

**EXECUTIVE SUMMARY**

**LCH Clearnet Limited (LCH) is one of the main central counterparties (CCPs) in Europe, serving major international exchanges and platforms, as well as a range of OTC markets.** The CCP is a user-owned, constrained-for-profit organization (i.e., beyond a certain threshold, profit goes back to users). Its risk management framework is robust. In particular, it regularly measures and manages its exposures to members, and this is done using intraday positions in all markets calculated at least once a day (and up to three times a day) as routine and on an ad-hoc basis as required by market conditions. However, such measurement is not undertaken for the NYSE Euronext LIFFE (LIFFE) market, but this is a routine capacity that should be developed. LCH's liquidity management is conservative, but it should put in place other safe and reliable funding options, including committed credit lines, to help it face extreme but plausible circumstances, such as disruptions to its tri-party repo arrangements or dislocations in the repo market. LCH secures its collateral pursuant to a conservative custody and investment policy, but it needs to confirm that its custodians' accounting practices and safekeeping procedures fully protect customers' securities. LCH mainly uses a private settlement bank model, which exposes the CCP to intraday credit risk. LCH should find a way to reduce its settlement exposures, with settlement in central bank money when possible and practicable. The CCP's supervision and oversight are risk-based and thus are implemented on a prioritization basis. They have been strengthened since the crisis, both at the Bank of England (BoE) and the Financial Services Authority (FSA).

## I. INTRODUCTION

### A. Objective and Scope of the Assessment

1. **This assessment was undertaken in the context of an IMF Financial Sector Assessment Program (FSAP) exercise for the United Kingdom over the period January-July 2011.**<sup>1</sup> The assessment covered LCH's observance of the CPSS-IOSCO Recommendations for Central Counterparties (RCCPs).

2. **This assessment covers LCH.Clearnet Limited (LCH), the main CCP active in the U.K.'s financial markets.** LCH is a wholly owned subsidiary of LCH.Clearnet Group Limited, which is a private company, limited by shares and registered in the United Kingdom. It is a holding company created as part of a merger in December 2003 to oversee the two wholly-owned operating subsidiaries of the Group; LCH (formerly The London Clearing House Limited), and Banque Centrale de Compensation SA (which trades under the name of LCH Clearnet SA and became an independent legal entity at the time of the merger, having previously been part of the Euronext group of companies).

#### Scope of coverage of the CCP

3. **LCH is one of the main CCPs in Europe, serving major international exchanges and platforms, as well as a range of over-the-counter (OTC) markets.** It clears a broad range of asset classes including: securities, exchange traded derivatives, energy, freight, interbank interest rate swaps, and euro and sterling denominated bonds and repos. LCH operates in a number of currencies,<sup>2</sup> among which the main ones are sterling, euro and U.S. dollar.

4. **LCH provides CCP services for:**

- London Stock Exchange (LSE);
- NYSE Euronext LIFFE (LIFFE);
- London Metal Exchange (LME);
- EDX London;
- SIX Swiss Exchange;
- Nodal Exchange; and

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<sup>1</sup> The assessors were Christine Sampic, IMF Senior Financial Sector Expert, and Nikil Chande, Principal Researcher in the Department of Financial Stability at Bank of Canada.

<sup>2</sup> Australian dollar, Canadian Dollar, Swiss franc, Czech koruna, Danish kroner, euro, sterling, Hong Kong dollar, Hungarian forint, Icelandic krona, Japanese yen, Norwegian krone, New Zealand dollar, Polish zloty, Swedish krona, South African rand and the U.S. dollar.

- Several European Multilateral Trading Facilities (MTFs).

In addition, it offers a number of OTC derivatives services, most notably SwapClear for interest rate swap and RepoClear for cash bond and repo trades in the following markets: Austrian, Belgian, Dutch, German, Irish, Finnish, Portuguese, Slovakian, Slovenian, Spanish, and U.K. government bonds.

### **Institutional and market structure**

#### **5. Currently, in addition to LCH, there are two CCPs based in the United Kingdom and two more are expected to begin operations in 2011 and 2012:**

- EuroCCP, a subsidiary of the U.S. DTCC, was implemented in August 2008 to clear equities from issuers in 19 markets traded on multilateral trading facilities and stock exchanges in Europe.
- ICE Clear Europe, a subsidiary of the U.S. Intercontinental Exchange (ICE), began providing clearing services for the futures markets of ICE Futures Europe and ICE's OTC energy markets in 2008, and in July 2009 launched separate clearing services for credit default swaps (CDS).
- In addition, U.K. regulators gave approval in December 2010 to Chicago Mercantile Exchange (CME) Group to launch clearing for the OTC derivative trades in London in early 2011, through CME Clearing Europe, a subsidiary of CME.
- Finally, NYSE/EURONEXT has announced its project to provide a dedicated CCP to clear LIFFE's transactions by 2012.<sup>3</sup>

In addition, several non-U.K. CCPs hold a Recognized Overseas Clearing House license, which allows them to clear U.K. securities and derivatives outside the United Kingdom.

**6. U.K. equities are traded across a number of trading platforms, including exchanges and Multilateral Trading Facilities (MTFs).** In 2010, in terms of value, around 60 percent of equities were traded on the LSE and cleared via LCH and SIX x-clear. The remainder of equity trading was undertaken over-the-counter, and through the MTFs, mostly Chi-X, BATS and Turquoise, with Chi-X and BATs cleared by EMCF, and Turquoise cleared by Euro CCP. The PLUS Markets exchange offers trading in the alternative, junior equities market (AIM) and is cleared by LCH. Transactions are settled in CREST; Euroclear Bank SA/NV (Euroclear), the Brussels-based International Central Securities Depository (ICSD); and SegaInterSettle (SIS), and the Zurich-based ICSD.

**7. Bond trading is undertaken via MTFs, bilateral trading systems, and voice brokers.** Part of it is cleared by LCH.

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<sup>3</sup> Today LIFFE's transactions are technically cleared by LCH Clearnet Limited.

8. **Financial derivatives are traded at LIFFE and EDX, and commodity derivatives at the LME and LIFFE, with clearing taking place at LCH.** LCH together with Nodal Exchange provides trading and clearing of cash settled financial Nodal power contracts in North America.

9. **In terms of volume cleared by LCH.Clearnet Group Limited, the overall trade volume for 2009 was down on the previous year at 1.6 billion (just over two billion contracts in 2008), volume falling most in equity and listed derivative markets.** RepoClear and SwapClear, which are LCH's two flagship OTC clearing services, have held up well: SwapClear currently clears more than 40 percent of the interest rate swap market, representing trades with a total notional principal of \$248 trillion. RepoClear clears 250,000 traded sides per month, representing a nominal value of €11 trillion.

#### **Regulatory structure—overview**

10. **The current tripartite structure in the United Kingdom was established in 1997.** It brings together those authorities with responsibilities connected to financial stability—HM Treasury (HMT), the Financial Services Authority (FSA) and the Bank of England (the BoE). The Memorandum of Understanding (MoU) between HMT, the BoE, and the FSA (2006) sets out the respective roles of each authority:

- The treasury is responsible for the overall institutional structure of financial regulation and the legislation which governs it, including the negotiation of European directives; informing, and accounting to Parliament for the management of serious problems in the financial system and any measures used to resolve them; and accounting for financial sector resilience to operational disruption within government.
- The FSA is responsible for, inter alia, the supervision of financial markets, securities listings and of clearing and settlement systems; the conduct of operations in response to problem cases affecting firms, markets and clearing and settlements systems within its responsibilities; and regulatory policy in these areas, including that intended to promote the resilience to operational disruption of authorized firms and Recognized Bodies.
- The BoE contributes to the maintenance of the stability of the financial system as a whole—one of its two core purposes. This includes overseeing financial system infrastructure systemically significant to the United Kingdom, in particular payments systems whether based in the United Kingdom or abroad. It falls to the BoE to advise the Chancellor, and answer for its advice, on any major problem arising in these systems. The BoE is also closely involved in developing and improving the infrastructure and strengthening the system to help reduce systemic risk.

11. **Regulation and oversight of LCH is carried out by the FSA and the BoE.** The FSA is the main regulator of LCH as a Recognized Clearing House, while the BoE's oversight remit focuses on LCH's inter-bank payment system.

12. **February 2011 treasury's consultation indicates that the government intends to transfer regulation and supervision of CCPs to the BoE by end 2012.** Under the proposed framework, the BoE would be directly responsible for supervising the providers of systemically important infrastructure. It would, therefore, remain the regulator of payment systems under Part 5 of the Banking Act 2009 and it would take over the FSA's responsibility for regulating settlement systems under the Uncertificated Securities Regulations 2001. The BoE would also be the regulator of central counterparties under the FSMA. This would bring the regulation of all three types of body together for the first time.

### **Information and methodology used for assessment**

13. **During the 2002 FSAP, a detailed assessment was made of CREST against the RSSS, including RSSS4 on central counterparties where LCH was assessed on a global basis.** No detailed assessment of LCH was conducted since the CPSS-IOSCO had not released the RCCP at that time. LCH was, in June 2006, assessed by the FSA and the BoE against the RCCPs. In 2009, LCH conducted a self-assessment against the RCCPs. The FSA reviewed it, together with additional material requested in support of it, and validated it at end 2009, with the BoE's input on recommendations relating to LCH's payment arrangements. For the FSAP mission, the FSA provided the 2009 assessment, which is published on LCH Clearnet's website, and a summary of the main changes having affected the system since then. It also provided a number of documents relevant for the assessment. Extensive meetings were held with officials from the FSA and the BoE, supplemented by discussions with officials from LCH as well as with three LCH members and settlement banks, and two exchanges.

14. **The Assessment methodology used was the one developed in parallel with the CCP recommendations themselves in 2004.** In accordance with the assessment methodology, the assignment of an assessment category with respect to a recommendation is based on the current situation existing without regard to any proposed or ongoing actions. Material changes underway are presented in the description and/or comment sections.

15. **Each recommendation was assessed on a qualitative basis based on a five-fold assessment categorization: observed, broadly observed, partly observed, non-observed, and not applicable.** The categorization follows the guidelines in the assessment methodology. As a general principle, a recommendation is considered observed whenever all assessment criteria are generally met without any significant deficiencies. A Recommendation is considered broadly observed whenever only minor shortcomings are found, which do not raise major concerns and when corrective actions to achieve full observance with the Recommendation are scheduled and realistically achievable within a prescribed period of time. A Recommendation is considered partly observed whenever the shortcomings are sufficient to raise doubts about the ability to

achieve observance within a reasonable time frame. A Recommendation is considered non-observed whenever major shortcomings are found in adhering to the assessment criteria. Whenever a Recommendation is assessed to be broadly, partly or non-observed, suggestions are proposed for achieving full observance. A Recommendation is considered not applicable whenever it does not apply given the structural, legal, and institutional conditions.

16. **No obstacles were faced in the work. The authorities and others were fully cooperative.**

## II. DETAILED ASSESSMENT

### A. Executive Summary of the Recommendation by Recommendation Assessment

17. **The regulation of LCH by the FSA and the oversight of its payment arrangements by the BoE are ground in statute.** A clear legal basis exists for LCH to act as a CCP, and for its netting arrangements, rights in collateral, and its procedures upon default. Where necessary, LCH protects itself further by obtaining or requiring legal opinions.

18. **LCH sets and monitors requirements for its members that depend on and are commensurate with the type of membership and the markets to be cleared.** These include minimum levels of financial resources and credit worthiness, and an appropriate level of operational capacity.

19. **LCH regularly measures its exposures to members, and this is done using intraday positions in all markets except the LIFFE one.** LCH should develop a routine capacity for doing so in the LIFFE market. LCH limits its exposures to potential losses from default through a variety of measures, including membership requirements, collection of initial margin including additional margin where necessary, contributions to a default fund, and the monitoring of position limits. Even though there is risk mutualization through a single default fund, the main focus is on initial margins, mostly following a defaulter-pay model.

20. **LCH uses various initial margin models for the different markets it clears, such as SPAN, PAIRS, and ERA. Its margining assumptions are generally conservative, and it regularly back-tests the intended coverage.** LCH can and does make both routine and ad hoc intraday margin calls, subject to a minimum transfer threshold. For the LIFFE market, if prices are particularly volatile, then LCH will make an intraday call based on the previous day's positions. LCH should develop a routine capacity to do so using current positions. LCH takes a conservative approach with regard to its collateral eligibility for initial margin.

21. **LCH has designed its default fund, which is comprised only of cash, in order that it will have sufficient resources to cover more than the single largest default.** This is tested daily using historical and theoretical scenarios, with end-day positions. In

the event of a default, LCH needs access to sufficient liquidity to fulfill its obligations in a timely manner. LCH's liquidity management is comprehensive and conservative, but it should put in place other safe and reliable funding options, which should include committed credit lines subject only to presentment, and could also include other options like mutualization of liquidity risk among the CCP's membership. This would help it face extreme but plausible circumstances, such as disruptions to its tri-party repo arrangements or dislocations in the repo market.

