant to the default rules of LCH as it has been designated as a system in the UK. As described in local legal opinions, protections also apply in each relevant jurisdiction where LCH is licensed or suitable mitigation are in place, including in relevant jurisdictions in the EU, following the UK's withdrawal from the EU on 1 January 2021 LCH performs its securities settlement with linked FMIs and ensure successful settlement by making its payments and deliveries only after settlement has been confirmed on opposite and equivalent payments or deliveries. |
| **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. | With regards to LCH's operation of the PPS, all currencies are final and irrevocable on the value date. For some currencies this will be same-day settlement (i.e. settled on the day of the instruction). Clearing members are required to have primary payment arrangements with PPS banks for each currency in which settlement is incurred. These must be supported by contingency arrangements in the event of failure of nominated PPS bank(s) and clearing members must evidence such contingency arrangements at the time of on-boarding and on an ongoing basis at the request of LCH. At the time of onboarding, LCH will test those arrangements prior to the applicant becoming a clearing member.<br><br>With respect to settlement via a Settlement Service Provider, a Payment Transfer Order shall be complete at the time specified by the relevant provider or operator as being the time when such instruction becomes irrevocable.<br><br>The Settlement Finality Regulations within the Rulebook do not provide for deferral of cash or securities settlement. Deferral of payment or settlement by a clearing member could lead to clearing member default, in accordance with the Rulebook.<br><br>When LCH makes intraday calls (see Principle 6) settlement must take place within an hour of the call being issued.<br><br>The Financial Transactions Procedures, part of the publicly available Rulebook, alongside the Settlement Finality Regulations, set out the information on the LCH's operation of the PPS, including the above. |
| **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. | LCH's Settlement Finality Regulations specify the times after which different types of Payment Transfer Orders are irrevocable.<br><br>The LCH Rulebook specifies that a clearing member's cash settlement obligation due to LCH via PPS is not deemed to have been satisfied when funds have been transferred from the member's account at the PPS Bank to the LCH account at the PPS bank, but only when funds have been transferred from the LCH account at the PPS Bank to the LCH account at LCH's concentration bank, and any time permitted for the recall of any such payment in the relevant payment system has expired. The initial transfer of funds from the member's account at the PPS Bank to the LCH account at the PPS bank will always be preceded by a payment confirmation from the PPS bank to LCH that such funds will be transferred to LCH. Once such a confirmation has been received by LCH, this payment can no longer be revoked by the PPS bank. Before this time, an unsettled payment could only be revoked by LCH; any other revocation could potentially lead to LCH issuing a Default Notice to a clearing member. |

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| | | Securities Systems Operators prescribe when securities settlement obligations have been satisfied. LCH will support any changes that a Securities Systems Operator may make to its prescribed settlement time. Non-cash settlement cancellations could be made subject to the Settlement Systems Operator's rules and prescribed cut-off times.<br><br>The LCH Rulebook, including LCH's Settlement Finality Regulations, is publicly disclosed on the LCH website. |
| **Publicly resource** | **available** | LCH Rulebook (inc. Settlement Finality Regulations)<br><br>PPS Arrangements and Concentration Activities |

## 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 risk arising from the use of commercial bank money.**

*LCH uses central bank money for settlement purposes where available and practicable. Where commercial banks are utilised, LCH has contractual arrangements in place through legal agreements and its Rulebook provisions, to minimise incurring credit risk. Supporting operational procedures and processes are also designed to mitigate credit and liquidity risk.*

| Key consideration | Detailed assessment |
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| **Key Consideration 1:** An FMI should conduct its money settlements in central bank money, where practicable and available, to avoid credit and liquidity risks. | LCH operates the PPS for the transfer of funds to and from clearing members. The PPS is overseen by the Bank of England as a Recognised Payment System under the Banking Act 2009. The PPS operates within the legal framework of the PPS Agreements between LCH and the PPS banks. There are separate PPS Agreements covering each jurisdiction where the PPS operates (i.e., the UK, USA and Australia) in order to support extended clearing hours.<br><br>Clearing members are required to maintain a (i) US dollar PPS account with any US PPS bank and (ii) PPS bank account with any UK PPS bank in EUR, USD and GBP, and in each other currency in which it incurs settlement obligations and provides securities collateral to LCH (except that it may maintain a PPS bank account at an Australian PPS bank for all of its AUD settlement and margin obligations). A clearing member may use different UK PPS banks for different currencies.<br><br>Settlement occurs over the books of each participating PPS bank between accounts maintained by the clearing member and those maintained by LCH. PPS banks then make (or receive) payment to/from the LCH concentration bank via the relevant Large Value Payment System for the currency. Note that any payment to or from the concentration bank represents the net position against LCH of all the clearing members that use a given PPS bank[9].<br><br>LCH's internal risk policies set a preference for the use of central bank services for concentration accounts where available. Practical considerations are, for example, the existence of policy determinations by the central bank of the currency or local legal frameworks that do not permit access to central bank accounts by CCPs, or else restrict the provision of such accounts to domestic CCPs or those deemed to be systemically important in that jurisdiction. |

[9] For example, consider a PPS bank that acts on behalf of just two clearing members. If one clearing member is owed $1 from LCH and the other clearing member owes $1 to LCH, there will be no payment from the PPS bank to the concentration bank.

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| | LCH continually expands its network of central banks where opportunity. Commercial banks that may be utilised by LCH as concentration banks for United States dollars and other currencies where LCH has no central bank account. Commercial concentration banks are subject to specific credit and operational criteria as laid out in LCH's internal risk policies.<br><br>LCH offers an FX deliverable segment via the ForexClear service[10]. The settlement of the cash flow associated with the cleared contracts takes place in collaboration with CLS[11] within the LCH-CLS pay-in window (06:00 - 09:00 CET),also known as CLSClearedFX. In the event a clearing member fails to make a payment, specific liquidity provisions are available to fulfil the payment obligation and allow the LCH-CLS session to complete. The liquidity provisions may be warehoused cash or Capped Contingent Swap Line (CCSL[12]), depending on the currency. |
| **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. | The rules governing the PPS ensure that LCH does not have credit exposure to PPS banks. A clearing member's obligation to LCH is only deemed satisfied once funds have been transferred from the PPS bank to the concentration bank of LCH and any time permitted by the relevant payment system has expired for the recall of any such payment (i.e., the payment could no longer be revoked). This means that a clearing member remains responsible for the obligation in the event of the PPS bank's failure. LCH's credit exposure to a commercial concentration bank ceases once the funds are transferred by the concentration bank to another entity in accordance with LCH's instructions. Accordingly, LCH performs intraday sweeps to concentrate funds onto LCH's concentration accounts to mitigate the liquidity risk that a clearing member cannot immediately make a payment through other means.<br><br>LCH sets out criteria for banks operating or applying to operate the PPS, which include:<br>• A minimum ICS calculated in accordance with and as required by LCH's internal risk policies;<br>• Operational requirements around accounting and SWIFT messaging; and<br>• Adherence to LCH procedures and the terms and conditions of the PPS Agreement.<br><br>LCH reserves the right to apply more stringent criteria when, in its assessment, a PPS bank's financial resources or operational capability are not commensurate with its level of business. PPS banks that fail to meet the criteria or have been downgraded below the minimum ICS are required to withdraw from service. |
| **Key Consideration 3:** If an FMI settles in commercial bank money, it should monitor, manage, and limit its | LCH calculates an ICS for each of its PPS and concentration banks. The score is calculated using quantitative and qualitative factors that include creditworthiness and capitalisation, the bank's regulation, supervision, access to liquidity and operational reliability. Each PPS and concentration bank's rating is subject to a formal assessment at least once per year. Other factors are considered during the wider on-boarding process. |

[10] FX Options and FX Forwards are eligible for clearing in eight currency pairs (AUD/USD; EUR/USD; EUR/CHF; EUR/GBP; EUR/JPY; GBP/USD; GBP/CHF; USD/JPY).
[11] CLS offers settlement via Real Time Gross Settlement systems for most FX products.
[12] The CCSL is a guaranteed capped commitment from clearing members allowing ForexClear to effectively manage same-day settlement via the execution of cleared FX swaps.

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| 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. | Under the PPS Agreements, LCH may undertake regular due diligence of a PPS bank and a PPS bank agrees to meet with LCH at least once per calendar year to formally review the service.<br><br>LCH's risk management policies set the standards for the selection of PPS and concentration banks, and monitoring of exposures that arise from PPS and concentration bank activities on a daily (and where appropriate, intraday) basis.<br><br>LCH has monitoring processes in place to assess the potential losses it and its participants face, and the liquidity pressures if there is a failure at one of its settlement banks. LCH mitigates the risk of potential losses through its Rulebook provisions which have the effect that a member remains liable for any amount due to LCH until such amounts have been transferred by the PPS bank to LCH's concentration account(s) (or paid out to another member using the same PPS bank). This risk is further mitigated for LCH and its participants, through the PPS agreements which specify that transfers to LCH concentration bank accounts shall be made within two hours of instruction, and LCH's procedures to 'shape' payment flows to avoid build-up of material exposures. Additionally, LCH sets unsecured intraday exposure limits for commercial concentration banks, which are monitored intraday and capped at 75 percent of LCH's capital base. |
| **Key Consideration 4:** If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks. | LCH does not conduct money settlements on its own books. |
| **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 | LCH executes a standardised set of binding terms and conditions with the commercial banks that participate in the UK, US or Australia PPS, i.e., the PPS Agreement. The PPS Agreement requires the PPS Bank to confirm payments to LCH and, that such payments confirmation occurs within specified time limits. Following payment confirmation, payments in respect of margin calls must be credited to the LCH account no later than such times set out in the PPS Agreement, i.e., by 9:00am (London time) on the relevant value day or within one hour for intraday calls with a same day value date. The PPS Agreement also requires that concentration transfers take place within two hours of receipt by the PPS Bank of the LCH instruction to concentrate funds. |

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| 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. | |
| **Publicly available resources** | PPS Arrangements and Concentration Activities<br>LCH Rulebook<br>EquityClear service overview<br>RepoClear service overview<br>ForexClear service overview |

## 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.**

*The LCH Rulebook governs and sets out the overall obligations and responsibilities of all market participants clearing physically delivered instruments (gilts, bonds and equities) through LCH. LCH does not offer to store physically delivered instruments. LCH manages the delivery cycle for all physically delivered instruments in accordance with its publicly available Rulebook.*

| Key consideration | Detailed assessment |
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| **Key Consideration 1:** An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities. | LCH supports physical delivery for the EquityClear, RepoClear and ForexClear clearing services.<br><br>The overall obligations and responsibilities that govern physical delivery are publicly defined in the respective exchanges and LCH Rulebook. LCH's Rulebook includes both the rights and obligations for all market participants as well as how the physical delivery process is administered. LCH does not offer to store physically delivered instruments.<br><br>LCH supports its clearing members by ensuring they have a comprehensive understanding of their obligations and the procedures for physical delivery and are adequately supported throughout the delivery process. The membership requirements for new clearing members set out the technical and operational obligations, including for physical delivery, that must be met as part of on-boarding process for the relevant clearing service. LCH provides training to new clearing members on the physical delivery process, LCH's systems and their obligations; as well as ongoing assistance to existing clearing members on the practical, operational or procedural aspects of the delivery process, where required.<br><br>For RepoClear and EquityClear, LCH sends settlement instructions to (I)CSD(s) or T2S[13] for settlement against its clearing members. These are settled under the rules and procedures of the (I)CSD or T2S(s). EquityClear also uses a settlement agent for certain CSDs.<br><br>LCH offers clearing of deliverable FX products, FX Options and FX Forwards, via the ForexClear service. The physical settlement of deliverable FX contracts takes place in collaboration with CLS. Within the LCH-CLS settlement session, each clearing member will have a net pay-in or pay-out obligation per currency. All pay-ins must be funded between 06:00 and 09:00 CET and only on completion of all pay-ins will CLS initiate the pay-outs. The CLS settlement session closes at 10:00 CET. LCH's Rulebook sets out the CLS payment procedures with respect to FX deliverable transactions. New ForexClear clearing members wishing to clear deliverable FX products are required to complete a series of tests to validate their ability |

[13] T2S is only used in the EquityClear service.

