Principles for financial market infrastructures:

Disclosure framework

Committee on Payments and Market Infrastructures (CPMI)

Status as of 31 December 2021

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Preface

Responding institution: Clearstream Banking AG
Jurisdiction(s) in which the FMI operates: Germany
Authority (ies) regulating, supervising or overseeing the FMI:
Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) and Deutsche Bundesbank

The date of this disclosure is 31 December 2021.
This disclosure can also be found at www.clearstream.com
For further information, please contact: marketquestionnaires@clearstream.com

I. Executive Summary

Clearstream Banking AG (Clearstream) is a central securities depository within the meaning of Article 2 (1) number 1 of the EU Central Securities Depositories Regulation (Regulation (EU) No 909/2014, CSDR), and a leading European post trade services provider with approximately 400 customers. Clearstream's Central Securities Depository (CSD) offers settlement, asset services, global securities financing, investment fund services, as well as various cash management services. Clearstream contributes to the safety and efficiency of financial markets and provides an exhaustive suite of connectivity to its customers and providers.

Clearstream discloses information about its governance structure publicly via the Company Governance section of its website. Information disclosed in this section includes:

- The company's operational structure
- The company's shareholding structure
- The names and titles of the members of its Supervisory Board
- The names and titles of its Executive Board members
- The roles and functioning of group committees:

Via its sister company in Luxembourg, Clearstream Banking S.A. (CBL), Clearstream delivers forward-looking services for cross-border transactions in 59 domestic markets worldwide.

Clearstream has multifarious array of stakeholders:

- Stakeholders to whom Clearstream provides a service to, i.e. issuers, issuer agents and customers.
- Stakeholders who provide a service to Clearstream, i.e. CSDs, ICSDs, Transfer Agents and Order Handling Agents.
- Stakeholders involved in the formation of the legislative and regulatory framework in which Clearstream operates, i.e. Clearstream's regulator, market associations.
- Stakeholders with a direct influence on Clearstream's equity, i.e. parent company and end investors.

As a licensed credit institution in Germany, Clearstream is supervised by the BaFin and must comply with the financial, legal, regulatory and statutory reporting banking requirements as specified in the provisions of the German Banking Act (Kreditwesengesetz). As a recognised securities settlement system in which Deutsche Bundesbank participates, Clearstream is supervised by Deutsche Bundesbank and must report according to and comply with rules and recommendations by Deutsche Bundesbank.

On 21 January 2020, CBF received its CSDR licence pursuant to Art. 16 CSDR and on 24 August 2021 CBF received the license pursuant to Art 54 (banking services) CSDR. This authorisation represents the final step in achieving full CSDR compliance for all of Clearstream's CSDs. Clearstream's German CSD, international CSD (ICSD, Clearstream Banking S.A.) and Luxembourg CSD (LuxCSD S.A.) already hold licences pursuant to Art. 16 CSDR.

Risk management is an elementary component of the management and control of Clearstream, effective and efficient risk management is fundamental to safeguarding its interests (both in terms of corporate goals and continued existence). The risk management policy documents Clearstream's enterprise-wide risk management concept by describing the risk management framework in terms of processes, roles and responsibilities applicable to all staff and organisations within all legal Clearstream entities. Clearstream has developed its own corporate risk structure and distinguishes between operational, financial, business and project risk.

Clearstream has Default Management Process (DMP) rules and procedures in place, which define the circumstances under which a customer of Clearstream is considered to be in default. Referring to the products and services offered, Clearstream defines two types of default, legal and contractual default. In order to identify customer's default and classify it in accordance with the above-mentioned default types, Clearstream has established Early Warning Indicators (EWI) and Signals (EWS) as an integral part of its DMP.

Clearstream's Business Continuity Management (BCM) policy states that in case of business interruption, operations must be resumed within appropriate time scales in order to:

- Safeguard Clearstream from significant losses, maintain revenue generation and shareholder value.
- Maintain customer confidence, market stability and liquidity and minimise systemic risk.
- Maintain management control, fulfil contractual obligations and regulatory compliance.

When Clearstream decides to enter a new market, it will request proposals (RFPs) from leading banks in this market, who meet Clearstream's stringent requirements for a depository / agent bank as well as a Cash Correspondent Bank (CCB), along with criteria such as appropriate licensing for banking and custody, credit rating, industry rank, management competence, liquidity, etc. This RFP process ties together a detailed operational review of each individual business process with legal and compliance review of the entire infrastructure as well as credit reviews of the various intermediaries.

II. Summary of the major changes since the last update of disclosure

While this is the first time that Clearstream provides the CPMI disclosure framework under the new structure, the main changes since the last published disclosure framework are:

- On 21 January 2020, CBF received its CSDR licence pursuant to Art. 16 CSDR (core and non-banking-type ancillary services services). On 24 August 2021, CBF received its licence to provide Banking Type Services pursuant to Art. 54 CSDR.
- Recently, Deutsche Börse and Clearstream announced the rollout of a new and completely digital post-trade platform D7, a cloud-backed and DLT-ready infrastructure that enables the digitization of financial instruments, starting with Retail Structured Products (see press release on 06.10.2021). In a stepwise approach, Deutsche Börse and Clearstream will expand the D7 offering to other asset classes and provide further functionalities and connect D7 to existing digital/ DLT-focused offerings (e.g., the above). Finally, the aim is to achieve a truly digital ecosystem for the complete digitization of financial products and markets.

With Clearstream having migrated to T2S, it acts as single gateway for settlement in T2S. The Investor CSD model has been rolled out in March 2018 and to provide customers with a single point of access to all T2S markets with comprehensive instrument coverage. Further details are provided at the following link: https://www.clearstream.com/clearstream-en/products-and-services/oneclearstream/migration-timeline

III. General background on the FMI

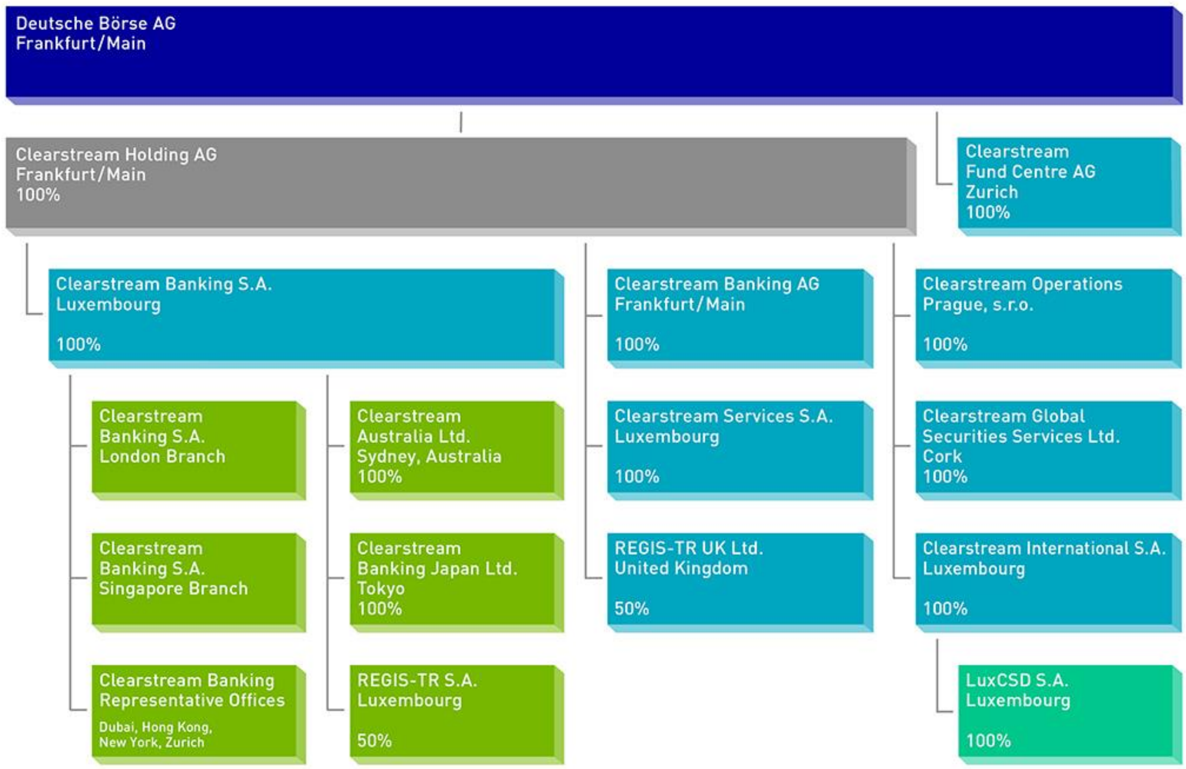
General description of the FMI and the markets it serves

Clearstream is an important player in the securities services industry. Clearstream provides access to the network of all T2S CSDs which have been fully assessed for monetary policy operations. Additionally, Clearstream customers will have access to all CSD and ICSD counterparties from both CSD and ICSD accounts and benefit from realignment of any Clearstream accounts independent of any system outside Clearstream, including T2S, in real-time and at any time. Customers choose whether the transactions are to be effected in Central Bank Money (via the CSD in Germany) or via Commercial Bank Money, which is offered via the ICSD in Luxembourg.

Clearstream offers access to a large number of securities markets across the globe, providing direct and secure access to domestic liquidity pools and the international market. As the demand for access to new markets and instruments develops, we will continue to expand our global network and to deliver market access solutions that meet the customer's needs.

General organisation of the FMI

Shareholding Structure of Clearstream:



Clearstream Banking AG - Supervisory Board

The Supervisory Board of Clearstream Banking AG stands as follows: Stephan Leithner (Chairman), Oliver Engels - Vice-Chairman, Peter Gomber, Christina Bannier, Peter Eck, Norfried Stumpf.

Clearstream Banking AG - Executive Board

The Executive Board of Clearstream Banking AG stands as follows: Berthold Kracke (Chief Executive Officer), Tilman Fechter, Martina Gruber, Volker Riebesell.

IV. Principle-by-principle summary narrative disclosure

Please note that Principle 6, Principle 14 and Principle 24 are not applicable to Clearstream.

Principle 1: Legal basis

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

Key consideration 1: The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

Material aspects and relevant jurisdictions

CBF is a Central Securities Depository ("CSD") with registered seat in Frankfurt/Main, Germany and as such authorised by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht ("BaFin")) under Art. 16, Art. 54 of Regulation (EU) No 909/2014 of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories ("CSDR") (core, non-banking ancillary services and banking-type ancillary services). CBF is also authorised and regulated as a credit institution according to the provisions of the German Banking Act (Kreditwesengesetz). Therefore, CBF is subject to banking supervision, which is carried out by BaFin in close cooperation with Deutsche Bundesbank, who has in addition an oversight responsibility for CBF as operator of a Securities Settlement System ("SSS"). Additionally, CBF is acting as a central registrar in the meaning of the electronic securities law ("eWpG").

The existing authorisations for its activities are described in the database of companies of BaFin (https://portal.mvp.bafin.de/database/InstInfo/institutDetails.do?cmd=loadInstitutAction&institutId=105564).

CBF offers services for the settlement of securities transactions of domestic and foreign securities. CBF settles securities transactions free of payment (FoP) or against payment (delivery-versus-payment (DVP)), ensuring that cash and securities are promptly, effectively and concurrently delivered between the parties involved. CBF also provides notary services (initial recording of securities in a book-entry system) as well as central maintenance services (providing and maintaining securities accounts at the top tier level). The non-banking-type ancillary services offered by CBF include, inter alia, supporting the processing of corporate actions (for example, in relation to distribution of dividends and interest payments, share splits, spin-offs) deriving from the securities that it holds in custody for its customers. In addition, CBF also performs securities lending and borrowing and collateral management services.

The ESMA CSD Register specifying in detail the services for which CBF has been granted authorisation pursuant to Art. 16/ Art. 54 of CSDR is available at the following link: https://www.esma.europa.eu/document/csd-register.

Securities can be held in custody with CBF under the following main structures:

- Collective Safe Custody (CSC; German: Girosammelverwahrung, GS): CSC is governed by the DepotG. CBF is currently the only national CSD for the German market providing CSC holding structure. Under German law, holders of securities held in CSC are granted a proprietary right to those securities (a 'right in rem') being a pro rata co-ownership right in a fungible pool of securities represented by a global note or a similar number of definite securities held by CBF in its vaults in accordance with section 5 paragraph 1 DepotG. Furthermore, there are certain kind of securities which can be represented in a dematerialized form via an entry in a central register (electronic securities in accordance with the eWpG) as well as bond issues of the German Federal State (Bundesanleihen) and of the German States (Länderanleihen) held by entry in the respective debt registers of the Federal Republic or State. Equivalent rights are granted under German law for such securities which CBF holds via a cross border CSD-Link with a foreign CSD based on an account relationship in accordance with section 5 paragraph 4 DepotG.

- Vaults Services for third parties (Lagerstellenverwahrung): e.g. insourcing of depository function from custodian banks.

- Individual Safe Custody (Streifbandverwahrung): Jacket custody of fungible and non-fungible securities certificates, where each customer is entitled to receive back the individual securities certificates with a particular serial number.

- Non-Collective Safe Custody (NCSC): NCSC applies to fungible securities kept abroad. The depository bank where the account is kept becomes the legal owner (acting as trustee) of the rights given to it under the legal system or by the market practice of the country of custody. The investor, as the account holder and beneficial owner, merely has a bilateral claim to the surrender of this legal title vis-à-vis his depository, under the law of obligations, and the rights of a beneficial owner to issue instructions to the trustee. CBF acts as the depository (intermediary) and keeps the positions in the form of book-entry credits on a fiduciary basis through CBL, which uses sub-custodians in various countries for purposes of custody.

The legal basis for each material aspect

The main legal provisions relevant for the establishment and the operation of CBF are outlined under Key Consideration 2.

The business relationship between CBF and its customers are subject to terms and conditions applicable to each material aspect. These documents are mainly governed and shall be interpreted by German Law and any disputes arising in relation to them shall be submitted to the competent courts of Germany (see e.g. number IX of the GTCs).

Material legal documentation of CBF:

1. The General Terms and Conditions (GTCs).
2. Securities Lending and Borrowing Rules of Clearstream Banking AG.
3. Special Conditions for Collateral Management.
4. Special Conditions for services that Clearstream Banking AG performs for its customers in relation to reporting and payment obligations arising from the French Financial Transaction Tax.
5. Special Conditions for the re-entry of internal instructions on CBF-i Accounts.
6. Special Conditions of Vestima Service of Clearstream Banking AG

The GTCs and Special Conditions can be downloaded from the following web site:
https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/general-terms-and-conditions

The GTCs and the Special Conditions are accompanied by Technical Rules (including but not limited to the Customer Handbook(s)) which contain a description of the services and the procedures and various technical aspects.

CBF publishes on its website announcements in relation to customer information and specific services on a regular basis. Announcements are generally made in German with an English translation or vice versa.

When becoming a customer of CBF, the relevant customer needs to accept CBF's General Terms and Conditions.

CBF will notify its customers in writing by e-mail and via its website of any changes in relation to the GTCs and the effective date thereof. Unless the customer informs CBF in writing of any objection within six weeks after the modification has been communicated to him, the customer will be deemed to have accepted such amendments.

For other CBF contracts and documentation entered into by the customer, amendments follow the procedures agreed by the customer and CBF therein.

Key consideration 2: An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

The implementation of clear and understandable rules, procedures and contracts is addressed in Art. 43 CSDR. CBF has set out rules (terms and conditions) as well as contracts relating to its SSSs and services which are binding upon CBF and its participants (see in detail Key Consideration 1).

CBF's contractual documentation is based on and reflects the requirements of German and EU law, including notably the German Securities Deposit Act (Depotgesetz, DepotG), the German Civil Law Code (Bürgerliches Gesetzbuch, BGB), law on electronic securities (Gesetz über elektronische Wertpapiere (eWpG)) and Regulation (EU) No 909/2014 of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories (CSDR).

The main legal provisions relevant for the establishment and the operation of CBF are the following:

- The German Banking Act (Kreditwesengesetz), section 1, paragraph 1 and 17;
- The Securities Deposit Act (Depotgesetz, on the safe custody and acquisition of securities):
  - section 1, paragraph 3, definition of "Wertpapiersammelbank";
  - section 3, paragraph 1, custody of securities by third parties;
  - section 5, paragraphs 1 and 4, CSC activity;
  - sections 6-9, rights of depositor, co-ownership in CSC;
  - section 9a, global securities certificates;
- The German Civil Code (Bürgerliches Gesetzbuch, BGB):
  - section 280 and following on liability;
  - section 929 and following regarding ownership and transfer of ownership;
  - section 1204 and following in relation to pledges;
- Law on Electronic Securities (eWpG)
- Federal Government Debt Act (Bundesschuldenwesengesetz), section 6 (entry of CSD into debt ledger equaling the existence of a pool of certificates (Wertpapiersammelbestand)) and the respective acts of the federal states;
- Law on the Restructuring of Bonds (Schuldverschreibungsgesetz), section 21;
- Stock Corporation Act (Aktiengesetz), Commercial Code general rules (including on company law aspects as well as on vindication, transfer of (co-)ownership, regular custody contract, good faith acquisition, mandate and agency etc.);
- Insolvency Code (Insolvenzordnung) in relation to the segregation of assets in the case of CBF's insolvency;
- Regulation (EU) No 909/2014 of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories (CSDR);
- Regulation (EU) No 575/2013 of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (CRR);
- Default and resolution procedures (German Banking Resolution Act (Sanierungs- und Abwicklungsgesetz))
- Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems (SFD), amended by Directive 2009/44/EC of the European

Parliament and of the Council of 6 May 2009 and by Directive 2010/78/EU of the European Parliament and of the Council of 24 November 2010

All laws and regulations governing the establishment and the operation of CBF are publicly available.

Key consideration 3: An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.

The legal basis for CBF's activities was described to BaFin in the CSDR application. The respective information is furthermore made transparent to the public in CBF's documentation (i.a. GTC, Customer Handbook) which is made available on the Clearstream website. Please refer to the information in Key Consideration 1 and 2 with regards to participants and – where relevant – participants' customers.

Key consideration 4: An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.

Enforceability of rules, procedures and contracts

The enforceability of the rights and interests in financial instruments under deposit with CBF by the participants and their entitlements are mainly governed by German law.

In the performance of the internal and where needed external reviews CBF undertakes of its rules, procedures and contracts, attention is also paid to ensure that they are enforceable in all relevant jurisdictions, including in the case of the default of a participant (as defined in Art. 2 para. 1 No. 26 CSDR).

Besides the legal relationship between CBF and its customers being governed by German law, there are also foreign law aspects relevant for CBF's services:

Third country laws and regulations are generally applicable to custody and settlement of securities held via a CSD-link or via a sub-custodian link. The settlement and custody rules governing such securities are determined by the specific market rules of the foreign CSD / sub-custodian, which are described in the relevant Market Link Guides on the Clearstream website.

Legal opinions are requested annually from independent law firms of good reputation to support the assessment and the review of the CSD-links and, via CBL, the sub-custodian links in order to cover, inter alia, the following main topics:

(i) the validity and enforceability of the relevant link agreement;
(ii) description of the nature of entitlement (i.e. detailing the rights and interest of CBF in respect of the financial instruments sub-deposited);
(iii) liability questions;
(iv) no lien, right of redemption etc. in relation to customer assets other than for such claims as may arise from the purchase, administration or safe custody of these securities;
(v) asset segregation;
(vi) no upper-tier attachment;
(vii) a description of the relevant settlement finality rules;
(viii) a description of the relevant insolvency law proceedings.

In addition, it is CBF's practice to require from its CSD / depository/agent bank information on any pertinent changes in domestic laws and regulations pertaining to securities, cash, exchange controls or tax issues.

In addition to the legal opinions, a three-point declaration of the relevant CSD and/or depository/agent bank where applicable and required under German law for investor protection purposes, is requested in relation to each link. Under such three-point declaration, the CSD and/or depository/agent bank) acknowledges that the securities held within the account of CBF are customer assets and that no liens of the depository other than for fees as may arise from purchase, administration and safe custody of these securities may be asserted with respect to such securities.

Avoidance, reversal or stays with respect to actions of CBF under its rules, procedures or contracts, other than the contractual right of CBF according to its relevant standard documents not to execute or carry out specific actions which would be in violation of laws, regulations or in case of violation of the counterparty of the relevant agreement between CBF and the relevant counterparty, could, subject to the rules on finality of settlement, potentially result from (i) the default of a counterparty (such as in case of insolvency, liquidation) or (ii) court order.

Degree of certainty for rules and procedures

CBF articulates the legal basis for material aspects of its activities by obtaining a well-reasoned legal opinion or analyses, inter alia – where reasonably required – with the support from an independent law firms of good reputation. To the extent practicable, the assessments/ opinions confirm the enforceability of CBF's rules and procedures.

Key consideration 5: An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

As outlined in Key Consideration 1 and 4, the legal relationship between CBF and its customers is governed by German law, which includes inter alia, the Governing Documents such as the CBF GTCs, and in particular, the entitlement of CBF's participants, the finality, CBF's liability, the deposit and registration in book-entry of securities, the creation and enforcement of collateral, CBF's insolvency and default procedures. Third country laws and regulations become relevant to custody and settlement of securities held via a CSD-link or via a sub-custodian link. CBF documentation governing its activities clearly outline the law that is intended to apply to each aspect of CBF's operations.

When CBF concludes non-German law governed contracts, the contractual documentation, is reviewed internally and submitted to the assessment of a local external law firm qualified in the relevant jurisdiction to provide comments and issue legal opinions covering, among other things, the validity of the choice of the law and jurisdiction.

Should despite all precautions ensured by CBF in its contractual documentation a dispute regarding conflict of law arise, such dispute would generally be handled by the in-house legal counsels of CBF who may obtain certainty via a reasoned and independent legal opinion and analysis.

Principle 2: Governance

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

Key consideration 1: An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.

Pursuant to CBF's updated version of the Articles of Incorporation (the "Articles"), the main objectives of the company are:

a. a securities clearing and deposit bank and the performing of all tasks relating to this, including data and information transfer between shareholders, institutions and issuers as well as the provision of appropriate systems;
b. a central accountancy and clearing office in order to facilitate the international securities clearing system;
c. a system for collateral provision and management (Collateral Management);

As a market infrastructure provider, Deutsche Börse Group (DBG) considers its primary responsibility to be the transparency of capital markets. By ensuring such transparency, it fosters stability in these markets, promoting their economic success.

CBF, as an integral part of DBG, aims to ensure the highest standards of safety for customer assets, with a strong focus on risk management.

The tasks and responsibilities of the CBF Executive Board design and establish the business strategy, the risk strategy, the strategy regarding capital adequacy and liquidity, as well as the guiding principles governing the organisational and operational structure including IT (technology) and internal communications processes, the internal control, compliance and risk management mechanisms, the professional conduct and corporate values, including escalation procedures, the central administration, including administrative, accounting and IT organisation, outsourcing, the management of continuing activities and crisis events and the appointment and replacement of persons holding key functions.