22. **In the event of a default, LCH has broad authority to close out the defaulter's contracts, transfer its open contracts, and sell its securities.** LCH has an internal Default Management Framework, which provides a reference guide and a high-level and detailed operational procedures manual to assist in the process of managing issues that will arise as a consequence of a default. In the event of a default, it would be in close contact with its regulators. LCH has successfully managed five defaults, and discussions with regulators and market participants suggest that the Lehman default was managed effectively.

23. **LCH's Treasury Investment Policy is comprehensive and conservative, with safety taking priority over revenue maximization.** The vast majority of cash is secured, and the policy outlines minimum credit rating criteria for its counterparties, concentration limits at the counterparty group level, diversification of assets, and criteria to mitigate interest rate risk. Noncash collateral is mainly held at two European Central Securities Depositories (CSDs), and one custodian bank in the United States. LCH needs to confirm that the U.S. custodian it employs, and any new custodians it uses, conform to Recommendation 12 of the RSSS (i.e. that they employ accounting practices and safekeeping procedures that fully protect customers' securities).

24. **The system is reliable and secure, and has adequate, scalable capacity.** Contingency plans and back-up facilities are in place to allow for timely recovery of operations and completion of the settlement process. However, there is no compulsory contingency testing for the largest participants, and no second IT back-up site (three sites architecture).

25. **LCH mainly uses a private settlement bank model, which exposes the CCP to intraday credit risk.** LCH should find a way to reduce its settlement exposures, with settlement in central bank money when possible and practicable.

26. **The CCP clearly states its obligations with respect to physical deliveries.** The risks from these obligations are identified and managed.

27. **LCH currently interoperates with the Swiss CCP SIX x-clear in the clearing of trades executed on the London Stock Exchange and on the SIX Swiss Exchange; and with Oslo Clearing for the EDX market.** Each link is a peer-to-peer model, in which both CCPs lodge initial margin with the other CCP, and either CCP can be placed in default should it fail to meet its contractual arrangement to the other CCP. Each CCP calculates the margin it requires from the other using the standard margin methodology it applies to its members. However, neither CCP contributes resources to the other's default

fund, to minimize contagion risk from defaulting members between the CCPs. Inter CCP exposures are collateralized. LCH has also applied to interoperate with EuroCCP and EMCF. This is under review by the competent authorities.

28. **LCH has in place procedures to control its costs of operation and undertakes regular analysis and benchmarking on charges.** Over the past three years, competition has led to significant fee reductions.

29. **A three-year program to align the ownership of the Group more closely to its users through a significant share buyback came to an end in 2009.** LCH.Clearnet Group Limited is now owned 83 percent by its users and 17 percent by exchanges that clear through it. As a U.K. incorporated company, LCH's Board and management are accountable to the shareholders. The Board includes four independent Board members (including the Chairman). LCH publishes its rules and procedures for the various markets cleared, together with information on risk management, application costs and procedures, minimum contributions towards (and interest rates on) the default fund, and the transaction tariffs. Margin calculation models are provided to the participants; but not the CCP's activity statistics, nor its detailed objectives<sup>4</sup> and the extent to which they are met.

30. **The role and responsibilities of relevant public authorities with respect to clearing activities are clearly defined and transparent.** The CCP's supervision and oversight are risk-based and thus are implemented on a prioritization basis. They have been strengthened since the crisis, both at the BoE and the FSA. Hiring and keeping the right expertise is challenging. The government intends to transfer regulation and supervision of central counterparty clearing houses to the BoE by 2013.

**Table 1. United Kingdom: Collation of Assessment Results by Assessment Category**

<b>Assessment category</b>	<b>Recommendations</b>
Observed	Recommendations 1, 2, 3, 4, 6, 8, 10, 11, 12, 13, 14, 15
Broadly observed	5, 7, 9
Partly observed	
Non-observed	
Not applicable	

<sup>4</sup> They can be provided on demand and were presented to 10 of LCH's largest customers in January 2011.

**Table 2. United Kingdom: Detailed Assessment of Observance of the Recommendations for Central Counterparties**

Recommendation 1.	<p><b>Legal risk.</b> A CCP should have a well founded, transparent and enforceable legal framework for each aspect of its activities in all relevant jurisdictions.</p>
Answers to key questions	<p><b>KQ1. Are the laws and regulations governing the operation of a CCP and the rules, procedures, and contractual provisions for its participants clearly stated, internally coherent, and readily accessible to participants and the public?</b></p> <p>The governing laws are clearly stated.</p> <p>LCH is a private limited company incorporated in the United Kingdom, and as such is subject to U.K. company law.</p> <p>LCH is regulated by the FSA. In this regard, it is a Recognized Clearing House under the Financial Services and Markets Act 2000 (FSMA), and is subject to the Recognition Requirements for Investment Exchanges and Clearing Houses which are issued under FSMA Regulations 2001 (SI 2001/1995). The FSA regulates LCH according to FSA's specialist sourcebook "Recognized Investment Exchanges and Recognized Clearing Houses" (REC). As REC is written at a fairly high level, the FSA also periodically produces Guidelines that are more detailed and prescriptive covering specific areas such as counterparty credit risk.</p> <p>LCH is also designated under the Financial Markets and Insolvency Regulations 1999 (SI 1999/2979) (the Settlement Finality Regulations).</p> <p>The interbank payment system operated as part of LCH is recognized by HM Treasury for oversight by the Bank of England under Part 5 of the Banking Act 2009.</p> <p>It also is a Derivatives Clearing Organization in the United States and is subject to Commodity Futures Trading Commission (CFTC) rules and the U.S. Commodity Exchange Act.</p> <p>By virtue of the membership agreement that LCH members sign with LCH, the members are subject to the rules made by LCH in the conduct of their business.</p> <p>The governing laws and regulations and rules are publicly available on the relevant websites.</p> <p>There is no evidence (for example, through successful legal challenges) that the applicable legislation, regulations and rules are not internally consistent.</p> <p><b>KQ2. Does the legal framework demonstrate a high degree of assurance that there is a clear and effective legal basis for:</b></p> <ul style="list-style-type: none"> <li>• The CCP to act as counterparty, including the legal basis for novation or open offer.</li> <li>• The timing of assumption of liability as CCP.</li> </ul>

- Netting arrangements.
- The CCP's interest in collateral (including margin) that a participant pledges or transfers to the CCP.
- Default procedures.
- Finality of transfers of funds and financial instruments.
- Other significant aspects of the CCP's operations, risk management procedures and related rules.

A clear contractual legal basis exists for LCH to act as a CCP, either through open offer (as with cash equity trades executed on the London Stock Exchange) or through novation.

Concerning the timing of novation, LCH novates trades as they are received by its systems, with the exception of futures and options, which are novated at the end of each business day. Since LCH novates exchange traded derivative trades for clearing at the end of each trading day, LCH is only legally at risk for such positions once they are accepted. Accordingly, LCH could (technically) refuse to accept a trade awaiting novation, and so avoid being at risk for such a trade. However, as a matter of policy and of compliance with established and accepted market practice, LCH has committed to accepting any trades awaiting novation that have been matched for counterparties (i.e. members) that were not in default when the trade was executed.

The existing relationship between LIFFE and LCH is rather unique in that LIFFE Clear acts as CCP for trades executed on the LIFFE exchange, however, the clearing guarantee arrangements and related risk functions are outsourced to LCH. LCH only assumes liability as a CCP for a trade executed on the LIFFE exchange if there is a default by one of the counterparties to the trade. In all other cases LIFFE Clear acts as counterparty. Early in the relationship, some uncertainty existed as to which party bore responsibility in the event of certain nondeliveries; however, this has been clarified through amendments to the clearing relationship agreement.

LCH is designated under the Financial Markets and Insolvency (Settlement Finality) Regulations 1999, which implements the EU Settlement Finality Directive in the U.K. (Directive 98/26/EC). These regulations reduce the risks associated with participation in designated payment systems by minimizing the disruption caused by insolvency proceedings against certain participants in the system.

Netting, which is based on contractual arrangements, is supported by U.K. law (specifically insolvency law) and EU law (specifically the Winding Up Directive and, arguably, the Financial Collateral Directive). Furthermore, it should be noted that ISDA had performed a large amount of due diligence with regard to the legal robustness of netting arrangements in jurisdictions across Europe, and had not raised any concerns with regard to the U.K. arrangements.

**KQ3. Are the rules, procedures and contracts of the CCP enforceable**

**when a CCP participant defaults or becomes insolvent? Is there a high degree of assurance that actions taken under such rules and procedures may not later be stayed, avoided or reversed?**

LCH is protected by a recently updated Part VII of the Companies Act 1989 (Part VII), which provides protection to clearing houses and investment exchanges recognized by the FSA from the general application of the financial markets insolvency laws of England and Wales.

In the event of a member default, Part VII protects LCH's rights to manage the default by – for example – netting positions or offsetting profits and losses, and prevents a liquidator from “cherry-picking” profitable contracts. The default rules, as protected by Part VII, apply to all (U.K. and non-U.K.) members.

Further protection comes from designation under the Settlement Finality Regulations. This protection further reduces any possibility that English courts would entertain a challenge to the actions taken by LCH to manage a member default.

Given the protections afforded by both Part VII and the Settlement Finality Regulations, there is high degree of assurance that the actions taken by LCH in managing a default would not be subject to successful legal challenge, which has been the historical experience.

**KQ4. Is there a significant level of cross-border participation in the CCP? Has the CCP determined whether there are other jurisdictions relevant for determining the adequacy of the legal framework? Has the legal framework been evaluated for the other relevant jurisdictions? Do laws and rules support the design of any cross-border arrangement and provide adequate protection to both CCPs in the operation of the arrangement? Are there conflicts of laws issues and, if so, have they been addressed? Have cross-border collateral arrangements been evaluated?**

Cross-border participation is extensive. Most of the 132 members are incorporated under the laws of England and Wales; however, there are a significant number of members incorporated in France, Germany, the Netherlands, and the United States.

Upon entry, foreign members are required to provide a legal opinion concerning the application of laws in the jurisdiction of incorporation. In addition, protections of the Settlement Finality Regulations are limited to EU Members. Thus, with regard to the enforceability of its security interest, LCH obtains legal advice in the United States and other countries.

LCH's netting arrangements are subject to local insolvency regimes, but it minimizes the resulting legal risk by holding collateral in countries where LCH is more comfortable with local enforceability and local insolvency law and wherever possible in accounts in its own name.

LCH has procured external legal advice on several foreign jurisdictions' enforceability issues.

As necessary, LCH also obtains legal opinions on the application of foreign

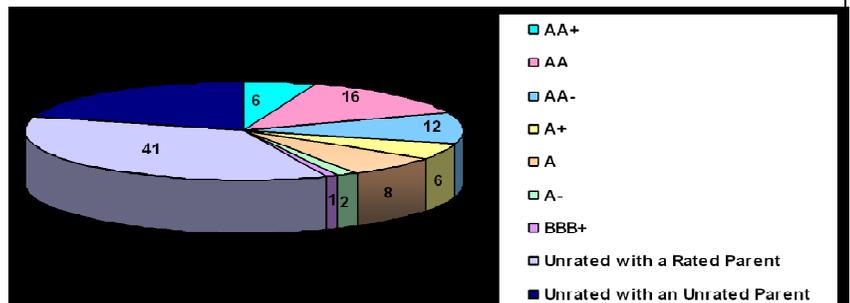
	law that are pertinent to the development of new services. This was recently done for LCH's client clearing initiative.
Assessment	Observed
Comments	
Recommendation 2.	<b>Participation requirements.</b> A CCP should require participants to have sufficient financial resources and robust operational capacity to meet obligations arising from participation in the CCP. A CCP should have procedures in place to monitor that participation requirements are met on an ongoing basis. A CCP's participation requirements should be objective, publicly disclosed, and permit fair and open access.
Answers to key questions	<p><b>KQ1. Does the CCP establish requirements for participants' financial resources and creditworthiness? If so, how? What factors are considered (for example, size, clearing for indirect participants, products cleared)? Does the CCP assess participants' operational capability? If so, how? What factors are considered (for example, arrangements to meet payment obligations, risk management policies, staffing, internal audit of risk controls and IT systems)?</b></p> <p>With regard to <b>financial resources</b>, LCH sets requirements for its members that depend on the type of membership and the exchanges and markets to be cleared.</p> <p>For exchange clearing members, the minimum levels for net capital and core capital applicable to any one exchange depend on the range of clearing business undertaken, with the requirement for the clearing of own business being the lowest and the requirement for the clearing of the business of other exchange members being the highest.</p> <p>For non-exchange clearing members, the minimum capital requirements are higher than for exchange clearing members.</p> <p>Typical minimum net capital requirements per product type are as follows:</p> <ul style="list-style-type: none"> <li>• Futures and options £5 million</li> <li>• Cash equity £5–10 million</li> <li>• Cash bonds and repos €100–400 million</li> <li>• Swaps \$5 billion</li> </ul> <p>Various categories of membership exist, and many members clear more than one market or product. In this case, the minimum capital requirement is the sum of the minimum capital requirements for each market or product. Moreover, if financial regulatory requirements are lower than the LCH requirements, then additional resources must be provided.</p> <p>For membership in SwapClear, an additional requirement is the ability to assist LCH in the management of a default by having the capacity to absorb a portion of the defaulter's portfolio, demonstrated by having an interest rate swap portfolio with a minimum notional amount outstanding of US\$1 trillion or equivalent. However, LCH is currently revisiting this requirement to facilitate greater access to its SwapClear service. The FSA will review the proposed change prior to its implementation.</p> <p>With regard to <b>creditworthiness</b>, credit evaluations of LCH's members are undertaken by LCH using financial reports and regulatory returns, external</p>

credit ratings, LCH's evaluation of standards of management and control, and in certain cases information received under information-sharing arrangements with the FSA. By agreeing to the Rules, members commit to this information being provided to LCH and other information that LCH may request so that it can evaluate the creditworthiness of its members.