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| | to perform settlement in CLS before onboarding. The first phase of testing is the payment trialling. This consists of a phase where clearing members are required to execute payment in each currency in CLS for three consecutive days and to receive these payments back on the same day from CLS. If this phase is successful, members are required to perform scripted testing. The scripted testing phase consists of an end to end clearing to settlement test with low value transactions. To be successful in this phase, members are required to execute two pay ins and two pay outs successfully in each currency.<br><br>Other clearing members, as part of the annual member survey, are asked to provide information on their ongoing technical and operational capacity, including for physical delivery. In addition, LCH provides training courses to all clearing members, which includes courses on the physical delivery process, enabling them to train their staff. Any clearing member can request additional training at any time. LCH further supports its clearing members by making test environments available such that they can test their procedures, processes and reconciliations and familiarise themselves with its systems. |
| **Key Consideration 2:** An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities. | LCH does not offer to store physically delivered instruments. LCH manages the delivery cycle for all physically delivered instruments in accordance with its publicly available Rulebook. As part of this management cycle, the risk and costs are primarily associated with the position management process and ensuring that a delivery is made in accordance with the contract specifications.<br><br>For those physical instruments that settle in an (I)CSD or via T2S, the relevant (I)CSD and T2S are responsible for administering the delivery process as well as the application of any associated fees to their respective participant.<br><br>LCH has procedures that are designed to actively manage positions/trades through to delivery.<br><br>LCH provides automated position reporting to its clearing members to enable them to accurately monitor their obligations and ensure they have the necessary inventory to fulfil their delivery obligation. For ForexClear, the service sets Settlement Position Limits (SPL) for clearing members of deliverable FX; SPLs are used to monitor against known settlement exposures for positions with a time to settlement of two business days or less. Every day ForexClear calculates and issues to clearing members a 'Net Initial Positions Report' containing the net cashflows to be settled within the LCH-CLS cycle on a currency and clearing member basis for a T+2 value date. During this period, any settlement obligation in excess of SPL must be traded down to below such limit.<br><br>With respect to the EquityClear and RepoClear services, LCH operates an active fails management process, which will ultimately see failed deliveries being rolled over to the following day for the respective member. LCH employs a fails fee regime in accordance with the LCH Rulebook and a fails fee covering RepoClear and EquityClear products. To maintain efficient and effective delivery processes, LCH regularly reviews delivery amounts against the obligations of its clearing members to ensure any risks are identified immediately in order to maintain a robust position management process. |

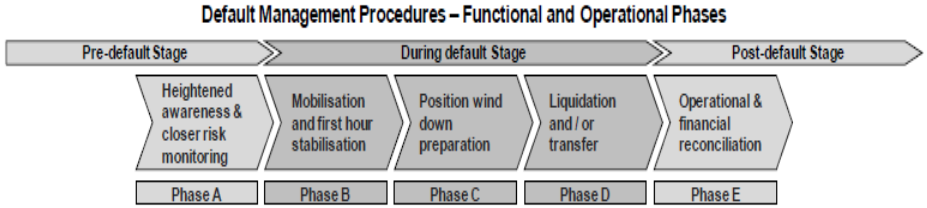
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| | Finally, LCH ensures its ongoing compliance with international sanctions, including with respect to potential impacts to the delivery process. To ensure that LCH's clearing members have the necessary systems and resources available to them, LCH sets transparent membership criteria requiring technology, operations and resources are in place prior to the member joining LCH and throughout their membership. In addition, LCH requires its clearing members to complete Static Data forms accurately and on a timely basis to ensure their delivery preferences are met. |
| **Publicly available resources** | LCH Rulebook<br><br>Listed Rates, SwapClear, EquityClear, RepoClear and ForexClear clearing services overviews |

## 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.**

*The LCH Rulebook contains default rule provisions that set out LCH's rights and obligations in the event of a clearing member default. It also contains provisions in relation to the management of the defaulter's positions and the allocation of losses.*

| Key consideration | Detailed assessment |
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| **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. | LCH's Default Rules, contained in its Rulebook, set out that it is entitled to place a clearing member in default if it appears to LCH that the clearing member is unable, or is likely to become unable, to meet its obligations in respect of one or more contracts.<br><br>The Default Rules set out a non-exhaustive list of events which may show that a clearing member is or is likely to become unable to meet its obligations. Under the rules, clearing members are also subject to certain notification and disclosure requirements, which include immediately informing LCH when they become aware of a petition for bankruptcy or an administration order; they cease, or believe they may cease, to meet the criteria for admission; or there has been a change in their business that would affect their ability to perform the obligations under the LCH Rulebook. LCH may (by circular to clearing members) specify criteria according to which an Automatic Early Termination Event will occur with respect to a clearing member if it becomes subject to any insolvency event.<br><br>The Default Rules set out the steps that LCH may take with respect to a defaulter, including entering into contracts to hedge market risk, selling any security, porting client accounts of that clearing member to another clearing member, auctioning the defaulter's proprietary portfolio to other clearing members (to include any client accounts of that clearing member which could not be ported to another clearing member), otherwise closing out any open contracts, and generally taking such action as LCH may deem necessary for its protection. The sequence of actions is determined by a number of factors, including size and characteristics of the defaulted clearing member's portfolio and the market environment.<br><br>Subject to any obligation under applicable regulation to trigger the procedures for the transfer of assets and positions held by the defaulting clearing member for the account of its clients to another clearing member, LCH generally has discretion over taking these steps. All significant decisions will be taken by the LCH CEO or CRO.<br><br>The functional and operational phases of default management are as follows: |




Upon calling a default, the LCH CEO will convene the Default Crisis Management Team (DCMT) which will be responsible for the overall management of the default. All LCH clearing services have a Default Management Process (DMP) and a Default Fund Supplement annexed to the Default Rules. The DCMT will instruct the Heads of each impacted Service to convene a DMG, which includes LCH executives and, for some services, clearing members. Where representatives of clearing members are seconded to a DMG of LCH for the purpose of default management, they act on behalf of LCH, and appropriate confidentiality arrangements are in place. The DCMT will delegate decision-making within prescribed limits to the DMGs. All significant decisions will be referred to the DCMT for approval. The Default Rules set out how LCH meets any losses arising from a default, including the use of collateral provided by the defaulter, LCH's own funds and the default fund(s).

The non-defaulting clearing members are incentivised to participate in the DMP and in auctions to safeguard their own default fund contributions and to ensure the continued operation of the markets.

The Default Rules also set out the order in which LCH reduces or bears its losses. In the first instance, losses are met by applying any collateral provided by the defaulter and then by recourse to the defaulter's contribution to the default fund(s). If those are exhausted, then further losses are met by payment from LCH's own funds of an amount determined by LCH in accordance with the requirements relating to the calculation and the setting aside of dedicated own resources under the Own Resources Provision of the Default Rules. Thereafter, losses are met by recourse to the indemnities given by clearing members other than the defaulter in respect of each default fund(s) to which it has contributed. The amount of such indemnity is limited to an aggregate amount, not exceeding the amount of the non-defaulting clearing member's contribution to the default fund(s) in respect of the relevant clearing service.

If 25 percent of the relevant default fund is utilised in managing the default, LCH has the right to call additional funds from non-defaulting clearing members in that service ('unfunded contributions' or 'assessments'). The value of unfunded contributions LCH may call from each service clearing member in respect of a given default is capped at each clearing member's funded contribution to the relevant default fund at the time of the default.

Should all funded and unfunded resources available to LCH be exhausted, a service continuity phase will be implemented. In this phase, clearing members of ForexClear, SwapClear and Listed Rates[14] would be subject to variation margin gains haircutting and clearing members of EquityClear and RepoClear would be subject to a loss distribution charge.

The service continuity phase continues for 10 days, or sooner if the soft cap is reached for any clearing member, at which point a vote would be taken among clearing members on whether to continue with the service continuity phase. The soft caps are, for ForexClear the higher of two times default fund contribution or $200mn; for SwapClear and Listed Rates the higher of £200mn or two times default fund contribution, and for the other services two times default fund contribution.

The ballot thresholds for a repeat of the service continuity phase of the default waterfall are that more than 50 percent of eligible clearing members must take part in the vote, and more than 75 percent of clearing members weighted by pre-default default fund contribution must vote in favour of service continuity, with no presumption of a positive vote from those clearing members who abstain from the ballot. If the continuation of service continuity is rejected, LCH would make arrangements to close the service.

Once the default management process is completed successfully, a 30-day cooling-off period is triggered. If the default fund has fallen below the floor level, clearing members must first restore the default funds to their respective floor levels within two business days, with the complete replenishment taking place at the end of the cooling off period.

If another default occurs within the 30-day cooling off period, the DMP will be implemented again and the replenishment will be cancelled; accordingly, service clearing members would be obliged to pay further unfunded contributions (assessments) called on the new default and participate in the loss distribution process if required. Such further unfunded contributions are subject to the same caps and ballot arrangements described above and are calculated as a product of the percentage by which the default fund has been reduced and the value of each clearing member's default fund prior to the default occurring (per default event).

Unfunded contributions may not be called by LCH in regard to more than three defaults in any six-month period.

LCH will continue to stress test the service default funds as usual throughout the DMP and during the 30-day cooling-off period. Following the standard LCH daily procedure for maintaining Cover 2, if any service clearing member's stress test losses above margin exceed 45 percent of the remaining default fund, LCH will call for additional margin from those clearing members to cover the excess uncovered stress test losses above the threshold. Clearing members with weaker credit scores are subject to lower thresholds.

[14] The SwapClear and Listed Rates services will share a default fund – this is known as the Rates Derivatives Default Fund and it is split into two margin classes (OTC Rates and Listed Rates). Depending on the activity of the clearing member which defaults, either the clearing members of SwapClear or Listed Rates are juniorised in the default waterfall. Please note that the Listed Rates service was unavailable during this review period, but as noted elsewhere in this assessment, will be re-launched in September 2024.

**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.

There are a number of levels of documentation and procedures that support the DMP, as outlined:

- The LCH Default Management policy details the standards which must be met in dealing with the default of a clearing member. This includes a requirement for clearing services to have a default management strategy in place for any new product or market and incorporated into the DMG for that service; this ensures that the default management process takes into account the specific characteristics of the financial markets cleared;
- The Default Management Guidelines provide a guide to be used by each service on how to define and implement the default management process according to the Default Management policy. The Guidelines describe the high-level strategy, principles, standards, ownership, and governance at the CCP and service level; and
- The Default Management Procedures, which are specific to each clearing service, detail the processes and procedures at the service level for managing a default, including arrangements for actions such as risk neutralisation, liquidation, client porting, auction organisation and execution, and loss allocation as appropriate. These procedures meet the standards laid out in the Default Management policy and follow the principles outlined in the Default Management Guidelines.

Throughout these documents, roles and responsibilities are clearly detailed. All areas are resourced to ensure that business as usual activity can be managed alongside a default event.

In the event of a potential or actual default, the DCMT will be convened. The key responsibility of this team is to ensure that all key aspects of the default management policy, guidelines and procedures are followed, including communication plans, the calling of the DMGs and monitoring DMG progress. Each department responsible for communicating to the various stakeholders is represented in the teams and has procedures to support the process.

The Default Management policy is updated annually, or more frequently if required, and it is subject to the formal review of the LCH Board Risk Committee followed by approval of the LCH Board. The Default Management Guidelines are reviewed at least annually, approved by the Executive Risk Committee, and shared with LCH Management Team).

The Default Management Procedures for each service are also reviewed at least annually. LCH's preparations for implementation of Default Management Procedures are enhanced by regular fire drills, as described further under Key Consideration 4.

Any Default Notice issued by LCH to a defaulting clearing member would be publicly disclosed on the LCH website.

Following the COVID-19 pandemic, LCH has implemented processes for remote participation in the DMGs.