The CBF Internal Control System (ICS) is a fundamental component of the overall risk management culture and of corporate governance. It consists of safeguards and controls embedded in the organisational structures, in particular within the business processes, to ensure that business processes and activities run in an orderly fashion and minimise risks. In accordance with the ICS approach, the duties of the Executive Board of CBF comprise, inter alia, analysing and assessing the risk of the business process, implementing adequate safeguards and controls within the business processes, monitoring the application of safeguards and controls, reporting promptly if material shortcomings in the ICS have been identified and ensuring awareness of the employees regarding the ICS.

A high emphasis is placed on the elimination or minimisation of risk, as also described in detail in the Pillar III report, published and available to customers on the Clearstream website, at the following link: https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114.

CBF contributes to enhancing the safety, efficiency and transparency of the securities markets, safeguard financial markets and give market participants confidence that securities transactions are executed properly and in a timely manner, including during periods of extreme stress. This is the case both to support the goal of delivering the best services to customers and thus ensure a growing customer base and also to ensure as neutral market infrastructure the continuation of market stability.

CBF is part of DBG's "Compass 2023" medium-term strategic plan. The compass points to further growth.

Key growth drivers are capital market trends, such as OTC to on-exchange, the increasing importance of the buy-side, the shift to passive investing and digitisation of the financial sector, which are addressed through the broad and diversified business model. In addition to continued secular net revenue growth, DBG plans to increase the net revenue contribution from M&A opportunities going forward.

The strategy of the Clearstream group aligns with these goals and will build on these pillars, with implementation taking place through five key strategic actions:

1) Strengthen product areas
2) Ensure regulatory compliance
3) Promote internal efficiency
4) Mobilise growth potential
5) Foster effectiveness in sales and client services

Besides playing a leading role in building a critical component of the European market infrastructure with TARGET2-Securities ("T2S"), a cornerstone of the strategy of the Clearstream group is to expand collateral management and investment fund services.

Leveraging on its ICSD in Luxembourg, Clearstream delivers forward-looking services to an international customer base that comprises banks, supranationals, central banks and broker/dealers. In the spirit of the before-mentioned, CBF has defined a business strategy to support its objectives and continues to refine these – where appropriate and necessary – to best serve the financial markets and contribute to its stability. Since its inception, the Clearstream group has provided safety, efficiency and stability particularly in the field of Eurobonds and for cross-border transactions in nearly 60 domestic markets worldwide.

CBF provides a comprehensive range of services, designed specifically to maximise settlement opportunities while minimising delays. Our secure, straight-through processing is efficient and near risk-free.

In order to meet the objectives of sustainable growth and market leadership in a post-T2S environment, the Clearstream group is adapting by improving its proximity to the markets in its network. Improving market proximity means establishing closer strategic partnerships with local agents for asset servicing. This will ensure that the service offering continues to meet the highest industry standards in terms of reliability, quality and efficiency of services.

Key consideration 2: An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.

Governance arrangements

The mandatory board structure of a German Stock Corporation (Aktiengesellschaft, AG), such as CBF follows the two-tier system. The Executive Board is the corporate body managing and representing CBF in accordance with section 76 of the German Stock Corporation Act (Aktiengesetz, "AktG"). The Supervisory Board is supervising and advising the Executive Board in accordance with section 111 of the AktG.

As a public limited liability company, the general principles as set out in the AktG are applicable. Control over the company is exercised by the shareholder(s), the roles and the responsibilities of the Executive Board and the Supervisory Board are defined by the AktG, the Articles of Incorporation and the Rules of Procedures for the respective bodies.

The shareholders' meeting is the most significant organ of the stock corporation because it appoints the Supervisory Board, ratifies the acts of the Executive and Supervisory Board members and passes resolutions on all fundamental issues. The Supervisory Board appoints the members of the Executive Board.

The governance arrangements under which CBF's Supervisory Board and Executive Board operate are the following:

- the Articles (in particular Chapters 8 and 9)

  The Supervisory Board, which is appointed by the general meeting, is bound to advise and supervise the Executive Board while strictly maintaining business confidential information. The Supervisory Board may choose which of the Executive Board's transactions needs their previous consent without violating the Executive

  Board's representation rights concerning business correspondence. The Executive Board determines and co-ordinates the various departments of CBF and also represents CBF. The Executive Board reports to the Supervisory Board;

- The Rules of Procedure (the "RoP") applicable to the Supervisory Board and to the Executive Board;

- Internal policies

  Processes for ensuring performance accountability are defined in the respective RoPs but also in other internal policies such as the Policy on Conflicts of Interest, and the Business Continuity Management Policy. Furthermore, the design of the risk management and internal controls are defined in the corresponding risk management, internal audit and compliance policies/charters in order to provide clear and direct lines of responsibilities and accountability for key functions.

As the Articles do not expressly reserve specific power to the general meeting of the shareholders other than the power set out by the law in section 119 et. seq. AktG and the delegation of the day-to-day management to the shareholders' meeting as well as to the Supervisory Board is legally not feasible, the Executive Board is entitled as per section 76 of the AktG to accomplish any act necessary or useful to realise the corporate objective. It shall represent CBF towards third parties and in legal proceedings, either as plaintiff or as defendant. Writs served on behalf of or upon the company shall be validly served in the name of the company alone.

Shareholders may exercise the membership rights that result from holding shares in the shareholders' meeting. CBF has only one shareholder and is therefore wholly-owned. The rights of the shareholders' meeting are listed in section 119 AktG. The shareholders' meeting may decide on:

- the appropriation of any net retained profits;
- the appointment (and removal) of supervisory board members (unless they are elected by the employees; in case of CBF one third of the supervisory board members must be elected by the employees due to the One-Third-Participation Act);
- the ratification of the acts of the members of the Executive Board and of the Supervisory Board;
- the appointment of the auditor;
- fundamental measures, e.g. the amendment of the Articles of association, capital increases or decreases and the approval of the conclusion of intercompany agreements (domination and/or profit and loss transfer agreements) and transformations (mergers, spin-offs etc.).

The annual financial statements prepared by the Executive Board must be approved by the Supervisory Board. The adopted and approved annual financial statements must then be presented to the annual shareholders' meeting, but a formal approval by the shareholders is normally not required.

Finally, the sole shareholder takes note of the report on the remuneration of the members of the Executive Board, which the Chairman of the Supervisory Board submits for information. The sole shareholder also notes that the Supervisory Board appointed an external auditor for the respective financial year.

The RoP of the Supervisory Board is setting out the procedures for its functioning, including the procedures to identify, address and manage the conflicts of interest.

The directors shall be elected by the general meeting of shareholders for a period of four years and until their successors are elected, provided however, that any director may be removed at any time by a resolution approved by a simple majority taken at a general meeting of shareholders. Every member is re-eligible for a further term of four years.

In line with CSDR, CBF has set up the following committees: Audit Committee, Risk Committee, Remuneration Committee. The members as well as tasks and responsibilities of the committees are described at the following link: https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/group-committees/cbf-committees

In addition, CBF established the CSDR CBF User Committee pursuant to Art. 28 Regulation (EU) 909/2014 in order to advise the Executive Board of CBF.

Disclosure of governance arrangements

CBF discloses information about its governance structure publicly via the Company Governance section of its website at https://www.clearstream.com/clearstream-en/about-clearstream/company-governance.

In addition, CBF also publishes a link to its Banking License on its website in the "Regulation" section at https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/banking-license.

Additional information related to governance provided to the public in this section includes, but is not limited to:

- Articles of Incorporation
- CBF's CPMI-IOSCO disclosure framework
- Compensation information

Moreover, CBF publishes annually its Association of Global Custodians Questionnaire disclosure response.
The current version is available at:
https://www.clearstream.com/clearstream-en/about-clearstream/due-diligence/agcquestionnaire

Key consideration 3: The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.

As outlined in Key Consideration 2 of Principle 2, the mandatory board structure of a German Stock Corporation such as CBF follows the two-tier system. The Executive Board is the corporate body managing and representing CBF and the Supervisory Board is monitoring and advising the Executive Board.

Roles and responsibilities of the boards

- The Supervisory Board, which is appointed by the general meeting, is bound to advise and supervise the Executive Board while strictly maintaining business confidential information. The Supervisory Board may choose which of the Executive Board's transactions needs their previous consent without violating the Executive Board's representation rights concerning business correspondence

- Rules of Procedure (the "RoP") applicable to the Supervisory Board and to the Executive Board

- Internal policies

Processes for ensuring performance accountability are defined in the respective RoPs but also in other internal policies. Furthermore, the design of the risk management and internal controls are defined in the corresponding risk management, internal audit and compliance policies/charters, including a specific Conflict of Interest Policy, in order to provide clear and direct lines of responsibilities and accountability for key functions.

CBF is accountable to (i) its shareholder(s); (ii) the German authorities in accordance with the German Banking Act andrelevant EU Regulations - notably the European Central Securities Depositories Regulation (CSDR) and (iii) its customers pursuant to the provisions of its General Term and Conditions (GTCs).

A policy on conflicts of interest as well as principles on the management of conflict of interest have been established in order to ensure long-term awareness and the adequate conduct of individuals regarding the avoidance and, if not possible, the management of situations (potentially) creating any conflicts of interest. It aims to, inter alia, support the Executive and Supervisory Board as well as employees in identifying and avoiding conflicts of interest and, where the latter is not possible, to show possibilities to manage (potential) conflicts of interest by establishing appropriate transparency and mitigating measures.

Any member of the Executive Board and Supervisory Board is bound to the corporate interest of the company. Each member of the boards must disclose conflicts of interest to the chairman of the Supervisory Board and the chairman of the Executive Board without delay and inform the other members of the Executive Board thereof. Adequate measures to prevent, limit or resolve conflicts of interest shall be taken in accordance with legal requirements and the applicable Conflicts of Interest Policy.

Review of performance

In order to be compliant with regulatory requirements, candidates and members of the Executive and Supervisory Board individually and collectively, must run through a suitability assessment, which is initiated by the Chairman according to the provisions of the German Banking Act and the respective Suitability Assessment Policy of the Company.

The performance of the Supervisory Board of CBF is assessed each year at the time when the shareholder(s) approve(s) the annual financial statements of CBF and relief ("quitus") is granted to the directors.

Key consideration 4: The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).

As required for companies with a two-tier board structure, none of the members of the Supervisory Board of CBF has an executive function within CBF. In addition, one third of the members of the Supervisory Board, two members, are fully independent of the company in accordance with art. 27(2) CSDR.

CBF adopted the policy for the assessment of the suitability of members of the management bodies (Supervisory Board, Executive Board) and key function holders. The objective of the policy is to ensure that members of management bodies and key function holders of the affected companies are suitable in terms of reputation, honesty, and integrity, knowledge, skills, and experience time commitment and independence as stipulated in the joint ESMA and EBA guidelines on the assessment of the suitability of members of the management body and key function holders under Directive 2013/36/EU and Directive 2014/65/ (EBA/GL/2017/12).

CBF organises appropriate quarterly trainings focusing on the requirements for Supervisory Board and Executive Board members and focusing on the proposals they made during the assessment of training requests from the Supervisory Board and the Executive Board.

Different means ensure that the long-term achievements of the institution's objectives are reflected in the remuneration:

1. The Clearstream group has a remuneration policy pursuant to CRD IV (as per editorial date, the CRD V remuneration-related requirements were not yet implemented in national law and will be subject to the next review cycle of the remuneration policy) which therefore integrates CBF's risk appetite. The interests of investors are taken into consideration and remuneration systems are in line with the risk strategy.

2. The payment of variable remunerations in CBF can be executed only if a certain number of performance criteria are met by the institution. As mentioned in the remuneration policy, the determination of the total amount of the variable remuneration "(i) shall take due account of the risk-bearing capacity, the multi-year capital planning and the profitability (ensuring the long-term achievement of the financial objectives of the FMI), (ii) must ensure the Group's ability to maintain or recover appropriate own funds and liquidity and (iii) must ensure the Group's ability to meet or recover the combined capital buffer requirements".

3. The remuneration structure and the pay-out schedule of variable remuneration for Executive Board members are aligned with sustainable and long-term performance (deferral mechanism and instruments ensure an incentivising of sustainable achievement of the FMI's financial and non-financial objectives). No performance variable remuneration is guaranteed, and, under performance conditions, Executive Board members are eligible to receive a performance-based variable remuneration.

Key consideration 5: The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.

Roles and responsibilities of management

Please refer to the replies to key considerations 2, 3 and 4 above as well as key consideration 6 below.

Experience, skills and integrity

A member of the Executive Board and the Supervisory Board must fulfil certain criteria. Inter alia, the person shall be of sufficiently good repute and shall have appropriate skills, knowledge and experience. In order to be compliant with regulatory requirements, candidates and members of the Executive Board and the Supervisory Board individually and collectively, must run through an annual suitability assessment, which is initiated by the Chairperson according to the provisions of the German Banking Act and the respective Suitability Assessment Policy of the Company but also on an ad-hoc basis throughout the year when changes in the Executive Board or the Supervisory Board occur.

The departments of Executive Board members are defined in the schedule of responsibilities. Each Executive Board member has sole managerial authority within the framework of the department assigned to them by the schedule of responsibilities and the resolutions of the joint Executive Board. Without prejudice to the division of responsibilities, each Executive Board member is responsible for management as a whole.

Enactment, modification and revocation of the schedule of responsibilities requires unanimous resolution of the joint Executive Board. If a unanimous resolution does not pass, the chairman of the Executive Board must petition the Supervisory Board to regulate the assignment of duties.

The schedule of responsibilities must be announced to the Supervisory Board without delay following its definition.

Key consideration 6: The board should establish a clear, documented risk- management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk- management and internal control functions have sufficient authority, independence, resources, and access to the board.

Risk management framework

Risk management is an elementary component of the management and control of CBF, effective and efficient risk management is fundamental to safeguarding its. The DBG Group Risk Management Policy is applicable to CBF and documents CBF's enterprise-wide risk management concept. It describes the risk management framework in terms of processes and roles and responsibilities applicable to all staff within Clearstream's legal entities.

The overall objective of the risk management framework is to enable the Executive Board of CBF to monitor the overall risk profile of CBF, as well as specific material risks, so that developments that could jeopardise the interests of CBF can be identified at an early stage and suitable countermeasures deployed. This is achieved through periodic and ad hoc reporting on all significant risk developments to the Executive Board. The process of reporting is further described in the risk type specific handbooks, for example Operational Risk reporting is documented in the Operational Risk Handbook.

CBF has been included throughout the development of the DBG corporate risk taxonomy, that is applicable to CBF. The taxonomy distinguishes between five aggregated risk types; Operational Risk, Financial Risk, Business Risk, Pension Risk, and Winding-down and Restructuring Risk. CBF's risk strategy is based on its business strategy and sets limits specifying the maximum risk permitted for the defined risk types as well as the overall risk of the bank. This is done by laying down respective requirements for risk management, risk control and risk limitation. CBF ensures that appropriate measures are taken to avoid, reduce and transfer, or intentionally accept, risk. Further details are described in Principle 3.

The Risk Committee is responsible for advising the Supervisory Board on the CSD's overall current and future risk tolerance and strategy. Its tasks and responsibilities are to:

- Advise the Supervisory Board on the institution's overall current and future risk appetite, risk tolerance and risk strategy and assists the Supervisory Board in overseeing the implementation of that strategy;
- With the Audit Committee, submit proposals to the Executive Board about how the conditions applied to customers in accordance with the business model and the risk structure could be created; and
- Examine whether incentives provided by the remuneration system take into consideration the risk, capital and liquidity structure of the institution and the likelihood and timing of earnings. The tasks of the Remuneration Committee remain unaffected;
- Review whether the conditions offered to customers take into account the institution's business model and risk structure;
- If this is not the case, the Risk Committee takes advice from external experts, if necessary. It determines type, comprehensiveness, format and frequency of information to be provided by the Executive Board with regard to strategy and risk.

The risk management processes and measurement systems are subject to regular reviews performed by Internal Audit, as well as External Audit. The role of Internal Audit is to assist CBF in achieving its objectives by supporting a standard of excellence in all of the organisation's business, information technology and regulated functions.

Key consideration 7: The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.

Identification and consideration of stakeholder interests

For the description of CBF's design and strategy, please refer to key consideration 1 in this Principle. For its rules, please refer to key consideration 4 of Principle 1.

CBF has a multifarious array of stakeholders, which can be broadly categorised into four groups as follows:

- Stakeholders to whom CBF provides a service, i.e.:
    - Issuers
    - Issuer agents
    - Customers
    - Clients of customers
    - (I)CSDs
- Stakeholders who provide a service to CBF, i.e.:
    - Domestic CSDs
    - Domestic depository banks, agent banks and common depositories;
    - Transfer Agents and Order Handling Agents
    - CCBs
    - (I)CSDs
    - Connectivity providers such as SWIFT
- Stakeholders involved in the formation of the legislative and regulatory framework in which the Clearstream group operates, i.e.:
    - Market associations

- National governments
- Supranational legislative bodies (such as the EU Commission)
- CBF's regulators

- Stakeholders with a direct influence on CBF's equity, i.e.:
  - Parent companies
  - End investors

<u>Stakeholders to whom CBF provides a service:</u>

CBF regularly reviews its GTCs and other governing documents to reflect the changes in legislation or regulatory environment. Any amendment to the GTCs and other governing documents is communicated to all customers of CBF.

The Clearstream group assists issuers and issuer agents to make their securities eligible on its platform, bysupport and guidanceeither via direct contact or via the participation in market associations (ICMA, ICMSA, ISMAG etc.). Furthermore, Clearstream entities are members of working groups of these market associations which aim to promote standards and to define the guidelines for the industry.

According to the CSD Regulation, a CSD is required to establish a User Committee for each security settlement system it operates.

CBF operates the securities settlement systems CASCADE and Creation and offers services through both systems. Consequently, CBF established two user committees.

Pursuant to Article 28 of the CSD Regulation (EU) 909/2014 (CSDR), the User Committee advises the Executive Board of the Company on the following topics:

- Committee shall advise the Executive Board on key arrangements that impact on its members, including the criteria for accepting issuers or participants in the securities settlement systems and on service level;
- Committee may submit non-binding opinions to the Executive Board, containing detailed reasons regarding the pricing structures of the securities settlement systems of the Company.

The advice of the Committee shall be independent from any direct influence of the Executive Board.

The Executive Board may seek advice and recommendation from the User Committees with respect to matters which are of relevance for the business of the Company and its relationship with customers, in particular:

- Business and marketing strategy;
- Development of new products;
- General market trends and requirements.

The Committee may submit non-binding opinions to the Executive Board, containing detailed reasons regarding the pricing structures of the CASCADE and Creation SSS.

The criteria that are relevant for the admissibility of a selected member to one of the User Committees are the following:

(a) Must be a client (account holder)

(b) Must have a contractual relationship with the Company

(c) Representatives of the largest transaction volumes and the highest percentages of market shares in assets under custody

(d) Representatives of the largest transaction volumes and the highest percentages of market shares in settlement

(e) Representatives of issuer and/or issuer agents of the largest issuing volumes of bonds

(f) Representatives of issuer and/or issuer agents of the largest issuing volumes of certificates and warrants

(g) Representatives of German banks and foreign investment banks

The Company strives to achieve a balanced composition of representatives of both issuers and participants.

<u>Stakeholders who provide a service to CBF:</u>

Existing relationships with CSDs and/or depositories/agent banks, transfer agents (Tas), CCBs, Euroclear Bank and connectivity providers are reviewed on an ongoing basis. In addition to periodic visits according to defined schedules, CBF may also choose to visit a supplier at any time to review the relationship and ascertain that all governing documents remain relevant to the activities and regulations of the market or request that the supplier visits CBF's premises. The service level agreement contracts with its suppliers is updated as and when necessary, on average this is being done on an annual basis. In addition, a legal opinion per country is obtained on an annual basis.

Institutions providing links to domestic markets abroad inform CBF of any changes to market practice and regulation in the market in question. Similarly, Clearstream's Network Management team informs such providers of upcoming changes to CBF's services, as well as working with them to develop new service offerings.

<u>Stakeholders involved in the formation of the legislative and regulatory framework in which the Clearstream group operates:</u>

Clearstream entities are represented in more than 35 market organisations globally:

- International Capital Markets Association (ICMA),
- European Repo and collateral Council (ERCC),
- International Securities Services Association (ISSA),
- International Capital Markets Services Association (ICMSA),
- International Securities Market Advisory Group (ISMAG),
- Securities Market Group (SMPG),
- Society for Worldwide Interbank Financial Telecommunications (SWIFT)
- Association of National Numbering Agents (ANNA)

Within Europe, the Clearstream group plays a leading role in various working groups and associations at EU level:

- T2S Governance Bodies - CSD Steering Group
- European Central Securities Depositories Association (ECSDA)
- ECB's Advisory Group on Market Infrastructure for Securities and Collateral (AMI-SeCo)
- ESMA Post-Trading Standing Committee

On a national level, the Clearstream Group maintains a strong network across several domestic markets and is particularly well represented in its home markets: Germany and Luxembourg. In Germany CBF is a member of the Bundesverband deutscher Banken e.V. (Federal Association of German Banks).

CBF covers roughly 50% of Euro-zone settlement volumes, and Germany is the home market to the Bundesbank, one of the four European Central Banks driving the T2S infrastructure development; the Clearstream entities were the first major (I)CSD group to sign the Framework Agreement. In doing so the Clearstream entities showed the way to the remaining CSDs and as such continue to contribute actively to the set-up of the pan-European settlement platform.

CBF additionally consults and obtains approval from its regulators before making significant changes to its design, rules and procedures.

Stakeholders with a direct influence on CBF's equity:

As Clearstream Holding is the sole shareholder of CBF, the sole shareholder assumes all powers conferred to the general meeting of shareholders. The sole shareholder's decisions are recorded in a minutes register held at the registered office. Regarding the strategy the CBF Executive Board informs the CBF Supervisory Board on a quarterly basis on the following topic "Business Strategy / Strategic Roadmap / Business Development".

CBF's Annual Accounts and Management Report are sent to its regulators and made available to its customers publicly via the website.

Disclosure

The description and Terms of Reference of the User Committees are published on:
https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/group-committees/cbf-committees/user-committee-cbf.

Furthermore, any major changes to the SSS, its operations, its rules are communicated to customers; normally via announcements before they are being integrated into the normal customer documentation, like General Terms and Conditions, the Customer Handbook and other.

Principle 3: Framework for the comprehensive management of risks

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

Key consideration 1: An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.

Risks that arise in or are borne by the FMI

Clearstream Risk Management

The Clearstream Risk Management function is responsible to develop strategies, policies, procedures and handbooks to identify, measure, monitor and report risks. Clearstream Risk Management comprises coverage of the three CSDs being CBF, CBL and LuxCSD.

Risk Management Policies and Procedures

The overarching Group Risk Management (GRM) Policy, as applicable to CBF, describes the enterprise-wide risk management concept, including the risk management framework in terms of processes, roles and responsibilities applicable to all staff and organisational units and levels. The Risk Management Process consists of the consecutive identification, notification, assessment, control (mitigation) and monitoring (reporting) of risks.