In some cases, minimum external credit ratings must be maintained. For example, a member of RepoClear (or its guarantor) must maintain a rating of BBB or above. Downgrades to BBB- or BB+ will attract greater initial margin, and a downgrade below BB+ will result in the member being required to leave the service

Similarly, a SwapClear member (or its guarantor) must maintain a rating of A, while downgrades to A-, BBB+, BBB will attract greater initial margin. And a downgrade to below BBB will result in the member being required to leave the service.

As of 2008, the credit rating distribution of members in LCH was as follows:



With regard to **operational capacity**, LCH requires that members have:

- arrangements to effect payment obligations to LCH;
- arrangements to effect collateral and delivery obligations to LCH;
- staff with appropriate experience and training; and
- a Board and senior management conforming to suitable standards of fitness and propriety.

To become a member of LCH, the applicant must maintain a back office:

- that is remote from both the trading floor and/or trading desks;
- with adequate systems (including but not limited to computer and communications systems) and records;
- with an adequate number of administrative staff fully conversant with procedures for managing the business; and
- with such equipment (including technology and connectivity) as may be stipulated by LCH.

Members that wish to join SwapClear must successfully participate in a SwapClear “fire drill” run by LCH, which involves submitting a bid for a notional portfolio of trades within a specific currency in a specified timeframe.

All members must have money settlement arrangements with a PPS bank, through which cash margin payments to and from LCH, payments for physical deliveries under commodity contracts, cash settlements and contributions to the Default Fund are made.

The PPS arrangements operate both in the United Kingdom and the United States. Each member is required to maintain a PPS bank account(s) in London in pounds sterling and for each currency in which it incurs settlements at one of the participating PPS banks. The U.K.-based arrangements operate from 07:00 until 16:00 London time, the U.S. arrangements until 22:00.

Furthermore, members are also required to have PPS banking arrangements in the United States under the U.S. PPS scheme, which is utilized after the U.K. cut-off time for PPS.

In addition, all members must have the necessary CSD or SSS facilities necessary to meet their delivery obligations.

**KQ2. Does the CCP monitor that participation requirements are met on an ongoing basis? If so, how? Through access to regulatory reports or directly? Are reports sufficiently timely to be useful for monitoring purposes? Under what conditions can the CCP suspend and terminate participants' membership? What arrangements does the system have in place to facilitate the suspension and orderly exit of participants that no longer meet the participation requirements?**

LCH monitors that membership requirements are met via member risk assessments. After the initial on-boarding process, LCH undertakes ongoing monitoring using a risk-based approach, where less credit worthy members and those not subject to external regulation are monitored more closely.

To undertake this monitoring, LCH receives annual accounts from all clearing members, as well as quarterly balance sheet data from nonregulated members. In addition, members must immediately notify LCH of significant decreases in their capital and any other information relevant to their financial health. If a clearing member has not been active on any exchange or market for a continuous period of three months, they will be asked to confirm that they intend to use their clearing member status or be asked to resign.

In situations where developments affecting a member, after closer inspection, are considered sufficiently serious, LCH has a range of measures at its disposal. It can impose one or more of the following measures, all of which have been exercised at various times:

- Higher initial margin requirements (super margin);
- Additional financial resource requirements (buffers);
- Position transfers to other Members;
- Trading for liquidation only;
- Prior authorization of trades above a certain size;
- Reduction in positions;
- Gross margining of client account positions;
- Termination of the Clearing Member agreement;
- Declaration of Member default.

	<p>Clearing members would only be suspended or terminated in extreme cases, if they failed to adhere to the rules, regulations and requirements of the clearing house, following consultation with the FSA.</p> <p>LCH has procedures in place to facilitate the orderly exit of members. LCH or the member firm is separately able to terminate membership with three months' notice. The member is obliged to close out all positions within this period before its membership finishes. LCH will help the member through this process as necessary.</p> <p>In the event that the resigning Member has not closed out or transferred contracts by the set termination date, LCH shall, at its sole discretion, be entitled to:</p> <ul style="list-style-type: none"> <li>• liquidate the contracts in accordance with the Rulebook; and</li> <li>• require that the firm remains a member of LCH until such time as there are no contracts in existence to which the firm is a party.</li> </ul> <p><b>KQ3. Do participation requirements limit access on grounds other than risks? Are they objective and do they permit fair and open access? Are participation requirements, including arrangements for orderly exit of participants, clearly stated and publicly disclosed?</b></p> <p>The FSA requires fair and open access, and during the on-boarding process for new products, the FSA assesses the participation criteria to ensure this is the case. The participation criteria appear to be objective and risk-based.</p> <p>Detailed participation requirements are publicly available.</p> <p>LCH is currently trying to find ways of altering its access criteria that will allow for greater global participation, while not exposing LCH or its existing membership to undue risks.</p> <p>With regard to orderly exit, there is publicly available information on resigning as a member.</p>
Assessment	Observed
Comments	
Recommendation 3.	<p><b>Measurement and management of credit exposures.</b> A CCP should measure its credit exposures to its participants at least once a day. Through margin requirements, other risk control mechanisms or a combination of both, a CCP should limit its exposures to potential losses from defaults by its participants in normal market conditions so that the operations of the CCP would not be disrupted and nondefaulting participants would not be exposed to losses that they cannot anticipate or control.</p>
Answers to key questions	<p><b>KQ1. How frequently does the CCP measure its exposures to its participants? Does the CCP have the capacity to measure exposures intraday? How timely is the information on prices and positions that is used in these calculations?</b></p> <p>LCH regularly measures its exposures to members, a minimum of three times per day, and more frequently in extreme market conditions. However, with regard to the LIFFE market, it does not have a routine capacity for calculating intra-day exposures. Intraday price moves are monitored and if price moves are severe enough LCH calls additional margin intraday for this market based</p>

	<p>on end-day positions from the previous day.</p> <p>LCH's monitoring of positions is focused according to its internal credit evaluations. Particular attention is paid to positions which are large in relation to either a member's financial resources or to open interest in a particular contract or product group that threaten the assumed holding period of the initial margin calculation. Position monitoring looks at house and client accounts both separately and together. If the monitoring gives rise to concerns (particularly about the size of positions in a member's client account) further information is sought, notably about the concentration of individual client positions and the risk management of client related business.</p> <p><b>KQ2. How does the CCP limit its exposures to potential losses from defaults by its participants? If margin requirements are used, does the CCP observe Recommendation 4? If not, how does the CCP ensure that closing out any participant's positions in normal market conditions would not disrupt the operations of the CCP or expose nondefaulting participants to losses that they cannot anticipate or control?</b></p> <p>To limit exposure to potential losses from a default, LCH uses membership requirements, which serve to lessen the likelihood of default occurring in the first place. In addition, LCH collects initial and variation margin, as well as contributions to a default fund.</p> <p>LCH also has other measures at its disposal to limit losses from defaults, including:</p> <ul style="list-style-type: none"> <li>• additional financial resource requirements (buffers);</li> <li>• additional initial margin requirements;</li> <li>• imposition of position limits;</li> <li>• trading for liquidation only;</li> <li>• prior authorization of trades above a certain size; and</li> <li>• issuing instructions to reduce positions.</li> </ul> <p>LCH also monitors large cumulative profits or losses. If large and unusual trading activity is detected (relative to previous exposures), LCH contacts compliance officers and seeks assurances from the senior executives or Boards of a member firm or parent company.</p>
Assessment	Observed
Comments	LCH should develop a routine capacity for calculating exposures intraday for the LIFFE market.
Recommendation 4.	<b>Margin requirements.</b> If a CCP relies on margin requirements to limit its credit exposures to participants, those requirements should be sufficient to cover potential exposures in normal market conditions. The models and parameters used in setting margin requirements should be risk-based and reviewed regularly.
Answers to key questions	<b>KQ1. What is the intended coverage of margin requirements? What is the time interval over which potential price movements are measured? Is the interval consistent with a reasonable assumption about how quickly a defaulting participant's positions could be closed out? How does the CCP validate the models and parameters used to determine the margin levels consistent with the intended coverage? How frequently does it review and validate the models?</b>

Initial margin is a measure of the inherent market risk of a contract or portfolio of contracts. It is intended to cover possible losses in the event of a default under normal market conditions, between the time of the last margin payment and the time that the relevant positions are either closed out, transferred to other members or hedged.

Cleared products and markets differ in terms of their risk profiles, structure, and correlations. LCH uses a number of different models to calculate initial margin requirements. These models can be grouped into two main types:

(i) Variance-Covariance models – London SPAN<sup>®</sup> (used for listed derivatives on NYSE Liffe, EDX and LME, and for EnClear and RepoClear)

(ii) Historical Simulation models – for EquityClear (ERA), for SwapClear (PAIRS) and for Nodal (VaR model).

*(i) Variance-Covariance models*

The Variance-Covariance model London SPAN<sup>®</sup> requires a set of parameters to be input in order to calculate the appropriate level of initial margin. The main parameters are the ‘scanning range’ (which reflects the outright risk faced by LCH over the potential close-out period) and the volatility shift factor for options. Scanning ranges are defined as the highest of the price movements over one or two days (the defined close-out period for unwinding defaulted positions is assumed, for most markets, to be two days) based on historical data usually over the past 60 business days.

The scanning ranges and volatility shifts are applied to various scenarios within the model and used to calculate the margin requirements for each member’s portfolio. However, the risk-reducing effects of price correlations, covariance between contracts or for particular trading strategies which are regarded as lower risk, can be factored into the model by means of margin offsets.

Margin parameters are reviewed on at least a quarterly basis. Ad hoc reviews occur when the initial margin levels are challenged by significant market moves.

*(ii) Historical Simulation Models*

Historical simulation margining models look at past price moves and generate scenarios based on the historical observed data (using one year of data for equities, two years for energy products and five years for OTC interest rate swaps). The close-out period following a default is assumed to be between two and seven days for equities, three days for OTC energy and five or six days for interest rate swap contracts depending on the currency.

*Confidence Level and Risk Appetite*

In order to ensure consistency amongst the models used, the LCH.Clearnet Group Board has, through its Risk Appetite statement, determined that it wishes initial margin to cover 99.7 percent of observations over the assumed holding period of a product. As such, LCH back-tests the results of the initial margin calculation on a daily basis, with reporting to the Senior Executive and the Risk Committee on a monthly and quarterly basis, respectively. This back-test measures initial margin held against the profit and losses incurred by

each contract over its assumed holding period. This aims to ensure that, regardless of the margin algorithm utilized, all products are assessed on a consistent basis and present the 'same' risk profile.

Total initial margin at LCH has typically been in the range of 40–50 billion euro-equivalent, approximately 64 percent of which is currently covered in cash.

**KQ2. Does the CCP have the authority and operational capacity to demand margin intraday to maintain the desired coverage? Under what circumstances?**

Pursuant to LCH Rules, LCH can and does make intra-day margin calls when prices are especially volatile. Routine intraday margin calls are subject to the call being above the minimum transfer amount of £100,000.

LCH has a routine intra-day capability to recalculate initial and variation margin using intraday positions and prices (except for the LIFFE market). For the LIFFE market, if prices in a contract change by a certain trigger percentage (of the initial margin level for that contract, dependent upon the importance of the contract) during the trading day, LCH will make an intra-day call on members on the basis of their positions the previous night.

Intra-day recalculations are made at least three times per day. Additional margin is called either routinely at 13:00 or on an ad hoc basis as necessary, up until close of business.

**KQ3. What types of assets does the CCP accept as margin? What types are actually held? How frequently are the assets revalued? Are haircuts applied that adequately reflect the potential for declines in asset values between the last revaluation and liquidation?**

Members may elect to use either cash or securities to cover margin requirements. To facilitate delivery, members may lodge securities either directly ("bilateral collateral") or using a tri-party mechanism ("tri-party collateral").