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| **Key Consideration 3:** An FMI should publicly disclose key aspects of its default rules and procedures. | LCH's Default Rules are contained in its Rulebook, which is publicly available on its website. These set out the circumstances in which a clearing member may be declared to be in default and, for each clearing service, the actions that LCH may take during the DMP, including the constitution of the relevant DMGs, tools for risk mitigation and liquidity management, auction arrangements and the sequence in which resources will be applied. |
| **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. | All LCH clearing services involve external participants (such as clearing members, execution brokers etc.), as required, in their default management fire drills. For some services (notably those serving the OTC markets), the DMGs include representatives from clearing member firms and are consulted on changes to the default management procedures.<br><br>A Group-wide default management fire drill takes place at least annually and more frequently if there are substantive changes to process which mean that further testing is required. The last fire drill exercise took place in November 2023. In addition, service-specific tests are held as and when required, for example if there are changes to rules and procedures within that service or if a significant new product is added. Such tests include external participants who would be involved in the DMP. Each external participant rehearses their role in an actual default event. For example, a broker will be given orders to simulate hedging or liquidation of positions, and clearing members will participate in the DMG to review a synthetic portfolio, recommend hedging and liquidation strategies and submit bids in an auction.<br><br>Following each fire drill test a report is produced that evaluates the exercise and identifies areas for improvement and change. The reports are shared with the Risk Committee, the Audit Committee and regulators following internal review. Services may also produce reports that are shared with their DMGs.<br><br>Each fire drill has specific objectives to ensure that all aspects of default management are covered by the range of different tests performed. Some tests include external clearing members and other FMIs; others seek to test internal routines or close-out assumptions and procedures.<br><br>The LCH Group-wide fire drills generally cover the scenario of a clearing member defaulting across all LCH services simultaneously. Scenarios may be introduced where the defaulting entity also acts as a counterparty of a different type (for example payment agent or investment counterparty).<br><br>A Group Default Crisis Management Team (Group DCMT) meeting is convened in the event of both a Group-wide fire drill and for a real default. Its role is to consider coordination opportunities and offer advice to the individual LCH CCP DCMTs, but it has no decision-making role. |

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| **Publicly available resources** | LCH Rulebook (inc. Default Rules)<br>Default Waterfall<br>Risk Management Overview<br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*LCH offers two models of client segregation arrangements, to meet the regulatory requirements of each jurisdiction in which it is authorised, and maintains its books and records, and segregated accounts where relevant, in accordance with those requirements. Under the international model, individual and omnibus segregated client accounts are made available to clients of clearing members. In addition, for services regulated by the CFTC, LCH provides client segregation arrangements satisfy U.S. segregation requirements. LCH's Rulebook sets out the rules of segregation and portability for each model.*

| Key consideration | Detailed assessment |
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| **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. | LCH offers segregation arrangements to meet the regulatory requirements of each jurisdiction in which it is authorised. LCH is required to legally segregate underlying client positions and collateral (including affiliates' positions and collateral) from clearing member proprietary business in all markets, including cash markets.<br><br>Individual segregation means that LCH records positions, margin requirements and collateral delivered by a clearing member for a specific client against an account that is exclusive to that client, and which is not exposed to losses on any other client or clearing member accounts.<br><br>LCH also offers a Custodial Segregation Account to clients in a limited number of jurisdictions for its SwapClear service, in which the same protections exist and allows the client to transmit non-cash collateral to LCH directly, and without first providing it to its clearing member.<br><br>Further, LCH offers various models of omnibus client segregation, in which clients' positions, margin requirements and collateral are pooled to different extents, although they are never commingled in LCH's books with positions and collateral of the clearing members' proprietary accounts.<br><br>Under the US model, for clients of Futures Commission Merchants (FCMs), LCH offers a single segregation model meeting CFTC requirements in relation to Cleared Swaps. This is the Legally Segregated Operationally Commingled (LSOC) model in which clients have additional legal protections against fellow client risk.<br><br>In the event of a default, for clearing members other than FCMs, positions and collateral in client accounts can be transferred (i.e. ported) to accounts at other clearing members on the instruction of the client(s) as long as the receiving clearing member consents. There are cases where the backup clearing member would have been chosen by the client in advance of the clearing member defaulting. If this is not the case, a client may appoint the backup clearing member at the |

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| | time of default. Porting will only be possible if the backup clearing member accepts the client's contracts to be ported. Depending on the type of account, it may be necessary for all the clients in that account to agree to port to the same clearing member (i.e. in the case of omnibus accounts where the collateral is netted across the clients in one account). LCH encourages clients to pre-arrange accounts with alternative clearing members to expedite the porting process in a default scenario; in many cases clients maintain multiple active clearing relationships.<br><br>In the event of a default, positions held in FCMs' client accounts would be dealt with in accordance with the instructions of the relevant client, to the extent possible, although the action taken must based on the approval of or in consultation with certain US authorities, as set out further below. The client can request that its positions be either closed out or ported. Positions and collateral in FCMs' client accounts would generally be ported upon the default of the FCM clearing member to a solvent FCM clearing member that is able and willing to accept the positions and collateral. The transfer is processed provided that, among other conditions, the value of the collateral held in the account is sufficient to cover the collateral requirement on LCH's books and the CFTC does not object to the transfer upon notice. In addition, the transfer of collateral would take place upon receipt of approval from the US Bankruptcy Court. The transfer process for FCMs is generally the responsibility of the appointed trustee in bankruptcy.<br><br>LCH obtains a legal opinion from law firms located in the jurisdiction in which each clearing member is incorporated before accepting a clearing member from that jurisdiction. This legal opinion is used to establish with a high degree of confidence that there is a locally legally enforceable legal framework in place that protects and supports provisions in LCH's Rulebook with respect to porting of client positions and collateral from challenge under the local insolvency law. Where it is unclear, or such legal framework is not in place, LCH requires that the clearing member execute a security deed, provided it has established via the legal opinion that the security deed is effective and enforceable in the legal jurisdiction of the clearing member.<br><br>The UK SFRs protect certain actions performed pursuant to the default rules of LCH as it has been designated as a system in the UK as noted in Principle 8. As described in with local legal opinions, protections also apply in each relevant jurisdiction where LCH is licensed or suitable mitigants are in place. A more detailed description of the legal aspects of LCH's activity can be found in the response provided for Principle 1. |
| **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 | As described above, LCH segregates clients' positions and collateral on its own books and records. Under the international client clearing model, LCH offers both individual and omnibus levels of segregation. For FCM clients, LCH offers the LSOC model, whereby collateral is also physically segregated from clearing members' proprietary collateral as required under CFTC Regulations Parts 1 and 22. |

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| should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts. | Collateral supporting clients' positions covers initial and variation margin, as well as margin add-ons (for credit risk, concentrated positions and other risks), and may include any excess collateral that clearing members may choose to post to LCH for their client accounts.<br><br>LCH relies on the information received from clearing members in relation to their respective client clearing business, including information on the proper segregation of positions and collateral. LCH maintains a separate record of the actual collateral provided in respect of each individually segregated account; whereas in omnibus accounts and in respect of LSOC, LCH allocates collateral to each client on a value basis. Collateral in respect of omnibus client accounts can be called on a net or gross basis depending on the account type. Under the LSOC model, the collateral is always called on a gross basis. In an individually segregated account, custodial segregated account and in the LSOC model a client's collateral is generally protected from fellow customer losses arising from any loss-making positions. In omnibus accounts there are varying degrees of protection from fellow client risk, which may include a mutualisation of losses and a pooling of risk between the clients in a relevant account. |
| **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. | LCH offers all known clients of a defaulting clearing member the opportunity to port to an alternative clearing member. The chances of porting being successful depend on the segregation model selected by the client and the extent to which the client has pre-arranged a back-up clearing member or can arrange one promptly after a default. Clients that choose to nominate preferred back-up clearing members are generally better able to ensure a timely porting process as LCH would be in a position to share relevant trade data with such clearing member(s) immediately following a default. Except in conditions of severe margin erosion (e.g. 50 percent erosion of initial margin) on the client account, LCH allows a minimum of 24 hours from the public announcement of the default for the defaulting clearing member's clients to identify and authorise a replacement clearing member for purposes of porting. Such minimum porting window does not apply to LCH's FCM clearing members and their clients.<br><br>The LCH Rulebook contains provisions in its Default Rules with respect to obtaining consent from clearing members to which positions and collateral are to be ported, where a client in an individual segregated account or clients in an omnibus gross segregated account have appointed a backup clearing member. The Rulebook also sets out that in the event of a default LCH will publish the deadline by which written consent must be received from a client for LCH to seek to port.<br><br>Once the porting is effected, the new clearing member will be called for any shortfall in margin cover (e.g., in relation to positions that lost money between the default and the porting). |
| **Key Consideration 4:** A CCP should disclose its rules, policies, and | In accordance with Article 39(7) of EMIR, LCH discloses statements on the legal basis associated with the different segregation accounts, including the basis on which collateral is protected. The disclosures cover the accounts offered under both the international and the FCM models. |

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| 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. | The risks and uncertainties associated with LCH's segregation and portability arrangements are disclosed in the Article 39(7) disclosure described above. Costs for different types of accounts are also disclosed on the LCH website. |
| **Publicly available resources** | Collateral Account Segregation<br>LCH Rulebook<br>CPMI-IOSCO Quantitative Disclosure<br>Article 39(7) EMIR Disclosure Statement (Non-FCM)<br>Article 39(7) EMIR Disclosure Statement (FCM) |

## 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.**

*General business risk is one of the risks considered within the risk management framework. To assess this risk consideration is given to key drivers, both with and without financial impact-reducing mitigants. These drivers are monitored quarterly and subject to the governance process. Accordingly, LCH holds liquid net assets funded by equity and has developed both a Recovery Plan and a Wind-Down Plan which are approved by the LCH Board and subject to review at least annually or following material changes.*

| Key consideration | Detailed assessment |
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| **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. | Business risk is included as a strategic risk in LCH's Risk Governance Framework. LCH identifies its business risks by considering the general business conditions which are likely to impair its financial position as a consequence of a decline in its revenues or an increase in its expenses resulting in a loss that must be charged against its capital. Examples of reasonable foreseeable drivers of business risk for LCH include cost overruns (including project overspends), impacts of competition on its revenue, volume and mix of collateral held, regulatory change and foreign exchange exposure.<br><br>In order to identify the specific business risks it faces, LCH identifies the drivers of business risk, reviews its existing control framework and quantifies the potential financial impact of reasonably foreseeable adverse loss events. Business risk drivers are considered both with and without financial impact-reducing mitigants in place. Business drivers are also considered for potential impact of simultaneous occurrence.<br><br>LCH faces business risks related to higher than expected costs and lower than expected revenues. This would include impact of increased competition in clearing and timing of clearing mandates for products currently cleared by LCH.<br><br>The drivers of business risk are monitored throughout the year and a detailed calculation is performed once a year or on a significant change to the business, which is reported to the LCH Board. Annual budgeting, the medium-term financial plan and quarterly forecasting processes assist in identifying any change to business risk drivers and forecast any impact of these changes. On a monthly basis, and forecast out to three years, cash flow effects of business risks are considered. Results of such forecasting are reported to senior management, LCH Audit Committee and to the LCH Board through forecast updates. |

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| | LCH's Risk Governance Framework includes a definition of capital risk, a statement on the appetite of the LCH Board regarding capital risk, and a clarification of responsibilities for the management and reporting of such risk. |
| **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. | LCH holds liquid net assets funded by equity so that it can continue operations and services as an ongoing concern if it incurs general business losses. LCH's minimum regulatory capital requirement includes a specific provision for business risk, which must be at a minimum equal to three months' operating expenses. LCH maintains a Wind Down Plan setting out in detail the steps it would need to take in order to wind down LCH in an orderly manner. This assessment includes a conservative estimate of the time and associated costs to achieve an orderly wind down equal to six months. LCH holds an additional capital amount equal to six months operating expenses to meet potential wind down costs. |
| **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 | LCH maintains a Recovery Plan and a Wind Down Plan, both of which are reviewed at least annually, or following material changes, and approved by the LCH Board.<br><br>The Wind Down Plan sets out the steps it would be necessary to follow should LCH need to wind down its clearing business. The plan sets out the roles and responsibilities of the internal functions to ensure an orderly wind down of the activities within six months. In addition, this plan takes into account the impact of such a wind down on external stakeholders such as members and the markets.<br><br>The Recovery Plan sets out the steps that LCH should take in order to maintain the continuity of its services, should such continuity be threatened. This plan takes into consideration the triggers for such a plan, the governance steps LCH must |