The GRM Procedure, as applicable to CBF, outlines that CBF applies a five-step process for risk management that consists of the consecutive stages of; identification, notification, assessment, control (mitigation), and monitoring (reporting).

DBG Risk Inventory (included within the GRM Procedure) gives the DBG risk taxonomy, applicable to CBF. The Risk Inventory (following an alignment process with all affected banking-regulated entities within DBG including CBF) is a comprehensive and complete list of all the potential risk items that CBF may be exposed to due to its current and future business operations. The inventory includes all of the risks that CBF is aware of. The Risk Inventory Taxonomy can be summarized as four levels. It includes the five aggregated key risk types; Business Risk, Financial Risk, Operational Risk, Pension Risk and Winding-down and Restructuring Risk.

CBF undertakes a consistent, regular, structured identification and assessment process of all risks the entity might be exposed to due to its business model and industry environment. In addition to the annual DBG-wide Risk Inventory Process, risk type specific risk items and drivers may be identified.

Risk Types

CBF defines risk as a potential negative impact on its financial, revenue and liquidity situation. In line with the DBG Risk Taxonomy, CBF differentiates between five aggregated risk types that are managed and controlled with distinct methods. These aggregated risk types are; Business Risk, Financial Risk, Operational Risk, Pension Risk, and Winding-down and Restructuring Risk. These are shown in the DBG Risk Inventory.

Operational risk

Operational risk encompasses all existing and newly arising risks in the context of the ongoing provision of services by CBF. In accordance with the Basel III framework, operational risk is defined as the risk of loss resulting from inadequate or defective systems and internal processes, from human or technical failure, from inadequate or defective external processes, from damage to physical assets as well as from legal risks that could arise from non- or inappropriate compliance with new or existing laws and regulations and all contractual commitments.

Operational risks that CBF does not want to run and that can be insured against at reasonable cost are transferred by closing insurance policies. All insurance policies are coordinated centrally for the entire DBG thereby ensuring the uniform risk/cost benefit insurance coverage.

Financial risk

CBF is exposed to financial risks in the form of credit, market, liquidity and intraday credit risk. Exposure to the above-mentioned risks is mitigated through the existence of effective control measures.

- **Credit risk**

Credit risk refers to the risk that a counterparty may default and is unable to meet its liabilities against CBF in full or at all. CBF grants loans to its customers in order to increase the efficiency of securities settlement. However, these lending operations cannot be compared with those of other credit institutions. Firstly, the loans are extended solely on an extremely short-term basis. Secondly, they are extended solely for the purposes of increasing the efficiency of securities settlement. These loans are fully collateralised. Loans are only granted to creditworthy customers with very good credit ratings. Furthermore, credit lines granted are uncommitted and can be revoked at any time.

The creditworthiness of potential customers is assessed before entering into a business relationship. In addition, CBF establishes customer-specific credit lines on the basis of both regular reviews of the customer's creditworthiness and ad hoc analyses as required.

Additional credit risks are associated with cash investments and cash holdings at Cash Correspondent Banks (CCB) and at CBL. CBF reduces this risk by investing secured via collateralized overnight placements with CBL. CBF establishes credit limits based on annual credit assessments and ad hoc analyses as required. The creditworthiness of CBF's CCBs and counterparties is also assessed on an annual or, if necessary, ad hoc basis.

- **Market risk**

Market risk is the risk of loss arising from holding assets and liabilities – on balance sheet or off balance sheet – with different maturity dates, creating exposure to changes in the level of interest rates, foreign exchange rates or market prices. Market Risk may arise in the form of interest rate risk (as a result of fluctuations in interest rates in connection with cash investments or borrowing), currency risk (in the operating business, when recognising net revenues denominated in foreign currencies or when holding positions in foreign currencies) and in the form of equity price risk.

CBF is exposed to interest rate risk in connection with cash investments. Interest rate risk is mitigated using a limit system that only permits maturity transformation to a small extent.

- **Liquidity risk**

CBF is exposed to liquidity risk in that it may lack sufficient liquidity for its intra-day cash operations or incur in increased refinancing costs in the event of liquidity shortage. Daily and intraday liquidity is monitored closely by the Treasury and Credit departments and managed with the help of a limit system. Sufficient credit lines and funding sources are available to provide cover in extreme situations. Further details on the robust framework to manage its liquidity risk are described under Principle 7 "Liquidity Risks", Key Consideration 1.

- **Intraday Credit Risk**

CBF is exposed to intraday credit risk, which is the risk that results from the provision of intra-day credit, inter alia, to the participants in a securities settlement system or other users of CSD services.

Business risk

Business risk reflects the sensitivity of CBF to macroeconomic and geopolitical developments and its vulnerability to event risks arising from other external factors. It is translated in EBITDA terms, reflecting both a potential revenue decrease and a potential increase of its cost base. CBF's financial performance is directly or indirectly subject to the evolution of a number of macroeconomic factors and the related effects. Revenues are directly or indirectly impacted, for example, by the level of interest rates, economic growth, equity market valuations and trading volumes, the level of issuance of securities, but also investor confidence in the economic environment.

CBF could be affected by other external factors, like changes in the competitive or regulatory environment.

Scenarios are established around the most significant risk events and quantitatively assessed. The respective departments monitor developments closely in order to take early mitigation actions if possible. Regulatory changes are continuously monitored by CBF. Potential changes are analysed, and appropriate measures are initiated in due time to fulfil all current and prospective.

Pension risk

Pension risk is defined as the risk of increased costs from the present value of the pension debt obligations due to increased life expectancy, salary growth and inflation increase. CBF is exposed to Pension Risk by its Pension Debt Obligations, primarily managed through a Contractual Trust Arrangement (CTA).

Winding-down and restructuring risk

Winding-down and restructuring risk is the risk that insufficient Capital/ Retained earnings/ Reserves are held for an orderly winding-down or restructuring of operations and services, in the case where new capital cannot be raised.

Winding-down and Restructuring Risk is included in the capital requirements outlined by CSDR as well as comparable requirements are laid out by BRRD for CRR institutions (MREL which targets financial and operational continuity).

Risk Management Handbooks

The Operational Risk Handbook describes objectives, overall approach and scope of operational risk. The objective of the Operational Risk Handbook is to give a comprehensive description of the processes and methodologies to manage operational risk and that follow Clearstream's Advanced Measurement Approach (AMA) for calculating the regulatory capital requirement for operational risk. The AMA is based on internal models and procedures to calculate the regulatory capital requirement considering that the operational risk management is an essential component of management and controls of operations.

The Advanced Measurement Approach (AMA) requires internal loss data and model-based methods to calculate the regulatory capital requirements. CBF has established a comprehensive operational risk framework and a set of instruments meeting both the requirements from a regulatory and business perspective. The roles and responsibilities within operational risk management are assigned to the organisational units at a local level as well as to Clearstream Risk Management at a central level. The Operational Risk Handbook includes topics such as: definition of operational risk, operational risk categories defined for CBF's specific business, root cause definition, organisational structure, roles and responsibilities, operational risk instruments and methods used as well as the respective reporting. Also, the most adequate treatment is applied to the identified risk in order to mitigate them or actively control them.

Clearstream Risk Management established an Operational Risk Procedure that serves as a guide in conjunction to the Operational Risk Handbook, primarily for the business departments within the organisation. This procedure describes the approach and major instruments applied within the process of managing operational risks on a high-level. Furthermore, it sets the internal standards regarding roles and responsibilities as well as the related duties of different legal entities within the Clearstream group.

Clearstream Risk Management also established a Handbook Financial Risk. The main objective of this handbook is to provide a comprehensive description of the organisational structure, processes, models and methodologies that constitute CBF's financial risk approach. Financial risk comprises the risk of losses arising from the default of counterparts (credit risk), from holding assets and liabilities for on- and off-balance sheet items, e.g. interest rate risk or currency rate risk (market risk), the risk of losses arising from the inability to meet all short and long-term obligations resulting from on-balance and off-balance sheet liabilities (liquidity risk).

Furthermore, Clearstream Risk Management established a Business Risk Handbook. The objective of this handbook is to provide a detailed description of the approach and instruments applied within the framework of business risk management. The handbook includes a detailed explanation of the framework and information on the functional organisation such as governance. The description of the model and validation process and reporting responsibilities is also provided in the handbook.

The Risk Management Framework including the underlying policies, procedures and handbook are subject to periodic reviews, at least annually.

Risk Measurement

CBF has installed a standardised approach for measuring and reporting all operational, financial and business risks across its organisation: the concept of "Value at Risk" (VaR). The purpose is to allow the overall risk appetite to be expressed in a comprehensive and easily understandable way and to facilitate the prioritisation of risk management actions. Furthermore, the risk reporting consolidates all risk measures across the company (operational, financial and business risks), except for liquidity risk, which is covered in the CBF Liquidity Stress Testing Model.

The VaR quantifies the risks to which a company is exposed. It indicates the maximum cumulative loss that CBF could face if certain independent loss events materialise over a specific time horizon for a given probability. CBF's models are based, in line with the Basel II / III framework, on a one-year time horizon and correlations between individual risk estimates are recognised when calculating the capital charge for operational risk. Between the individual risk types, the most conservative approach of a correlation of "1" is implemented.

CBF also performs VaR calculations in order to detect potential risk concentrations, as well as stress test calculations, which consider even more conservative model parameters than the regular VaR calculations.

The aim of the risk management framework applicable to CBF is to set adequate and comprehensive risk management standards to ensure the sustainability of its operations and thereby smooth and efficient market operations.

This framework ensures that CBF:

- can identify, measure, monitor, manage and report risks it may be exposed to, as well as ensuring it limits the risks its poses to others;
- applies appropriate risk control and monitoring measures to safeguard the integrity of financial markets and limit potential exposures and systemic risks.

CBF has put in place a wide range of internal control processes and procedures, including security, technical and operational organisational arrangements and risk control measures, to ensure they protect both CBF and the interests of the external stakeholders, i.e. its users and their respective clients, the CSD links, CCPs, trading venues, payment systems, settlement banks, liquidity providers and investors.

Key consideration 2: An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.

The aim of the Clearstream risk management framework is to set adequate and comprehensive risk management standards to ensure the sustainability of CBF's CSD operations and thereby smooth and efficient market operations. This framework ensures that CBF:

- is able to identify, measure, monitor, manage and report risks that may be posed to them as well ensuring they limit the risks they pose to others.

- apply appropriate risk control and monitoring measures to safeguard the integrity of financial markets and limit potential exposures and systemic risks.

These include a wide range of internal control processes and procedures, including security, technical and operational organisational arrangements and risk control measures, to ensure they protect both the CSDs themselves, and the interests of the external stakeholders i.e.:

its users and their respective clients, the respective CSD links, CCPs, trading venues, payment systems, settlement banks, liquidity providers and investors.

Key consideration 3: An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk- management tools to address these risks.

Material risks

These measures include the management of material risks related to (i) availability risk borne from reliance and connectivity to SWIFT, IT systems and applications for the provision of essential core business services, (ii) service deficiency risks borne from operational interdependencies of our critical outsourcing & third party governed services, CSD market links and supplier network providers, (iii) the operational risks that may be posed by CBF key participants as well as credit risks related to customers in default all of which can potentially impact the smooth running of business services and the soundness and stability of the financial markets and system as a whole. The identification and management of operational risk is further described under Principle 17, Key Consideration 1.

Information on risks associated with products and services provided (e.g. risk transparency towards customers):

CBF disclose to their users extensive information in the respective documentation that allows users to assess the risks associated with the products and services they provide. CBF explicitly states the risks associated with each product or service they offer. The users and indirectly their clients are therefore well informed of the type of risks they are facing when contracting with CBF. This information is reflected in relevant documentation and in a detailed manner the list of services offered to clients i.e.:

- In line with Article 34 (5) CSDR (A CSD shall disclose to all clients information that allows them to assess the risks associated with the services provided), the CSDs' product documentation and in particular Customer Handbooks and Product Guides provide with necessary information for clients to assess the risks they face from the CSDs. Customers can perform their own risks assessments and handle the risk the CSDs are posing to them.

Critical service provider risks:

With regards to critical entities (e.g. critical providers of services such as SWIFT), CBF has defined and implemented a critical service provider governance framework procedure based on the CPMI IOSCO Financial Market Infrastructure assessment methodology. For more details, please refer to Principle 17 (Key consideration 7).

Key consideration 4: An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

Scenarios that may prevent an FMI from providing critical operations and services

CBF has identified different idiosyncratic and systemic scenarios, which could potentially prevent it from being able to provide its critical operations and services as going concern. The scenarios are based on plausible near default events taking into account the requirements of the Annex DR 2017/390, particularly points 6 and 7.In total, CBF has identified seven stress scenarios, which are classified into following categories:

1. Different idiosyncratic scenarios affecting the operational capacity as well as capital and liquidity profile of CBF.
2. Different market-wide scenarios affecting mainly liquidity and capital profile.
3. A combination of idiosyncratic and market-wide scenarios to derive a larger stress magnitude, based on which the effectiveness of appropriate mitigating tools is tested accordingly.

Recovery and orderly wind-down plans

CBF distinguishes between requirements for a recovery plan (mitigating a near-default situation), a restructuring and wind-down plan (ensuring a solvent wind-down) and a resolution plan (insolvent wind-down).

The recovery plan as well as the restructuring and wind-down plan are drawn up and maintained by CBF. Their purpose is to set out available tools of CBF to overcome severe financial and operational shocks that could potentially undermine the viability of CBF and sustainability of its business. Ultimately, the plans aim at ensuring the continuity of CBF's critical operations and services, also preventing significant adverse effects on the financial system. The resolution plan, on the other hand, is owned and drawn up by the National Resolution Authority (NRA) with the objective to resolve CBF in an orderly manner in case the strategies under the recovery plan or the restructuring and wind-down plan are not sufficient to prevent the failure of CBF. In concrete terms this means that CBF can no longer meet its obligations as they fall due or is at immediate and evident risk of not being able to do so ('fail or likely to fail' situation according to the BRRD). CBF provides a continuous support to the NRA for the preparation and maintenance of the resolution plan.

As aforementioned, the recovery, restructuring and wind-down plans, outline the critical operations and services of CBF, which were identified and assessed in accordance with the requirements stipulated in EBA/Op/2015/ 05 and the Commission Delegated Regulation (EU) 2016/778. A function was classified as 'critical', when its discontinuance is likely to lead to a disruption of services that are essential to the real economy or financial stability in one or more member states and when that specific function cannot be adequately substituted, i.e. other market participants are not able or willing to take over the functions provided by CBF in an adequate timeframe.

The recovery plan includes seven scenarios which assess whether CBF's critical operations and services are affected as a going concern. The selected scenarios stand for severe but plausible near-default situations covering a full range of stresses, both CBF specific (idiosyncratic) and market-wide (systemic). In general, the scenarios simulate the stress on CBF's liquidity, capital, profitability and operational capacity. Furthermore, they test the adequacy of various recovery measures available to CBF, each with an execution plan identifying key processes and potential barriers to implementation.

CBF has identified a number of viable recovery options and evaluated them towards their applicability in times of stress. These options aim at helping CBF to restore its financial and operational viability in stress situations. They are grouped in recovery options covering the aspects of capital, liquidity, risk positions, and operational capacity.

The Recovery Plan as well as Restructuring and Wind-down Plan are reviewed and updated by Clearstream Risk Management at least annually to ensure their continuous improvement. The plans are subject to the CBF Executive Board approval before being submitted to the regulators.

The review and update process is initiated in one of the following cases:

- regular annual review;
- significant changes in the legal or organisational structure of the Clearstream group;
- significant changes of the business model or the business activities of the Clearstream group;
- significant changes with respect to the financial or the risk situation, that have essential effects on the recovery plans;
- other important reasons that may apply.

Principle 4: Credit risk

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

Key consideration 1: An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.

CBF, in its role as German CSD (collective safe custody), in principle provides neither credit extensions nor advance funds to its customers.

The situation is different for the NCSC holding since credit is provided by CBF. It provides two complementary sets of credit facilities to allow the highest possible settlement efficiency. These include the Unconfirmed Funds Facility (UCF) and the Technical Overdraft Facility (TOF). The size of these lines is defined as a function of the trading activity and credit worthiness/internal rating of the customer, as well as the availability of appropriate collateral

The Clearstream Credit Strategy articulates the core credit principles for the maintenance of a robust credit risk framework in order to maintain credit decisions that are determined according to well-defined and objective credit granting criteria. Members of the CBF Executive Board review / approve the Credit Strategy on an annual basis.

The Credit Strategy establishes the objectives guiding CBF's credit activities that include all business activities that give rise to credit risk. The Credit Strategy sets out the high-level core credit principles in place within CBF, to ensure:

I. Credit exposures to individual customers and customer groups are fully secured through the use of collateral and other equivalent financial resources;
II. Intraday and overnight credit risk is identified, measured, monitored, and managed;
III. Collateral and other equivalent financial resources used to fully cover corresponding credit exposures are measured, monitored, and managed;
IV. Potential residual credit exposures are identified, measured, monitored and managed;
V. Reimbursement procedures along with sanctioning rates are maintained, to discourage overnight credit exposures;
VI. Controls exist to maintain the reporting of credit exposures in accordance with regulatory requirements;
VII. Regular public disclosure to the market on aspects of credit risk measurement, monitoring, and management.

CBF is exposed to credit risk arising from a number of different sources but mainly from settlement and custody activities. Credit appetite is defined as CBF's non-binding tolerance for accepting credit risk. It is approved by the CBF Executive Board, taking into account CBF's business strategy, its role as an operator of a Securities Settlement System, as well as the target risk profile on its credit portfolio. Credit appetite is expressed numerically as the maximum amount of all credit limits available to customers and counterparts.

The CBF Executive Board determines the governing principles within Clearstream's Credit Strategy. This includes CBF's overall credit granting criteria. CBF's Executive Board ensures that CBF's credit activities are executed within the framework articulated within Clearstream's Credit Strategy.

Group Credit & Default Management Department provides independent credit assessments, internal credit ratings and credit monitoring on all credit risk-related activities. These services are offered to several DBG subsidiaries including CBF under the existing outsourcing agreements. All CBF Credit services have been outsourced to Clearstream Services, a sister company, and to Clearstream Banking Singapore, a branch of CBL Luxembourg. Group Credit is responsible for implementing the Credit Strategy and developing policies and procedures aimed at identifying, measuring, monitoring, controlling and reporting credit risk for all activities throughout CBF.

Group Credit & Default Management Department is responsible for performing independent assessments of the creditworthiness of CBF's counterparts with credit limits. It maintains systems and operating procedures for early warning and remedial action with respect to credit deterioration.

Group Credit & Default Management Department is responsible for ensuring credit exposures remain within levels consistent with prudential standards and therefore within predefined limits.It ensures that exceptions to credit policies, procedures and limits are reported on a timely basis to the CBF Executive Board, the Clearstream Risk Committee, the CBF Supervisory Board and its Risk Committee

Key elements of CBF's framework for managing credit risk include credit limits / collateral / internal credit ratings / credit control / and stress testing.

For compliance with Art. 59(3)(a) CSDR, the Credit Strategy, the Credit Policy and the Credit Handbook which form the CBF Credit Risk Framework has been filed with the relevant competent authorities.

Key consideration 2: An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

Credit risk arises from the loans granted to customers within the scope of custody and settlement activities.

Customer financing is extended on an intraday basis and mainly for the purposes of increasing the efficiency of securities settlement.

They are only granted on a secured basis and are fully collateralised.

Credit lines remain uncommitted and can be revoked at any time.

The creditworthiness of potential customers is assessed before entering into a business relationship. CBF establishes customer-specific credit lines based on regular reviews of the customer's creditworthiness and ad hoc analysis as required.

CBF's rules with respect to the granting of intraday credit facilities to customers (TOFs) and (UCF) expressly set out a ´waterfall principle´ that applies to the allocation of the proceeds after the enforcement of the collateral is extended to secure the borrower's exposure under the "TOF & UCF agreement" named "WIDERRUFLICHE BESICHERTE INNERTAGES-ÜBERZIEHUNGSKREDITFAZILITÄT (TOF) UND UNBESTÄTIGTE GELDEINGANG-KREDITFAZILITÄT (UCF) (i.e. secured obligations).

Group Credit measures and monitors that:

- Credit exposures to individual customers and customer groups are fully secured through the use of collateral and other equivalent financial resources;
- Intraday and overnight credit risk is measured, monitored, and managed;
- Collateral and other equivalent financial resources used to fully cover corresponding credit exposures are measured, monitored, and managed;
- The management of potential residual credit exposures are measured, monitored, and managed;

Additionally:

- Reimbursement procedures along with sanctioning rates are maintained, to discourage overnight credit exposures;
- Controls exist to maintain the reporting of credit exposures in accordance with regulatory requirements;

The following risk management tool is used at CBF to control / mitigate credit risk:

Credit Exposure Monitoring Tool (CEMT)

The Credit Exposure Monitoring Tool (CEMT) allows CBF to aggregate exposures. The system updates at regular intervals and provides a consolidated view of credit exposures arising from securities settlement-related credit exposures, calculated close to real time.

Daily, Monthly and Annual Reporting is performed by the Credit Monitoring Team.

Key consideration 3: A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.

Coverage of exposures to each participant

CBF applies a conservative approach for the credit granting and for the collateral eligibility criteria. CBF mitigates credit risk on counterparts by granting credit on a fully collateralised basis. CBF accepts securities as collateral and applies conservative haircuts (please also refer to Principle 5). Through the application of sound collateral eligibility criteria, conservative haircut treatment in the valuation of collateral, and active monitoring for credit deterioration (at the individual customer level and on customer group level), CBF maintains and holds sufficient resources to offset both current and potential future exposure.

Credit limits on settlement of securities transactions

When granting credit with respect to the facilitation of the settlement of securities transactions, collateral is pledged on customers' accounts opened with CBF. In order to mitigate market and liquidity risk on collateral, a haircut is applied to the calculation of the collateral with respect to the valuation of securities. The purpose of the haircuts is to offset the potential loss of value (including liquidation costs) that may result from adverse price moves over the liquidation period (i.e. the period between the default of the counterpart and the actual sale of the collateral). For details please refer to Principle 5.

Haircuts are set taking into criteria listed in Art. 13 (3) and Art. 14 (2) of DR 2017/390 such as issuer type, term to maturity, credit risk, the country of issuance, and rating of the underlying assets. Additional qualitative limits are established to mitigate, among others, concentration and correlation ("wrong-way") risks. Such limits provide an important cushion against the risk of "contagion" under situations of market stress, which is relevant for CBF given that its clientele is naturally concentrated towards financial institutions.

For DNS payment systems and DNS SSSs in which there is no settlement guarantee

Please refer to above "Coverage of exposures to each participant".

Key consideration 4: A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

Coverage of current and potential future exposures to each participant

Not applicable to CBF.

Risk profile and systemic importance in multiple jurisdictions

Not applicable to CBF.

Additional financial resources

Not applicable to CBF.

Supporting rationale and governance arrangements

Not applicable to CBF.

Key consideration 5: A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

Stress testing

Not applicable to CBF.

Review and validation

Not applicable to CBF.

Key consideration 6: In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

Not applicable to CBF.

Key consideration 7: An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.