Acceptable Collateral	
Cash	Sterling
	Euros
	U.S. Dollars
	Swiss Francs
	Japanese Yen
	Swedish Krona
	Danish Krone
	Norwegian Kroner
Government debt	Austria
	Australia
	Belgium
	Canada
	Denmark
	Finland
	France
	Germany

		<table border="1"> <tr><td></td><td>Italy</td></tr> <tr><td></td><td>Japan</td></tr> <tr><td></td><td>Luxembourg</td></tr> <tr><td></td><td>Netherlands</td></tr> <tr><td></td><td>Norway</td></tr> <tr><td></td><td>Spain</td></tr> <tr><td></td><td>Sweden</td></tr> <tr><td></td><td>United Kingdom</td></tr> <tr><td></td><td>United States</td></tr> <tr><td>Other</td><td>Performance Bonds</td></tr> <tr><td></td><td>U.S. Govt Agencies</td></tr> <tr><td></td><td>Govt guaranteed bonds</td></tr> </table>		Italy		Japan		Luxembourg		Netherlands		Norway		Spain		Sweden		United Kingdom		United States	Other	Performance Bonds		U.S. Govt Agencies		Govt guaranteed bonds	
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	<p>For U.S. government agencies, a concentration limit is to be set to this collateral category, by member, at the lower of 20 percent of total margin requirement or \$500 million.</p> <p>For performance bonds, there is a limited range of acceptable issuers subject to a limit of £50mn (or equivalent in other currencies) per issuer.</p> <p>LCH has discretion to decline any collateral type even if it is within the acceptable collateral policy.</p> <p>The application of the collateral acceptance policy is subject to audit, and the appropriateness of the policy is reviewed annually by the Risk Committee.</p> <p>Haircut rates are calculated using the largest two-day change in yield over the last five years. Securities are bucketed into categories, with the longest duration in each bucket used to represent the bucket. Reviews of collateral haircuts take place on a regular and ad-hoc basis (if market conditions warrant). The last collateral haircut review was implemented on March 7, 2011. Members generally get one week notice of a haircut change, although LCH reserves the right to apply the new haircut immediately.</p>																										
Assessment	Observed																										
Comments	For the LIFFE market, if prices are particularly volatile, then LCH will make an intra-day call based on the previous day's positions. LCH should develop a routine capacity to do it using intra-day positions.																										
Recommendation 5.	<b>Financial resources.</b> A CCP should maintain sufficient financial resources to withstand, at a minimum, a default by the participant to which it has the largest exposure in extreme but plausible market conditions.																										
Answers to key questions	<p><b>KQ1. Has the CCP established procedures to stress test its exposures in extreme but plausible market conditions? What scenarios are evaluated? Do the scenarios include the most volatile periods that have been experienced by the markets for which the CCP provides services? Does the CCP have sufficient resources in the event of default by the participant with the largest exposure? Has the potential for multiple simultaneous defaults been evaluated? Are stress tests performed at least monthly, with a comprehensive reconsideration of models, parameters and scenarios occurring at least annually? Does the CCP have a clear policy on actions to be taken in the event that stress testing results indicate resources are not likely to be adequate to meet its obligations resulting from a default? Has it adhered to that policy? Is the policy made available to participants and authorities?</b></p>																										

	<p>The default fund is approximately £600m, and it is held as secured cash deposits at a number of financial institutions (through fixed deposits, swaps, security purchases or repo transactions).</p> <p>Members are required to make a cash contribution to the Default Fund according to the markets that they clear, based on their usage of those markets and subject to minimum levels.</p> <p>The default fund is comprised of four fixed segments, with minimum contributions:</p> <ul style="list-style-type: none"> <li>• Exchange Fund Amount, minimum contribution £100,000.</li> <li>• EquityClear Fund Amount, minimum contribution £1,000,000.</li> <li>• RepoClear Fund Amount, minimum contribution £1,000,000.</li> <li>• SwapClear Fund Amount, minimum contribution £2,000,000.</li> </ul> <p>The fixed segments are redistributed among the clearing members once per quarter, based on the relative share of each member's clearing activity.</p> <p>Clearing activity is defined with reference to average levels of initial margin (except for Exchange Fund calculation, which also takes into account the average volume of trades).</p> <p>The default fund is designed so that LCH has enough financial resources to withstand the default of the higher of:</p> <ul style="list-style-type: none"> <li>• The member with the largest stress testing losses plus other members from the same financial group, together with the simultaneous default of the five least creditworthy members, representing a measure of contagion risk;</li> <li>• The second and third largest members by stress testing losses (plus other members from the same financial group).</li> </ul> <p>The adequacy of the Default Fund is stress tested daily, using a combination of:</p> <ul style="list-style-type: none"> <li>• Historical scenarios (for example, the 1987 stock market crash, Sterling Exchange Rate Mechanism exit, the 1998 bond market crisis, the Long Term Capital Management collapse, Hurricane Katrina and Lehman Brothers default); and</li> <li>• Theoretical scenarios (either where observed correlations in historical scenarios are stressed further or LCH has created scenarios more extreme than historical scenarios).</li> </ul> <p>LCH has approximately 60 scenarios, which are run daily across the portfolios of all members. LCH examines the losses each clearing member would have suffered under each of these scenarios, using end-day positions. LCH examines whether the margin would have been sufficient to cover the resulting losses and if not how much of the default fund would have been required.</p> <p>In addition, there are internal triggers relating to stress testing losses that ensure that further analysis is carried out on a daily basis for any member that is identified as having a sharp increase in stress testing losses or which are material in the context of their business. If LCH identifies that one or more</p>
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members have stress testing losses of greater than 90 percent of the total Default Fund, procedures are in place to take the necessary course of action to ensure that the member(s) continue(s) to meet their margining obligations to LCH.

Stress test results are assessed daily by senior management. The results of stress testing also inform the “Default Fund adequacy exercise”, undertaken monthly by the Executive and each quarter by the Risk Committee and reported to the Board. If the results of stress testing move beyond certain trigger points between quarterly assessments, the Secretary of the Risk Committee is obliged to report to the Chairman of the Risk Committee (who is an independent non-executive director) and the Chief Executive Officer. If they consider it necessary, they will convene a special meeting of the Risk Committee. In any case, the Secretary of the Risk Committee is obliged to provide a full report with recommendations at the next meeting of the Risk Committee.

**KQ2. What are the types and values of resources that the CCP has available to cover losses from participants’ defaults? Is there a high degree of assurance that the CCP will be able to draw on those resources for the anticipated value in the event of a participant’s default? Do the CCP’s rules prohibit them from being used to cover operating losses or losses from other CCP activities?**

The Default Fund totals approximately £600 million. Additionally, for SwapClear related losses only, LCH can apply a further £50 million from each nondefaulting SwapClear member.

The pecking order for resources following a default:

- Defaulter’s margin.
- Defaulter’s contribution to the Default Fund.
- Up to £20 million of LCH’s capital.
- Remainder of Default Fund (i.e. survivors’ contributions).
- If the default of a SwapClear member were to use all of the Default Fund, LCH then has the right to request £50 million from each remaining SwapClear member on a nonvoluntary basis. This can then be used to cover any further losses resulting from the defaulted member’s Swaps portfolio.
- Remainder of LCH’s capital.

LCH has withstood five member defaults, including most recently the default of Lehman, and has not once had cause to utilize the Default Fund.

	<p><b>KQ3. Are any of the resources that the CCP is relying upon to cover losses from defaults not immediately available to meet the CCP's obligations? If so, has the CCP obtained committed credit lines subject only to presentment that allows it to borrow against those assets? If so, can those lines be drawn upon sufficiently quickly to ensure that the CCP can meet its obligations when due?</b></p> <p>LCH has a liquidity management plan that sets itself up to be able to meet both operational liquidity needs and liquidity needs arising from the default of one or more of its members.</p> <p>Each day, and for each settlement member, LCH estimates the liquidity demands that would arise from the default of that member. And then when determining what liquidity demands to prepare for in the event of default(s), LCH accounts for the larger of:</p> <ul style="list-style-type: none"> <li>• The default of the member with the largest first day liquidity requirement, together with the simultaneous default of the five least creditworthy members; or</li> <li>• The default of the two members with the second and third largest first day liquidity requirement.</li> </ul> <p>LCH also includes the impact of the simultaneous default of any other member within the same group as the defaulted member(s). And when calculating its liquidity availability, LCH does not take into account any liquidity flows resulting from treasury investment activity with any of the defaulting members.</p> <p>LCH regularly compares its liquidity demands with the available liquidity it has maturing and the liquidity that it can make available, through for example its credit facilities with CSDs.</p> <p>However, none of LCH's credit lines are committed, and thus LCH should put in place safe and reliable funding options that are subject only to presentment. This would help it face extreme but plausible circumstances, such as disruptions to its tri-party repo arrangements or dislocations in the repo market.</p>
Assessment	Broadly Observed
Comments	In the event of a default, LCH needs access to sufficient liquidity to fulfil its obligations in a timely manner. LCH should put in place other safe and reliable funding options, which should include committed credit lines subject only to presentment, and could also include other options like mutualization of liquidity risk among the CCP's membership. This would help it face extreme but plausible circumstances, such as disruptions to its tri-party repo arrangements or dislocations in the repo market.
Recommendation 6.	<b>Default procedures.</b> A CCP's default procedures should be clearly stated, and they should ensure that the CCP can take timely action to contain losses and liquidity pressures and to continue meeting its obligations. Key aspects of the default procedures should be publicly available.
Answers to key questions	<b>KQ1. Do the CCP's default procedures state clearly what constitutes a default? If a default occurs, do the CCP's default procedures provide it with authority to promptly close out or manage the positions of a defaulting participant and to apply the defaulting participant's collateral or other resources? Do the CCP's procedures, or mechanisms other</b>

**than those of the CCP, permit the transfer or (as an alternative) liquidation of the positions and margin of customers of the defaulting participant? Do the procedures empower the CCP to draw promptly on any financial resources?**

A default is broadly defined with an element of discretion for LCH: "In the event of a Clearing Member appearing to the Clearing House to be unable, or to be likely to become unable, to meet his obligations in respect of one or more Contracts..."

More concrete examples of the types of actions that can constitute a default are provided in Rule 5 of the Default Rules. These include, for example:

- breaching any terms of the Regulations or Procedures or of any agreement with LCH. (5a);
- failing to pay any sum due and payable to LCH (5f);
- having a bankruptcy petition presented or bankruptcy order made or a voluntary arrangement approved (5i); and
- having a petition presented for the winding up of a member (5l).

In the event of a default, the default rules provide LCH with wide discretion to manage the situation. Under Rule 3, LCH may take such steps listed in Rule 6 as in the circumstances appear to it best calculated:

- to discharge all the Clearing Member's rights and liabilities; and
- to complete the process set out in Rule 8, which is the process to determine the net amount(s) owed/owing by the defaulter.

Rule 3 also states that the interests of the financial system more broadly should be taken into account:

"Before taking any such step the Clearing House shall have regard to the interests of the members of any market that the Clearing Member may belong to and shall, where in the circumstances it is reasonably practicable to do so without prejudice to those interests if applicable or the interests of the Clearing House..."

Rule 6 lays out steps that can be taken following a default, including for example:

- closing out the defaulter's contracts (6b);
- selling securities deposited by the defaulter (6e);
- transferring defaulter's open contracts to other clearing members (6g);
- taking actions deemed necessary by LCH for its protection (6p); and
- taking other step to complete the process in Rule 8 (6r).

Rule 8 describes the process for determining the net amount(s) owed/owing by the defaulter. This includes:

- setting off amounts payable by or to the defaulter to produce net amount(s) owed/owing;
- if there is net amount owed by the defaulter to LCH, setting off against any cover standing to the credit of the defaulter's account; and

- using positive balances in proprietary accounts to meet shortfalls in customer accounts.

**KQ2. Does the legal framework provide a high degree of assurance that the decisions to liquidate or transfer a position, to apply margin or to draw down liquidity resources in the event of the insolvency of a participant would not be stayed or reversed? Does national insolvency law permit identification and separate treatment of customer and proprietary assets?**

Part VII of the Companies Act protects LCH from the general application of the financial markets insolvency laws of England and Wales. It protects LCH's right to manage a default by netting positions or offsetting profits and losses, and prevents a liquidator from "cherry-picking" profitable contracts.

Further legal protection comes from designation under the Settlement Finality Regulations, reducing the likelihood that English courts would entertain a challenge to the actions taken by LCH to manage a member default.

MiFID (European directive 2004/39/EC) provides for the protection of customer's assets. Following the implementation of MiFID in the U.K., the FSA's rules provide for the protection of customer assets in the following ways:

- The FSA's Principles for Business apply to all firms, setting out their fundamental obligations, including Principle 10: "A firm must arrange adequate protection for clients' assets when it is responsible for them".
- The Client Assets sourcebook (CASS) contains the FSA's rules on how authorized firms hold and control customer assets. Its objectives is to ensure that the customers' assets cannot be used by a firm for its own account, and that, in insolvency, as far as possible, customers get back their rightful entitlement assets.