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| 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. | take to invoke the plan and a number of recovery tools that are available to LCH. Each available tool is assessed for its impacts to LCH's clearing members.<br><br>LCH holds capital equal to the operating expenses for the six-month period required to wind down. LCH bases its calculation on the latest audited expenses.<br><br>LCH invests its capital including the capital used to cover general business risks and the wind down plan in very high quality, very liquid instruments with low market risk, in line with applicable regulatory requirements. LCH capital is held on the balance sheet of LCH separately from the resources designated to cover clearing members' defaults. |
| **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. | LCH's assets held to cover business risk are composed of short-term reverse repos, the purchase of short term highly liquid government securities and overnight cash deposits. The maturity profile of the reverse repos and cash held to cover general business risk means no conversion of assets is required. The securities are high quality, very liquid and with low market risk.<br><br>LCH assesses the quality and degree of liquidity and marked to market value of its liquid net assets through daily monitoring, regular reporting and monthly internal governance reviews. |
| **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 | LCH produces a Recovery Plan which sets out the steps that the CCP will take in order to maintain the continuity of the services that it provides and the activities that it carries out in the event that such continuity is threatened. This plan is approved by the LCH Board as well other executive committees (Management Team, Executive Risk Committee and Risk Committee).<br><br>The Recovery Plan covers the capital raising strategy which is to utilise existing capital balances (e.g. regulatory capital held against the various risks or surplus capital) in order to meet the immediate skin in the game replenishment / loss allocation / liquidity shortfall (where required). |

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| the board of directors and updated regularly. | The Recovery Plan also includes triggers for activating the equity capital raising strategy. These are be based on the daily monitoring of the capital headroom against the related EMIR requirement carried out by the Finance team.<br><br>Other recovery tools that can be used if there is a breach are the Capital Surplus buffer, Suspension of dividend payments, Suspension of variable / discretionary benefits or the Business Continuity strategy. These tools can be effective as a cash management tool. |
| **Publicly available resources** | Annual Report and Financial Statements<br><br>CPMI-IOSCO Quantitative Disclosure |

## Principle 16: Custody and Investment Risks

**An FMI should safeguard its own and its participants' assets and minimise 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.**

*LCH's investment strategy is aligned to its overall risk management approach and regulatory obligations in the jurisdictions where it is permitted to operate. LCH maintains counterparty, custodian and (I)CSD relationships only after appropriate due diligence at the outset and satisfactory outcomes from ongoing review.*

| Key consideration | Detailed assessment |
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| **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. | LCH's internal risk policy on payment, settlement and custody sets a preference for safeguarding collateral (whether this is securities provided by clearing members, held as investments, or as collateral received in reverse repos) in accounts at (I)CSDs. Where an (I)CSD cannot be used (normally because of time zone or regulatory constraints), LCH uses a custodian bank. In each case the entity holding the collateral must meet standards set in the policy, including criteria in relation to creditworthiness and operational reliability.<br><br>All (I)CSDs and custodian banks are subject to the requirements described in the internal risk policy on payment, settlement and custody risk, as well as the criteria set out in the internal risk policy on counterparty credit risk and third-party risk management. These include a minimum internal credit score, legal review, due diligence, and the application of exposure limits.<br><br>LCH's monitoring of compliance with these criteria, and the overall suitability of (I)CSDs and custodians, is performed via a regular programme of due diligence. Entities most critical to LCH's operations (e.g., margin and collateral software providers; CSDs; operating platforms) are reviewed on an annual cycle and commercially important suppliers are reviewed at least every three years. This requires (I)CSDs and custodians complete a template covering all matters referenced in the policy and provide evidence where necessary. |
| **Key Consideration 2:** An FMI should have prompt access to its assets and the assets provided by participants, when required. | LCH ensures it has prompt access to its assets by only maintaining custody arrangements with high quality (I)CSDs and custodians, as determined under its policy and through its due diligence programme. As well as by maintaining multiple custody relationships and seeking legal counsel, including jurisdictional legal opinions. In relation to collateral, LCH satisfies itself via the due diligence process and legal review that it would have access to the assets in the event of the custodian bank's default. |

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| | Furthermore, LCH has multi-centre operational support, with relevant functions (such as operations, technology, and risk management) in the New York, London and Sydney offices which can support the default of a clearing member. |
| **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. | LCH uses a range of (I)CSDs and custodian banks to diversify where collateral is held. This includes two major (I)CSDs, the domestic UK Securities Settlement System, an Australian CSD, a Singapore CSD and three US custodians.<br><br>Risk exposures to custodian banks are aggregated with risk exposures to the same entities arising from investment, clearing or payments activity and monitored against credit limits set per entity. Where the custodian is a commercial bank and where cash balances are held on account at the custodian temporarily in connection with investment activity, LCH manages transactions such that its intraday unsecured exposure to the custodian remains below 75 percent of its capital, a limit set in internal risk policy. |
| **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. | LCH's investment risk strategy is set by the LCH Board, on the advice of the LCH Board Risk Committee, and in line with the LCH Board's Risk Appetite. The investment strategy is disclosed at an aggregate level on request to clearing members of LCH and a description of how the total cash received from participants is held/deposited/invested is included in LCH's disclosures against the CPMI-IOSCO Quantitative Disclosure Standards. The primary objectives of the investment strategy are capital preservation and liquidity provision, and these objectives are captured in LCH's Investment Risk policy. The Investment Risk policy's key objectives are to restrict investments to (i) high quality counterparties, (ii) reverse repurchase arrangements against very high quality and liquid collateral using appropriate haircuts, (iii) the purchase of short term high quality, low credit risk and highly liquid securities, (iv) deposits with central banks, (v) keeping unsecured lending and deposits with commercial banks to a minimum, and (vi) maintaining a maximum exposure to Interest Rate Risk limited to 10 percent of the CCP's capital resources. The Investment Risk policy emphasises the preference for secured transactions and highly marketable securities and sets maturity limits based on investment types. Further, the Investment Risk policy also specifies liquidity management as a key principle and sets investment concentration limits and appropriate haircuts for reverse repurchase collateral. Additionally, the policy requires that investment limits are reviewed regularly to ensure they remain in line with risk appetite.<br><br>The concentration limits for LCH investment activities include restrictions on exposures to particular counterparties, measured at the counterparty group level; the proportion of investments representing an exposure to a particular issuer; and exposures to reverse repo collateral, by ISIN, security type and issuer. Additionally, LCH sets exposure limits specified at the investment counterparty level by transaction type (e.g., reverse repo, FX swap) and by maturity.<br><br>Intraday and overnight exposures are monitored against the applicable limits and any breaches are escalated, reported, and remediated through internal governance processes. |

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| | | LCH does not invest margin received from a clearing member in securities issued by that clearing member or its affiliates.<br><br>LCH maintains pre-arranged and highly reliable relationships with a wide range of high-quality counterparties enabling swift execution and settlement of transactions. LCH also tests the ability to liquidate such financial assets with little, if any, adverse price effect with these counterparties according to a regular programme. |
| **Publicly resources** | **available** | Risk Management Overview<br><br>Collateral Management<br><br>CPMI-IOSCO Quantitative Disclosure |

## 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.**

*Operational risk management is a key component of the LCH risk management framework and encompasses appropriate tools and mechanisms to enable the effective identification, assessment, and mitigation of such risk. The operational risk management arrangements incorporate a "three lines of defence" structure that has been endorsed by the LCH Board, and places responsibility for managing operational risk on the business as the first line of defence, ensuring that an Accountable Executive from the business is appointed as Risk/Control Owner.*

| Key consideration | Detailed assessment |
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| **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. | LCH's Risk Governance Framework and Operational Risk Management policy that provides the framework through which operational risk is managed throughout LCH. The Operational Risk Management policy sets out the basis of LCH's governance for operational risks and the Risk Governance Framework identifies the following risk categories comprising the Operational risk universe:<br>• Technology Risk: Risk that a failure or change in technology leads to negative reputational, financial, regulatory or customer impacts.<br>• Business Continuity Management Risk: Risk that there are inadequate resiliency strategies and processes in place to mitigate operational disruption.<br>• Information Security and Cyber Risk: Risk arising from the inter-connectivity and inter-dependencies of the organisation, caused principally, but not exclusively, through the use of technology and by digitalisation that may be exploited either accidentally or maliciously by internal or external adversaries, thereby adversely impacting systems and processes.<br>• Physical Security Risk: Risk from physical actions and events resulting in a loss to LCH.<br>• Third Party Risk: Risk that the failure of external or intra-group service providers creates material business disruption or a negative impact on business performance.<br>• Data Risk: Risks relating to the potential adverse impact of inadequate oversight and management of data, including the opportunity cost associated with mismanagement. |

- Operational Process Risk: Risk arising from failed internal processes relating to customer, post trade and market operations and operational governance processes. This category comprises of all other risks related to important activities that if not managed appropriately can lead to financial loss, reputational damage, or regulatory sanction.
- People and Culture Risk: Risks relating to the management and engagement of LCH's workforce, including challenges to deliver on the group strategic objectives due to inappropriate cultural intent or dependencies on skills, knowledge, development, leadership, and wellbeing.
- Regulatory Compliance, Legal, Corporate Disclosure Risk: Risks of breaching legal or regulatory requirements and obligations, and the inappropriate reporting and disclosure of financial, taxation and regulatory information

The Operational Risk Management policy sets out the roles and responsibilities across first, second and third lines of defence. The responsibilities include the identification, assessment, monitoring and management of operational risks to the risk appetite defined by the Board. Regular control assurance is undertaken by each clearing service and function (the first line of defence) and is reviewed by the Resilience Risk team (the second line of defence).

The policy sets a framework through which operational risks are identified, including through review of audit findings, loss events and near misses, as well as external events which may give rise to increased vulnerabilities and changes to systems or processes. The policy also includes use of deep dive reviews to identify risks and to assess controls in response to, for example, management focus or external drivers. The aim of the deep dives is to review a specific process and understand how it operates, and conduct scenario analysis, and stressing relevant operational risks. Such exercises and oversight ensure operational procedures maintained by the specific services and functions are appropriately implemented and mandate that any changes to risk profile or actions arising from a deep dive are reported to the second line with associated remediation plans. Further, LCH's Third Party Risk Management policy requires all services and functions that outsource activities to establish appropriate processes and controls to ensure such activities are undertaken in a manner that allows LCH to meet its regulatory and legal obligations. In addition, any new outsourcing arrangement, or material changes to existing arrangements, may be subject to regulatory review or approval.

LCH maintains a comprehensive library of operational risks. Based on the activities, each business area must select those risks and define the controls applicable to them. The library ensures a consistent and comprehensive definition of risk is used for identification, assessment, and management of the risks on inherent and residual basis.

Operational risks are monitored through regular review and reporting to the Risk Resilience Committee, Executive Risk Committee, the Management Team and the LCH Board Operational Resilience Committee.

Periodic risk and control assessments are conducted by dedicated employees in the first line. The risks identified through the risk and control assessments are used to determine mitigating actions (where required), which are then prioritised to improve stability and resilience.