Allocation of credit losses

The "TOF & UCF agreement" and the CBF General Terms and Conditions (GTCs) provide in particular that further to the enforcement of the first ranking security interest granted over the assets held in pledged accounts in favour of CBF (the "Pledge"), CBF shall (1) "apply any amount of proceeds of such enforcement to payment of the Secured Obligations and (2) as soon as reasonably practicable thereafter, transfer to those pledgor(s) whose Pledge has been enforced any amount of proceeds in excess of the Secured Obligations on a pro-rata basis determined by the proportion of the collateral they owed prior to the enforcement event to the aggregate value", as defined in the TOF and UCF agreement.

Potentially uncovered credit losses may materialise when, in the event of liquidation process being triggered, either (i) collateral and other equivalent financial resources (pursuant to Art. 15 DR 2017/390) are insufficient to cover credit exposures or (ii) no collateral is available to cover credit exposures.

Allocation of potentially uncovered credit losses (as per Art. 25 (2) point (a) DR2017/390) follows the procedures as defined in Clearstream Liquidation Framework: If at the end of the liquidation process, (i) all the collateral of the defaulting participant has been liquidated, and (ii) the outstanding exposure has not been fully covered by the corrective measures, and (iii) there is no other recourse to cover the remaining exposure, then the uncovered exposure will lead to the materialisation of a loss for CBF. There is no mutualisation of the loss with other participants.

Additionally, it should be noted that CBF has a recovery plan to ensure the continuity of its critical functions in case its capital, liquidity or operational capacity are adversely affected. As such, should operational or credit losses reach an amount that affects the capital situation of CBF significantly and threatens the continuity of its critical functions, CBF has numerous recovery options at its disposal to restore the capital situation and ensure the resolvability of CBF, as outlined in the Principle 3, Key Consideration 4.

Replenishment of financial resources

For details on replenishment of financial resources, please refer to Principle 7 Liquidity risks, Key Consideration 10.

Principle 5: Collateral

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

Key consideration 1: An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

The general principles and framework under which financial assets are considered acceptable for the collateralisation of credit limits are documented within the Clearstream Credit Policy and the Clearstream Credit Strategy. Both the Credit Policy and the Credit Strategy are reviewed / approved annually by the CBF Executive Board.

Definition of collateral

In the scope of the Credit Policy, "collateral" means any financial security, in any form, that is held by CBF to mitigate credit risk and that would be liquidated or otherwise used in the event of a counterpart defaulting.

Acceptable collateral

The Credit Policy defines the term "acceptable collateral" as financial securities that fulfil certain common standards – the so-called collateral eligibility criteria.

Collateral eligibility criteria

CBF accepts collateral that fulfils the requirements set in Art. 10 (1), Art. 10 (2), 11 (1) and 11 (2) of DR 2017/390 on collateral eligibility.

As such, only collateral in the form of debt instruments, transferable securities and money market instruments issued by governments, certain public authorities and issuers with low credit risk (rated BBB- or above), low market and low liquidity risk may qualify.

Key consideration 2: An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

Valuation practices

Collateral valuation

CBF has a collateral valuation system in place to set haircuts and concentration limits for collateral which take into account the criteria such as the instrument type, maturity, credit risk, the country of issuance, industry and denomination currency. When the collateral is considered eligible at the central bank, CBF bears in mind that the haircuts applied are and should not be lower than haircuts applied by the central bank to that type of collateral. Stressed market conditions are considered within the price volatility risk factor of the collateral valuation system and haircut are assigned accordingly. Regular haircut back testing is conducted in order to assess the robustness of the collateral haircuts.

Collateral valuation systems

CBF´s collateral management system is deemed appropriate to its core activity of custodian and securities settlement system and flexible enough to accommodate potential changes to current collateral management practices and procedures.

The main features of the collateral management systems are:

- Automatic collateral haircut calculation
- Flexible maintenance of haircut parameters
- Reporting functionality allowing for detailed analysis of collateral pool
- Collateral concentration threshold monitoring
- Automatic exclusion of correlated collateral

The collateral management system is fully automated and collateral valuation and provision processes are embedded in the securities settlement engine and do not require any manual intervention.

Changes in collateral haircut due to changes in the value of one of the risk parameters are reflected and applied within CBF's settlement systems at each ARM (Asset Reevaluation Manager).

Collateral monitoring

CBF monitors on a near-to real-time basis values collateral with credit and market risk. CBF performs its collateral valuation and monitoring on mark to market model.

Haircutting practices

CBF has a collateral valuation system in place to set haircuts and concentration limits for collateral which take into account the criteria such as the instrument type, maturity, credit risk, the country of issuance, industry and denomination currency. When the collateral is considered eligible at the central bank, CBF bears in mind that the haircuts applied are and should not be lower than haircuts applied by the central bank to that type of collateral.

Collateral haircuts

In order to mitigate the market and liquidity risks on securities used as collateral, CBF applies a haircut in the calculation of the Security Collateral Value (SCV). Generally, haircuts aim at covering the potential loss (current and PFE) of value due to adverse price moves over the liquidation period (i.e. the period between the default of the counterpart and the actual sale of the collateral), as well as costs incurred in the liquidation of the asset. Haircuts are expressed as a percentage and its amount reflects the characteristics of the security and not the customer's creditworthiness.

Key consideration 3: In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

Collateral haircuts

In order to mitigate the market and liquidity risks on securities used as collateral, CBF applies a haircut in the calculation of the Security Collateral Value (SCV). Generally, haircuts aim at covering the potential loss of value due to adverse price moves over the liquidation period (i.e. the period between the default of the counterpart and the actual sale of the collateral), as well as costs incurred in the liquidation of the asset. Haircuts are expressed as a percentage, and their amount reflects the characteristics of the security and not the customer's creditworthiness.

Collateral haircuts (liquidation of collateral in stressed market conditions)

CBF ensures that its policies and procedures on collateral haircut determination take into account the fact that the collateral may need to be liquidated under a set of stressed market conditions.

Collateral haircuts (liquidation period)

Collateral haircuts are set in a conservative manner taking into consideration a maximum number of days to liquidate period.

Collateral haircuts (correlated entities)

To comply with Art. 13 (5) of DR 2017/390, no collateral value shall be assigned to securities provided by an entity belonging to the same group as the borrower. CBF does not grant collateral value to correlated entities and negates the collateral value from correlated securities.

Collateral haircuts (conservative treatment of haircuts to limit pro-cyclicality)

To comply with Art. 13 (6) of DR 2017/390, CBF ensures that the haircuts are calculated in a conservative manner to limit pro-cyclicality as far as possible. The CBF system which calculates the collateral haircut is based on a set of different risk categories thus helping to limit the effects of pro-cyclicality that could potentially arise from a single risk category.

The annual review of the collateral policies and procedures is another measure to limit the effects pro-cyclicality. In case the collateral haircuts are deemed too low as a result of ensuing macro-economic developments, CBF can increase the haircuts if necessary. CBF's internal credit rating, which is also used to rate the collateral issuer helps to balance any pro-cyclicality that may arise from the external rating agencies ratings.

Sufficiency of haircuts and validation of haircut procedures

Securities recorded in CBF's collateral system are revalued on an ongoing basis against the valuation matrix for changes in the value of risk factors, or changes in parameters within the valuation matrix. Any change in the valuation matrix, or from changes in either risk factors or parameters will automatically, triggers a recalculation of the haircut applied to the collateral valuation of securities.

Key consideration 4: An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

Collateral concentration limits

A concentration of credit risk refers to a credit exposure with the potential to produce losses large enough to threaten a bank's financial condition. Unduly high concentration of credit risk has the potential to cause material losses which could significantly weaken CBF's competitive position in the market and / or lead to a credit ratings downgrade, resulting in a loss of customer confidence. In the course of its credit granting activities, CBF might be indirectly exposed to concentration risks in its respective collateral pool. This risk may materialize as the potential loss which CBF may suffer during the default management process, due to an insufficient diversification of its collateral pool.

CBF actively monitors concentration and correlation risks in its collateral pool. Collateral concentration limits are monitored at both the level of CBF, and customer institution level.

Collateral concentrations are monitored across multiple concentration criteria and limit types, such as issuer, country, wrong way risk, instrument type, settlement currency, instrument's credit rating, ECB eligibility, liquidity and price volatility.

Customer breaches to any of the above-listed concentration limits are monitored, analysed and reported, triggering respective risk mitigation measures until the breach is remediated accordingly. Collateral concentration limits and procedures are subject to regular review, on at least on an annual basis. More frequent reviews may be conducted in case of deteriorating market conditions or where material change demands such a review.

Key consideration 5: An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

Cross border collateral mitigation

The legal risks that arise through the use and acceptance of cross-border collateral at CBF relate primarily to conflicts of laws with respect to the creation, perfection, and enforcement of such collateral. The legal framework for the creation, perfection, and enforceability of collateral as well as the conflict of law rule is defined under German Law (i.a. sections 1205 et seqq. Civil Law Code; section 17a DepotG) following the implementation of the Financial Collateral Directive 2002/47/EC of 06.06.2002.

The standard TOF and UCF Contracts contain rules on the enforcement of pledged securities without any notice according to section 1245 Civil Law Code, and collateral can thus be sold after an event of default has occurred. As per Art. 207 para. 3 Regulation (EU) No 575/2013, Art. 43 para. 2, 38 para. 13 Commission Delegated Regulation (EU) 2017/390, CBF has to perform regular assessments covering the financial instruments received by CBF as collateral to ensure the validity and enforceability of CBF's collateral arrangements in certain jurisdictions. As per Art. 38 para. 13 Commission Delegated Regulation (EU) 2017/390, CBF takes all necessary steps in advance to establish the enforceability of its claim to financial instruments provided as collateral. CBF's participants are mainly located in Germany and if not, principally in another Member State of the European Union. The validity, enforceability and recognition of the German law governed pledge as set out in number XXX of the CBF GTCs applies. Further, CBF's collateral arrangements are designed in such a way as to ensure the best possible effectiveness and enforceability of the pledge. For this purpose, the collateral arrangements contain in particular provisions on the granting of a first-ranking pledge, the agreement that any pledge of collateral under the arrangement shall be governed by German law and that the lex situs with respect to the collateral covered by the pledge shall be German law. Also, the pledge remains in full force and effect until full payment and performance of all collateralized obligations of the pledger, and remains binding also on successors and assignees of the pledger (provided that the pledger may not assign or otherwise transfer the rights and obligations under the collateral arrangement without the prior written consent of CBF). Furthermore, the pledger is obliged, upon the request of CBF, to produce any documents or certificates, to perform any acts or take any steps that can reasonably be required by CBF in enforcing its pledge in accordance with the terms of the collateral arrangement.

Additionally, the documents mentioned in Principle 1 set out provisions to mitigate the above identified risks. According to the GTCs, all securities held by a customer at CBF, for which the customer has notified CBF of its ownership or unrestricted power of disposal pursuant to section 12 paragraph 4 or section 13 of the DepotG, are pledged in CBF favour to secure the entire present or future obligations that the customers have, or may subsequently have, towards CBF in consequence of any services provided by CBF to the customers. CBF has the right to debit the customer's cash account with fees, interest and expenses which accrue when CBF acts on behalf of the customer or in its presumed interest; in addition, it is authorised to sell any collateral securities to cover a debit balance without any prior notice.

CBF ensures that cross-border collateral can be used in a timely manner by:

- Requiring a first-ranking pledge on the securities pledged as collateral, which is deposited in CBF´s system;
- Adhering to a strict policy of selection of its network of depository institutions, including the performance of regular reviews (please refer to Principle 16);
- Maintaining updated default management and collateral realisation procedures (please refer to Principle 13);
- Monitoring the concentration of collateral per currency.

It is therefore widely accepted that the use and acceptance of cross-border collateral at CBF, whilst subjecting CBF to legal risk, does not carry any additional risk with respect to operational and market risk.

Key Consideration 6: An FMI should use a collateral management system that is well-designed and operationally flexible.

Collateral management system design

CBF collateral management system (NCMS) is well designed by internal IT which offers full onsite support and maintenance. NCMS is fully automated and has the below listed main features:

- Automatic collateral haircut calculation
- Flexible maintenance of haircut parameters
- Reporting functionality allowing for detailed analysis of collateral pool
- Automatic exclusion of correlated collateral
- Maintenance function for classification purposes

The collateral management system is fully automated and collateral valuation and provision processes are embedded in the securities settlement engine and do not require any manual intervention.

Changes in collateral haircut due to changes in the value of one of the risk parameters are reflected and applied within the settlement system at each ARM (Asset Reevaluation Manager).

Operational flexibility

Operational flexibility of NCMS include for example: flexible maintenance of haircut parameters, flexible collateral percentage override function for example for negating collateral value from securities that are issued by issuers that are facing financial or legal troubles, flexible collateral tier override function.

Principle 7: Liquidity risk

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

Key consideration 1: An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.

CBF has established robust frameworks (investment / liquidity management policies, stress testing model and operational procedures) and has tools in place to measure, monitor and manage its corresponding liquidity risks, including intra-day liquidity risks, for each currency of the security settlement system for which it acts as settlement agent. Policies are reviewed and approved at least annually by the CBF Executive Board.

CBF operates two Securities Settlement Systems (SSS), namely CASCADE and Creation. CBF manages its liquidity and the associated risks stemming from its commercial bank money activities (refer to Key Consideration 2 below for details).

CBF's target for its liquidity management is the ability to manage its varying cash positions to have sufficient liquidity available in all currencies for a timely provision of settlement and payment services as they fall due, and have in place measures to deal with unexpected disruptions to its cash flows.

Due to the nature of its business, CBF does not have any long-term obligations and does not require long term funding. Thus, CBF's liquidity requirements are mainly intraday and overnight.

CBF achieves its liquidity management objectives through permanent measurement, monitoring and management of its liquidity requirements and liquid resources. CBF has in place a range of ex ante and ex post measures.

Ex ante measures include permanent liquidity buffers in main currencies, committed and uncommitted secured/unsecured liquidity facilities, real-time monitoring of expected cash flows, etc., while ex post measure include escalation procedures and regular stress testing.

CBF's intraday objective is to execute payments and settlement as they fall due. To determine the amount of liquid resources required on an ongoing basis in each relevant currency, Clearstream Risk Management runs a wide range of stress scenarios (see Key Consideration 9 below on stress testing). The level of required liquidity shall be the highest liquidity exposure identified in the various scenarios of stress.

Key consideration 2: An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.

All sources of liquidity risk are considered for the measurement, monitoring and management of CBF's intraday liquidity management, including its relations to the entities and linked financial market infrastructures or other entities that may pose liquidity risk to its intraday liquidity flows.

Credit approves credit limits based on the various roles of its counterparts and considers the size of the total exposure on the applicant and all its affiliates. The monitoring process is described in further detail in Principle 4.

CBF has defined intraday liquidity management processes, timelines and thresholds for management escalation in case of non-receipt of funds along with a crisis management system alerting the appropriate level of management depending on the seriousness of incidents.

The CBF Liquidity Management Policy states the roles and responsibilities when facing a crisis event where day-to-day liquidity generation measures would not be sufficient to cover a liquidity shortage in one or several currencies. The liquidity issue would be escalated to CBF's Executive Board which can decide in view of the liquidity crisis event to activate exceptional liquidity generation measures.

To monitor its actual cash balances held with its cash correspondent banks and central banks, CBF captures credit and debit advices received from its agents and intermediaries and compiles intraday on a near to real-time basis the current actual available cash balances in all currencies. CBF also matches its expected flows against incoming and outgoing funds on a near to real-time basis.

CBF has specific intraday operational processes and procedures to identify, measure and monitor intraday liquidity needs. The determination of the potential largest aggregate payment obligation is based on a wide range of stress tests, including stress tests implying customer defaults and idiosyncratic and/or market disruption elements.

To meet its intraday objectives, CBF has in place intraday funding sources. To determine the amount of liquid resources required on an on-going basis in each relevant currency, CBF runs a wide range of stress scenarios (see Key Consideration 9 below on stress testing).

As prescribed in the CSDR regulation, CBF also measures and monitors its own qualifying liquid resources on a currency basis.

Key consideration 3: A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

CBF maintains as liquid resources own funds, customers' residual cash balances, multicurrency committed FX swap facilities and an intraday credit line with CBL.

CBF funds its qualifying liquid resources (as required by CSDR) with its own funds and own debts. CBF invests its own resources into HQLA (high quality liquid assets) bonds issued or guaranteed by top rated governments or Supranational issuers. The uninvested part of its own resources is held in an account at the Deutsche Bundesbank. Both bonds and uninvested own funds are kept unencumbered on a separate account under the direct management of treasury as its liquidity management function and may only be used as a source of contingent funds during stress periods. These assets are directly transferrable to the Deutsche Bundesbank to generate intraday liquidity via CBF's credit line.

CBF tests on a regular basis the capacity of its liquidity providers to perform on their commitments to provide intraday liquidity.

CBF invests its available cash on a secured basis if possible or towards the end of the respective currency deadline to avoid as much as possible an unforeseen liquidity squeeze. CBF has a range of tools in place to manage liquidity gaps, such as secured borrowing, committed funding facilities, credit line at the Deutsche Bundesbank, etc…

CBF defines a minimum amount of QLR that it needs to maintain to cover the liquidity impact caused by the default of the two participants including their parent undertaking and subsidiaries against whom CBF has the largest intraday liquidity exposure.

To test the sufficiency of CBF's liquid resources to act as a source of backstop liquidity, designed a set of liquidity stress scenarios that are in line with the requirements set out in the CSDR and MaRisk. Concretely, CBF calculates forward looking liquidity stress tests considering a number of extreme but plausible stress scenarios, among those the default of the two participants that would generate the largest aggregate payment obligation for CBF under stressed market conditions (Cover 2 + market stress). The stress tests are calculated on CBF level in isolation and groupwide (considering Clearstream group credit institutions as a whole).

Key consideration 4: A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.

Sufficient liquid resources

Not applicable to CBF.

Risk profile and systemic importance in multiple jurisdictions

Not applicable to CBF.

Key consideration 5: For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

Composition of qualifying liquid resources

The minimum amount of CBF's available QLR shall at any time at least be sufficient to manage the risk to which it would be exposed following the default of at least two participants including its parent undertakings and subsidiaries towards which it has the highest exposures (Cover 2).

CBF's available QLR is composed of its own funds (cash and securities), central bank facility with Deutsche Bundesbank and a range of committed liquidity facilities with creditworthy financial institutions.

Availability and coverage of qualifying liquid resources

CBF has routine credit access at the Deutsche Bundesbank and is able to pledge its ECB eligible securities from its investment portfolio to generate intraday liquidity in EUR whenever it would be required.

All QLR mentioned above fulfilling the defined conditions are kept in separate accounts under the direct management of Treasury as CBF's liquidity management function and may only be used as a source of contingent funds during stress periods.

Key consideration 6: An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

Composition of supplemental liquid resources

Additional liquidity sources to fulfil requirements are:

- o The residual cash of CBF clients
- o The intraday credit line at CBL to the size of CBF pledged collateral at CBL
- o Uncommitted and undisclosed overdraft lines with its CCBs

Availability of supplemental liquid resources

The residual CBF clients residual cash balances, the intraday credit line at CBL and the uncommitted overdraft lines at its CCBs are immediately available.

Key consideration 7: An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.

Clearstream Treasury ensures through due diligence that each of the selected committed facility providers has sufficient information to understand and manage its associated liquidity risk, and is able to comply with the conditions of a prearranged and highly reliable funding arrangement.

A Due Diligence Questionnaire is completed by each facility provider and good candidates for providing a committed facility.

This assessment allows Treasury to reassess the providers' profile. Dependent on the outcome of the assessment the contract may be rolled over/ renewed or not.

Clearstream Treasury in particular reviews if the counterparty meets internal and regulatory criteria. Clearstream defines the following minimum criteria:

- minimum internal credit rating of 'D' (strong credit quality)
- access to the Central Bank of issue of the currency
- settlement instructions in place to settle in the currency of issue
- sufficient information to understand and manage its associated liquidity risk.

Clearstream Treasury in its liquidity management function tests its operational procedures by performing regular liquidity generation tests. The result of the tests is reported to management periodically.

Key consideration 8: An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.

CBF has a central bank account at Deutsche Bundesbank. Liquidity available on this account can be directly accessed via SWIFT payment message without any restrictions and unconditional access is guaranteed as funds are held under the sole responsibility of Clearstream Treasury and are unencumbered. The nostro transfer functionality in CBF's trade entry system allows the transfer of funds from CBF's Deutsche Bundesbank account to another cash correspondent bank or to CBL intraday within the RTGS opening time.

Through its Deutsche Bundesbank account, CBF has access to the following ECB standing facilities:

- Marginal lending facility to obtain overnight liquidity from the central bank, against the presentation of sufficient eligible assets
- Deposit facility to make overnight deposits with the central bank to reduce unsecured positions on commercial banks.

CBF also uses its Deutsche Bundesbank account to deposit its non-invested own funds (cash part of its QLR).

Key consideration 9: An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

To determine the amount and regularly test the sufficiency of CBF's liquid resources, Clearstream Risk Management performs a number of forward-looking liquidity stress tests on a regular basis. These liquidity stress tests are conducted at the level of CBF itself as well as on the superordinate level of Clearstream Holding AG.

Within a dedicated liquidity stress testing framework, Clearstream clearly defines the objectives of conducting the tests, describes the different scenarios to be calculated (including the underlying parameter calibration and assumptions), sets out the relevant management reporting lines, regulates the ongoing and effective review of the stress testing processes, and ensures that a procedure for follow-up actions based on stress test results is in place.

The liquidity stress tests conducted at CBF level have been designed in line with the requirements set out in the CSDR, while taking MaRisk requirements in account. The CSDR regulation ensures that systemically important securities infrastructures are subject to common EU rules. It has mandated the EBA to develop regulatory technical standards (RTS), which the Commission adopted as DR 2017/390 that specifies the details of the frameworks and tools for monitoring, measuring and management, reporting and public disclosure of the liquidity risks, including those that occur intraday. The key requirements on liquidity stress testing are described in Art. 35 (5), 36 (6) and 36 (7) DR 2017/390.

CBF's liquidity stress tests consider all entities and products that may pose a material liquidity risk to CBF and are calculated on relevant currency level where the liquidity exposures are tested against CBF's qualifying liquid resources (QLR). They cover a multi-day period and are tailored to CBF's liquidity risk profile using a wide range of scenarios, considering idiosyncratic and market stress factors as well as their combination. Such stress factors include among others the default of the two participants that would generate the largest aggregate payment obligation for CBF (Cover 2), a multiple default event, the temporary inability of a liquidity provider to provide liquidity, a general economic slowdown (including shifts in market factors) and a change in the institution's reputation. The stress test results show the potential impact that a stress event might have on the liquid resources in each relevant currency. Exposures towards entities that play multiple roles (e.g., both as nostro agent and as client of CBF) are aggregated daily and across all roles to ensure that second-round effects are adequately reflected in the stress simulation.

The results of the different liquidity stress tests are reported to various internal stakeholders such as the CBF Head of Risk Management, the Asset and Liability Committee, Treasury Front Office, and the Executive Board of CBF. Based on the results, Risk Management may recommend taking measures concerning CBF's liquid resources.