The FSA's client asset rules do not apply directly to LCH as it falls outside the scope of the relevant MiFID provisions relating to customer asset segregation. However, the rules do impose obligations on investment firms (including brokers and custodians) when they effect transactions using LCH.

**KQ3. Does the CCP's management have an internal plan for implementing its default procedures? Does the plan maintain a measure of flexibility for the CCP in deciding how best to implement its default procedures? Does the plan address the need for coordination in cases where more than one CCP, authority or a separate market operator is involved? How frequently is the plan reviewed?**

LCH has an internal Default Management Framework that provides the framework for single or multiple product default management. The objective of the Framework is to provide a reference guide and a high-level operational procedures manual to assist in the process of managing issues which will arise as a consequence of a potential or actual default of a member, and arrangements for each of the business streams.

LCH's aims are to:

	<ul style="list-style-type: none"> <li>• minimize the impact on the membership and fulfil obligations where possible towards remaining members;</li> <li>• minimize losses for LCH and protect the Default Fund (by closing out the defaulter's portfolio at minimal cost); and</li> <li>• maintain market integrity.</li> </ul> <p>LCH does have discretion in managing a default. All the plans for managing a default are subject to the discretion and assessment, at the time, of the Chief Executive of LCH, who has overall responsibility for placing a member in default.</p> <p>The Executive and Risk Committees review the Default Management Framework annually.</p> <p>To ensure familiarity with the default policies and procedures, workshops, desk top reviews and fire drills are conducted internally on a regular basis and were successfully utilized during the default of a major financial institution in September 2008. A "lessons learnt from the recent default experience" exercise has been conducted and all material items identified are in the process of being addressed.</p> <p><b>KQ4. Are the key aspects of the default procedures (specified in paragraph 4.6.9) publicly available?</b></p> <p>The Default Rules are available on the website.</p> <p>Also available is the document "Default Management Overview Exchange &amp; Commodity Derivatives Markets", which was produced in conjunction with the FOA Operations Working Group and which outlines key aspects of LCH's default management arrangements and the processes for member interaction and communication in the event of the default of a clearing member. However, the document does not detail the internal activities performed by LCH as part of the default management process.</p> <p>There is also a publicly available document on LCH's Default History.</p>
Assessment	Observed
Comments	
Recommendation 7.	<p><b>Custody and investment risks.</b> A CCP should hold assets in a manner whereby risk of loss or of delay in its access to them is minimized. Assets invested by a CCP should be held in instruments with minimal credit, market and liquidity risks.</p>
Answers to key questions	<p><b>QK1. At what types of entities is collateral held? Does the CCP verify that these entities' procedures and practices conform to Recommendation 12 of the RSSS? If so, how? Does the CCP confirm that its interest in the securities can be enforced and that it can have prompt access to the securities in the event of a participant's default, even if these securities are held in another time zone or jurisdiction? Does it monitor the financial condition of its custodians on an ongoing basis?</b></p> <p>Cash collateral is held at a number of banks. LCH invests cash funds derived from margins, cash arising from settlement failures, Default Fund contributions and paid-up share capital. This cash is invested with approved counterparties through fixed deposits, swaps, security purchases or repo</p>

transactions. As a matter of principle, transactions secured with, or investments in, marketable securities are preferable to fixed deposits.

Noncash collateral is mainly held in the U.K. and Europe at CSDs, although a bank custodian is used for U.S. Treasuries. LCH has an up-to-date legal opinion for one of its European CSDs and its legal opinion for another is in the process of being revised.

LCH has conducted due diligence on the legal agreements surrounding holding of collateral, to confirm enforceability of legal agreements in jurisdictions in which collateral is held. The only securities held outside the European time zone are held in New York.

The due diligence carried out by LCH does not specifically include an assessment of its custodians' compliance with RSSS12, although LCH intends to do so with any new custodian. Although previous due diligence with respect to the European CSDs doesn't specifically include confirmation of compliance with RSSS12, LCH has legal opinions for the two European CSDs, which give it comfort that the CSDs employ accounting and safekeeping practices that protect customers' securities. However, for its U.S. custodian, LCH should undertake due diligence that specifically confirm this is the case, and it should follow through on its stated intention to do so for any new custodians.

**QK2. How is cash invested? Are investments secured? What standard does the CCP use to ensure that obligors are highly creditworthy? What standard does the CCP use to ensure that investments have minimal market and liquidity risks?**

LCH has a comprehensive and conservative treasury investment policy.

The majority of cash deposits are secured through tri-party repo, DBV (a general collateral repo mechanism in CREST), and directly purchased Government assets such as treasury bills. Not all cash can be secured because of LCH's liquidity needs, intra-day calls that are made too late in the day to be invested on a secured basis, settlement failures, or payment flow imperfections.

LCH applies base haircuts for repo transactions, which depend on the credit rating of the counterparty. Incremental haircuts are to be applied depending on the type of security. They are determined by the Risk Management Department on a regular basis (at least quarterly) and based on 99.7 percent of the moves of generic bond yields; based on the larger of one or two-day yield movements over the previous five years. The following transactions are subject to additional haircuts: cross currency transactions, securities not priced for two or more days, zero-coupon bonds. Back testing of haircuts is conducted on a quarterly basis and haircuts are benchmarked against relevant central bank haircuts.

LCH specifies limits for its security purchases. The limits vary for different counterparties and different maturity limits apply (ranging from three months to three years) that are subject to establishing the necessary systems and processes to manage the resulting risk exposures. Moreover, all securities purchased from the counterparties must be ECB eligible. Government securities should be purchased in the domestic currency wherever possible,

	<p>with the exception of U.K., France, Germany and the Netherlands Government guaranteed debt (which must be AAA rated). All Government or Government Guaranteed Securities over one year in term are limited to a maximum of 10 percent of any particular issue.</p> <p>Counterparty credit ratings, financial resources and CDS spreads are monitored on a continuous basis. If a counterparty's rating or financial resources deteriorate or improve to the extent of leading to a change in limit, this limit is changed immediately. In addition to the ad-hoc notifications, the schedule of limits is reported on a fortnightly basis.</p> <p>LCH manages its own capital assets. The funds are re-invested only in short term instruments.</p> <p><b>QK3. Does the CCP consider its overall exposure to an obligor in choosing investments? Are investments limited to avoid concentration of credit risk exposures? If so, how?</b></p> <p>LCH takes into account it's overall credit exposure to individual obligors, ensuring that exposure remains within acceptable concentration limits. LCH has minimum counterparty credit ratings, and also a concentration limit of 10 percent to any one counterparty group (with the exception of AAA-rated governments).</p> <p>LCH also has a policy that promotes diversification across fixed deposits, swaps, securities purchases, and repos. The treasury policy defines absolute limits for cash deposits, FX swaps, IR swaps and Repos. In addition, the treasury policy requires the following:</p> <ul style="list-style-type: none"> <li>• Cash deposits and foreign exchange swaps: LCH restricts cash deposits with commercial banks or building societies in pounds sterling, EUR and U.S. dollars to an overnight term, and cash deposits in other than these currencies to a maximum maturity of seven business days between value date and maturity date. Possible exceptions are specified.</li> <li>• Foreign exchange swap transactions greater than one month must have a signed Credit Support Agreement in place with the counterparty (under ISDA or FBF standards).</li> <li>• Interest rate swap transactions should be monitored to ensure that they are not concentrated with any one counterparty. Interest rate swap transactions executed for a term greater than one month must have a signed Credit Support Agreement in place with the counterparty (under ISDA or FBF standards), with daily risk measurement.</li> <li>• All repo transactions should be conducted under RSA, GMRA or MRA agreements. Repo limits are not additive to the limits specified for interest rate swaps.</li> </ul> <p>LCH divides collateral acceptable for repo securities into three different "sets" according to credit quality and sets concentration limits accordingly.</p>
Assessment	Broadly Observed
Comments	Noncash collateral is mainly held at two European CSDs, and one custodian bank in the United States. The due diligence carried out by LCH does not

	<p>specifically include an assessment of its custodians' compliance with RSSS12, although LCH intends to do so with any new custodian. Although previous due diligence with respect to the European CSDs doesn't specifically include confirmation of compliance with RSSS12, LCH has legal opinions for the two European CSDs, which give it comfort that the CSDs employ accounting and safekeeping practices that protect customers' securities. However, for its U.S. custodian, LCH should undertake due diligence that specifically confirm this is the case, and it should follow through on its stated intention to do so for any new custodians.</p>
Recommendation 8.	<p><b>Operational risk.</b> A CCP should identify sources of operational risk and minimise them through the development of appropriate systems, controls and procedures. Systems should be reliable and secure, and have adequate, scalable capacity. Business continuity plans should allow for timely recovery of operations and fulfilment of a CCP's obligations.</p>
Answers to key questions	<p><b>KQ1 - Does the CCP have a process for actively identifying, analyzing and addressing its operational risk, including risks arising from its outsourced operations and its other activities?</b></p> <p>An operational risk management framework has been established at the Group level, supported by tailored enterprise-wide software, which systematically identifies, assesses, monitors and controls/mitigates material operational risks. This is achieved through departments' self-assessment of risks and controls, the collection and analysis of loss data, and the development of Key Risk Indicators as appropriate. Identified operational risks are reviewed against LCH's risk appetite as set by the Board for each of the major risk areas.</p> <p>Business operations are subject to a program of Internal Audit reviews, which are independent of line management, and the results are reported directly to the Group's management (including the Group Chief Executive Officer) and audit committees. Following each review, management will put in place an action plan to address any issues identified. Internal Audit evaluates the adequacy and effectiveness of the Group's systems of internal control, as well as the level of compliance with policies, and reports, in addition to management's own Combined Assurance reporting, to the audit committees and senior management. Any significant weaknesses are reported to the Boards.</p> <p>LCH does not outsource any core activity, only ancillary activities, such as software development.</p> <p><b>KQ2 - Does the CCP have a business continuity plan that addresses events posing a significant risk of disrupting operations? Do plans ensure that critical information can be recovered in a timely manner? Do plans provide, at a minimum, for the recovery of all transactions at the time of the disruption to allow systems to continue to operate with certainty? Is the business continuity plan regularly reviewed and tested with participants? Have appropriate adjustments to operations been made based on the results of such exercises?</b></p> <p>LCH has comprehensive business continuity arrangements to deal with the short, medium and long-term disruptions. Its business recovery strategy is founded on a Business Impact Assessment, which is reviewed annually and when any significant changes have taken place within LCH. A business continuity framework has been developed, which covers departmental</p>

emergency procedures, processes, procedures and staff contact details and agreed emergency procedures in order to maintain or restore business operations in the required timescales. Business continuity and disaster recovery plans are reviewed on an ongoing basis and assessed on a quarterly basis.

LCH operates its own two live IT centers in the greater London area. They are around nine miles apart, with two distinct risk profiles, and are linked in a synchronous mode. The activity is continuously shared between both, and one of the IT centers can take over the whole activity in case the other is down: the network needs to be re-pointed to the remaining system and operational staff needs to check services, hence a two-hour recovery window. There is no third IT center to resort to in case both primary IT centers fail.

There are two office sites for the operational teams both located in London. They are not active/active, and a 45 minutes walk is needed to switch operational activity from one site to the other. Remote access is possible from operational staff homes and is regularly tested. It has been used several times in 2009 and 2010 due to inclement weather, G20 summit, and public transportation strikes.

Immediate recovery would occur within two hours of a major incident affecting the primary offices - business critical functions would be relocated to the dedicated live site and work would resume. The Crisis Command Centre would be activated for immediate occupation by the Crisis Management Team. No loss of data, or data reconciliation, is expected since both IT centers operate on a synchronous basis (Synchronous Data Replication). However, the swap is not fully transparent for the participants, who would need to check a number of services.

LCH undertakes at least an annual internal testing exercise, which includes IT Disaster Recovery, Office Recovery and crisis simulation with Executive and Senior Management, table top exercises to rehearse departmental recovery teams and Call Tree exercises. LCH undertook four internal exercises in 2010, although not all included IT recovery. In addition, LCH offers its participants to test the swap between both IT centers twice a year, on a voluntary basis. However, there are no compulsory tests for participants, even the largest ones. The operational failure of a major participant to interact with LCH would be very disruptive, hence the need to be sure they are operationally reliable and have in place tested contingency arrangements.

**KQ3 - Are there adequate management controls and sufficient (and sufficiently well qualified) personnel to ensure that procedures are implemented appropriately? Are operational reliability issues reviewed regularly by senior management, including review by persons not responsible for the relevant operations? Is there an internal audit function and does it review operational risk controls?**

LCH staff is stable (low turn-over rate) and experienced. Procedures are regularly tested to ensure that they would be appropriately implemented in case of operational failure.