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| | In terms of people risk, please see Principle 2 (Governance) Key Consideration 5 on the pre-employment screening process and the LSEG Vetting policy and the process for development and attaining qualifications. Aside from these benefits, and appropriate remuneration, the company has identified tools to endeavour to retain key staff should turnover be identified as a risk. Senior management are subject to annual performance reviews, including assessments against their objectives and core competencies.<br><br>LCH is subject to the LSEG governance framework for change management. This framework considers any resource requirements for projects and mitigates the risks that changes, and major projects inadvertently affect the smooth functioning of the legal entities in the Group, including LCH, by setting out a flexible structure for delivery of change (by size and complexity of change). The framework sets out a methodology of categorising change; the category of change then determines the appropriate governance, reporting, minimum testing requirements and finally go-live approvals. Each LCH business line maintains oversight of its change portfolio. |
| **Key Consideration 2:** An FMI's board of directors 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 Operational Risk Management policy, which is approved by the LCH Board, clearly defines the key roles and responsibilities for operational risk. These responsibilities are separated between the LCH Board, first, second and third lines of defence. In general, the first line of defence is responsible for the day-to-day management of operational risk, including maintaining an effective system of internal controls. The LCH Board sets out its appetite for operational risk through the Risk Governance Framework. The first line is within the business lines and support functions. The second line oversight, support and challenge are provided by a dedicated risk function. This function is also responsible for providing aggregated reporting to internal senior executive committees as well as the LCH Board and its committees, as relevant. LCH's independent internal audit function provides the third line of defence by delivering a programme of assurance.<br><br>The Operational Risk Management policy is reviewed annually and approved by the LCH Board. The Board Operational Resilience Committee and the Board Audit Committee receive reporting on any operational risks assessed as outside or near appetite.<br><br>LCH reviews and tests its systems, policies, and procedures with its clearing members in several ways. LCH involves its clearing members in testing before the launch of new products and systems. In terms of data centre testing, LCH has the ability to switch hosting of its on-premises applications between its data centres, coupled with recovery activities available within its cloud-hosting environment. LCH conducts two data centre production switches per year to test against the two-hour Recovery Time Objective (RTO). All clearing members are invited to participate in these activities.<br><br>Clearing members are also required to participate in annual default management fire drills, in which the management of a default scenario is rehearsed. In each of these cases, LCH actively reviews the results so that any issues may be addressed, or improvements can be considered. A report with the findings from the annual default management fire drill |

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| | exercise is presented through internal risk governance, including presentation to the Risk Resilience Committee, the Executive Risk Committee and the Board Risk Committee.<br><br>LCH's independent audit function also conducts reviews of operational risk as part of its audit plans. |
| **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. | LCH's corporate strategic objective underpin the firm's commitment to effective risk, control, stability management. The first two corporate objectives being 'to provide market-leading risk management and resilience standards and clearing solutions' and 'to manage our members' and clients' risk by providing effective and efficient clearing services'. The Board sets a risk appetite and endorses the LCH Risk Management Framework to manage reliance, reliability, and stability of the CCP, which is cascaded throughout the firm. LCH has further defined service levels based on key performance indicators. |
| **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. | Minimum systems capacity levels are equal to two times the peak of at least the previous two years and must be tested annually. The capacity testing must cover key processes such as those for registering trades and calculating margin and settlement. Services experiencing significant growth in volumes are expected to forecast their future requirements and ensure that sufficient capacity will exist in the future.<br><br>The policy also requires that technology systems supporting critical services must meet a stressed capacity requirement. Capacity utilisation must be monitored at least daily and stressed capacity tested at least annually. In addition, each service is the subject of monthly service reviews, which include an assessment of key performance indicators, such as capacity. Furthermore, ahead of the implementation of new products or material system changes, LCH performs testing to provide assurance that system capacity will be, or will remain, adequate for normal and stressed volumes.<br><br>LCH systems are subject to regular risk based independent review by the internal audit function.<br><br>Should real-time system monitoring and monthly service reviews reveal capacity performance and trends which have disrupted or may disrupt operational functioning, action will be taken to investigate the cause and identify necessary timelines for increasing headroom for capacity. If capacity were to be exceeded, this would be investigated and remediated. Following remediation LCH would investigate the root cause and implement steps to prevent reoccurrence. |
| **Key Consideration 5:** An FMI should have comprehensive physical and information security policies that address all | LCH has a number of policies, standards and controls in place for safeguarding its physical and information security. Regular reviews are undertaken to understand potential vulnerabilities and threats i.e., physical, intrusion and natural disaster, that LCH may be subject to. |

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| potential vulnerabilities and threats. | The polices that govern these potential vulnerabilities are:<br>• The LSEG Physical Security policy, which covers people, physical assets, material assets and confidential information.<br>• The LSEG and LCH Information Security Risk policies address the risks of unauthorised access, use, disclosure, modification, destruction of or disruption to information and/or information systems. LCH has added an entity-specific appendix. LCH has also adopted LSEG's 21 information security standards and 29 technology standards, which are to be read in conjunction with the LSEG Information Security policy.<br>• In addition, LCH complies with the LSEG Enterprise Records Management policy and LSEG Confidentiality policy.<br><br>LCH has in place physical access controls, security personnel and security barriers on each floor of its premises and CCTV. Access to buildings and floors is granted via an Identification ID Badge which is required to be worn by staff. These measures are in place in all LCH and LSEG offices and are a prerequisite for any new site.<br><br>LCH carries out an assessment of its information security framework against the CPMI-IOSCO Guidance on Cyber Resilience incorporates key considerations aligned to the Cyber Institute profile which is based on the National Institute of Standards and Technology Cyber Security Framework (NIST-CSF). |
| **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 | The LCH Business Continuity Management programme, as outlined in its Business Continuity Risk policy, has been developed to provide continuity and timely recovery of LCH's business operations in the event of a major incident or crisis. The policy sets an RTO of two hours for all critical processes; this RTO is in place regardless of the scale of the incident or disruption. LCH has a Disaster Recovery Plan in place that describes the technical steps that are required to failover critical systems from one data centre to another in order to achieve the critical process RTO. Each of the clearing services and functions also BCP which detail recovery strategies for loss of premises, staff, technology, and critical third parties.<br><br>LCH operates a set of data centres in London with enhanced back-up capabilities designed with high levels of security and based on Rubrik technology, enabling a rapid and efficient backup and recovery of data across data centres.<br><br>LCH has a CMT that includes representatives from all clearing services and functions. In the event of a crisis, the CMT will be convened and will work to a predefined CMT Plan. The CMT plan ensures that the management of a crisis is effective and is coordinated to minimise the impact on clearing members, suppliers, employees, and the reputation of LCH. The CMT plan includes responsibilities for communications internally and externally. The CMT continues to meet every quarter to undertake scenario-based exercises of possible threats. Exercise findings are documented in a post-exercise report and circulated internally. Further, LCH uses an automated tool to contact its employees in the event of a real-life crisis event. LCH has notification requirements with relevant regulators when BCP or procedures are activated. The LCH Compliance function will typically manage the communications with such regulators in the event of a crisis. |

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| 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. | LCH has immediate access to work area recovery facilities, in the event of the loss of the primary office location. In the event of a metropolitan incident, critical processes can be transferred to staff that have been cross trained in another LCH office (in another country). Each LCH clearing business and function can use the cross-regional handover in relevant scenarios. Staff also have access to remote working, which operates as BAU as part of the hybrid working model. The Business Continuity Programme requires regular testing of work area recovery and alternate sites and crisis management plans. The frequency of testing exercises may be adjusted in response to the operating environment or where live incidents have occurred resulting in plans being invoked. |
| **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. | LCH has identified operational, financial, credit, market and legal risks that can arise from its clearing members, other FMIs and service and utility providers. The operational risks related to such connections (and which could impact business continuity) are identified and analysed as part of each clearing service and function's business impact assessment (BIA), as well as in aggregate at the LCH level.<br><br>LCH's participation requirements are designed to mitigate the risks that LCH faces as a CCP and seek to ensure that clearing participants have capabilities, procedures and personnel that are adequate to meet the operational requirements of LCH. Risks related to service and utility providers are addressed through the LSEG Procurement policy. This policy requires that supplier selection is transparent, that due diligence is performed on suppliers, and an appropriate contract is in place for the services supplied and that suppliers agree to the LSEG Supplier Code of Conduct. Any extension of current activity with an existing supplier must also comply with the LSEG Procurement policy.<br><br>Certain LCH services are offered globally to participants across US, Europe, and Asia Pacific. LCH ensures operational support to participants in these geographic areas and manages relevant risks through the interaction of relevant operations, technology and risk management functions in the New York, London, and Sydney offices. Each clearing service and business function has a BCP that details recovery strategies for loss of premises, staff, technology, and critical third parties in the event of a significant incident or major crisis.<br><br>LCH is dependent on several third-party suppliers to carry out certain critical activities supporting its operations. LCH's Critical Suppliers Oversight Strategy has defined a tiering methodology based on the criticality of its suppliers. Tier 1 includes the most critical suppliers on the basis that their service failure would cause an immediate impact on LCH's critical operations (e.g., margin and collateral software provider, CSDs and operating platforms). Such suppliers are therefore subject to enhanced oversight and monitoring. Further, LCH has in place a governance framework for vendor management that includes KPIs that act as a minimum service performance standard for all relationships; these are supported by specific indicators tailored to the type of vendor. LCH's critical suppliers are subject to a bi-annual review process. As part of its oversight and monitoring of critical vendor and outsourcing relationships, LCH carries out an annual due diligence assessment, which factors in cyber requirements. |

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| | Annually, the business reviews the business continuity management capabilities of its critical suppliers to ensure that, as a minimum, they maintain adequate resilience to ensure appropriate continuity of the services they provide to LCH. Critical suppliers are requested to complete a due diligence questionnaire which incorporates the guidance in Annex F of the CPMI-IOSCO Principles.<br><br>Outsourced service providers are required to have in place business continuity arrangements equivalent to those in place at LCH. Outsourced providers are also invited to participate in LCH's business continuity testing to ensure successful recovery of critical services in the event of a major crisis. Clearing members must maintain risk management policies and procedures that address the risks they may pose to LCH, including liquidity management and settlement procedures, and should have contingency payment arrangements in place that can be used to satisfy the margin obligations to LCH in the event of a failure of the nominated PPS banks. LCH carries out annual due diligence exercises on clearing members and requires them to participate in the default management fire drill to ensure that, in a real-life event, they would be able to support the LCH default management process as required. Further, at the time of onboarding, LCH asks that prospective clearing members confirm they have disaster recovery arrangements that support their planned clearing business. Clearing members are also invited to participate in the annual data centre failover test.<br><br>Besides considering the risks posed to LCH by FMIs, LCH considers the risks it may pose to other FMIs. Consequently, in addition to conducting its own ongoing due diligence, LCH cooperates and participates in reciprocal due diligence exercises with relevant external parties, for example service review meetings and business continuity testing. These include key supplier quarterly business reviews and industry-wide business continuity exercises such as SIMEX. |
| **Publicly available resources** | LCH Rulebook<br><br>Training for Clearing Members<br><br>CPMI-IOSCO Quantitative Disclosure<br><br>Business Continuity |

## 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.**

*LCH's participation requirements are designed to be the least restrictive while ensuring that risk to LCH and the markets its serves is minimised. Participation criteria are publicly available through the LCH Rulebook and website, and clearing members are monitored for ongoing compliance with the requirements. The LCH Rulebook contains provisions to manage circumstances where a clearing member no longer meets the criteria.*

| Key consideration | Detailed assessment |
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| **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. | Requirements for participation in LCH are based on risk-based principles and are designed to ensure that all clearing members are of suitable financial standing with sufficient operational capabilities. They are also subject to an ICS assessment. Final approval for all participation applications rests with the Executive Risk Committee, subject to the LCH Board Risk Committee being notified of approvals. Where the Executive Risk Committee refuses an application, the applicant may appeal to the LCH Board Risk Committee.<br><br>Minimum levels of net capital and default fund contributions are required as part of the clearing member admission criteria. These are set out below by service and are subject to an absolute minimum net capital requirement of £5mn sterling: |

| Service | Clearing Member Type | Minimum Net Capital Requirement | Default Fund | Minimum Default Fund Contribution[15] |
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| Listed Interest Rates | Listed Interest Rates Clearing Member[16] | £5mn | Rates Derivatives | £0.5mn |

[15] These are published at https://www.lch.com/membership/ltd-membership
[16] The minimum requirements will be greater if the Listed Interest Rate clearing member is a member in additional services.

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| Listed Interest Rates | Futures Commission Merchant | $7.5m[17] | Rates Derivatives | £0.5mn |
| RepoClear | Individual clearing member | €100mn | RepoClear | £2mn |
| RepoClear | General clearing member | €400mn | RepoClear | £2mn |
| RepoClear | Agent member | $10bn[18] | RepoClear | £2mn[19] |
| SwapClear | SwapClear clearing member | $50mn | Rates Derivatives | £10mn (plus £4mn in respect of the SwapClear Tolerance Contribution Amount) |
| SwapClear | SwapClear Futures Commission Merchant | $50mn | Rates Derivatives | £10mn (plus $4mn in respect of the SwapClear Tolerance |

[17] Listed Rates is tested with the SwapClear service during fire drills for the Rates Derivatives default management process.
[18] Group consolidated net capital.
[19] Calculated at the Sponsored Clearing Member level.