The stress test assumptions and parameters are reviewed and updated systematically by Clearstream Risk Management at least on an annual basis. Adverse market developments, changes within CBF's business model as well as changes within relevant regulatory requirements can lead to an ad-hoc review.

Key consideration 10: An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

Same day settlement

In view of the very short-term nature of obligations arising from core settlement activities, liquidity requirements are mainly intraday and overnight.

Most of Treasury's daily investment and funding activities are same-day market transactions. Same-day market transactions are executed in Treasury's day-to-day cash management to meet its intraday objectives (refer to Principle 7, Key Consideration 1 above).

Same-day transactions are also used to place funds overnight with a diversified panel of counterparties. All Treasury transactions are electronically recorded in CBF's trade entry system. After validation from Treasury Back Office (4-eyes principle), the payments and repayments are automatically generated at the defined payment/repayment date(s) (same-day or later) from the concluded trade.

CBF may also execute same-day transactions with its liquidity providers (committed and uncommitted) to deal with unexpected disruptions to its intraday liquidity flows.

Replenishment of liquidity resources

To reduce the risk of a liquidity squeeze to the maximum extent possible and make sure to have sufficient liquidity in all currencies to pay all financial obligations as they fall due at all time (even during a stress event), CBF strictly follows its investment strategy with a main focus on secured investments.

CBF has a range of day-to-day and contingency intraday liquidity generating measures described in its Liquidity Management Policy and its Liquidity Contingency Funding Plan. These intraday measures can be repeated to cover a multiday period until the liquidity stress event is over.

Principle 8: Settlement finality

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

Key consideration 1: An FMI's rules and procedures should clearly define the point at which settlement is final.

Point of settlement finality

CBF operates two different securities settlement systems:

- CASCADE by use of Target2-Securities;
- and Creation (also called the CBF-i activity).

According to Article 39 (2) and (3) of CSDR, a CSD shall, inter alia:

- Ensure that each securities settlement system that it operates defines the moments of entry and of irrevocability of transfer orders in that securities settlement system in accordance with Articles 3 and 5 of Directive 98/26/EC (as amended by EU directive 2009/44/EC (Settlement Finality Directive). The Settlement Finality Directive has been transposed into national law, inter alia, via the German Banking Act (Kreditwesengesetz).
- Disclose the rules governing the finality of transfers of securities and cash in a securities settlement system.

Settlement finality is – for both securities settlement systems – defined in number V para. 7 and numbers XXIV and XXV of CBF's GTCs, published on the website of Clearstream (www.clearstream.com) in the Key Documents section. The GTCs are binding upon all customers and CBF.

In addition to that, CBF has various links to foreign CSDs outside of T2S. In such cases securities transactions do not settle within one of CBF's settlement systems. Therefore, the information under "internal instructions" in the forthcoming paragraphs does not apply in such case. Information about settlement finality for these cases is to be found under "external instructions".

1. Internal instructions (settlement in CASCADE/ T2S or Creation)

Internal instruction shall refer to instructions of a customer account held with CBF or between two CBF customer accounts.

- Moment of entry

A transfer order for payment and delivery transactions issued to CBF for settlement in T2S is considered as entered into the CBF system, as soon as T2S discovers that the T2S validation rules have been met.

A transfer or payment order for payment and delivery transactions issued to CBF for settlement in Creation is considered as entered into the CBF-system, as soon as Creation discovers that the Creation validation rules have been met.

- Moment of irrevocability

The transfer order issued to CBF for settlement in T2S is irrevocable, as soon as it is indicated as "matched" by T2S. With this binding booking the transfer order will then be processed in T2S (Settlement).

The transfer or payment order issued to CBF for settlement in Creation is irrevocable, as soon as it is indicated as "matched" by Creation. With this booking the transfer order will then be processed in Creation (settlement). Matched internal instructions can only be bilaterally cancelled (please refer to "Key Consideration 3" below for details).

- Moment of final settlement

Finality of the internal instructions is reached when those instructions have settled in T2S or Creation and the associated re-registering has taken place in the custody ledger (section 14 of the German Securities Deposit Act (Depotgesetz)).

The binding booking in T2S is achieved:

- for against payment transactions, when the transfer of title of a security in T2S as well as the respective cash payment in T2 have been executed, i.e. once the securities are booked in the T2S accounts and the cash is booked on the TARGET2 accounts (DCA) of the CBF customers;

- for free of payment as well as against payment transactions in a non-T2S eligible currency, when the transfer of title of a security in T2S has been executed.

The binding booking in Creation is achieved:

- for against payment transactions, when the transfer of a client's claim against CBF for surrender ("Herausgabeansprüche") of securities that CBF holds within Creation or on a fiduciary basis with a foreign depository as well as the effected cash payment have been executed, i.e. once a debit entry in the client's securities account and a corresponding credit entry into the securities account of another client are posted and the cash is booked via cashless money transmission to the Dedicated Cash Accounts (DCA) or the current accounts maintained by the clients with CBF or to respective accounts of third parties authorised by them;

- for free of payment transactions, when the transfer of a client's claim against CBF for surrender ("Herausgabeansprüche") of securities that CBF holds within Creation or on a fiduciary basis with a foreign depository in Creation has been executed.

Instructions are reported to customers as settled e.g. via Xact Web Portal, CASCADE File Transfer, ClearstreamXact MT536 (Statement of Transactions), MT54x and an additional MT950 (Money Statement) for against payment.

Further, please refer to the chapter 1.5 "Services for collective safe custody (T2S settlement)" of the CBF Customer Handbook.

2. External instructions ("links" settlement via Creation)

Please refer to the section "Finality in the case of links" below.

Finality in the case of links

For the purpose of this paragraph, "depository" shall refer to another central securities depository (CSD), a securities settlement system (SSS) operated by a CSD (that is, a linked issuer SSS) or to a financial intermediary to which CBF entrusts the safekeeping and administration of securities that CBF holds via its sister company CBL, on behalf of the customers. For the avoidance of doubt, the term "depository" shall be understood as the entity with which CBF has its securities account for the deposit of the securities on behalf of the customers.

The moments of entry, of irrevocability and finality of external instructions are defined in accordance with the domestic rules applicable to the relevant local market. Transactions settling with a counterparty in a foreign market (that is, in the context of links) are indeed considered by CBF as relating to external instructions for the finality of deliveries of securities. These can be settled in the foreign markets either against or free of payment. The irrevocability and enforceability of the external instructions are then achieved in the books of the depositories. CBF makes information available to its customers via dedicated Market Link Guides ('MLGs'), including information about the moments of entry, irrevocability and enforceability as applicable for each market in question as well as the rules governing the finality of transfers of securities and cash as defined by each depository or local issuer's SSS (i.e. deliveries of securities to or from a domestic counterparty are final depending on the local market regulations and practices). The MLGs are published on the Clearstream website (https://www.clearstream.com/clearstream-en/products-and-services/market-coverage, please refer to the respective section "Operational arrangements").

Once the external instructions are final (that is, irrevocable and unconditional) with the depository and upon notice of credit/ debit of the relevant account of CBF with such depository, CBF will update the customers' accounts accordingly.

Deliveries of securities to or from a domestic counterparty are final depending on local market regulations and practices. Deferral of final settlement as applied per the rules defined in the system of CBF is only experienced in case of deliveries to or from domestic counterparties as finality may depend on local market regulations or practice. For markets where such exception exists, the local market regulations and practice has been published and are accessible to CBF customers.

For links to foreign markets, CBF requests – on an annual basis - legal opinions issued by local external law firms confirming that settlement finality can be achieved in accordance with local laws and regulations, notwithstanding any insolvency procedure. CBF, for all such links to another FMI, will ensure that finality is achievable in a way that protects the activity of its customers and guarantees the asset protection.

Key consideration 2: An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.

Final settlement on the value date

For CASCADE/ T2S and Creation internal settlement, RTGS settlement applies.

Settlement on value date or same day settlement can be completed in case that both counterparties fulfil their settlement obligations for processing on the intended settlement day.

It should be noted that CBF cannot influence the point in time when settlement transactions actually settle as this depends on the instructing participants´ cash and/or securities resources as well as their settlement priorities (including putting instructions "on hold" to block settlement on the intended settlement date or after for reasons unknown to CBF).

For further information on the completion of final settlement, please refer to the section "Intraday or real-time final settlement" below.

For external Creation settlement local market rules apply. Please refer to the respective Market Link Guides for details.

Intraday or real-time final settlement

CASCADE/ T2S settlement

Instructions transmitted to T2S are processed in different settlement cycles in T2S. For cash and securities settlement, T2S offers a sequential night-time processing (night-time settlement - NTS) with two cycles and up to two real-time processing cycles (real-time settlement - RTS). Cash entries which result from securities settlement or from interest and redemption payments, cross-border market and reverse claims for FCSC securities as well as from fees and charges are booked on the Dedicated Cash Accounts (DCA).

Settlement can take place in both NTS and RTS. T2S Night-time Settlement (NTS) is the first settlement cycle with final settlement on the next business day. All valid instructions that are due on the next day or that were already due at an earlier point in time but could not be successfully processed are included in NTS processing.

The settlement timing slots in T2S are according to business days, that is, start of day for a new business day takes place at about 18:45 CET on the calendar day when the T2S business day ended. Settlement in T2S starts with the Night-time Settlement (NTS) at about 20:00 CET and ends with the Realtime Settlement at about 18:00 CET.

After 16:00 CET, FoP and DVP settlement for specific transactions (GC Pooling in USD, transactions involving foreign currencies) is still possible until 18:00 CET and 17:40 CET respectively. Cash settlement takes place via customers' T2 Dedicated Cash Accounts (DCA) when payments are made in EUR and through Creation when payments are made in other currencies.

For further details please refer to the chapter 1.5 "Services for collective safe custody (T2S settlement)" of the CBF Customer Handbook.

Creation internal settlement:

For the SSS “Creation”, the settlement day consists of one main settlement processing, the real-time processing, followed by the end of day processing as described in chapter 3.4 “The settlement day“ of the CBL Customer Handbook, which from an operational perspective is valid for CBF customers for the Creation settlement activity. In order to detect differences or errors in the instructions submitted, matching attempts are applied as soon as the instruction has been submitted to and validated. Details on the matching process are provided in chapter 3.7 “Matching requirements” of the CBL Customer Handbook.

For external Creation settlement, local market rules apply. Please refer to the respective Market Link Guides for details.

Key consideration 3: An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

1. CASCADE/ T2S and Creation internal settlement

Unmatched instructions can be revoked (cancelled) anytime.

Matched internal instructions can only be bilaterally cancelled. Customers cannot cancel their matched internal instructions unilaterally even if the requested settlement date has not been reached. If no matching cancellations are received by then and the instruction has not settled by the end of day processing on settlement date, CBF will, in the name and on behalf of the customer, issue a renewed cancellation request for the new instruction for settlement on the next settlement date; such new cancellation request must be matched by the customer’s counterparty on the same settlement date.

Settled instructions cannot be cancelled by participants.

For further details please refer to the sections on “Cancellation of delivery instructions” (mainly within the sections “Processing instructions”) and the sections on “Settlement failure” in the chapters 3.2 and 3.3. of the CBF Customer Handbook.

2. External Creation settlement

Local market rules apply, these are described and publicly available in the respective Market Link Guides for further details.

Principle 9: Money settlements

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

Key consideration 1: An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.

In line with Article 40(1) CSDR, cash payments related to deliveries-versus-payment (DVP) transactions are settled in Central Bank Money (CeBM) where available and practical. This is currently the case for:

1. CBF´s "CASCADE" settlement via the T2S platform (currently, only EUR currency settlement is offered by CBF) through the CBF´s participants T2 DCAs of a central bank. Every CBF participant securities account is associated with a DCA account.

2. CBF´s link to Switzerland (settlement of Swiss securities versus CHF currency).

For non-T2S settlement, prior to opening a local/ domestic market link, Clearstream Network Management assesses the availability and practicability of processing cash settlement in local currency via an account held with the local Central Bank (Central Bank Money settlement –CeBM). Alternatively, settlement in Commercial Bank Money (CoBM) using a Cash Correspondent Bank is applied.

To support day-to-day payment activity, CBF relies primarily on:

- a direct access to TARGET2 for T2S-eligible currencies payments (payments in CeBM – Central Bank Money) related to the SSS "CASCADE" eligible settlement transactions;
- a large network of Cash Correspondent Banks (CCBs; payments in CoBM – Commercial Bank Money) related to the SSS "Creation" eligible settlement transactions.

Information about settlement related cash processing is described within the chapters 2.1 "Cash and securities accounts per transaction type", 4.2 "Cash settlement in EUR through TARGET2", 4.3 "Cash settlement of non-EUR currency", and 4.4 "Cash settlement through the Swiss National Bank", 7.7 "Financing: availability of funds", 7.8 "Collateral Valuation" of the CBF Customer Handbook and the chapters 3. "Settlement services" and 5. "Cash Financing services" of the CBL Customer Handbook, published on Clearstream´s website.

In more detail:

For against payment settlement in EUR currency on the T2S platform operated by the European Central Bank, CBF requires its customers to have T2S Dedicated Cash Accounts (DCAs) which are linked to the corresponding securities account of the customer. The accounting structure (integrated model) gathers cash and securities accounts in the same technical environment. Cash settlements in T2S take place exclusively on DCAs, i.e. cash accounts that are opened in the books of one T2S participating Central Bank and are exclusively dedicated to the settlement of the cash leg of securities transactions initiated by CSD participants and the settlement of liquidity transfers for liquidity management purposes initiated by central bank participants. Each DCA is linked through static data to one or more RTGS accounts of the same currency held in a central bank. For the settlement of cash related operations in T2S, the provision of liquidity to cash accounts (i.e. to the DCAs) is necessary. For this purpose, T2S provides the technical means for its participants (CSD and central banks) to transfer funds from the RTGS' accounts onto the technical platform or from one T2S DCA to another. The holders of the DCAs have the responsibility to monitor the balance in their DCA(s) and shall be able to issue liquidity transfer orders in T2S.

Further information on cash settlement through T2S

The cash settlement of securities transactions and certain corporate actions generally involves the following instruction types:

- Transfer of securities against payment in EUR: Delivery-versus-Payment (DVP), Receive-versus versus-Payment (RvP)
- Transfer of securities with payment in EUR: Delivery with Payment (DwP), Receive with Payment (RwP)
- Payment in EUR without transfer of securities: Payment Free of Delivery Debit (PFoD-DBIT), Payment Free of Delivery Credit (PFoD-CRDT)

These transactions can settle in T2S during night-time settlement (NTS) as well as during real-time settlement (RTS), until 16:00 CET. In both cases, the cash is settled directly via a DCA linked to the respective Securities Account (SAC). The DCA can either be stated in the instruction or be set up as a default DCA at CBF.

Customers can either open their own DCA at one of the central banks participating in T2S or make use of a cash correspondent's DCA for which a respective credit line exists. Each connection between a SAC and a DCA which is to be used for cash settlement must be set up as a SAC-Link by CBF and authorised via a Credit Memorandum Balance (CMB) by the responsible central bank or cash correspondent in advance.

If a transaction cannot settle due to lack of cash or credit line, T2S will reconsider it for settlement in regular intervals during the day. That means that an increase of cash or credit line on the DCA is considered in a timely manner.

Funding

Customers participating in settlement of RvP, DwP or PFoD-DBIT instructions in T2S must generally ensure that there is sufficient cash or credit line available on the DCA. The liquidity is transferred from an RTGS main account and such a liquidity transfer can be instructed – depending on the technical connectivity of the customer – either in T2S, TARGET2 or CASCADE Online.

The funding of the DCA to, be used for night-time settlement (NTS) of the following T2S Business Day via CASCADE Online, is conducted on the basis of an individual or standing instruction to CBF until 18:30 CET. The cash forecast function in CASCADE supports customers in determining how much cash needs to be reserved and takes account of the following transactions:

- Matched OTC transactions against payment;
- Stock exchange trades (CCP and Non CCP);
- Eurex exercises;
- New issues;
- Interest and redemption payments of German government bonds.

Key consideration 2: If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.

When commercial bank money settlement takes place in relation to the Creation activity, the settlement asset used is a claim on CBF itself. CBF is subject to CSDR Article 16 and holds a limited purpose banking licence, allowing it to provide banking services in relation to settlement services only. Credit and liquidity risk stemming from the use of commercial bank money for settlement in Creation is covered under Principles 4 and 7; details on collateral management to mitigate credit risk are stated under Principle 5.

In relation to CoBM cash processing on the CBF participants´ multi-currency cash accounts (i.e. the CBF-i accounts), CBF makes available to its participants documentation that is applicable to the SSS "Creation" in the CBF Customer Handbook (including "Financing" and "Collateral valuation" as stated in our feedback to Key Consideration 1 above.

Commercial bank money settlement applies for:

1. Non-EUR T2S cash settlement: for non-EUR T2S cash settlement and settlement outside T2S (i.e. CBF´s international services, "CBF-i", using the SSS "Creation"), CBF settles cash payments through its own accounts. The CBF-i (cash) accounts are opened with CBF and technically held on the Creation platform.

2. Cash settlement for internal, external and Bridge transactions: the SSS "Creation" allows for internal and external (local market) settlement processing, including the processing of transactions via the Bridge with Euroclear Bank. CBF participant accounts are associated with multi-currency cash CBF-i accounts for CoBM funding needs in the

relevant settlement currencies in the books of CBF. In conjunction with this requirement and in relation to internal settlement in non-EUR currencies and external settlements in all eligible currencies, CBF offers securities settlement exclusively against payment in CoBM through the respective local Cash Correspondent Bank, based on the cash funding and provisioning processes of the Creation platform. Cash settlements are effected by crediting and debiting the relevant cash accounts of the CBF participants.

In more detail:

CBF's commercial bank money activity and the respective cash settlement in most currencies outside of T2S eligible currencies (currently also including securities settlement versus payment in the T2S-eligible currency DKK) is executed through the respective local Cash Correspondent Bank (CCB). For every settlement currency, a CCB (several for Euro) is appointed to handle the external payment and receipt of funds between the domestic banking system for the currency and CBF. All CBF customers have multi-currency cash accounts in the relevant settlement currencies in the books of CBF. Money settlements are affected by crediting and debiting the relevant cash accounts of the customers. CBF operates a Delivery versus Payment (DVP) Model 1 system, thereby ensuring simultaneous final settlement of securities and cash funds transfers on a gross (transaction by transaction) basis. For all DVP transactions, the cash funds have either to be available on the customer's account or can be made available through our cash financing facilities.

For its external Creation settlements (local markets), CBF is using central bank money where feasible. Non-T2S settlement against payment is taking place in CoBM (in line with Article 40(2) CSDR) in more than 40 currencies eligible for securities settlement for most links.

CoBM settlement occurs in adherence to the following principles:

Cash reporting for CoBM payments is produced exclusively from the CBF-i accounts.

The availability and funding of CoBM on the CBF-i account is governed by the descriptions available in the CBF Customer Handbook; it is the responsibility of the CBF participant to provide adequate cash liquidity required for settlements against that account.

For every eligible settlement currency, at least one Cash Correspondent Bank is appointed to handle the external payment and receipt of funds between the domestic banking system for the currency and Creation. Details of the Cash Correspondent Banks are provided in the Cash Timings Matrix published on the Clearstream website. With regard to CSD links, the CCB is published in each Market Link Guide section "General information".

Funds are transferable intraday depending on the cash deadlines of the respective currencies. Cash deadlines vary in accordance with the time zones of the liquidity providers of the currency. Timings are outlined in the Cash Timings Matrix, which is publicly available on Clearstream's website.

Key consideration 3: If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.

Not applicable as CBF settles the cash leg in its own books.

Key consideration 4: If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.

CBF has a limited banking licence that allows it to only offer banking services ancillary to core and non-banking services. All CBF-i customers have cash accounts in the available settlement currencies in the books of CBF. CBF performs cash settlement by debiting and crediting the cash accounts of the customer.

CBF has a robust risk management framework that covers all key sources of risk including credit and liquidity risks. Please refer to Principles 3, 4, 5 and 7.

Key consideration 5: An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.

Not applicable as CBF settles the cash leg in its own books.

Principle 10: Physical deliveries

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

This principle should be reviewed in the context of Principle 15 on general business risk, Principle 23 on disclosure of rules, key procedures and market data, and other principles, as appropriate.

Key consideration 1: An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.

The General Terms and Conditions (GTC) are defining the asset classes eligible for physical delivery in CBF. The following securities are accepted for physical delivery into custody with CBF:

Securities in bearer or registered form issued by German issuers and governed by German Law;
Securities in bearer or registered form issued by foreign issuers and not governed by German Law;

For physical deliveries into CBF, CBF only accepts securities in collective safe custody which are transferable and fungible in accordance with section 1 para. 1 and section 5 para. 1 German Securities Deposit Act (Depotgesetz) and number XI of the GTCs.

For physical deliveries of commodities, CBF relies on bilateral agreements with the issuers or agents.

In the case of individual safe custody (also referred to as jacket custody), which is also regulated in sec. 2 of the German Securities Deposit Act, the custodian or, in the case of custody with a third party, CBF, must segregate the securities to be kept in safe custody from other securities holdings it keeps in safe custody (separated from its own and third persons' holdings), on the depositor's express request. The depositor in question must be identified on the outside. This identification often takes place in the form of a "jacket" marked with the depositor's name. This separation preserves the depositor's sole ownership of the physical securities certificate in question and when the certificate is deposited this ownership is not transformed into fractional co-ownership of the collective holding.

CBF's obligations and responsibilities with respect to the delivery of physical instruments or commodities are defined in accordance with German Law. The rules of the German Securities Deposit Act regarding the deposit are applicable to CBF.

The procedures surrounding the delivery of each of the classes of securities, the instruction requirements and procedure for effecting physical delivery are set out in the GTCs, the Customer Handbook and other publications, like for example regular customer announcements.

Settlement process

The highly efficient settlement platform, T2S and the relevant vaults platform CARAD, support CBF and its customers in the settlement and custody of transactions in physical securities and offer in particular:

- Deposit and withdrawal of physical securities to and from the holdings in the vaults;
- Recording and administration of certificate numbers (ledger);
- Conducting checks against the list of invalidated or stopped securities;
- Processing defective and replacement certificates.

CBF is a Model 1 DVP system, ensuring simultaneous final settlement of securities and funds transfers on a gross (trade-by-trade) basis. When customers give instructions to deliver or receive securities against payment, each securities transfer is linked to the specific payment.

Key consideration 2: An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

The main risks associated with the storage and delivery of physical instruments is the loss of certificates during the process and the receipt of fraudulent certificates. There is a team with experienced staff, being responsible to update the 'operational risk scenario analysis' regularly. These scenarios take into account the different types of risk, such as 'fraudulent destruction', 'theft', 'transportation issues', 'loss', 'betrayal', 'attacks', and so on. Root causes with a validated percentage of possible issues in the different categories are established. Offenders, different types of a possible crime, possible loss or damage has been taken into account, based upon statistics of the 'Federal Criminal Police Office' (Bundeskriminalamt, 'BKA'), rounded out by own internal data, if applicable. It is always on the spot to avoid or reduce at least significantly any risk with regards to operational processes in daily business.