Independent review of operational performance is achieved at CEO level and through the Operational Committee of LCH. This committee regularly reviews reports for all production and operational incidents, along with the Audit

	<p>Committee.</p> <p>There is also an independent adviser on operational risk within executive management. Operational risks and controls are an embedded part of Internal Audit work. Risk assessments conducted by Internal Audit take into account operational risk. The Audit Committee is fully involved in the processes of the business continuity plans.</p> <p><b>KQ4 - How many times during the last year has a key system failed? What is the most common cause of failures? How long did it take to resume processing? How much transaction data, if any, were lost? How does the CCP ensure the integrity of messages? Does the CCP have capacity plans for key systems and are key systems tested periodically to determine if they can handle stress volume?</b></p> <p>LCH grades incidents affecting its key systems on a priority scale from 1 to 4, with 1 being the most serious and 4 the least. A priority 1 Incident is classified as: "An incident which prevents LCH from fulfilling its financial, legal or regulatory obligations - widespread unavailability of services to all Members or Partners." A priority 2 incident is classified as: "An incident which impairs LCH ability to fulfil its financial, legal or regulatory obligations - limited availability of services to multiple Members or Partners." Three priority 1 or 2 incidents have occurred since 2008, without any loss of data, two of them outside business hours: the availability of the IT centers has stayed within the 99.98 percent target.</p> <p>Security is built into all systems and services to ensure their accuracy, reliability and confidentiality. LCH aims to comply with ISO/IEC 27002 information security standard. For financial messaging, LCH uses industry accepted systems ensuring a high level of message integrity (e.g. Swift and Arrow). Some of the partners, in particular exchanges, communicate through secure communication mechanisms (VPN), which provide authentication on the messages that detect when the integrity of a message has been compromised.</p> <p>LCH seeks to ensure that all systems (both software and hardware) have headroom capacity well in excess of expected volumes. IT Services Production performs regular stress testing on key systems using the multiples of peak daily volume.</p>
Assessment	Observed
Comments	<p>Additional comments:</p> <p>LCH should envisage making contingency testing compulsory for the largest participants to ensure they are operationally reliable and have in place tested contingency arrangements to deal with an operational failure, affecting either their access to LCH or LCH itself.</p> <p>Such a core and global infrastructure should envisage implementing a second back-up site (three sites architecture), located outside the greater London area.</p>
Recommendation 9.	<p><b>Money settlements.</b> A CCP should employ money settlement arrangements that eliminate or strictly limit its settlement bank risks, that is, its credit and liquidity risks from the use of banks to effect money settlements with its participants. Funds transfers to a CCP should be final when effected.</p>
Answers to key questions	<p><b>K1 - Does the CCP use the central bank model or the private settlement bank model?</b></p>

LCH mainly resorts to a private settlement bank model: it transfers cash to and from it and its members through a mechanism known as the Protected Payments System (PPS). This consists of a network of commercial banks, known as PPS banks, which provide accounts to both LCH and its members in one or more of the currencies in which liabilities are incurred. In each currency, there is also a concentration bank which LCH holds an account with, which is used to collect surplus funds from each of the PPS banks, and send funds to PPS banks where LCH has a net debit position.

The PPS in fact consists of two separate systems. The “London PPS” is based in London, and is used for making the vast majority of cash transfers. The “U.S. PPS” operates in New York/Chicago, and is used at the end of the day, after the U.K. payment systems have closed. LCH members are required to open an account in London in pounds sterling and each currency in which it incurs settlements. They are also required to open a U.S. dollars account in the United States. A member can use different PPS banks for different currencies. The transfer method to/from the concentration bank varies slightly according to currency. For pounds sterling this transfer is made via CHAPS (though not all sterling PPS banks are direct members in CHAPS). For EUR, cash transfers are made through TARGET2; U.S. dollars cash transfers are made over Fedwire and CHIPS and, for all other currencies, the transfer is made through a nostro-style arrangement through the relevant PPS banks.

In 2010, the distribution of the sum of all (net) payments between LCH and its members through the PPS was the following: 40 percent in U.S. dollars, 32 percent in Euro, 24 percent in pounds sterling, and 4 percent in the other currencies. Those payments included cash margin payments, payments for commodity deliveries, cash settlement, and default fund contributions. The total daily amount of the sum of all (net) payments was pounds sterling equivalent 5,955 million over all those currencies.

The BoE acts as the concentration bank to LCH for both the sterling and euro PPS, offering LCH “concentration bank accounts” this means that surplus funds from LCH’s accounts at the PPS banks are collected in the concentration bank accounts at the BoE, and are paid away to cover LCH’s obligations. The concentration bank accounts are also used to send and receive funds to/from LCH’s unsecured money market counterparties, as well as to top-up/draw down their accounts at International Central Security Depositories for secured money market investments (Euroclear and Clearstream).

The BoE provides collateralized intraday liquidity to LCH in sterling up to a pre-agreed limit.

For U.S. dollars, Citibank NA is the concentration bank and for all other currencies the concentration bank is HSBC Bank plc. Funds transfers by the PPS banks to and from these concentration banks are effected through FedWire, CHIPS or via nostro accounts.

In addition, LCH uses several settlement banks in CREST for its daily settlement activities. The BoE is its settlement BoE for gilts’ transactions and provides LCH with collateralized intraday credit for these purposes.

**KQ2 - Do the CCP’s legal agreements with its settlement bank or banks**

**provide that funds transfers to its accounts are final when effected? Do the laws of the relevant jurisdictions support these provisions? Do the payment systems for the currencies used support intraday finality? Does the CCP routinely confirm that funds transfers have been effected as and when required by those agreements?**

LCH has been designated by the FSA under the European Settlement Finality Regulations. The effect of this is that when a PPS Bank sends a SWIFT message confirming payment on behalf of a member, the sending of the message represents a commitment by the PPS bank on behalf of that member to pay what has been demanded by LCH.

Settlement finality for funds transfers by the PPS banks to and from the concentration banks follow the rules of the system they are effected through: CHAPS, TARGET2, FedWire, CHIPS or via nostro accounts.

**KQ3 - If the private settlement bank model is used, does the CCP establish and monitor strict criteria for the banks used that address their creditworthiness, access to liquidity, and operational reliability?**

Due to the way that LCH's Protected Payments System operates, LCH has unsecured intra-day credit balances at the PPS banks and the concentration banks. LCH is directly exposed to member default risk until PPS banks have transferred the funds internally to LCH's account at the PPS bank. From this point, LCH is exposed to the risk of default of the PPS bank until the PPS bank has transferred the funds to LCH's account with the concentration bank. At this last stage, once the money has been transferred to the concentration bank account, LCH is exposed to the risk of a default of the concentration bank. For LCH, this risk is mitigated for euro and sterling transactions as the concentration bank for these currencies is a central bank. However, LCH continues to be exposed to a default of its commercial concentration banks. Because of the differences in timing for sending/receiving funds to/from PPS banks, unsecured money market counterparties, and cash accounts at CSDs for secured money market deals, LCH frequently builds up intra-day balances at its concentration banks.

The PPS banks' risk is mitigated in two ways. First, PPS banks have to have a minimum Fitch credit rating of A (or the S&P or Moody's equivalent). In the event that a PPS bank is downgraded below the minimum long-term rating criterion, or it fails to meet the operational capability criteria, the PPS bank will be required to leave the service. Second, LCH has ensured that its policy on the timing of transfers from PPS banks to concentration banks is closely adhered to. A formal deadline of two hours (maximum) for transfer of funds to the concentration bank has been incorporated into a PPS Agreement between LCH and the U.K. PPS banks, which limits the time period in which it is exposed to the risk of bank failure, and this is strictly monitored.

In order to better mitigate the risk of default of a PPS bank, LCH recently assessed whether members could appoint a back-up PPS bank in the event that a member's PPS bank might be unable to provide the service requested. The survey also questioned whether members have other back-up arrangements like pre-arranged borrowing facilities with alternative banks other than the PPS banks in place. Results were that all members have implemented at least one back-up arrangement to mitigate the exposure to their primary PPS bank.

	<p>The requirements to be a commercial concentration bank are not published and there is no formally agreed alternative in place.</p> <p><b>KQ4 - If the private settlement bank model is used, does the CCP actively monitor the concentration of exposures among the settlement banks, and routinely assess its potential losses and liquidity pressures from a settlement bank's failure?</b></p> <p>LCH routinely monitors the operational performance of PPS banks and their efficiency in meeting the required deadlines. A monthly report on performance is prepared for LCH senior management, and regular "PPS bank forums" are held where performance issues are discussed. Particular performance issues are discussed directly with the senior management of the bank(s) concerned.</p>
Assessment	Broadly observed
Comments	LCH should find a way to reduce its settlement exposures to PPS and commercial concentration banks. Settlement should be in central bank money when possible and practicable.
Recommendation 10.	<b>Physical deliveries.</b> A CCP should clearly state its obligations with respect to physical deliveries. The risks from these obligations should be identified and managed.
Answers to key questions	<p><b>KQ1 - Does the CCP have rules that clearly state its obligations with respect to deliveries of physical instruments?</b></p> <p>LCH's regulations state its obligations in respect of physical deliveries in all relevant markets. The procedures for members to follow are laid out in Clearing House Procedures Section 5: Commodity Deliveries.</p> <p>Contracts are physically delivered upon expiry or option exercise. LCH obligations are thus to make delivery of the relevant instrument or (as appropriate) indemnify participants for losses incurred in the delivery process.</p> <p><b>KQ2 - Does the CCP have obligations to make or receive deliveries of physical instruments? If yes, does the CCP use DVP mechanisms that eliminate principal risk? If no DVP mechanism is available, does the CCP take other steps to mitigate principal risk?</b></p> <p>When LCH is obligated to make or receive deliveries of physical instruments or commodities (2–5 percent of open interest is physically delivered) it will, as far as possible, eliminate principal risk through the use of the Delivery versus Payment (DvP) mechanism provided by the relevant SSS. Where no DvP mechanism is available (for example for the soft commodity contracts like coffee and cocoa, LCH uses a Receive versus Payment (RvP) instruction, by definition stating that only cash will be accepted in exchange for delivery of the physical instruments. LCH holds the commodity until cash is received. However, this is not the case for power and gas contracts, for which payment follows physical delivery, and LCH holds delivery margin against this settlement risk.</p> <p><b>KQ3 - Has the CCP identified the liquidity, storage and delivery (other than principal) risks to which it is exposed because of the delivery obligations that it assumes? Does the CCP take steps to mitigate these risks? What steps does it take?</b></p>

	The initial margin held against the relevant positions is far in excess of the negligible cost of storage, insurance etc. The liquidity of products as both futures and during delivery is considered in the setting of the initial margin.
Assessment	Observed
Comments	
Recommendation 11.	<b>Risks in links between CCPs.</b> CCPs that establish links either cross-border or domestically to clear trades should evaluate the potential sources of risks that can arise, and ensure that the risks are managed prudently on an ongoing basis. There should be a framework for cooperation and coordination between the relevant regulators and overseers.
Answers to key questions	<p><b>KQ1 - What kinds of link are in operation? Has the CCP carried out a risk analysis of the potential sources of risks arising from the link? Are the resultant risk management arrangements designed to minimize or contain these risks such that the CCP remains able to observe the other recommendations contained in this report?</b></p> <p>LCH currently interoperates:</p> <ol style="list-style-type: none"> <li>with the Swiss CCP SIX x-clear in the clearing of trades executed on the London Stock Exchange and on the SIX Swiss Exchange. Trading members of these exchanges can elect to clear their business in the equity products covered by the interoperability arrangement on either LCH or x-clear - both the London Stock Exchange and Swiss Exchange list products for trading that are not within the scope of the interoperable arrangement; and</li> <li>with Oslo Clearing for the EDX market. EDX London is the Equity Derivatives Market initially formed by the London Stock Exchange in 2003. On December 7, 2009, EDX London changed their technology platform and formed a strategic relationship with Oslo Børs to offer their respective members access to each others' markets, order book and liquidity. EDX and Oslo Bourse operate linked order books, in which an order placed on both trading platform can match and trade with an order placed on the other trading platform. All business traded on EDX is cleared by LCH and all business traded on Oslo Bourse is cleared by Oslo Clearing (OC). EDX trades an average daily volume of 100,000 contracts.</li> </ol> <p>LCH has carried out a risk analysis of the potential sources of risk arising from those links and has taken risk management measures to contain them (see KQ3).</p> <p>LCH has also applied to interoperate with EuroCCP and EMCF. This is under review by the competent authorities.</p> <p><b>KQ2 - Which laws and contractual rules govern the link? What steps have the CCPs taken to satisfy themselves that these laws and rules support the design of the link and provide adequate protection to both CCPs in the operation of the link?</b></p> <p>SIX x-clear has been granted a special membership of LCH (effectively similar to the General Clearing Member class (GCM)), to clear SIX Swiss Exchange (U.K. equity only) and LSE equity trades. Through a mutual structure between LCH and SIX x-clear, both parties are able to co-clear for one another.</p>

A similar arrangement exists for OC (see KQ3 for details).