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| | | | | Contribution Amount) |
| EquityClear | Individual clearing member | £5mn | EquityClear | £0.5mn |
| EquityClear | General clearing member | £10mn | EquityClear | £0.5mn |
| Special Member | Special member | At the discretion of the CCP | | |
| ForexClear | ForexClear clearing member | $50mn | ForexClear | $5mn |
| ForexClear | ForexClear Futures Commission Merchant | $50mn | ForexClear | $5mn |

In terms of operational capability, all clearing members must have adequate back-office infrastructure to support a high volume of transactions and be able to pay and receive cash obligations to and from LCH, via accounts with eligible PPS banks and through a contingency mechanism in the event of a PPS bank outage.

Typically, this requires appropriate systems to manage the clearing member's clearing activities, and staff with sufficient knowledge and experience of those systems. Before going live and in cases where the LCH Onboarding function deem it necessary, clearing members receive operational capability training.

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| | LCH conducts default fire drills at least annually for all services. For its SwapClear[20] and ForexClear services, a failure to participate or perform in a fire drill may lead to suspension. Clearing members can, in lieu of participation in a fire drill, demonstrate that they have an affiliated clearing member or an 'Approved Outsourcing Agent'[21] that has taken part on the clearing member's behalf. These tests have been designed to demonstrate the clearing member's ability to load, price and bid on a fixed number of trade sides in auctions held to manage a clearing member default. For RepoClear, clearing members must make best efforts to bid if asked to do so. During default management fire drills, selected clearing members are asked to bid on auction packs.<br><br>All applicants for membership must provide a legal opinion from an independent external legal adviser practising in the relevant jurisdiction confirming that the prospective member has all necessary permissions and capacity to undertake its obligations as a clearing member in accordance with its and LCH's regulatory obligations.<br><br>LCH may impose additional, risk-based conditions on clearing members and may at any time vary or withdraw any such conditions. These conditions may include a requirement to post additional collateral or a requirement for prior authorisation for trades above a defined ceiling.<br><br>To achieve a balance between open access and risk, LCH continuously monitors a wide range of credit indicators for clearing members, including capital-to-risk ratios, and applies real-time risk management controls such as concentration limits and margin multipliers, rather than relying solely on hurdle-based participation criteria. In addition, the Default Management Process seeks to ensure that a clearing member's contingent obligations in the event of default are commensurate with the nature and scale of its cleared activity. |
| **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 | LCH's participation requirements are designed to mitigate the risks that LCH faces as a CCP in a way that ensures the least restrictive access that circumstances permit. LCH tries to ensure that its participation requirements continue to be appropriate, and in line with regulatory requirements. LCH monitors the membership criteria as part of the ICS framework set out in the Counterparty Credit Risk policy. The ICS framework is independently reviewed at least annually and is subject to approval by various internal committees, the Risk Committee, and the Board. Prior to on-boarding, and then at least once a year, clearing members are subject to a formally documented credit review, based on the ICS assessment that includes confirmation that all membership criteria are met.<br><br>Net capital requirements ensure that clearing members have adequate financial resources to withstand unexpected losses.<br><br>For each service, the nature and scale of the clearing members' clearing activity is used to define the default fund contributions and margin requirements. The floor for default fund contributions seeks to ensure that all clearing members |

[20] Listed Rates will be tested with the SwapClear service during fire drills for the Rates Derivatives default management process.
[21] An approved Outsourcing Agent can only sponsor a maximum of three members. Additionally, any entity of a group can outsource to any other entity within the same parent group with no limit. As of 31 March 2024, no SwapClear or ForexClear member uses these agents.

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| risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit. | have enough capital at risk such that they have an appropriate incentive to monitor and control the risks that they bring to the service. See also Principle 4 (Credit Risk).<br><br>Membership requirements are risk-based, including the need to have all necessary operational capabilities (e.g., access to relevant trading and settlement venues, and to have necessary regulatory permissions).<br><br>Different criteria apply depending on the nature of membership being applied for. Broadly, criteria may be differentiated by clearing service, and whether the applicant would be clearing only for itself or also for clients. The differing nature of risk an applicant poses is determined by these elements and criteria are set in a manner proportionate to the risk.<br><br>The participation criteria, including restrictions to participation, are publicly disclosed on the LCH website, and are included in the LCH Rulebook, which explicitly requires clearing members to comply with the criteria at all times.<br><br>During the review period, LCH introduced a new membership status of 'Dormant Membership' for RepoClear Sponsored members. This membership type allows members to reduce their Default Fund contribution from minimum £2,000,00 to £250,000 if they are not actively trading. Dorman Sponsored Members are not allowed to clear any trades until they have paid the required £2,000,000 Default Fund contribution. Dormant members remain subject to the same net capital and credit score requirements as active members. |
| **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. | The LCH Rulebook contains notification and disclosure requirements to ensure compliance with the financial requirements for participation in each service. LCH monitors compliance with participation requirements as part of the ICS framework as stated above. Under the framework, the LCH Credit Risk Team monitors clearing members against specific participation criteria and internal credit limits and receives regular financial reporting from clearing members. Clearing members' credit quality is evaluated regularly and an ICS is assigned. Clearing members are required to provide LCH with notice of material events that could affect their credit standing, including events such as bankruptcy or insolvency. On receiving new information, LCH's Credit Risk team re-evaluates the clearing member's ICS as required by the Counterparty Credit Risk Policy and considers whether that clearing member can continue to fulfil its obligations to LCH and continue to meet the publicly stated membership criteria. The results of such reviews allow LCH to identify the appropriate actions to take in respect of a clearing member, including (but not limited to) placing it in default. In addition, the Clearing Membership Agreement requires clearing members to notify LCH if they no longer meet the participation requirements. In addition, default fire drills (see Key Consideration 1) assess whether clearing members' operational capabilities continue to meet LCH's minimum standards.<br><br>Regulated clearing members must provide LCH with copies of all returns made to their regulators, and these are required within 30 days of their original submission. Non-regulated clearing members must provide quarterly balance sheet and profit |

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| | and loss statements within 30 days of their quarter end. LCH monitors all clearing members daily by referring to publicly available information, including credit ratings, share prices, credit spreads and media commentary.<br><br>The Rulebook outlines the actions LCH may take if there is an indication that a clearing member no longer meets the membership requirements or if its risk profile deteriorates, including: more detailed monitoring, increased margin requirements, prior authorisation for trades above a specified size, position reduction, position transfer to other clearing members, trading for liquidation only, and the declaration of default. LCH has the authority to declare a clearing member in default as soon as the membership requirements are breached. Where a clearing member is in breach of the membership requirements, but has not defaulted on payments to LCH, LCH may allow a grace period for the clearing member to remedy the breach before issuing a Default Notice. Once a Default Notice has been issued, withdrawal of the clearing member occurs, following the Default Procedures.<br><br>A clearing member may resign its membership of the LCH services of which it is a member by exercising certain of its rights under LCH's Default Rules ("Accelerated Termination Provisions"), or by giving LCH no less than three months' written notice, by completing a resignation letter. The clearing member must terminate all open contracts registered with LCH within this three-month period. If after three-month period the portfolio has not been closed out, LCH may liquidate the portfolio or require the clearing member to remain in the service until there are no remaining contracts. PPS arrangements must be maintained until all fees have been collected and to enable repayment of the clearing member's default fund contribution(s).<br><br>LCH has procedures in place to facilitate the suspension and orderly exit of clearing members; these are disclosed in the publicly available LCH Rulebook. |
| **Publicly available resources** | LCH Rulebook<br><br>Clearing Members<br><br>Risk Management Overview<br><br>Training for Clearing Members<br><br>CPMI-IOSCO Quantitative Disclosure |

## Principle 19: Tiered Participation Arrangements

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

*Clearing members act as principals to LCH for both proprietary and client business, including under the FCM model (where a statutory agency trust also applies). There is no direct exposure to the default of a clearing member's client; however, the Rulebook provides for LCH to collect information from clearing members about their clients or indirect clients. Where a portfolio is overly concentrated LCH may apply margin multipliers to mitigate such risk. LCH also takes steps to mitigate risk from tiered participation by offering porting to clients.*

| Key consideration | Detailed assessment |
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| **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. | The FCM model, available in SwapClear, ForexClear and Listed Rates, uses an agency trust style approach whereby the clearing member guarantees the performance of the client, meaning that the FCM Clearing Member is fully liable to LCH for the performance of all obligations arising in connection with FCM Contracts registered with LCH.<br><br>The non-FCM model uses a principal-to-principal approach. Each contract is between LCH and the clearing member, with the clearing member having a corresponding (equal but opposite) contract with the client.<br><br>LCH has no direct exposure to the default of a clearing member's client in either FCM or non-FCM models.<br><br>Obligations to LCH arising from the activities of indirect participants are in all cases obligations of the relevant clearing member, and the risk management processes referred to under Principles 3-10 apply to risk arising from positions recorded in clearing members' proprietary and client accounts.<br><br>Before offering client clearing, a clearing member must obtain authorisation from the LCH Onboarding Team.<br><br>LCH requires clearing members that clear for clients, affiliates or other third parties to hold segregated proprietary and client accounts for positions and collateral. LCH offers a choice of Individually Segregated Accounts (ISA) and Omnibus Segregated Accounts (OSA) to its clearing members. This model supports clearing of direct clients (clients of clearing member) as well as indirect clients (clients of client of clearing member).<br><br>A more detailed discussion on LCH's segregation and portability arrangements can be found at Principle 14 (Segregation and portability).<br><br>LCH collects varying degrees of information about clients of clearing members, depending on the segregation model selected, through client account opening procedures. This information is provided and kept updated by clearing members, |

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| | as LCH has no contractual arrangements with clearing members' clients. LCH requires clearing members to keep client information up to date and review clients' contact information at least annually.<br><br>The data collected is most detailed in the case of clients selecting ISAs. For other segregation models, LCH may not have detailed or any client information. For example, clearing members may provide client information for those clients which use OSAs, but this is not mandatory and the information is maintained by the clearing members.<br><br>Indirect client ("client-of-client") accounts are visible to LCH in the same way as direct client accounts and hence are subject to the same level of scrutiny and monitoring as direct client accounts. Therefore, indirect client clearing risks are identified in each account similarly to direct client clearing risks. Margin models have been developed and implemented to measure these risks on an overnight and intraday basis. However, LCH does not hold details of individual entities that are clients of clients.<br><br>The material risk arising at LCH from tiered participation is the default of a client, which disrupts or materially adversely affects a clearing member. In the event of a clearing member default, LCH could face risks should positions and collateral held for clients of a defaulting clearing member is not able to be ported. LCH may, therefore, in these circumstances, liquidate client positions and apply collateral in a similar as for proprietary accounts. Following the completion of default-management processes (the closing or transfer of positions and the realisation of collateral), LCH may apply surpluses in a clearing member's house account(s) to offset losses in the clearing member's client account(s), but not vice versa.<br><br>LCH mitigates these risks through setting appropriate membership criteria for its clearing members, by monitoring client portfolios and accounts, and by setting rules which allow, where possible and required, the efficient and timely porting of clients in default scenarios.<br><br>The standards for tiered participation are set out in LCH's Financial Resources Adequacy policy and is in accordance with the LCH Risk Governance Framework, which is approved by the LCH Board. |
| **Key Consideration 2:** An FMI should identify material dependencies between direct and indirect participants that might affect the FMI. | LCH monitors the activity of its clearing members and the activity in each of its client accounts, be they in omnibus or individual accounts. LCH monitors the proportion of house to client activity for its clearing members, and where clients are known, LCH can establish an account of the activity with named clients in total, by clearing service.<br><br>LCH can apply margin multipliers where a clearing member's aggregate client portfolio is overly concentrated. The LCH margin methodology (in terms of initial, liquidity and concentration margin) increases margin requirements progressively with large positions in both proprietary and client accounts. |