Vault reconciliation, to avoid loss of certificates, is performed by CBF, including the following:

1) Daily controls of physical security deliveries and receipts together with the corresponding order in the CASCADE settlement platform, to ensure safe receipt and proper system recording of deliveries.

2) Daily reconciliation of positions booked in CASCADE settlement platform following settlement of securities instructions versus holdings in Vaults Management application.

3) Inventory controls ensuring that all securities deposited with CBF and recorded in the Vaults Management application, are also physically deposited in the vaults. This includes a predominantly digital reconciliation process of Global Notes encompassing an electronic annual completeness check of sealed inventory and a more detailed spot-check control on a pre-defined amount of the physical inventory.

The receipt of fraudulent certificates is avoided by undertaking in-depth validation checks upon receipt. These checks consider of signature checks of transfer documents and validation check of certificates in accordance to the market practice.

The fees for the delivery of physical securities and commodities are clearly stated in the CBF fee schedule, where the general rules for charging fees on the relevant deposit service are set out.

Principle 11: Central securities depositories

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

Key consideration 1: A CSD should have appropriate rules, procedures, and controls, including robust accounting practices, to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.

Safeguarding the rights of securities issuers and holders

Concerning the protection of the rights of the securities holders, CBF offers the possibility to its customers to choose between a segregated account structure or an omnibus account within the CBF system. Further details are described in Key Consideration 5 below.

Please note that CBF as a CSD with registered seat in Frankfurt/Main, Germany, maintains accounts in CBF, which are indeed opened in the customer's name. A sub-account structure permits to open clearly identifiable accounts to segregate customer and underlying client's assets. In the local markets linked to CBF, customer assets are held in an omnibus account in CBF's name. This account however is segregated from the proprietary assets of the local CSD and other CSD-customer's assets. CBF does not hold "own" assets in local markets.

CBF does not use for any purpose securities that do not belong to it. CBF may however use securities of a participant where it has obtained that participant's prior express consent. CBF requires its participants to obtain any necessary prior consent from their clients. This corresponds to the legal requirements of Art. 38 paragraph 7CSDR. For more information regarding the usage of securities and the rules for obtaining written consent may be seen in the GTCs under number XXX et. seq. Clearstream's GTC's are available at:
General Terms and Conditions - CBF (clearstream.com)

Securities can be held in custody with CBF under any of the following types:

Collective Safe Custody (Girosammelverwahrung, GS/CSC): CSC is governed by the German Securities Deposit Act (DepotG). Further details regarding CSC are described in Principle 1 Key Consideration 1. The process for admission of securities to CSC by CBF is initiated by the applicant, the issuer (or the issuing bank (lead manager) acting on the issuer's behalf), which submits the request for admission to CBF. The applicant must be a credit institution and a customer of CBF. The admission and depositing of securities in CSC are described in number XI CBF GTC's.

Holders of securities held in CSC have a proprietary right to those securities (a 'right in rem') being a pro rata co-ownership right in a fungible pool of securities deposited by CBF directly or through a cross border CSD-Link with a foreign CSD based on an account relationship qualified under section 5 paragraph 4 DepotG.

CBF books its customers a CSC balance (GS-Gutschrift). This system enables the transfer of rights inherent to the securities by book entry. This is known as a securities transfer by book entry. The co-ownership of securities held in CSC is transferred in accordance with the principles of property law, i.e. by agreement in rem and transfer. Depositories, as CBF's customers and (intermediate) custodians as well as CBF as a CSD only provide the depositor (third-party) possession of the securities kept in custody, as required by civil law. As custodians, they are not the owners of these securities, neither in the sense of a trustee nor in the sense of a beneficial owner. When a transfer of co-ownership fractions takes place, constructive possession must move from the depositor who sells them to the depositor who buys them or to his depositories, on all levels of the custody chain. Under section 4 paragraph 1 DepotG, CBF is deemed to have explicit notice of third-party ownership of the securities that a depository, as an intermediate custodian, keeps in custody with CBF. This means that CBF is attributed with the knowledge that the securities which the depository has delivered into safe custody do not belong to the depository. This applies as long as the depository does not give CBF explicit notice that certain securities are its own positions. The particular consequence of this constructive notice of third-party ownership is that these securities owned by third parties enjoy full protection in the event of debt enforcement measures and similar acts against the depository or CBF.

Individual Safe-Custody (Streifbandverwahrung): Custody of fungible and non-fungible certificates, where each customer is entitled to have the individual certificates with a particular serial number at his disposal. In the case of individual safe custody (also referred to as jacket custody), which is also regulated under the DepotG, the custodian or, in the case of custody with a third party, CBF, must segregate the securities to be kept in safe custody from other securities holdings it keeps in safe custody, on the depositor's express request. The depositor in question must be identified on the outside. This identification often takes place in the form of a "jacket" marked with the depositor's name. This separation preserves the depositor's sole ownership of the physical securities certificate in question and when the certificate is deposited this ownership is not transformed into fractional co-ownership of the collective holding.

Non-collective safe custody: For securities that are not settled via the T2S platform, CBF keeps the positions in the form of book-entry credits on a fiduciary basis, using the technical and functional infrastructure of its sister company Clearstream Banking S.A., Luxembourg, which uses custodians in various countries for purposes of custody. Depositories are under an obligation to obtain what is known as a "Three-Point Declaration" from the (first) custodian outside Germany. The requirements of the "Three-Point Declaration" are explained in detail under Key Consideration 4. It is the predominant opinion that in the event of insolvency on the part of CBF or the depository, the intermediate custodian's or the beneficial owner's rights to the surrender of these securities are eligible for separation from the debtor's assets.

In the case of certain registered shares, CBF is offering a "CASCADE registered shares service" allowing customers to either register the shares under their nominee account name or in the name of the final beneficial owner.

If the collective holding is decreased due to a loss, for which CBF is not responsible, CBF will apportion such loss on a pro rata basis to the participants according to the fraction each participant (for its clients) holds in this collective holding at the moment that the loss occurred. CBF's liability pursuant to section 7 paragraph 2 sentence 2 DepotG and as established in the GTCs (number VII "Liability"), shall remain unaffected.

If CBF were to become insolvent, participants' securities would not fall in the bankruptcy estate of CBF. Pursuant to section 47 of the German Insolvency Code, the clients would be entitled to a right of segregation. If said securities are not sufficient to ensure the full restitution of the securities maintained on the account, they will be allocated between the account holders in proportion to their rights. In case CBF is responsible for the loss of securities, such a customer would have a senior claim in an insolvency proceeding, according to section 32 DepotG.

Prevention of the unauthorised creation or deletion of securities

CBF has appropriate rules, procedures and controls in place to prevent unauthorised creation or deletion of securities:

- Authorised creation of securities positions in the CBF system is only performed upon receipt of securities to be credited to customer accounts either through a new issue distribution (issuing agent) or the settlement of a corporate action.
- Authorised removal of securities positions is generally performed upon final maturity or in the context of a corporate event.
- Integrated securities provisions checks before release of a settlement instruction do also prevent unauthorised creation of securities.

Daily reconciliations are performed to ensure the correct application of the rules to prevent unauthorised creation or deletion of securities. The various reconciliation measures as well as the handling of differences are detailed below in "Periodic reconciliation of securities issues" of this same Key Consideration.

Periodic reconciliation of securities issues

The internal and external reconciliation procedures and controls ensure on a daily basis that rules are adhered to. CBF's records reflect the outstanding amount of the issue. The issuer or its agent has the obligation to perform at least a daily reconciliation with the CSD in order to reflect that the total outstanding amount at all times matches the outstanding amount of the issue. Further details on reconciliation of securities accounts and registers are provided in number XII CBF GTC's.

Reconciliation frequency

CBF performs daily internal securities reconciliation processes that it maintains centrally. It involves those functional and non-functional processes performed in the books, respectively systems of CBF aiming to ensure the integrity of a security issue.

CBF also maintains daily securities reconciliation processes with various external parties. This refers to daily reconciliation of movements and positions that relies on reporting to be received from an external party, and securities positions which therefore are not (fully) maintained centrally by CBF. The main purpose of the reconciliation is to ensure the integrity of the issue and minimise operational risk related to open differences in the respective holdings. For Investmend Funds, the daily frequency refers to the NAV frequency.

A daily reconciliation of the total holding per security issue is performed automatically by CBF's systems. Validations are performed in accordance to whether settlement data is received from T2S or Creation. The automated checks are performed at minimum once per day.

Daily reconciliation of securities positions is also performed to validate the securities positions held or mirrored at external party e.g. registrars, CSDs.

The reconciliation for securities held in CSC with the CSDs for which links exist (investor-CSD), is also performed on a daily basis. For securities held in NCSC, reconciliation with CBL and its cub-custodians takes also place on a daily basis.

Every issuer / registrar of CASCADE-RS eligible registered securities is provided by CBF with the overall reconciliation record on a daily basis.

CBF has established a reconciliation process versus the issuer agents (as there is no contractual relationship with the issuer of a security in registered form nor with the entity maintaining the issuer´s register) , meaning CBF provides the issuer agents on a daily basis with a reconciliation file containing the total issue outstanding amount (IOA) per respective securities requested for admission by the relevant issuer agent as recorded in the books of CBF.

The issuer agent must reconcile the report daily with the information filed in the ownership register of the registrar and with the records of the transfer agent or the entity acting in this capacity. Any identified mismatch or discrepancy must be reported to CBF within the business day following the reception of the report. The issuer agent must further provide all information necessary to enable CBF to ensure the integrity of the issue.

Since CBF has no relationship with Fund Managers or Transfer Agents, but with the issuer agent and receives mark-ups and mark-downs directly from him, the daily reconciliation of the IOA issued via CBF is conducted with the issuer agent.

CBF performs several controls and reconciliation processes on physical inventory to ensure duly safekeeping and proper handling of physical securities:

1) Daily controls of physical security deliveries and receipts together with the corresponding order in the CASCADE settlement platform, to ensure safe receipt and proper system recording of deliveries.
2) Daily reconciliation of positions booked in CASCADE settlement platform following settlement of securities instructions versus holdings in Vaults Management application.
3) Inventory controls ensuring that all securities deposited with CBF and recorded in the Vaults Management application, are also physically deposited in the vaults. This includes a predominantly digital reconciliation process of Global Notes encompassing an electronic annual completeness check of sealed inventory and a more detailed spot-check control on a pre-defined amount of the physical inventory.
4) The controls processes are in scope of the annual audit performed by the Internal Audit function and/or the External Auditors and on the field work, samples of evidences are being assessed for adequacy of controls and adherence to procedures.

Each remaining difference following reconciliation tasks is reported as open until it is fully resolved and corrective actions have been taken or respectively missing movements have been booked. The reconciliation team investigates the reconciliation differences and may identify missing movements to solve them; however the corrective action itself can only be confirmed as correct and be booked by the impacted CBF business unit or the external party. Only once these movements will have been reported or respectively transmitted to the reconciliation application, the open reconciliation break can be reconciled and the open item authorised and closed.

According to CSDR reconciliation requirements, any reconciliation break is immediately investigated by the reconciliation team and the respective CBF business unit. Both the reconciliation team and impacted business unit(s) will perform all necessary measures to remedy the break without undue delay, as required by the regulation.

Where the reconciliation break reveals an undue creation or deletion of securities (UCoD), and CBF fails to solve this reconciliation break by the end of the following business day, CBF will suspend the affected securities issue from settlement until the undue creation or deletion of securities is resolved.

In such cases, CBF will inform internal and external stakeholders without undue delay of the fact that settlement in the relevant securities issue is suspended. Internal and external stakeholders will also be informed without undue delay when the undue creation or deletion of securities is resolved, and settlement in the affected securities issue is resumed

In order to allow its participants to perform their daily reconciliation obligations, CBF makes daily statements of holdings and transactions available for customers that they have to subscribe to in line with number XII Reconciliation of securities accounts and registers of the CBF GTCs.

The robustness of the system and the daily reconciliation processes is reviewed also by the external auditor.

Key consideration 2: A CSD should prohibit overdrafts and debit balances in securities accounts.

CSDs that have outsourced their settlement activity to T2S have no measures at hand that could prevent negative securities' positions as CSDs rely on T2S provision checks and settlement rules. The CSD is reflecting the T2S settlement results. Negative balances might be accepted if and on accounts that operate as mirror accounts. In these cases, these accounts as well as their counterparty accounts must be included in the reconciliation process.

If the structure of an account does not allow negative securities balances – then the settlement platforms also perform a "provision check" before executing a participant customer's instruction, thereby ensuring that sufficient securities are available on the participant account to execute the delivery and preventing a debit balance in securities accounts. This ensures that no negative securities balances can result for the settlement process, even on an intra-day basis.

As per Art. 37 paragraph 3 CSDR, no negative securities balances are allowed on participant accounts maintained by the CSD. There is no specific article that covers the securities reconciliation of Internal Accounts. However, this reconciliation type is an additional check to avoid any mismatch or inconsistency that could lead to the undue creation or deletion of securities (UCoD).

Key consideration 3: A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilise or dematerialise securities.

The majority of today's issues (roughly 99%) is already done in immobilised form. The process for admission of securities to CSC by CBF is initiated by the applicant, either the issuing bank (lead manager) or the issuer issuer himself, which submits the request for admission together with the certificate(s) and various accompanying documents to CBF. To simplify and shorten the admission process for certificates, warrants and certain types of bearer bonds, CBF offers its customers the eMISSION Service. Issuers and issuing banks (lead managers) can use an internet portal to submit to CBF the terms and conditions of issue and the basic data for new issues of securities certificates etc. In addition to government bonds, where dematerialised issuance has been possible for a long time, the dematerialised issuance lately became compliant with the DepotG. This was enabled through the newly adopted Electronic Securities Act (eWpG), which entered into force on June 10, 2021. Issuers are now able to issue securities also electronically in dematerialised form.

Key consideration 4: A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.

CBF obtains (and subsequently updates as per CSDR requirements) a third party Legal Opinion in respect of the legal protection afforded to the securities deposited with CSDs / sub-custodians in each market pursuant to local laws (in particular insolvency protection). Therefore, when appointing a CSD / sub-custodian, CBF reviews the custody risks associated with the decision to entrust the securities to the sub-custodian.

CBF assesses and reviews regularly the custody risks associated with the decision to entrust the securities to the CSD / sub-custodian.

CBF publishes the essential points of the legal opinion in the "Legal arrangements" section of the Market Link Guide on the Clearstream website.

CSDs / sub-custodians are requested to provide a Three-Point-Declaration in which the non-German custodian confirms that the securities positions delivered into safe custody by the depository are kept as customer positions of the depository, that these can be separated from the CSD's / sub-custodian's assets in the event of its insolvency and that, as a matter of principle, it will not assert any rights of lien or rights of retention in relation to these securities. Furthermore, the custodian promises that it will not outsource the custody of the securities positions underlying the Three-Point Declaration to a third party without the consent of CBF.

The Three-Point-Declarations are also published on the Clearstream website under Company Governance / Regulation.

Key consideration 5: A CSD should employ a robust system that ensures segregation between the CSD's own assets and the securities of its participants and segregation among the securities of participants. Where supported by the legal framework, the CSD should also support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings.

In order for the safe custody and settlement of securities transactions to be carried out by CBF, customers can maintain a collective account at CBF, in which the securities holdings of multiple underlying clients of the customer are booked together. This level of segregation corresponds to the omnibus client segregated account (OCS) as set out in the Art. 38 paragraph 3 CSDR. Alternatively, the customer may choose to set up separate deposit accounts at CBF to segregate the securities of its individual clients from the holdings of the participant and of its other clients. This level of segregation corresponds to the individual client segregated account (ICS) as set out in the Art. 38 paragraph 4 CSDR. CBF books for either account type (ICS or OCS) the securities and any other fungible financial instruments received as a deposit or held in an account, separately from its own proprietary positions and off balance sheet (i.e. independently of ICS or OCS). Under German law, section 2 DepotG provides for a separate safe custody of securities in the case of individual safe custody.

Additionally, German law provides in Section 4 para.1 DepotG, that participant accounts held by CBF are managed as a third-party deposit.

Please also refer to CBF's CSDR Article 38 disclosure document, available at the following link:
https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/csdr-article-38-disclosure

Customer assets are held in an omnibus account in CBF's name with the local CSD and therefore segregated from the proprietary assets of the local CSD. Please note that CBF does not hold its own assets at the CSD level in the local market.

For assets held in NCSC via 6-series accounts on the Creation platform, a different operating model applies. In this context, Clearstream uses accounts directly at the CSD or indirectly via a custodian. At the CSD/custodian, Clearstream holds an account for its proprietary assets and an omnibus account for its customer assets.

The above makes the recovery of assets by customers easier in the event CBF becomes insolvent. CBF customers' assets deposited with CBF are governed and protected by the provisions of the DepotG and the German Insolvency Act.

As described above and under Key Consideration 1, customers depositing securities in collective safe custody with CBF benefit from a right in rem. They are co-owners in the pool of securities deposited at CBF up to the amount of securities held on its securities account. Customers depositing securities in non-collective safe custody with CBF receive a pro rata claim for delivery in relation to the asset pool for the respective securities' class in the custodian state. Under German law, in the event of bankruptcy of CBF, CBF's customers would be entitled to claim their assets or equivalent assets deposited with CBF in accordance with section 47 of the German Insolvency Act as they have a right to segregate the securities.

The right of segregation would apply, irrespective of whether securities are booked in ICS or OCS, so that both segregation types provide a similar level of protection in case of insolvency of CBF.

Key consideration 6: A CSD should identify, measure, monitor, and manage its risks from other activities that it may perform; additional tools may be necessary in order to address these risks.

CBF identifies, measures, monitors and manages the risks from other activities as described below. In the following CBF describes some additional items, complementing information as provided in Principles 3, 4, 7, 15, 16 and 17.

Besides central safekeeping and administration of securities and settlement, a variety of functions are performed for financial institutions across selected markets and financial instruments.

CBF also performs cash management and FX services, as well as financing, lending and borrowing services. CBF also offers investment funds related services, including an order routing solution (Vestima). This service covers mutual funds, exchange-traded funds as well as alternative funds. Comprehensive custody management includes f.ex. withholding tax and proxy voting services. CBF also offers related information distribution including customer reporting and a comprehensive New issues service.

Any risk deriving from credit and liquidity activities are is addressed and described under Principles 3, 4 and 7.

We consider settlement Corporate Actions (including proxy voting) to be considered as central safekeeping and administrative functions.

The order routing, settlement and custody services for investment funds do not present any other material risks for which the risk management is different to the one described in Principles 3, 15, 16 and 17.

For collateral management agency services, credit and liquidity risks mainly relate to derived asset servicing and settlement activities and are therefore not different to the ones described in Principles 4, 5 and 7.

For securities lending services, a dedicated legal framework is put in place with each individual customer in addition to the CBF GTCs.

CBF offers the following foreign exchange service to its customers for the CBF-i activity:

- Automatic FX service for custody proceeds;
- Automatic FX service for interest charges;
- Automatic FX service for standard monthly fees;
- FX service for securities Settlement Instructions;
- Case-by-case FX service.

In addition, these services are delivered in accordance with key risk and credit principles: permanent monitoring process in place to identify large customer positions which may lead to unwanted nostro balances, regular daily reconciliation of cash balances and a contractual framework in place with each of the two CCBs.

For any new products, the input channels are manifold – they can be triggered by customers themselves; some will be CBF's reply to market or regulatory changes and again in many instances, CBF's management will be the main driver behind new developments and product strategies.

More largely, CBF has put in place a wide range of IT tools, controls and procedures to minimise the impact of sources of risks to ensure the integrity of securities issues, minimise and manage the risks associated with the safekeeping and transfer of securities.

IT tools support the monitoring and reduction of operational risks and ensure the technical environment of CBF remains stable (e.g. ensure processing, monitoring of the infrastructure, etc.). With regards to operational risk, CBF is in particular using IT tools & processes to manage and monitor its systems to minimise operational risks for the settlement systems.

Furthermore, CBF has in place a wide range of various controls set up with the aim of minimising the impact of sources of operational risk. The control environment includes IT controls themselves but also covers several different other types of controls (e.g. cybersecurity, local access management, physical access management, stress testing/VaR, BCM, project management process, 4 eyes principle, etc.). Some of these controls are detailed and documented in the "Mitigation actions and controls" section of CBF operational scenarios which lists information on controls and procedures (which may also be supported by IT tools). The other controls types are further detailed in the policies and procedures used by CBF to minimise the impact of sources of operational risk.

Principle 12: Exchange-of-value settlement systems

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

Key consideration 1: An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.

CBF settles transactions that involve the settlement of two linked obligations being the delivery of securities against the payment of cash (delivery versus payment transaction). Principal risk is avoided through the irrevocable and simultaneous exchange of the securities (the delivery) and the cash value (the payment) to settle a delivery versus payment transaction.

(i) The legal framework applicable to CBF's services and settlement activities is defined in Principle 1.

(ii) The Customer Handbook (publicly available on the Clearstream website at the following link: https://www.clearstream.com/resource/blob/1314846/5d2b55d49e401791ef9a0c1229ade9f5/cbf-customer-handbook-en-data.pdf), chapters 3 "Securities settlement" and 4 "Cash settlement" describe the settlement mechanisms and rules applicable and binding upon CBF and the customers in order to eliminate the principal risk in the system.

(iii) From a technical perspective, the T2S/ CASCADE and Creation platforms process all instructions in real time ensuring a simultaneous exchange of delivery and payment. Securities are matched and provisioned prior to settlement to ensure the adequacy of cash and securities for settlement. The timely processing is assured by undertaking regular mitigating measures, such as system developments as soon as potential system performance issues are detected. The high level of system performance is being ensured by regular system regression testing activities.

Note: CBF has outsourced the settlement of transactions in securities in collective safe custody (CSC) to the T2S platform. This includes transactions against central bank money (with cash settling on T2) as well as transactions in foreign currencies (with securities settling free of payment in T2S, and cash settling on the Creation platform). Within the securities settlement, T2S executes the following for provided instructions:

- Acceptance of the instruction entry (Settlement Finality 1);
- Processing;
- Validation;
- Matching (Settlement Finality 2);
- Settlement of the transmitted instructions;
- Administration of positions;
- Reporting of transactions and of positions.

A real-time interface between T2S and CBF ensures the exchange of settlement information as well as the consistency of the instructions in T2S and CBF.

The finality of instructions is further described in Principle 8.

The order in which transactions are considered for provisioning and settlement is generally determined by:

- The transaction priority (assigned by the customer or by CBF);
- The settlement sequence option on the account.

Principle 13: Participant-default rules and procedures

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

Key consideration 1: An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

Participant default rules and procedures

CBF has Default Management Process (DMP) rules and procedures in place which define, the circumstances under which a participant of CBF is considered to be in default, the measures implemented to mitigate the risks arising from a participant default and the testing activity to ensure its continuous improvement.