**KQ3 - What are the potential sources of operational, credit and liquidity risks arising from the link? Are effective mechanisms in place, including arrangements between the linked CCPs, to monitor and manage the risks identified?**

The LCH – x-clear link is a peer-to-peer model, in which both CCPs lodge initial margin with the other CCP, and either CCP can be placed in default (subject to the terms of the CCPs' link clearing agreement and the respective CCP's default rules) should it fail to meet its contractual arrangement to the other CCP. Each CCP calculates the margin it requires from the other using the standard margin methodology it applies to its members. However, neither CCP contributes resources to the other's default fund (to minimize contagion risk between the CCPs). LCH collateralizes its exposures to x-clear using a performance bond issued by a bank that is independent of both CCPs. LCH uses collateral lodged by its members to secure this bank guarantee. x-clear collateralizes its exposure to LCH using bonds. These bonds are sourced from collateral lodged with x-clear by its members. The exposure levels between LCH and x-clear have been typically at around €35 to V70 million, but has been observed to peak at values of over €250 million during periods of high equity trading volume.

As with the LCH – x-clear link, the LCH – OC link is a peer-to-peer model, in which both CCPs lodge initial margin with the other CCP, and either CCP can be placed in default (subject to the terms of the CCPs' link clearing agreement and the respective CCP's default rules) should it fail to meet its contractual arrangement to the other CCP. Each CCP uses its standard margin methodology to calculate the margin required from the other CCP. LCH and OC collateralise their respective inter-CCP positions lodging a performance bond (issued by a bank that is independent of both CCPs) with the other CCP. The bank guarantee LCH has lodged with OC is separate (and issued by a separate bank) from the bank guarantee lodged with LCH by OC. The value of these performance bonds varies as the level of inter-CCP exposure varies. This is secured by collateral lodged with LCH by its members. During December 2010, the average inter-CCP exposure was £5.9 million, with a maximum exposure of £9.2 million.

**KQ4 - For the purposes of regulation and oversight of the link, is there a framework for cooperation and coordination between the relevant regulatory and oversight authorities, including provisions on information sharing and the division of responsibilities in the event of any need for coordinated regulatory action?**

The Swiss Financial Market Supervisory Authority (FINMA) and the Norwegian Financial Supervisory Authority (FSA) are signatories to Annex A of the IOSCO MMOU, so confidential information can be exchanged with both authorities within the remit of the MMOU. Similarly, the Norwegian Kredittilsynet is a signatory to the CESR MMOU. In addition, the FSA has an MoU with the Swiss Financial Market Supervisory Authority (FINMA) and the Swiss National Bank (SNB) as SIX x-clear is a Recognized Overseas Clearing House (ROCH) and was recognized as such in August 2004.

The FSA and the Swiss authorities engage closely with regard to supervisory

	<p>oversight of the LCH and x-clear link. An annual ‘face-to-face’ meeting is held between the FSA, BoE, SNB and FINMA to discuss clearing rated matters, with additional meetings (both physical and by conference call) to discuss any significant issues of interest to the authorities. The interaction between the FSA and the Swiss authorities has increased substantially as a result of the application by LCH, EuroCCP, x-clear and EMCF to interoperate. A number of tri-lateral (U.K., Swiss, and Dutch) meetings have been held in the past 18 months and a bi-weekly conference call between the authorities is held. In February 2010, the authorities made available a joint statement on regulatory standards for the interoperable arrangement; for cash equity clearing. In particular, they will require that these credit exposures are measured, monitored and mitigated by the holding of collateral by the interoperating CCPs. This collateralization must be in addition to the collateral and default protections each CCP already holds to mitigate its counterparty risk against its members. In short, it is necessary that the additional counterparty risk present in the system is ‘priced in’ appropriately and matched by the holding of a sufficient level of additional collateral within the clearing system.</p> <p>LCH has been informed by the FSA that it is required to implement changes to its link with OC in order to bring this link into compliance with the FSA’s requirements for interoperable links.</p> <p>LCH and x-clear have proposed to extend their interoperable arrangement to include cash equity business traded on other platforms (including Chi-X, BATS and Turquoise). This application has been assessed by the U.K. and Swiss authorities, and the CCPs have been informed that changes to their interoperable arrangement will be required (both for the clearing of any new trading platforms and for the existing link).</p> <p>The FSA has discussed the LCH – OC clearing link with the Norwegian FSA (NFSA), both prior to the establishment of this link and once the link was operational. The NFSA and the FSA are currently discussing the text of a clearing specific MOU to be put in place between the two authorities.</p>
Assessment	Observed
Comments	
Recommendation 12.	<b>Efficiency.</b> While maintaining safe and secure operations, CCPs should be cost-effective in meeting the requirements of participants.
Answers to key questions	<p><b>KQ1 - Does the CCP have in place procedures to control costs (for example, by benchmarking its costs and charges against other CCPs that provide a similar service and by analyzing the reasons for significant differences)? Does the CCP have in place procedures to regularly review its pricing levels against its costs of operation?</b></p> <p>LCH has in place procedures to control its costs of operation. These include an annual budget process, in which the budget for the year ahead is reviewed by senior management and approved by the Board. Additionally, monthly management accounts compare actual results against budget, incorporate a full year forecast, and are distributed to the Board and discussed at Board meetings. LCH also undertakes monthly meetings with department heads to review actual and forecast costs.</p> <p>LCH undertakes regular analysis and benchmarking on charges. In terms of costs, the many different cost-structures in the CCP arena do not facilitate effective benchmarking of comparable data, although this is carried out where</p>

	<p>possible, for the cash-equity market for example. Over the past three years, competition has led LCH to significantly reduce its fees.</p> <p><b>KQ2 - Does the CCP regularly review its service levels (for example, by surveying its participants)? Does the CCP have in place procedures to regularly review operational reliability, including its capacity levels against projected demand?</b></p> <p>Service level agreements are in place between LCH and the trading platforms which set out operational reliability; capacity levels versus projected demand are reviewed regularly.</p> <p>LCH does not have formal SLAs with its members. They are required to complete a Membership Application and are subject thereafter to the Clearing House Procedures.</p> <p>Operational reliability is monitored by the operations and IT areas of the business. Reports are produced for review by the Operations Committee. Capacity levels are also reviewed and monitored and when service enhancements are proposed, the impact on capacity is assessed and analyzed.</p>
Assessment	Observed
Comments	
Recommendation 13.	<p><b>Governance.</b> Governance arrangements for a CCP should be clear and transparent to fulfil public interest requirements and to support the objectives of owners and participants. In particular, they should promote the effectiveness of a CCP's risk management procedures.</p>
Answers to key questions	<p><b>KQ1 - What are the governance arrangements for the CCP? What information is publicly available about the CCP, its ownership and its Board and management structure?</b></p> <p>LCH is a wholly owned subsidiary of LCH.Clearnet Group Limited (Group), and issues of group-wide governance rest with the Group Board. The governance arrangements are clearly specified and information regarding them is publicly available in the annual report of Group (currently the 2010 annual report). In particular, the composition of the LCH Board and LCH Risk Committee is detailed. However, no information is publicly available about LCH management structure.</p> <p>The LCH Board meets at least quarterly. It has full and effective oversight of the company and monitors executive management through review of and discussions about information provided to it by executive management, as well as reports from Internal and external Audit and through LCH's Risk and Audit Committees.</p> <p>LCH has entered into a commercial arrangement with OTCDerivNET (OTCD) whereby OTCD provide 100 percent funding for the development of the Interest Rate Swap clearing product (SwapClear), in return for a profit share and representation in the governance of SwapClear (only). Launched in October 2000, OTCDerivnet is a consortium of banks in the OTC fixed income derivatives markets whose purpose is to partner with LCH in the development of a secure, efficient and cost-effective post-trade dated environment for the benefit of the OTC derivative industry and boost the volume of swaps cleared on SwapClear.</p>

A SwapClear Board was established in September 2010, and a SwapClear CEO recruited who reports to both the LCH CEO and the SwapClear Board. The FSA reviewed this new arrangement when it was implemented and is monitoring it on a regular basis (via the Board meetings' minutes and meetings with the CEO). Risk management and operations (among other areas including some IT functions) are specifically excluded from the scope of the SwapClear Board, which is of an advisory nature.

**KQ2 - Is there a clear separation in the reporting lines between risk management and other operations of the CCP? How is this separation achieved? Is there an independent risk management committee?**

The Risk Committee is a sub-committee of the LCH Board. It is chaired by an independent non-executive LCH Board member, and it includes user/member representatives. It is responsible for setting new, and changing and approving all market, counterparty, liquidity and operational risk related policies and submitting them to the LCH Board for ratification if required. The Risk Committee receives periodic reporting on risk related policy review results (incl. stress and back testing), summary exception reports (e.g. limit breaches) or any special report as requested by the committee. The Risk Committee is responsible for assessing the effectiveness of the risk policy framework, its implementation and maintenance.

The Risk Management Department, as part of the executive structure, is independent from all other departments within LCH.

**KQ3 - What steps are taken to ensure that management and the Board have the adequate skills and incentives to achieve the CCP's objectives of delivering sound and effective services and to meet related public interest requirements? What are the mechanisms the Board has in place to ensure that the objectives include delivering sound risk management and meeting related public interest requirements? How are management and the Board made accountable for their performance? How is the composition of the Board determined? Are there mechanisms to ensure that the Board contains suitable expertise and takes account of all relevant interests? Are reporting lines between management and the Board clear and direct? Is the Board responsible for selecting, evaluating and if necessary, removing senior management?**

A three year program to align the ownership of the Group more closely to its users through a significant share buyback came to an end in 2009. LCH Group is now owned 83 percent by its users and 17 percent by exchanges that clear through it. There is a cap of 5 percent on individual membership, but no cap on aggregate membership per category of institutions. LCH is a user owned, profit constrained type of organization.

As a U.K. incorporated company, LCH.Clearnet Limited's Board and management are accountable to the shareholders. The Board includes four independent Board members (including the Chairman). Non-executive directors of the Board are drawn from the membership of the Group Board. Group Board membership includes representatives of users of the services of operating subsidiaries with a variety of complementary skills, product knowledge and industry experience; and ensures that Board and customer interests are closely aligned. Each Board member attends an introduction

	<p>session covering the main operational areas of the company. Product (e.g. EquityClear, SwapClear) information is presented at Board meetings to enhance Board members' understanding of the main services.</p> <p>Directors are required to disclose interests or positions that conflict or appear to conflict, prior to the relevant Board meeting(s). Conflicts of interest are managed as and when they arise.</p> <p>The Board receives an annual report reviewing risk management arrangements, defines the risk appetite of the company and receives various other risk related reports on a regular basis. The annual review describes the governance arrangements in place for risk management.</p> <p>The Board is responsible for selecting, evaluating, and if necessary removing, senior management. LCH CEO reports directly to the Board.</p> <p>Since 2009, the FSA has routinely interviewed Board-level appointees as part of its work to ensure the Recognition Requirement Regulations are being met. Although it has not routinely interviewed individuals below director level before appointment, it has regularly assessed senior managers' suitability through continuous meetings. Where the FSA believes that a relevant individual might compromise LCH's compliance with the Recognition Requirement Regulations, it will set out its concerns to the senior management.</p> <p><b>KQ4 - Are the CCP's objectives, those responsible for meeting them and the extent to which they have been met disclosed to owners, participants and public authorities? If so, what/who are they?</b></p> <p>LCH publishes its high-level objectives on its website, they are the following:</p> <ul style="list-style-type: none"> <li>• To reduce risk and safeguard the financial infrastructure in the markets they serve;</li> <li>• To deliver market leading and cost-effective clearing services; and</li> <li>• To be the leading multi-asset clearing house, independently serving diverse markets around the world.</li> </ul> <p>Details of the Group objectives are disclosed to the participants as part of the marketing activities. LCH does not specifically disclose detailed objectives to participants and the extent to which they are met (LCH Clearent SA published its 2010 achievements and roadmap for 2011, but this is not the case for LCH Clearent limited). However, the Group annual report elaborates on the objectives and the way they are met. For example the 2010 annual report explains that "The Management, with the Board's support, is focused on ensuring LCH is a best-in-class clearing services provider. A robust and modern infrastructure is essential for this and several significant milestones were achieved in 2010.... In London the implementation of Synapse will support a range of listed derivative markets and good progress is being made with the upgrade of the interest rate swap clearing system..... In support of the increasingly global nature of our clients' businesses and the markets we serve, the Group also set up extended capabilities with up to 22 hours / five days a week operational capacity." Information is also made available upon request to the relevant authorities.</p>
Assessment	Observed