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| **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. | As outlined above, LCH monitors the activity of its clearing members and the activity in each of its client accounts, be they in omnibus or individual accounts. LCH monitors the proportion of house to client activity for its clearing members, and where clients and indirect clients are known by LCH is able to build a picture of the exposure to named clients in total, by clearing service and by client.<br><br>All activity driven by either direct or indirect participants across the LCH clearing services is monitored daily.<br><br>LCH produces daily reports which are used to monitor client positions and associated cash flows. LCH has the ability to apply margin multipliers, where a clearing member's client portfolio is overly concentrated. |
| **Key Consideration 4:** An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate. | Risk management policies and procedures covering indirect participation are reviewed at least annually.<br><br>LCH produces daily reports to monitor client positions and associated cash flows. LCH can apply margin multipliers, where a clearing member's client portfolio is overly concentrated.<br><br>LCH considers and monitors the risks arising from tiered participation within its risk governance framework. As described above, the Risk Governance Framework and Financial Resources Adequacy policy have been enhanced in respect of tiered participation risks, and LCH regularly reviews the level of risk arising from indirect participants. |
| **Publicly available resources** | Risk Management Overview<br><br>Collateral Account Segregation |

## Principle 20: FMI Links

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

*LCH has multiple and varied FMI links: specifically, LCH maintains links with (I)CSDs, Trade Repositories, Payment Systems and other CCPs. All such arrangements are considered within the LCH risk management framework and subject to rigorous, detailed due diligence and rigorous internal governance processes.*

| Key consideration | Detailed assessment |
|---|---|
| **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. | LCH maintains FMI links with (I)CSDs, CCPs, Trade Repositories and Payment Systems. Such link arrangements are governed by contractual agreements. Where required, LCH will engage with relevant regulators, as part of the regular regulatory oversight, before entering into a new link arrangement with another FMI.<br><br>The process of connecting to a new FMI is subject to LCH internal policies and procedures, which set out the requirements to be fulfilled and the governance approval process to be followed. LCH policies identify the criteria to be met, set out certain risks posed and assign responsibility within LCH for monitoring, analysis and escalation of such risks. LCH will assess a new FMI through due diligence and review of documentation and information acquired, both directly and indirectly. The review will include assessment against criteria such as corporate structure, credit risk, operational and technical resilience, legal structure and associated risk, operational risk (including cyber) and contingency arrangements. Further, the due diligence on FMI links considers the impact from operational failures, liquidity issues and overall creditworthiness, and effectiveness of any risk mitigants such as contingency processes. Findings, with a final recommendation, are presented through the LCH internal risk governance process for approval. Any new FMI link is established and maintained in accordance with LCH internal risk policies, which are aligned to the PFMIs. The policies are subject to annual review and each FMI link arrangement is subject to ongoing monitoring and periodic review. Further, FMIs, among other entities, are considered in the context of the LCH Critical Suppliers Oversight Framework, developed to ensure LCH can effectively manage its dependencies on such suppliers.<br><br>Ongoing due diligence of FMI links that are intermediaries, such as (I)CSDs, that give rise to settlement, payment or custody risks, is performed at least every two years. For those deemed to be critical suppliers or if there have been significant changes, this due diligence is performed more frequently. FMI links are assessed against criteria and risks set out in the Settlement, Payment and Custody Risk policy, and the applicable conditions of Principles 8, 11 and 17 are also taken into consideration. |

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| | For links with Trade Repositories, LCH will consider regulatory and reputational risks specifically. Trade Repositories are assessed in accordance with the LCH Third Party Risk Management Policy.<br><br>Interoperating CCPs are considered as part of the Financial Resource Adequacy policy and the Counterparty Credit Risk policy. The former details the risks which must be assessed before LCH enters into any interoperability arrangement with another CCP. The latter sets the standards for the management of the credit risk that could be posed by various parties and intermediaries of LCH. The policy describes the ICS Framework applied to such parties, including interoperating CCPs. The ICS is set between 1 and 10, whereby 1 represents low default probability in line with the AAA public ratings and 10 is equivalent to a defaulting counterparty. The factors, metrics and adjustments used to determine the scoring for a particular party are subject to review at least annually, and independently validated in accordance with the Model Governance Validation and Review policy. In the case of interoperating CCPs, the factors used to determine their ICS are financial analysis and operational capability. All new or revised interoperating CCP arrangements are subject to internal governance processes and regulatory non objection.<br><br>LCH's recovery planning process also reviews the impact to itself and its FMI links, if either party enters into a recovery scenario.<br><br>Finally, LCH's Settlement Finality Regulations, part of the Rulebook, are intended to mitigate the risks associated with payments and securities settlement. These Regulations are supported by LCH's designation under the UK SFR (see Principle 8 for further information). |
| **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. | As set out above, LCH conducts detailed due diligence before establishing a new FMI link. At the time of writing, LCH maintains links with FMIs in Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Poland, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom and the USA. LCH's arrangements pursuant to FMI links are governed by contractual agreements, which specify the law governing such an agreement. LCH's due diligence involves the review and assessment of i) the applicable legal framework in the jurisdiction where such FMI is located; and ii) the FMI's terms and conditions that LCH is required to agree and adhere to. Interoperable arrangements are governed by Master Clearing Link Agreements (MCLA) with the counterparty CCPs and Inter-CCP joint operating procedures. The legal framework governing such agreements adheres to the ESMA Guidelines on Interoperability and are subject to English law. LCH obtained appropriate legal opinions on the enforceability of the agreements in respect of insolvency, inter-CCP pledge agreements, treatment of collateral, LCH's netting rules and applicable sections of the LCH Rulebook. |
| Key Considerations 3-6 are not applicable to CCPs. | |

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| **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. | LCH's interoperable links are governed and managed on a bilateral basis. All arrangements are agreed contractually in a MCLA, which adheres to the conditions of the ESMA Guidelines on Interoperability, and the Inter-CCP procedures agreed between the parties to the MCLAs.<br><br>LCH will consider entering into an interoperable arrangement with another CCP only where that other CCP is authorised/recognised by its home regulators under the applicable regime and adheres to the CPMI-IOSCO's PFMIs, as implemented in the local jurisdiction. Further, the Financial Resource Adequacy policy sets out the risks which must be assessed before LCH enters into any interoperability arrangement with another CCP. For example, the other CCP's margin model adequacy risk must be assessed to ensure margin coverage is sufficiently conservative and methodologies are transparent. Collateral risks must be assessed ensuring that collateral LCH deposits is protected from the default of the interoperating CCP. In line with the same policy, interoperable CCPs are subject to the same LCH risk management framework that is applied to clearing members. In accordance with the ESMA Guidelines on Interoperability, LCH does not require an interoperating CCP to contribute to any LCH default fund or other financial resources. However, the LCH's default fund for the particular clearing service in which the interoperating CCP participates is sized to include the interoperating CCP's positions.<br><br>In order to mitigate the spill-over effects from the default of a linked CCP, LCH considers whether the default waterfall and the default management procedures are addressed within the interoperating CCP's rules and procedures. LCH also considers whether contagion risk is sufficiently collateralised through exchange of margin between the interoperating CCPs. In the LCH interoperable arrangement, each CCP holds collateral to cover inter-CCP risk at Clearstream Luxembourg in a bankruptcy remote structure and meets calls against it from the other CCP through pledge arrangements. In addition to contagion risk, LCH also assesses the market and credit risk posed by the interoperating CCP and ensures additional margin is called where necessary. As part of its ongoing review, LCH conducts quarterly meetings with the interoperating CCPs' risk managers to obtain information on any material changes such as changes to margin methodologies, operational risk framework or third-party relationships. |
| **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 | The LCH risk framework takes into account exposures to interoperating CCPs. In accordance with the Counterparty Credit Risk policy, interoperable CCP arrangements are subject to credit exposure monitoring thresholds on an ongoing basis; credit tolerances apply to interoperating CCPs and indicate exposure levels beyond which an intraday margin call would be triggered. Further, the policy sets out Guideline Escalation Triggers. This results in regular monitoring by the Credit Risk Team of adverse changes in respect to certain factors (e.g., financial data, ICS factors, external rating) and escalation to risk committees where necessary. This process ensures that current and potential future exposures are covered with a high degree of confidence. Moreover, stress testing procedures ensure LCH's margin models maintain at least a 99.7 percent confidence level and margin posted to cover inter-CCP risk is held in a bankruptcy remote structure. |

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| without reducing the CCP's ability to fulfil its obligations to its own participants at any time. | In accordance with the ESMA guidelines on interoperability, LCH does not require an interoperating CCP to contribute to any LCH default fund, nor does LCH contribute to the default fund of any interoperable CCP. However, LCH's default fund, for the particular clearing service in which the interoperating CCP participates, is sized to include the interoperating CCP's positions. Hence any additional contribution arising from an interoperating CCP is provided pro rata by the clearing members of that clearing service. Moreover, LCH has a number of processes in place to manage inter-CCP risk, for example regular intraday initial margin and variation margin calls, end-of-day margin calls and regular stress testing of inter-CCP exposures. Further, the rights and obligations set out in the relevant legal documents govern the process by which each CCP ensures risk is managed. LCH has the right and ability to call additional margins, including concentration, liquidity and stress margins where an assessment has been made that additional resources are required to mitigate potential losses and ensure that LCH's ability to fulfil its obligations to its clearing members are not adversely affected at any time.<br><br>LCH consults the clearing members of the relevant clearing service about material changes to interoperable CCP arrangement/s. LCH also publicly discloses on its website the interoperable CCP arrangements and the general risks of participating in such a service in relation to the sharing of uncovered losses and uncovered liquidity shortfalls resulting from a CCP link arrangement, as set out in the LCH Default Rules. |

Key Consideration 9 is not applicable to CCPs.

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| **Publicly available resources** | CCP Interoperability<br><br>CPMI-IOSCO Quantitative Disclosure |

## Principle 21: Efficiency and Effectiveness

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

*LCH maintains an operating structure that considers its clearing members and the products cleared and is designed to be efficient and effective. The mechanisms within this operating structure are subject to periodic review to ensure that they remain productive and continue to facilitate the goals and objectives of participants and the markets LCH serves.*

| Key consideration | Detailed assessment |
|---|---|
| **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. | LCH is a global multi-asset class clearing house serving a broad number of major exchanges and platforms as well as a range of OTC markets. LCH's commitment to the horizontal model and open access ensures a clear growth path for clearing across multiple markets, exchanges, venues and geographies. In line with Principle 18, LCH's believes in the importance of fair and open access given the critical role CCPs play in the markets.<br><br>LCH is committed to working closely with its clearing members and the markets it serves to provide clearing solutions and its staff adhere to a code of conduct which sets out the minimum standards for engagement with stakeholders. LCH is connected to a number of intermediaries to perform its services, including other FMIs such as interoperating CCPs, CSDs and other parties used for settlement, payment or custody purposes; and LCH ensures fair and open access to and from these in line with applicable regulatory requirements in the jurisdictions where it operates, as well as its internal standards.<br><br>LCH is partly owned by its clearing members, which therefore are included in the LCH governance process by being represented on relevant committees. The LCH Board and the LCH Board Risk Committee include user and independent director representation. LCH also has several advisory and risk working groups related to specific clearing services where new product initiatives, collateral extensions, and projects are discussed with clearing members. Proposals for significant changes to risk models must be reviewed with clearing members in these working groups, and their views will be documented and included with the proposals where approval is necessary, including at the Risk Committee and Board. Through these forums and clearing member consultation, LCH ensures appropriate consideration of its users' needs.<br><br>Any change which may fundamentally affect the way LCH operates will involve a change to the LCH Rulebook and such changes are considered by the Rule Change Committee. This Committee will independently assess the changes and set a minimum time for clearing member consultation for rule amendments that are deemed material. Feedback received from clearing members is assessed and any further material changes proposed will be considered again by the Rule Change Committee before they can be made live. Further, LCH is an active market participant, providing thought leadership into industry-wide initiatives to promote financial stability and to improve the effectiveness and efficiency of the markets. Any significant change that fundamentally affects the LCH operating model are made only after clearing member consultation. |