Referring to the products and services offered, CBF defines two types of default:

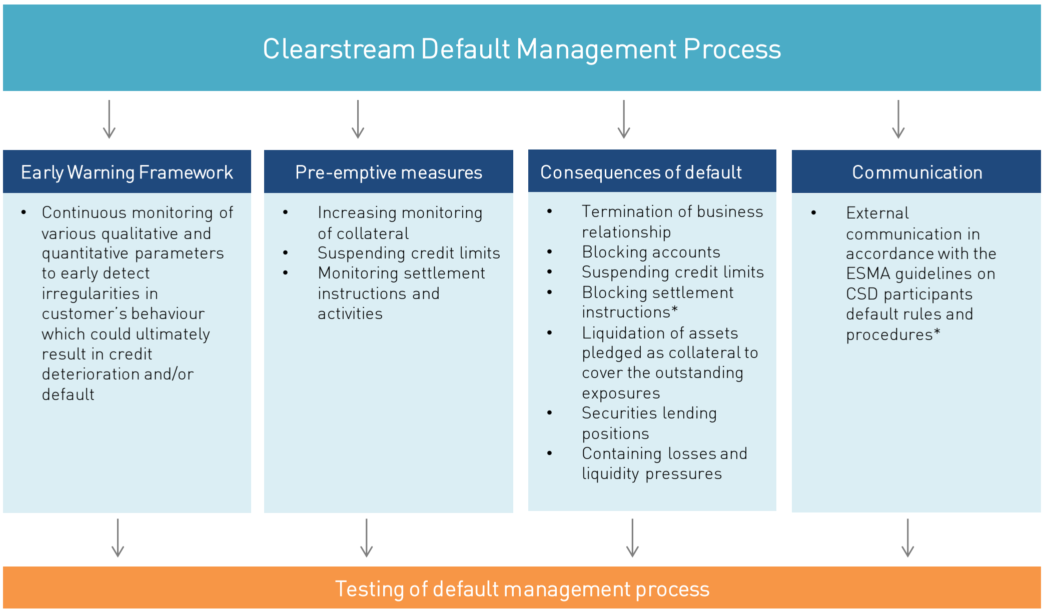
(i) General default, when a customer is unable to fulfil its contractual obligation according to an agreement with Clearstream where insolvency proceedings, as defined in point (j) of Article 2 of Directive 98/26/EC on settlement finality in payment and securities settlement systems, as amended ("Settlement Finality Directive"), are opened against a customer ("insolvency proceedings" shall mean any collective measure provided for in the law of a Member State, or a third country, either to wind up the participant or to reorganise it, where such measure involves the suspending of, or imposing limitations on, transfers or payments)

(ii) Contractual default, according to which a participant is unable or unwilling to fulfil, in a timely manner, one or more of its scheduled obligations according to an agreement with CBF.

In order to identify a default and classify it in accordance with the above-mentioned default types, CBF has established the Early Warning Framework which is based on early warning indicators and their monitoring thresholds which have been determined based on identified risks in the various business areas like Custody and Settlement, Treasury, Securities Financing, etc. The continuous monitoring of these indicators and their thresholds ensures an early detection of irregularities in participant's behaviour, which could ultimately result in participant's credit deterioration or default. As such CBF could take pre-emptive measures even before the default occurs.

The Default Management Process of CBF has been implemented in accordance with the Principle 13 CPMI-IOSCO and the Art. 41 CSDR.

The following chart describes different phases of the DMP, which consist of (i) monitoring (identifying participant's default at an early stage and taking some preliminary measures in order to eliminate/reduce the exposures) , (ii) taking corrective measures (liquidation of defaulting participant's pledged collateral in order to cover the outstanding exposure) and (iii) communicating, as per ESMA guidelines, its competent authority and the defaulting participant of the actions to be taken or taken by the CSD following the default and any other persons of the actions taken following the default.



*applicable only to insolvency

Key consideration 2: An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

The Clearstream Default Management team (CDM) is the owner of the DMP. The DMP is initiated and coordinated by CDM, which regularly reviews, tests and amends the process, where necessary, in order to be well prepared to act if needed. In case of a participant default CDM would initiate the DMP. Upon approval of default, the DMP foresees the suspension of the credit limits (if not already implemented as a pre-emptive measure) and the liquidation of the defaulting participant's collateral for the purpose of covering their outstanding exposures (if any). Liquidation of collateral is a corrective measure in the default management process. The key objectives of liquidation are to (i) minimise the losses for CBF, (ii) limit disruptions to the market by ensuring a smooth collateral liquidation and a timely completion of settlement even under stressed market conditions and as a result avoid impact on the normal settlement activity of non-defaulting CBF participants, as well as (iii) sell collateral in a prudent and orderly manner.

CBF's settlement system ensures a clear segregation of the participant's proprietary and their underlying clients' assets. Only participant's proprietary assets are subject to liquidation in case of default. The underlying clients' assets are segregated on dedicated accounts. They cannot be pledged under the pledge permitted by the CBF's GTCs and therefore underlying clients' assets are not subject to liquidation or off-set in case of participant default (if not specially agreed otherwise).

Upon default of a participant of CBF, there are two types of treatment for the underlying client's assets:

(i) in general, should a CBF participant default contractually, the participant will be able to continue its operations at CBF once the outstanding exposure of CBF, on the given participant, has been covered in accordance with the rules and procedures of DMP. As such, the defaulting participant will also be able to continue the operations of its underlying clients as its assets remain on the accounts opened with CBF (however, CBF could decide on case-by-case basis to terminate the relationship in accordance with the GTCs and its Customer Access and Acceptance Policy);

(ii) should a CBF participant default legally, CBF would follow the instructions of the appointed administrator in order to transfer the remaining proprietary assets of the defaulted participant as well as the assets of its underlying clients to the dedicated accounts opened by the insolvency administrator. Should an underlying client wish to open a direct account with CBF, CBF would apply the standard due diligence under the participant acceptance criteria and decide whether an underlying client meets the criteria to be accepted as a new CBF participant.

With regards to the participant's underlying client transactions, CBF applies the settlement finality rules, provided the provisioning rules are respected. Should a participant of CBF default, the DMP would be activated and the accounts of the defaulting participant would be blocked. Under the settlement finality rules, CBF would allow manual release of pending transactions.

CBF's GTCs and its uncommitted intraday technical overdraft facility agreement (TOF agreement) govern the right of pledge over participant's proprietary assets and their enforcement of those assets in case of a participant's default. Based on this, the DMP of CBF defines the operational processes which enable CBF to promptly access the above-mentioned pledged assets in case of a participant default and liquidate them in order to cover the outstanding exposures of the defaulted participant.

Additional financial resources that can be used for avoiding liquidity pressures or covering potential liquidity gaps are defined in Principle 7, key consideration 10 of this document. In addition, the Clearstream Recovery Plan states that financial resources are to be used for recovering from a major potential loss.

In compliance with the ESMA guidelines on CSD participants default rules and procedures, CBF would communicate the participant default and/or the measures taken following the participant default to all relevant stakeholders. CBF's default management procedures define the communication path in case of a participant default to the relevant internal and external stakeholders. The communication of default to the competent and relevant authorities of CBF is part of the communication plan. In order to inform the non-defaulting participants of the actions taken following a participant's default, CBF will publish a press release on its website as well as an alert on Xact Web Portal and CreationOnline. (CreationOnline is planned to be decommissioned by end of 2021).

All default management processes and procedures are reviewed, tested, updated and approved by the CBF Executive Board at least annually in order to ensure their quality and functionality.

Key consideration 3: An FMI should publicly disclose key aspects of its default rules and procedures.

CBF publishes the overview of its main default management rules on Clearstream website
https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management

Key consideration 4: An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

CDM conducts the default management testing in order to ensure a continuous improvement of the DMP and the best possible level of preparation for a crisis situation, which can be triggered either by a participant default or a market crisis. In addition to the regular maintenance of DMP, CDM undertakes the default management testing following any substantial changes to CBF default rules and procedures or upon the request from its competent authority. In accordance with the ESMA guidelines and depending on the type of test, CDM invites different participants. These can be CBF participants, relevant market infrastructures and any other entities, as appropriate, for the securities settlement system it operates. The competent authority may also request to take part in such tests. CDM tests the default management process also to ensure that all relevant participants are familiar with their roles and responsibilities in the DMP. Additionally, the objective of default management testing is to provide training and guidance to CBF personnel on how the default rules and procedures should be implemented.

CDM also disclose on Clearstream's website at least a summary of the result of the performed tests and the contemplated changes to its default rules and procedures, if any. Additionally, Clearstream offers participants the opportunity to be involved in the Clearstream default management framework by going through Clearstream's default rules and procedures as well as the testing activity with the Clearstream Default Management unit.

Principle 15: General business risk

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

Key consideration 1: An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

The business risk reflects the sensitivity of CBF to macroeconomic developments and its vulnerability to risks arising from other external threats. It is translated into EBITDA terms, reflecting both a potential revenue decrease and a potential increase of its cost base.

Assessments and estimations of business risk scenarios are performed by business experts within CBF with the support of risk management and are based on the group-wide scenario catalogue to ensure consistency. Each year new scenarios are identified by business experts. Business experts are responsible for identification and quantification of all business risk scenarios. Details on responsibilities, process and procedures with regards to risk management are documented in Clearstream's Business Risk Handbook. The Handbook is reviewed annually and updated on an ad-hoc basis.

CBF's financial performance is subject to the evolution of a number of macroeconomic factors and the related effects, both directly and indirectly. Both internal and external factors are analysed and assessed with regards to business risk for CBF. Revenues and costs could be, directly or indirectly, impacted by e.g. the level of interest rates on the market, projected economic growth of business segments within CBF, new regulations coming into play, unforeseen mergers and acquisitions, poor execution of projects, non-achievement of strategic targets, rising competition levels, reputational risk, and also investors' confidence in the economic environment in the Euro zone.

For CBF, the framework to manage and control business risk comprises several instruments including scenario analysis, an early warning system based on Key Risk Indicators (KRIs) and the capital model.

At least on an annual basis (plus an ad-hoc basis if needed), Clearstream Risk Management organises joint workshops with business owners and performs scenario analysis workshops, along with capital model calculations. During a scenario analysis workshop, experts' opinions on the severity and frequency of business risk events are collected. Clearstream Risk Management documents and validates the results, challenges the underlying severity and frequency estimations and addresses all changes and deviations accordingly.

Furthermore, as an additional level of assessment, Clearstream Risk Management performs stress testing. The stress testing approach compares several stress situations, such as materialisation of a worst case scenario and materialisation of all scenarios at the same time with the projected annual EBITDA. In addition, reverse stress tests are performed where the impact on the available risk-bearing capacity is analysed. Results of the stress tests indicate that potential losses arising from business risk are matched by adequate risk-bearing capacity.

In order to ensure completeness and the timely update of the business risk framework, CBF regularly monitors the main business risk drivers, analysing the information received by different organisational area.

Key consideration 2: An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

The reports received by Clearstream Risk Management include detailed information on CBF's profit & loss figures, operational expenses, cash flows, project controlling, etc. Through a regular monitoring and analysis of the information received, Clearstream Risk Management is able to identify trends and evolutionary changes related to CBF's internal/external business environment.

Capital requirements under CSDR:
In order to be compliant with the Article 6 Commission Delegated Regulation (EU) 2017/390 ("DR 2017/390"), Capital requirements for business risk, CBF applies all the following:

• Estimate the capital necessary to cover losses resulting from business risk on reasonably foreseeable adverse scenarios relevant to its business model, here described as scenario analysis;
• Document the assumptions and the methodologies used to estimate the expected losses in the scenario documents;
• Review and update the scenarios at least annually

The capital requirements of a CSD for business risk shall be whichever of the following is higher:

• the estimate resulting from the application of the scenario analysis, minus whichever of the following is the lowest:
▪ the net income after tax of the last audited financial year;
▪ the expected net income after tax for the current financial year;
▪ the expected net income after tax for the previous financial year where audited results are not yet available;
• 25% of the CSD's annual gross operational expenses

Capital model: The required capital for business risk will be calculated based on the results of a statistical model. The overall objective of the business risk model is to simulate a loss distribution for a period of one year. The actuarial technique applied is modelling the occurrence of a business risk event (i.e. the frequency) and the impact of such an event (i.e. the severity). Simulating risk events and respective losses with the Monte Carlo simulation gives the required aggregate loss distribution. From the loss distribution the several risk figures are derived:

➢ Expected loss: The expected loss is defined as the statistical mean of the aggregated loss distribution. It indicates which annual loss CBF might face on average over a long period of time.

➢ Value-at-Risk: The Value-at-Risk (VaR) is defined as the amount that is not exceeded in q% cases of all years. For economic capital purpose the 99.90% percentile is calculated and for internal purposes the 99% percentile is calculated. Any other percentile can be derived from the aggregate loss distribution.

➢ Expected shortfall to the q-percentile: Defined as the statistical mean of the loss distribution above the q-percentile. It is used as a proxy for the loss amount the bank could face if the q-percentile is exceeded.

Key Risk Indicators (KRIs) are used as an early warning system for business risk. Through the identification and measurement of leading indicators, e.g. deviation from projected revenues or costs, information on changing levels of risk are received at an early stage. This methodology relies on the monthly review of a defined set of KRIs. The KRIs and thresholds should be linked to existing risk scenarios and are reviewed with the business areas at least in the course of the scenario analysis process. All KRIs are collected and analysed by Clearstream Risk Management on a monthly basis. KRI information is analysed for trends and monthly breaches. The results of KRI analysis are used to proactively update the scenario database and/or trigger a re-assessment of the company business risk's estimations.

Key consideration 3: An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.

Recovery or orderly wind-down plan:

CBF distinguishes between requirements for a recovery plan (mitigating a near-default situation), a restructuring and wind-down plan (ensuring solvent wind-down) and a resolution plan (insolvent wind-down).

The recovery, restructuring and wind-down plan are drawn up and maintained by CBF. Their purpose is to set out available tools of CBF to overcome severe financial and operational shocks that could potentially undermine the viability of CBF and sustainability of its business. Ultimately, the plans aim at ensuring the continuity of CBF's critical services and operations, also preventing significant adverse effects on the financial system.

At present, the recovery capability of CBF is considered to be given. A suitable number of viable recovery options has been identified for the case that CBF is exposed to a severe stress. The range of identified recovery options ensures that CBF can raise sufficient capital or funding to withstand severe stress affecting its capital and liquidity profile. In addition, there is a range of recovery measures aimed at restoring operational capacity or strengthening the risk profile.

Operational capability has also been proven to be stable, even in crisis situations. This is the result of robust and efficient crisis management processes and procedures as well as detailed business contingency measures, which are partially also reflected in the recovery plan.

Both, risk and financial profile of CBF prove to be robust and only an extreme event would trigger a near-default situation. As aforementioned, CBF has a number of recovery options, which would be implemented as an appropriate response to a severe stress. In addition, CBF has adequate crisis and default management procedures to deal with anomalies and emerging crisis situations. These procedures are regularly tested to ensure their effectiveness and that all relevant stakeholders are familiar with their roles and responsibilities. As such, CBF is able to respond very quickly to a crisis event and implement the necessary mitigating tools in a timely manner.

The recovery plan is reviewed at least annually and approved by the Executive Board of CBF as described in Principle 3, Key Consideration 4.

In the restructuring and wind-down plan several tools have been identified as being applicable in restructuring and wind-down scenarios. The differentiation of the scenarios is undertaken on the basis of the criteria and requirements stipulated by the CSDR and taking into account the applicable tools accordingly. These tools vary in their applicability and feasibility depending on the scenario.

The restructuring and wind down plan of CBF defines a restructuring and wind-down timeline based on the relevant scenario and the applicable tools. Accordingly, the necessary amount of capital is derived to ensure that the critical operations and services can be continued during the restructuring or wind-down period.

Key consideration 4: Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.

CBF's investment portfolio is composed of issuers whose bonds have a remaining life to maturity below 10 years. These assets are exclusively EUR-denominated ECB eligible HQLA Level 1 assets (CBF's equity is only in EUR currency) and are kept unencumbered on a separate account under the direct management of Treasury as the liquidity management function. The assets may only be used as a source of contingent funds during stress periods. They are directly transferrable to Deutsche Bundesbank to generate intraday liquidity via CBF's credit line.

Key consideration 5: An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.

The recovery plan of CBF includes a range of measures that CBF could take to restore its equity profile or raise additional equity should it fall close to or below the amount needed to ensure a going concern. As aforementioned, the recovery plan is subject to CBF Executive Board approval. Furthermore, the plan is tested at least annually to ensure its effectiveness and a continuous improvement.

Principle 16: Custody and investment risks

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

Key consideration 1: An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

CBF assesses local CSDs when creating a new link, and on a yearly basis for existing links via a link arrangement review questionnaire and by conducting an on-site visit to the CSD. For CSDs not under CSD-R, a more extensive questionnaire is sent, and Clearstream's Credit Department assesses the CSD's creditworthiness and reviews it on a yearly basis.

Whenever possible, CBF holds its assets in accounts at the local CSD. The role of the supplier, in that case, is reduced to a power of attorney and can be revoked with immediate effect. For all types of links the elements necessary for the asset protection are reviewed internally but also by an external legal opinion to make sure they are compliant with CBF's obligations towards its customers such as the enforceability of the agreement with the supplier with whom CBF holds its or its participants' assets as well as the protection of the assets, e.g., in case of insolvency of the supplier.

In case of a participant's default, CBF will ensure that all accounts holding pledged positions will be immediately blocked to avoid any transfer of positions. If the decision to liquidate a participant's portfolio is taken, the pledged assets are segregated to enable the liquidation process. In order to enable prompt access to its or to its participant's assets, CBF monitors the quality of the service provided by its suppliers and their adherence to the standards defined in the contractual arrangements.

CBF, when setting up a new link, requires a legal opinion from an external legal counsel. The legal opinion represents a confirmation of key legal requirements in respect to the market served, including:

- Entitlement of Clearstream to securities and the nature of Clearstream's rights;
- Enforceability of the agent's (and CSD's) obligations;
- Enforceability of the judgment of courts located in relevant jurisdictions;
- Recoverability of assets (cash and securities) in case of bankruptcy;
- Legal status and authority of the agent (and the CSD);
- Segregation requirements.

The legal opinion is subject to annual renewal at Clearstream's expense and in accordance with the agreement made with legal counsel.

All CSDs and/or depositories/agent banks appointed by CBF are contractually required to obtain and maintain all necessary permits, licenses and consents or authorisations required by the applicable law to enable them to fulfil their obligations under the agreement. The legal opinion from an external counsel mentioned above further confirms the relevant and competent regulators of the CSD and/or depository/agent.

Each market is under the supervision of a dedicated Clearstream Network Relationship Manager and a back-up is also designated. Each Network Relationship Manager performs an "end-to-end" role, covering all suppliers and infrastructures for a given market including:

- Monitoring and maintenance of legal documentation
- Annual credit review (by Credit Department on behalf of Network Management);
- Policies and guidelines - risk, contractual;
- Process definition;
- Supplier / Market Review Process;

- Management statistical reporting and business targets;
- Key Performance Indicator reporting, analysis and action planning;
- Issue Management;
- Incident Management;
- Benchmark development and maintenance;
- Monitoring and communication of market changes internally across impacted CBF departments and externally towards customers.

Due diligence visits (DDVs) are organised annually to each supplier, i.e. depository/agent banks, and link arrangement reviews with each CSD.

Due diligence inspections consist of any verification deemed "appropriate" in order to ascertain that the agent/depository/sub-custodian is fulfilling its obligations under the legal agreement pursuant to the professional standards of a securities custodian. It further allows to monitor and manage any additional risks resulting from the use of an agent bank and verify that the link and the agent bank meet the regulatory requirements set out in CSDR.

DDVs and link arrangement reviews also provide Network Management with very valuable information about the market and are a good opportunity to discuss about subjects such as regulatory changes, market developments, fee renegotiations or potential business developments (e.g., the inclusion of a new asset class on the link). Generally, service reviews focus on a specific set of issues or topics whereas a due diligence visit is an overall assessment of the supplier and the market.

CBF maintains a close dialogue with its Operations staff, allowing to rank its suppliers on the basis of MIS data collected by the Network Managers and Operations teams. This is completed by periodic Depository Quality Assessments for supplier across the network.

CBF verifies the compliance of the CSD and/or depository/agent bank with the provisions of the agreement by collecting annually officer's certificate relating to the internal control system implemented by them; in the officer's certificate the supplier confirms compliance with the agreement; that effective internal controls are in place for the securities, that such controls are being reviewed at least annually by the supplier's external auditors and that during the preceding year, no such review has revealed any material deficiencies or made any material objections other than those already notified to CBF, as the case may be.

CCBs (in the case of the CBF-i activity) are subject to similar obligations compared to those of the suppliers as described above.

Key consideration 2: An FMI should have prompt access to its assets and the assets provided by participants, when required.

CBF has immediate access to its own and customer´s assets.

CBF's own securities and cash assets are kept unencumbered on separate accounts under the direct management of treasury in its liquidity management function with immediate access.

Immediate access for CBF customer assets held in the CSD where CBF is a direct participant and held in local markets assessed via the 6 series accounts is granted.

In the depository contracts, it is specified that no lean and no pledge can affect the assets and the Legal Opinion as described in the previous Consideration verifies this as well.

In case of a participant's default, Clearstream will ensure that all accounts holding pledged positions will be immediately blocked to avoid any transfer of positions. If the decision to liquidate a participant's portfolio is taken, the pledged assets are segregated to enable the liquidation process. In order to enable prompt access to its or to its participant's assets, Clearstream monitors the quality of the service provided by its suppliers and their adherence to the standards defined in the contractual arrangements as described above.

Key consideration 3: An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

The optimal reduction of exposure to suppliers is achieved by holding assets under custody directly with the respective CSD. Currently the vast majority of securities are held under this structure.

Elements with regards to the monitoring of the exposure vis-à-vis CSDs and/or depositories/agent banks and CCBs (in the case of the CBF-i activity) are described in further detail in the key consideration 1 of this Principle as well as in Principles 4 and 7.

Key consideration 4: An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

Investment strategy

The primary objectives are to manage own funds and customer cash in order to ensure:

1. Capital preservation, i.e. minimising credit and market risk, and
2. Access to liquidity to always ensure the ability to satisfy payment obligations timely

CBF's investment strategy forms part of its liquidity risk management strategy and is described in Principle 7. Further details are available via the Pillar III report. The report is published on www.clearstream.com at the following link:

https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114.

CBF does not engage in proprietary trading activities and does not maintain a trading book. Investments in securities as part of the investment or short-term portfolios are only high-quality liquid assets (HQLA) against high-quality obligors. These are purchased with the "buy and hold" strategy and recognised in the banking book. They always remain unencumbered and available for an immediate sale or monetisation if required. The Investment Policy defines limits for securities purchase transactions.

Risk characteristics of investments

Treasury invests in highly liquid financial instruments with minimal market and credit risk. To minimise the counterparty default risk, placements may only be executed with counterparties of adequate creditworthiness. Credit quality is expressed through an internal rating assigned by the Credit department and described in the Credit Policy[1].

The policy requires that 90% of available funds are placed on a secured basis, i.e.:

(a) deposited with central banks or

(b) through arrangements that ensure the collateralisation of cash with highly liquid assets.