Comments	<p>Additional comment</p> <p>LCH should publish information about its management structure, and disclose detailed objectives to participants and the extent to which they are met.</p>
Recommendation 14.	<p><b>Transparency.</b> A CCP should provide market participants with sufficient information for them to identify and evaluate accurately the risks and costs associated with using its services.</p>
Answers to key questions	<p><b>KQ1 - Does the CCP disclose to market participants its rules and regulations, relevant laws, governance procedures, risks, steps taken to mitigate risks, the rights and obligations of participants and the costs of using the CCP services? Does the CCP make clear when and in what circumstances it assumes counterparty exposure and any restriction or limitations on its fulfillment of its obligations? Does the CCP disclose appropriate quantitative information on its clearing, netting and settlement activities? Does the CCP provide market participants with sufficient information on default procedures and stress testing?</b></p> <p>LCH publishes its rules and procedures for the various markets cleared, together with information on risk management, application costs and procedures, minimum contributions towards (and interest rates on) the default fund, and the transaction tariffs. LCH does not make public information relating to default stress tests. Stress test scenario results are assessed by the Risk Management Department daily and the Risk Committee quarterly. Margin calculation models are provided to the participants. For example, they can download Risk parameter files to calculate London SPAN initial margins. The files contain details of all the London SPAN parameters as well as the theoretical profits and losses for each of the SPAN scenarios.</p> <p>PPS arrangements and the requirements to be a PPS bank are available on the LCH website, as well as the list of the existing PPS banks. However, little information is available on concentration banks.</p> <p>Little quantitative information is available on the LCH website on its clearing, netting and settlement activities.</p>

	<p><b>KQ2 - How is information made available? In what language or languages? In what form?</b></p> <p>They are published in English on the LCH Clearnet Group website.</p> <p><b>KQ3 - Has the CCP completed and disclosed the answers to the key questions set out in this report? Are there regular reviews to ensure that the information contained in the disclosures remains current, complete and accurate?</b></p> <p>LCH published its 2009 self-assessment, as validated by the authorities, on the LCH Clearnet Group website. However, key questions are answered in a very general way.</p>
Assessment	Observed
Comments	<p>Additional comments:</p> <p>Additional public information would be welcome, for example on concentration banks and LCH's activity (statistics).</p> <p>The assessors encourage LCH to publish a more detailed self-assessment.</p>
Recommendation 15.	<p><b>Regulation and oversight.</b> A CCP should be subject to transparent and effective regulation and oversight. In both a domestic and an international context, central banks and securities regulators should cooperate with each other and with other relevant authorities.</p>
Answers to key questions	<p><b>KQ1 - How is the CCP regulated/overseen? Describe the laws that authorize and govern the CCP's operation, the applicable regulatory bodies and their respective authority for the CCP's operation. Do the securities regulator and central bank have sufficient legal capacity and resources (including experienced staff and funding) to carry out effective regulation and oversight?</b></p> <p>LCH is incorporated in the U.K. as a private limited company, and as such is subject to U.K. company law. It is regulated by the FSA:</p> <ul style="list-style-type: none"> <li>• as a Recognized Clearing House (RCH) under the Financial Services and Markets Act 2000 (FSMA);</li> <li>• subject to the Financial Services and Markets Act 2000 (Recognition Requirements for Investment Exchanges and Clearing Houses) Regulations 2001 (SI 2001/995);</li> <li>• according to the FSA's specialist sourcebook, "Recognized Investment Exchanges and Recognized Clearing Houses" (REC);</li> <li>• designated under the Financial Markets and Insolvency Regulations 1999 (SI 1999/2979).</li> </ul> <p>It is also a Derivatives Clearing Organization in the United States and subject to Commodity Futures Trading Commission (CFTC) rules and the U.S. Commodity Exchange Act.</p> <p>LCH has been classified as a High Impact Firm by the FSA. Therefore the FSA annually produces an assessment of the current key risks alongside risks anticipated over the next 12 months, and how they will be mitigated in the form of a close and continuous supervisory program. LCH is assessed regularly (with comprehensive assessments in 2006 and 2010). In addition, thematic or specific "deep-dive" analyses are regularly performed (on margin calculation models for example), and new services are systematically assessed. Monthly meetings take place at the level of manager / lead</p>

associate, and quarterly meetings with the chairman. There are also annual relationship management meetings, close and continuous meetings with the chairman, and biannual meetings with the non-executive directors.

In addition, the inter-bank payment system operated as part of LCH has been recognized by HM Treasury for oversight by the BoE under Part 5 of the Banking Act 2009. Part 5 of the Banking Act 2009 establishes a statutory regulatory regime for payment systems. This regime, operated by the BoE, replaced the previous nonstatutory arrangements. The Act also includes requirements for operators of recognized payment systems to have regard to Principles published by the BoE. The BoE uses the 10 Core Principles for Systemically Important Payment Systems, plus the following four additional principles:

- **Business Risk:** The system should manage its business risks so that its users can rely on continuity of its services.
- **Interdependencies:** The system should regularly review the risks it bears from, and poses to, other infrastructures as a result of interdependencies, and should implement controls adequate to manage those risks
- **Indirect Participants:** The system should understand and manage risks that are brought to the system as a result of participants' relationships with indirect participants
- **Outsourcing:** The system should manage its outsourced relationships prudently, ensuring that contractual and risk management arrangements are clear, appropriate and robust.

To help with the practical implementation of these four additional principles, the BoE is drafting guidance that describes the key issues that should be addressed by operators. This is expected to be published by the end of Q1 2011. The BoE makes an assessment of the risks to financial stability posed by a particular system and aims to calibrate the intensity of its oversight accordingly. As a matter of routine, the BoE follows a programme of risk reviews for each system, which includes an annual review against the BoE's principles. The outcome of the BoE's risk reviews is formalized in Expectations Letters to the system operator, which set out the BoE's expectations for issues to be dealt with and actions to be taken by the operator. In each case, it specifies a timescale by which the BoE expects them to be completed. The BoE expects, as a matter of routine, to meet senior representatives of the operators of recognized interbank payment systems at least four times each year to gather information and review progress in mitigating risks, to carry out risk assessments and to communicate its expectations as to improvements.

In terms of the BoE's ability to carry out oversight, it is provided with a series of statutory tools in the Banking Act:

- Under Section 204 the BoE may require the provision of information in relation to its oversight functions.
- Section 190 gives the BoE a power to instruct an operator to take particular actions in respect of the system's rules.
- Section 191 gives the BoE a general power to issue directions to the operators of recognized interbank payment systems.
- Section 193–194 gives the BoE powers to appoint an inspector to enter

premises on, or from which, any part of a recognized interbank payment system is operated. This would include the premises of any outsourced technical services providers.

- Section 195 gives the BoE powers to require an operator to commission an independent report from an expert in a particular field.
- In the event of a compliance failure and in certain other circumstances, the BoE may choose to impose one or more of the sanctions set out in Section 197–200. These include publishing details of compliance failure and sanctions (197); imposing a penalty (198); stopping the system from operating (199); and disqualifying management (200).

LCH's supervision and oversight are risk-based and thus are implemented on a prioritization basis. They have been strengthened since the crisis, both at the BoE (to which the 2009 Banking Act granted statutory powers to conduct payment systems oversight) and at the FSA (for example by analyzing CCP's internal risk management models in detail, which was not the case previously). The FSA now places a greater emphasis on the quality of close and continuous supervision and the use of regulatory judgement; the need to anticipate and explore issues in a proactive manner; and on-going supervisory programs around the key issues.

Finally, both the FSA and the BoE organize market intelligence meetings to get feedback on clearing issues, and the BoE meets members or PPS banks if it thinks there is a need to discuss an issue in more detail. However, there is no regular dedicated meetings with LCH participants and partners (such as exchanges, PPS and concentration banks) to get their views on the efficiency and robustness of the CCP, and assess their own interaction with the system.

Both the FSA and the BoE have put in place dedicated teams to implement the supervision/oversight of market infrastructures and their embedded payment systems, with a mix of a few experienced senior staff and junior newcomers. Hiring and keeping the right expertise, in particular as far as risk management is concerned is challenging. In addition, experts' teams are facing other demands, in particular stemming from the EU and international regulatory agenda.

HMT is currently consulting regarding financial regulatory reform. The government intends to transfer regulation and supervision of settlement systems and CCPs to the BoE by 2013. These functions will sit alongside its existing responsibilities for payment systems oversight. This would bring the regulation of all three types of body together for the first time in the U.K.

**KQ2 - Are the objectives, responsibilities and main policies of the securities regulator, central bank and, where relevant, banking supervisor clearly defined and publicly disclosed? Are the regulations, roles and policies written in plain language so that they may be fully understood by CCPs and their participants?**

The rules and guidance governing the regulation of LCH by the FSA are publicly available on the FSA's website and the FSA is required by law to consult on matters of policy which could affect the regulatory framework within which LCH operates.

The BoE's approach to statutory oversight is set out in The Bank of England's

	<p>oversight of interbank payment systems under the Banking Act 2009, which is available on its website.</p> <p>The respective roles and responsibilities of the BoE and the FSA are contained in a MoU, which is publicly available on each institution's website (as well as the HM Treasury website).</p> <p><b>KQ3 - What information is the CCP required to provide, including information on operations that have been outsourced? How frequently is this information provided? Are there specific information requirements for participants' defaults and CCPs' financial difficulties? Is the CCP required to report significant events, such as rule changes, outages, and changes in risk management procedures?</b></p> <p>LCH is subject to the Recognition Requirements and the REC part of the FSA Handbook and adheres to the notification requirements, and requests made by the relevant regulators as to the provision of additional information.</p> <p>The BoE has access to regular information on payment flows across the PPS generally, and has specific access to data on the performance of PPS banks in Sterling and Euro as it is LCH's concentration bank for those currencies. In addition, LCH has to provide the BoE with regular and detailed legal and operational information.</p> <p><b>KQ4 - Is there a framework for cooperation between relevant authorities for the CCP, including domestic and nondomestic authorities? If so, describe the principles underlying this (these) framework(s) and their main contents, including any information sharing arrangements and decision making procedures.</b></p> <p>Domestic cooperation between the FSA and the BoE in the regulation and oversight of LCH is governed by the MoU mentioned above. This MoU, together with the clear separation between embedded payment systems and other functions of the CCP, provide a clear work distribution between both authorities.</p> <p>European jurisdictions place reliance on the regulation of LCH by the FSA. International cooperation is achieved through MoUs with the relevant regulators in the relevant overseas jurisdictions (an MoU has recently been signed between the FSA on the one hand and the CFTC and the SEC respectively on the other, there are also MoUs with the Swiss, Dutch and Australian regulatory authorities). The MoUs primarily contain provisions on information sharing between the relevant regulators. Meetings to discuss issues of common regulatory and oversight concern are held at least every three months between the FSA and the securities regulators and central banks of other jurisdictions.</p> <p>In addition, the French prudential supervisory authority (ACP- Autorite de Controle prudentiel) conducts the consolidated supervision of the LCH.Clearnet Group Limited, since its only subsidiary with a banking license is located in France.</p>
Assessment	Observed
Comments	<p>Additional comment:</p> <p>In addition to their existing market intelligence meetings, the FSA and the BoE may want to set up regular dedicated meetings with LCH participants</p>

	and partners (such as exchanges, PPS and concentration banks) to get their views on the efficiency and robustness of the CCP, and assess their own interaction with the system.
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## B. Recommended Actions

**Table 3. United Kingdom: Actions to Achieve Observance**

Reference recommendation	Actions to achieve observance
Recommendation 5 – Financial Resources	To fully observe, LCH should put in place other safe and reliable funding options, which should include committed credit lines subject only to presentment, and could also include other options like mutualization of liquidity risk among the CCP's membership. This would help it face extreme but plausible circumstances, such as disruptions to its tri-party repo arrangements or dislocations in the repo market.
Recommendation 7 – Custody and Investment Risks	To fully observe, LCH needs to confirm that the U.S. custodian it currently employs, and any future custodians it may use, conform to Recommendation 12 of the RSSS (i.e. that they employ accounting practices and safekeeping procedures that fully protect customers' securities).
Recommendation 9 – Money settlements	LCH should find a way to reduce its settlement exposures to PPS and commercial concentration banks. Settlement should be in central bank money when possible and practicable.

**Table 4. United Kingdom: Additional Actions**

Reference recommendation	Additional actions
Recommendation 3 – Measurement and Management of Credit Exposures	LCH should develop a routine capacity to recalculate exposures intraday for the LIFFE market.
Recommendation 4 – Margin Requirements	For the LIFFE market, if prices are particularly volatile, then LCH will make an intraday call based on the previous day's positions. LCH should develop the routine capacity to do so using intraday positions.
Recommendation 8 – Operational risk	LCH should envisage making contingency testing compulsory for the largest participants to ensure they are operationally reliable and have in place tested contingency arrangements to deal with an operational failure, affecting either their access to LCH or LCH itself.  Such a core and global infrastructure should envisage implementing a second back-up site (three sites architecture), located outside the greater London area.