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| | Additionally, clearing members are involved in the development and testing of new service releases of technology relating to new products, services or systems.<br><br>The LCH client management functions collect and collate enhancement and change requests from clearing members and submit to senior management for consideration. |
| **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. | LCH's corporate strategic objectives are:<br><br>• To provide market leading risk management and clearing solutions.<br>• To manage our members' and clients' risk by providing effective and efficient clearing services.<br>• To promote a safe and stable financial market foremost in all that we do.<br><br>The strategy for achieving these objectives is to continue to offer LCH's proven risk management capabilities across a range of asset classes with a commitment to partner with clearing members to develop the services that make markets more efficient and safe.<br><br>The LCH Board, through its internal governance process, creates and maintains well defined strategic and financial plans. Progress against goals and objectives are included in the publicly available consolidated LCH Group report and accounts.<br><br>LCH senior management reporting enables the LCH Board to assess and have oversight of the progress of LCH against its goals and objectives, in line with the strategy and the priorities of its senior management. LCH management assesses performance against its annual corporate strategic objectives on a quarterly basis. Performance against these objectives is reported to the LCH Group Board and the LCH Remuneration Committee. In addition, LCH senior management regularly reviews its risk governance framework and reports to the Board on the extent to which risks are managed within the LCH Board's tolerance. LCH's financial performance against budgets, targets and multi-year financial plans is also regularly reviewed and reported to the Board. |
| **Key Consideration 3:** An FMI should have established mechanisms for the regular review of its efficiency and effectiveness. | LCH carries out reviews of its operating model as needed with a view to enhancing efficiency and effectiveness whenever necessary.<br><br>Principle 3 (Management of Risks) sets out the type of risks that LCH faces. The LCH Board defines tolerance levels for each category of risk and sets guidelines for internal reporting to provide assurance that the framework is observed. LCH effectiveness is achieved to the extent that it performs within the Board risk appetite. |

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| | LCH monitors its efficiency and effectiveness through a regular review of processes and procedures, among a number of other mechanisms, e.g. root cause analysis of incidents and continued monitoring of systems, platforms and processes to enhance resilience.<br><br>LCH operates a number of project boards that review the efficiency and effectiveness of its strategic and improvement plans during the life-cycle of projects. Significant projects may also have independent reviews undertaken which are reported to the Board.<br><br>LCH continues to review its operating models to ensure they are fit for purpose to support LCH's business whilst being lean and efficient. |
| **Publicly available resources** | LCH Corporate Objectives<br><br>LCH Company Structure (inc. markets served) |

## 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.**

*LCH uses internationally accepted communication procedures and standards where they are existing and practicable. Where such standards and procedures are not defined, LCH may facilitate use of proprietary messaging.*

| Key consideration | Detailed assessment |
|---|---|
| **Key Consideration 1:** An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards. | For an overview of the systems and standards that support the LCH clearing process, including reporting, payment and settlement, please refer to Principle 3. LCH works to internationally-recognised procedures and standards wherever possible.<br><br>For payments, LCH uses SWIFT ISO15022 or ISO 20022 standards for all payment instructions. For securities settlement, LCH uses a combination of SWIFT ISO 15022 standards and the CSD/Custodian's proprietary GUI interfaces.<br><br>Clearing members may provide settlement instructions to LCH either through LCH's proprietary GUI interface (CMS) or via SWIFT ISO 20022 standard Collateral Proposal message.<br><br>As well as providing proprietary reporting to clearing members, LCH provides standards-based reporting wherever possible. This is the case for cash and securities reconciliation messages and margin calls messaging. These messages can be provided directly to clearing members or to nominated third parties i.e. collateral managers or custodians.<br><br>Where industry standard interfaces for custodians and (I)CSDs are not available LCH either develops to third party specifications or defines a proprietary interface. |
| **Publicly available resources** | PPS Arrangements |

## 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.**

*The LCH website discloses the LCH Rulebook, the fees and risks associated with becoming a clearing member of LCH, as well as details of the LCH default waterfalls. Details of accepted eligible collateral including haircuts, and clearing member participation criteria are also disclosed on the publicly available LCH website, as is volume and value transaction data for each service.*

| Key consideration | Detailed assessment |
|---|---|
| **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. | The LCH Rulebook covers all material aspects of LCH's activities, with clear and certain legal basis for its operations and the rights and obligations of clearing members in respect of each clearing services.<br><br>The Rulebook includes provisions on product eligibility criteria, and specific contract terms to be met by contracts submitted for registration. LCH's rules ensure that on receipt of particulars of a transaction, specifying all the economic terms, it will accept or reject the transaction and notify the clearing members accordingly. Further, LCH rules specify that, following novation, the original contract between the buyer and the seller is extinguished and replaced by an equal and opposite contract between LCH and each clearing member acting as principals to such contract.<br><br>Further, the Rulebook sets out the membership criteria (also available on the LCH's website pages describing each clearing service), provisions on settlement finality, clearing member's default (including the obligations of defaulting and non-defaulting clearing members), enforcement of collateral, business continuity and disciplinary proceedings. The LCH Rulebook is made publicly available on the LCH website. Regulation 44 of the General Regulations sets out how the Rulebook may be amended from time to time by the Rule Change Committee, following consultation with clearing members for material rule changes. In such cases, clearing members are given a consultation period in which to provide comment on rule changes made available via the secure area of the LCH website. The final rule changes, which require self-certification with the CFTC, are made publicly available on the LCH website, in line with CFTC regulatory requirements.<br><br>The Rule Change Committee oversees LCH's rule implementation process and establishes the rule consultation and amendment process for all rule amendments. Following a determination of material changes by the Committee a period of consultation with LCH's clearing members will commence in order to provide them with the opportunity to comment on the proposed amendments. Prior to presentation at the Committee there may be an internal peer review of the changes with |

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| | Legal and Compliance staff or, for significant rule changes, a review will be carried out by external lawyers to ensure clarity and effectiveness.<br><br>LCH's website includes information on the LCH risk governance framework, margin methodology (including the expected coverage of initial and variation margin requirements) and margin models, default funds and stress testing, acceptable collateral and associated haircuts and fees, and available collateral segregation accounts.<br><br>LCH's website is currently being migrated to a new operating platform for better administrative management and ease of use for both members and internal staff.<br><br>LCH is also required to disclose relevant information to regulators in the jurisdictions where it operates, including financial information, audit reports and reporting regarding events or changes to its operations. To ensure compliance with relevant regulatory reporting requirements, LCH maintains embedded regulatory reporting procedures and a Regulatory Reporting, Notifications and Disclosure policy. |
| **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. | The LCH Rulebook, the structure of LCH's default waterfalls, LCH's PPS arrangements, as well as the list of current PPS banks, are published on the website. In addition, LCH provides its clearing members mechanisms to estimate initial margin obligations. The key features of each clearing service are also on the website, user guides and technical specifications are available on request.<br><br>As noted above, the Rulebook sets out the rights and obligations of LCH and its clearing members. |
| **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. | On becoming a clearing member, training is required for clearing members without previous LCH clearing experience. It is required that at least two personnel are fully conversant with clearing procedures. LCH has developed a training curriculum which covers all services. The clearing member on-boarding training covers risk management, margining, collateral operations and reporting. Furthermore, refresher operational training is provided for any existing clearing member on an ad-hoc basis, as required.<br><br>Bespoke training for any element of clearing may be formulated and delivered on request.<br><br>The Member Training team distributes evaluation forms to all training attendees and collects feedback to make adjustments and improvements to the service and the training material where necessary. |

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| | Outside of formal training, LCH staff are available to clearing members and dedicated teams are in place to assist clearing members, where necessary. Contact details are available on the LCH website.<br><br>If it becomes apparent that a clearing member lacks understanding of a particular element of the clearing process, the clearing member is contacted to discuss the requirement for further training. |
| **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 | Fees and descriptions of each LCH clearing service are disclosed on the LCH website; where relevant, volume-based discounts or fee holidays are clearly stated on the relevant fee page and are offered to all eligible clearing members on a non-discriminatory basis.<br><br>LCH issues circulars to members notifying them of material changes to the fees prior to making the changes. In addition, notifications are posted publicly on the website. This allows for easy comparison across CCPs offering similar services. |
| **Key Consideration 5:** An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values. | In accordance with LCH's policy of complete disclosure in accordance with the CPMI-IOSCO Disclosure Framework, LCH publishes self-assessments of compliance with the PFMIs and makes quarterly quantitative disclosures in accordance with the "Public quantitative disclosure standards for central counterparties". Updates to the qualitative self-assessment are made every two years or more frequently as required by LCH's national competent authority.<br><br>Quantitative data such as transaction volumes, notional outstanding values and end of day mark-to-market prices are made available to the public on the LCH website.<br><br>General information on LCH's activities and operations is publicly disclosed on LCH's website. This information includes a list of clearing members, the products cleared by each service, the acceptable collateral clearing fees, risk management related information and clearing member application procedure as set out in the Rulebook.<br><br>This information is disclosed to the public on the LCH website in English. |
| **Publicly available resources** | CPMI-IOSCO Qualitative and Quantitative Disclosure<br><br>LCH Clearing Services (information on fees and volumes)<br><br>Training for Clearing Members |

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| | LCH Rulebook |
| | LCH Proposed Rule Changes |
| | Default Waterfall |

# Appendix A: Key Terms and Abbreviations

| Abbreviation | Full Name |
|---|---|
| AIRB | Advanced Internal Rating-Based |
| BCP | Business Continuity Planning |
| BIA | Business Impact Assessment |
| BSL | Business Services Limited |
| CaLM | Collateral and Liquidity Management |
| CCO | Chief Compliance Officer |
| CCP | Central Counterparty |
| CCSL | Capped Contingent Swap Line |
| CEO | Chief Executive Officer |
| CFTC | US Commodity Futures Trading Commission |
| CLS | Continuous Linked Settlement Bank |
| CMS | Collateral Management System |
| CMT | Crisis Management Team |
| CPMI | Committee on Payments and Market Infrastructures |
| CRMC | Credit Risk Management Committee |
| CRO | Chief Risk Officer |
| CPSS | Committee on Payment and Settlement Systems |
| CSD | Central Securities Depository |

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| DCM | Derivatives Contract Market |
| DCMT | Default Crisis Management Team |
| DFAM | Default Fund Additional Margin |
| DMG | Default Management Group |
| DMP | Default Management Process |
| DVP | Delivery Versus Payment |
| EMIR | European Markets Infrastructure Regulation |
| ESA | Exchange Settlement Account |
| FCM | Futures Commission Merchant |
| FMI | Financial Market Infrastructure |
| FMX | Fenics Markets Xchange |
| FSMA | UK Financial Services and Markets Act 2000 |
| FX | Foreign Exchange |
| IBS | Important Business Service |
| ICS | Internal Credit Score |
| ICSD | International Central Securities Depository |
| IOSCO | International Organization of Securities Commissions |
| INED | Independent Non-Executive Director |
| ISA | Individually Segregated Account |
| KYC | Know Your Customer |

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| LCH | LCH Limited |
| LCH Group | LCH Group Holdings Limited |
| LSEG | London Stock Exchange Group |
| LSOC | Legally Segregated Operationally Commingled |
| MCLA | Master Clearing Link Agreement |
| MDR | Market Data Refresh |
| MI | Management Information |
| NDF | Non-Deliverable Forward |
| NDO | Non-Deliverable Option |
| NED | Non-Executive Director |
| NIST-CSF | National Institute of Standards and Technology Cyber Security Framework |
| OTC | Over-The-Counter |
| OSA | Omnibus Segregated Account |
| PFMI | Principles for Financial Market Infrastructures |
| PPS | Protected Payments System |
| PSL | Portfolio Specific Liquidity |
| RBA | Reserve Bank of Australia |
| Repo | Repurchase Agreement |
| Reserved Matters | Certain matters which must be approved by the LCH Board, and which cannot be delegated to the LCH executive. |
| RTO | Recovery Time Objective |

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| RTS | Regulatory Technical Standards |
| Rulebook | The LCH Rulebook and the procedures contained therein (the LCH Procedures) |
| Settlement Finality Directive | Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems |
| SOFR | Secured Overnight Financing Rate |
| STLOAM | Stress Test Loss Over Additional Margin |
| STLOIM | Stress Test Loss Over Initial Margin |
| STLOTM | Stress Test Loss Over Total Margin |
| TRF | Trade Registration Fund |
| UK SR | UK Settlement Finality Regulations 1999 |
| VaR | Value-At-Risk |

LCH

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