If no access to a central bank's deposit facility has been granted or if no other alternative secured instruments is available Treasury places uninvested funds among several commercial institutions to avoid concentration risk.

[1] Accordingly, placements may only be executed

- with counterparties with a minimum internal rating of 'D' which corresponds to an external rating of 'BBB+/BBB' (Fitch / S&P) / 'Baa1/Baa2'(Moody´s) or
- with counterparties exceptionally approved by CBL's/CBF's Executive Board

Principle 17: Operational risk

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

Key consideration 1: An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

Identification of operational risk

CBF established appropriate systems, policies, procedures and controls which are described within the adopted Risk Management framework. CBF applies a five-step process for risk management, described in Principle 3 above. The risk identification involves, to the most complete extent possible, all operational risk issues relevant to CBF, as well as risk drivers. Risks may arise as a result of internal activities or external factors and the risk examination must be performed with regard to existing or new processes, when concluding new business or entering new service areas. The identification can be reactive, following an operational risk event, but it should also be pro-active, based on regular reviews of processes in order to identify weak areas, or based on scenarios taking into consideration all potential sources of issues These following four risk classes have been defined to suit CBF's business model best.

CBF distinguishes between four main operational risk classes:

- **Availability risk:** This risk class contains losses arising from disruption of service delivery due to unavailability of technical or human resources, f.ex. disruption or unavailability of IT systems, staff unavailability, f.ex. due to an epidemic, or unavailability of facilities, both internal and external factors are considered.
- **Service deficiency:** This risk class covers losses arising from impaired processes or execution due to product, process or execution deficiencies, f.ex. internal human errors or omissions, supplier deficiencies, product flaw, or loss or destruction of customers' assets. The biggest risks for this category are internal human errors; however, CBF could also suffer from an operational loss due to human errors in external sources' internal procedures.
- **Damage to physical assets:** This risk class comprises losses arising from damage to physical assets of CBF, f.ex. due to natural hazards, accidents, terrorist attacks, or sabotage. Risks such as terrorist attacks with potential far reaching destruction of facilities or killing of some mission-critical people are assumed as possible threats to CBF.
- **Legal risks and risks associated with business practices:** This risk from legal offences include losses that could arise as a result of non-compliance or inappropriate compliance with new or existing laws, losses from inadequate contract terms or from court decisions not adequately observed in customary business practice, as well as risks from fraud. Violations against laws / regulations and other compliance risk related topics represent the biggest threat to CBF. CBF has exposure to damages including legal costs, monetary penalties including fines, disgorgement of gains and/or forfeiture of assets and potential business interruption or other consequences arising from requirements of cooperation or other measures imposed by the regulating entity.

The categorisation of operational risk into risk classes and risk drivers supports the internal collection of data on operational risk events. As well as the scenario analysis exercises, and the regular collection of KRIs.

IT tools support the identification, monitoring and management of operational risks and ensure the technical environment of CBF remains stable (e.g. ensure processing, monitoring of the infrastructure, etc.). With regards to operational risk, CBF is, in particular, using IT tools and processes to manage and monitor its systems to minimise operational risks for the settlement systems.

Furthermore, CBF has in place a wide range of various controls set up with the aim to minimise the impact of sources of operational risk. The control environment includes IT controls themselves but also covers several different other types of controls (e.g. cybersecurity, local access management, physical access management, stress testing/Value-at- Risk, BCM, project management process, 4 eyes principle, etc.). Some of these controls are detailed and documented in the "Mitigation actions and controls" section of CBF's operational scenarios which lists information on controls and procedures (which may also be supported by IT tools). The other control types are further detailed in the policies and procedures used by CBF to minimise the impact of sources of operational risk.

After the risk identification step, the risks are notified to Clearstream Risk Management:

⇒ Notification stage: All risks are centrally recorded. All organisational units and individual employees must timely notify Risk Management on risks which they have identified and evaluated. Depending on the materiality two forms of notification can be distinguished: Periodic and ad hoc.

The next steps are:

⇒ Assessment: All operational risk events or potential new risk developments are assessed qualitatively or in financial terms. The assessment of an incident or a potential risk development aims at quantifying the risk in financial terms using the "Value at Risk" methodology and comparing the result with the available risk cover. It takes into account mitigation measures currently in place.

⇒ Controlling/management: The most adequate treatment is applied to the identified risk in order to mitigate them or actively control/manage them. In general, mitigation encompasses the following: risk avoidance, risk reduction, risk transfer and intentional risk acceptance. All organisational units and employees must perform risk control, implement mitigating action, and monitor these actions according to the established processes.

The last stage of the process is monitoring and reporting of the identified risks to the Executive Board.

⇒ Monitoring/reporting: The Executive Board is at least on a quarterly basis and in addition on ad hoc basis – if required - and consistently informed about material risks and the related risk control measures.

CBF employs several policies, processes and controls that are designed to ensure that operational procedures are implemented appropriately:

- Risk strategy
- Operational Risk Handbook: The objective of the Operational Risk Handbook is to give a comprehensive description of the processes and methodologies that constitute CBF's AMA.
- Operational Risk Procedure: This procedure describes the approach and major instruments applied within the process of managing operational risk on a high level. Furthermore, CBF has established a segregation of duties and follows the three lines of defense governance concept for operational risk management (the Business as first line, the Risk Management function as second line and Internal Audit as third line).

  CBF also conducts reviews of its risk management framework to identify the necessity or possibilities for amendments and improvements. This is performed at least once a year in the context of the Internal Capital Adequacy Assessment Process (ICAAP).

Change management and project management policies

CBF follows a stringent project management process which consists of three sub processes:

- Project planning and initiation, including the creation of a Project Charter, a Project Management Plan, and other key project management deliverables.
- Project monitoring control and reporting: This describes the series of activities involved in managing a project against its approved project plans, managing scope and costs, managing relationships with suppliers to the project, managing stakeholders and communications, risks, issues and dependencies, project change, configuration management and quality, as well as reporting performance.
- Project closure: This describes the series of activities involved in closing a project appropriately, inclusive lessons learnt.

A dedicated Market Member Readiness (MMR) team is involved in projects from their initial set up. Their task includes the review of the Business Requirements Analysis (BRA) to identify any impacts on customers and other market participants, with the objective to communicate these as early as possible and ensure the readiness of these external shareholders. This avoids the risk of customers and other external stakeholders not being able to perform their business activities with CBF.

Software change management takes place according to a defined and documented process. The purpose of this process is to control changes to the application software in an organised manner by implementing approved changes with minimal disruption. Its scope covers the full life cycle of changes, including the correction of software incidents, requests for software change, approval of the change, development activities to realise the change, the initiation of software configuration management activities, testing activities and approval to launch the change in production environment. The standards mentioned above and used by us stipulate minimum requirements for availability and service continuity management.

As per our methodology processes, an acceptance, being functional and/or technical, is always mandatory for any change or fix in order to guarantee that the change functions correctly in a replica of the live environment, performs in the manner that was expected, does not cause degradation of other systems, and meets the needs of the business. This is complemented by:

- A system and technical acceptance test: System performs as per technical requirements; no negative impact on other systems; performance check. This can involve testing with external parties, f.ex. depositories.
- A business acceptance test: Development is according to business requirements.

Key consideration 2: An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

Roles, responsibilities and framework

CBF has adopted a two-tier board structure and is therefore currently managed by the Executive Board which is supervised by the Supervisory Board. Effective and efficient risk management is vital to protect CBF's interests and it enables CBF to achieve its corporate goals and safeguards its continued existence.

The Executive Board of CBF approves and owns the Clearstream Risk Strategy according to the bylaws of the legal entity in Germany. The CBF Supervisory Board and CBF Risk Committee receive the Risk Strategy for acknowledgement.

The CBF Executive Board is ultimately responsible for the risk strategy of CBF. The risk strategy reflects the risk appetite, which defines the maximum loss the Executive Board is willing to take in one year, the tolerance in the light of the risks, as well as the performance levels aspired. The CBF Executive Board ensures that the risk strategy is integrated into the business activities throughout CBF and that adequate measures are in place to implement the strategies, policies and procedures. The Executive Board holds the responsibility to determine and communicate the risk appetite and that the risk management framework is adapted accordingly.

The Executive Board of CBF has the ultimate responsibility to ensure a strong risk management culture. This includes the ultimate responsibility for risk management, including operational risk and the determination of an appropriate level of aggregate risk tolerance and capacity. The Executive Board also establishes a risk management framework that is consistent with the risk tolerance and capacity.

The Executive Board is timely and consistently informed about material risks and the related risk control measures. The reporting is an essential part of Risk Management and is designed to give the Executive Board and Supervisory Board timely and accurate information about the risks that CBF has encountered. All relevant data and information are collected, assessed and prepared by Clearstream Risk Management.

The risk management framework of CBF, as stated in the Operational Risk Procedure, aims at ensuring that all threats, causes of loss and potential disruptions are properly identified as soon as possible, centrally recorded, assessed (that is, quantified in financial terms to the largest possible extent), reported in a timely manner and consistently, together with suitable recommendations to the respective Executive Board, and controlled.

The risk management framework is constantly challenged by internal auditors, external auditors and regulators. In addition, to make sure that operational risk management approaches and systems are up to date, Risk Management's employees are members of different associations of risk management professionals that are engaged in the further development of respective operational risk topics. They regularly check for and take part in risk management conferences or seminars in this area.

Key consideration 3: An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

From a business perspective, the operational reliability objectives are documented within a large set of key performance indicators (KPIs) that allow a quantifiable and qualitative view of service delivery provided by Business Operations. Such KPIs deliver information on effectiveness, efficiency, degree of automation, turnaround times, operational quality and operational risks for business processes. The operational reliability objectives (non-exhaustive list of) are:

- Automate processes and operate in STP mode wherever possible, i.e. in the areas of income, corporate actions, tax, reconciliation
- Reduce operational errors to a minimum in all areas
- Provide competitive deadlines
- Reduce reversals to a minimum
- Set up new customer accounts as soon as possible
- Meet the Recovery Time Objective (RTO) of 2hours for time critical systems
- Provide self-explanatory documentation to decrease number of calls to Client Services

The before-mentioned KPIs are both of qualitative and quantitative nature and can be classified in 3 different categories, those that focus on:

- Quality and risk aspects
- Capacity and volume aspects
- Process efficiency aspects

Key consideration 4: An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

All of these reliability objectives aim at delivering services to customers at the highest level possible while ensuring a robust service resilience. This also includes the operation of systems at defined service levels.

CBF ensures continuously highest levels of system availability for the core systems. (Occasional downtime was scheduled on weekends for essential system maintenance.) The Creation and CASCADE platforms are designed to cope with settlement volume peaks 50% greater than average daily activity. Higher peaks can be directly handled by assigning further infrastructure capacity.

CBF has a monitoring of volumes in business and IT in place. Volume information is collected on a daily basis. This is supported by the monitoring of KPIs and deadlines, as defined in the service level agreements. In case of deviation, an analysis is performed. If deviation is due to increasing volumes (changes of the market environment), capacity increases are performed immediately and backed by capacity on demand arrangements with infrastructure providers in order to ensure the performance. Changes follow the IT change management process including impact assessments and subsequent stress tests if necessary.

CBF monitors the capacity of its systems to ensure that a capacity buffer is maintained. This key internal indicator, known as "headroom", is the driver for performance improvements or upgrades necessary to sustain this capacity buffer. If needed, systems are upgraded. Each month, a capacity management report including volume trends analysis is produced. Specific thresholds have been defined as an indicator to upgrade IT systems.

From a control perspective, during each application audit, KPIs and latest capacity management reports are reviewed and compared with the latest incidents reports. The capacity management process itself is also part of the audit plan.

Thanks to a comprehensive change management and release management process, IT systems go through a structured development and testing process before being put into production. Robust tests are also performed throughout the lifetime of the IT systems - this includes, but not limited to, whenever material changes are implemented to the system or when the system has suffered a major operational disruption, as applicable on the basis of the underneath root cause.

CBF practices a BCM risk mitigation and avoidance strategy by proactively preparing, identifying risks, assessing the risks and taking preventive precautionary measures to address and mitigate such adverse effects in infrastructure or data centre services in the form of developing and upholding business continuity and disaster recovery procedures. By maintaining a dual data centre strategy and keeping all key components redundant and identical between the two different data centres for the Clearstream-hosted applications, it is warranted that mainframe servers operated under full sysplex, enterprises disk storage systems and the tape library infrastructure including peripheral hardware such as Storage Area Network (SAN) and network components are always fully operational in both locations. This is perpetuated by continuously employing both data centres with running production and test workloads. Running production workloads in both locations will always fully allocate and demand the underlying infrastructure in its entirety for both data centre locations.

Business volume is monitored throughout the day and during night-time batch operations. If there is a significant increase in business volume systems are equipped with additional headroom of unallocated resources to accommodate higher workloads.

Business Operations has a high level of process automation and therefore a massive and sudden jump of settlement volumes has only a limited impact on Business Operations. Mitigation actions to cope with it will be mainly limited to resources measures like extended working hours, temporary allocation of resources from non-impacted business areas to impacted areas.

Key consideration 5: An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

Physical Security

CBF's physical security objectives are defined in DBG's corporate security policy and Physical Security Standard.

Various sources, such as internet and media research, security information providers and governmental institutions are consulted when evaluating physical vulnerabilities and threats. Physical vulnerabilities and threats, resulting risks thereof and adequate counter-measures are defined on an ongoing basis.

A major component of the defined processes derived from the corporate security policy is the group-wide security manual which describes operational and administrative tasks, segregated in a general part and a location specific part. In addition to this security manual, various other processes and procedures are established to ensure a highest possible safety for people and assets.

All processes are subject to permanent monitoring and verification which is guaranteed amongst others by security assessments, intelligence and monitoring, risk analysis, internal and external auditing, penetration testing as well as awareness campaigns and trainings.

The main corporate security elements listed hereafter.

- An access control system is in place for all premises and respective logs are kept. A card access system is in place for all areas, monitored 24/7. There are additionally armoured doorways to high sensitivity areas CCTV cameras are installed inside and outside the buildings. They operate in real time 24 hours, 7 days per week. Security guards are on site 24/7 and all entrances are checked by cameras.
- A Security Management System (SMS) is connected to the fire central and its fire detectors. Furthermore, the SMS is connected to an intrusion alert system. Surveillance of technical installations (temperature etc.) is also installed. Visitors are required to sign in at reception providing valid proof of identity, and must be

accompanied by staff onsite. The building is therefore restricted to authorised personnel and accompanied visitors.

All projects have to follow the Corporate Security policy framework to address sources of physical vulnerability as described in the security manual, like the monitoring of third party providers (f.ex. access to buildings), Information Security and data protection principles, fire protection guidelines, etc.

Information Security

Addressing information security, CBF has implemented a comprehensive Information Security Framework (ISF). The ISF is based on the overall Information Security objectives and specifies the hierarchy of documents to define IS control requirements along the assets to be protected and their implementation as well as their surveillance to reach and maintain an adequate state of Information Security at CBF based on their risk appetite and disposition. Consequently, the ISF serves as the foundation for a consistent and homogenous implementation of the ISMS. Furthermore, the ISF defines consistent terms relevant for IS Management and specifies the scope and applicability of the rules and requirements. It is approved properly, published and communicated to employees and stakeholders.

The ISF is based on ISO 27001/ 27002/ 27005 Standards and considers relevant regulatory requirements such as MaRisk/BAIT, CIRCULAR CSSF 12/552 and CSDR.

The following IS objectives as defined in the ISF are key to secure CBF's corporate assets, to support CBF strategy and operations (business enablement), and to comply with relevant laws and regulations:

- Confidentiality: Enabling authorised access to information and associated assets when required.
- Integrity: Guaranteeing the accuracy and completeness of information and processing methods.
- Availability: Enabling access to information and associated assets when required.
- Authenticity: Ensuring genuineness and reliability of information.

There is a dedicated Chief Information Security Officer, who reports to the Executive Board and supports the colleagues in business, IT, and especially CBF Information Owners to adequately protect their information and corresponding facilities from significant loss and to be compliant with legislative, regulatory, and contractual requirements.

The ISF includes Information Standards which set and describe the security controls which represent an adequate protection for CBF dependent on the information classification. Deviations are assessed for adequate risk management decision. Schemes for information classification, risk assessment and risk management are defined and maintained.

Policies and standards are reviewed on a regular basis, at least annually.

IT Operations is in charge of operating the IT environment securely. This includes, but is not limited to, the installation, configuration and maintenance of IT systems and applications, handling of related processes, detection of suspicious events, handling of incidents, user and change management, monitoring and assessing risks due to technical evolutions, and escalation of risks to the information owner.

Group Security is in charge of several 1st Line of Defence Information Security processes, e.g. Access Control, Privilegded Access Management, Vulnerability Management, Penetrationtest coordination, Information Risk Assessments and Risk Register, Inf.Sec. Incident Management / Computer Emergency Response Team (CERT), and many more.

Security tools are in place and cover amongst others access control, intrusion prevention and detection, denial of service, vulnerability scanning (for identifying potential vulnerabilities on IT applications and underlying IT infrastructure), events logging and monitoring, etc.

The Computer Emergency Response Team (CERT) is in charge of analysing pro-actively potential impacts of major cyber incidents and determining a regularly updated picture of cyber situational awareness. The CERT is also in charge of managing information security events and incidents.

Tests are performed for instance before the implementation of new processes and tools, regular penetration tests are performed ensuring the effectiveness of the controls in place.

Key consideration 6: An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

Objectives of business continuity plan

Clearstream strives to provide products and services with utmost reliability. It thus gives the highest importance to the resilience of its business to safeguard it against incidents and disasters, as the unavailability of core processes and resources represents a substantial risk for Clearstream and potential systemic risk to the markets as a whole. Therefore, CBF aims to satisfy itself and the markets of its ability to continue to operate under adverse conditions or in the face of unexpected events or disasters.

To achieve that, CBF has developed business continuity measures to address the loss of significant numbers of staff in one location, including dispersed operations and business transfers.

CBF's Business Continuity Management (BCM) policy states that in case of business interruption, operations must be resumed within appropriate time scales in order to:

- Safeguard CBF from significant losses, maintain revenue generation and shareholder value.
- Maintain customer confidence, market stability and liquidity and minimise systemic risk.
- Maintain management control, fulfil contractual obligations and regulatory compliance.

The policy further defines that the functions, which are indispensable for the critical daily operations in view of the above objectives, are called mission critical and must be resumed within a Recovery Time Objective (RTO) of 2 hours.

In accordance with the policy, the business continuity plans define the processes and resources including systems and the associated RTO, thereby observing an RTO of 2 hours for mission critical functions. Further RTO classes have been defined for functions which can be suspended for up to 24 hours, up to 1 week or more than 1 week.

The business continuity plans address the unavailability of systems, workspace, staff and suppliers in order to ensure the continuity and rapid resumption of the critical operations in cases of major or wide-scale scenarios.

Design of business continuity plan

Business Continuity Plans (BCPs) are a collection of information, guidelines and procedures which are compiled, developed and maintained by the relevant organisational units for use in the event of a business disruption, an incident or a crisis to maintain the continuity of critical operations.

Functions which are indispensable for the critical daily operations are called "mission critical" and must be resumed within a Recovery Time Objective (RTO) of 2 hours.

Each mission critical Function of Clearstream must establish, implement, develop and maintain a BCP to describe its time critical business activities, associated business recovery requirements and business recovery action plan.

The BCM framework, and associated BCPs, are designed to be as comprehensive as possible. Events which would lead to the unavailability of the key resources (e.g. workspace, IT systems, staff, suppliers) do fall within the scope of the Clearstream BCM framework. As a matter of fact, continuity plans deal with the direct effects of an event (workspace unavailability, staff unavailability, etc.) rather than the specific root cause (e.g. natural disaster, pandemic situations, physical attacks, intrusions, terroristic attacks, etc.) as all these events would ultimately lead to the unavailability of facilities, staff, suppliers or technical equipment.

Interface to IT Disaster Recovery

Begin IT a fundamental resource to enable effective and smooth operations of Clearstream critical operations, an interface to IT Disaster Recovery has been established.

IT Disaster Recovery plans are established by the respective Function operating the different technology clusters to document the IT related infrastructure recovery, restoration and continuity to respond to IT that significantly impact Information and Communication Technology.

Interface to Incident & Crisis Management

An Incident and Crisis Management process is in place to facilitate the co-ordinated and rapid reaction to an incident/crisis in a controlled and effective manner, in order to contain and resolve the incident, minimise business and market impact and return to normal activity as quickly as possible.

Incident Managers are appointed as the single points of contact in their respective business areas in case of incidents and disruptions. This also ensure the proper escalation up to the Executive Board and Executive Committee levels.

An alert system classifies incidents and disruptions according to colour codes relating to a respective level of business impact. The alert system ensures an adequate response to incidents and crises, including the potential activation of business continuity plans. The system also provides for the timely notification of relevant internal and external parties, including:

- Communication to customers.
- Communication with external suppliers, other FMIs.
- Communication to the market, as applicable
- Communication to regulators, as applicable

Secondary site

Secondary Site – Business and IT Operations

Clearstream's operativity is distributed across several processing sites around the world, in particular: Luxembourg, Frankfurt, Cork, Singapore and Prague. Geographical distance between the mentioned operational hubs ensures diversity in terms of risk profile among processing sites and enables risk mitigation. Processing sites are fully equipped in terms of capabilities, functionalities, staffing arrangements and operational at any time, to ensure that the required RTO can be met in case of incident or crisis.

In addition to the distributed processing mentioned above, in Luxembourg, Cork and Frankfurt backup facilities provide alternative office space for Clearstream mission critical units in the event their normal office location would become unavailable. As per the processing sites, the backup locations are fully equipped in terms of capabilities, functionalities, staffing arrangements and operational at any time, to ensure that the required RTO can be met in case of incident or crisis.

Secondary Site – Data Centers (DC)

The systems architecture is designed to satisfy high availability requirements. The systems infrastructure is duplicated between two distant data centers. Components such as network communications, servers and storage are running in parallel in the two centers. Core systems are clustered and load-balanced between the two centers to allow quick take-over in case of failure. Production data is synchronously mirrored in real-time between the two centers, ensuring the preservation, online availability and integrity of transaction data following a disruption without data loss. In addition, data can be restored from off-line data back-ups which are taken at different intervals during the production cycle and are duplicated on libraries located in both data centres.

A failover mechanism ensures that no data is lost. In the event of one component becoming unavailable, the "remaining" data centre can cover workloads on a normal level. Data centre capacities and normal load usage are designed and dimensioned to handle full-load operations alone.

Review and testing

BCP Testing

Business Continuity Plans (BCP) must specify how critical services, processes and resources will be reinstated to a predetermined level within pre-defined timescales after a business disruption, an incident or crisis affecting one or several of the key resources. The implemented solutions are tested or exercised regularly to ensure its effectiveness, functionality and to provide assurance that a real incident could be successfully managed. Tests and exercises further provide awareness and training to staff members involved in the execution of activities.

Therefore, Clearstream has adopted a comprehensive BCM testing framework based on key principles and with ambitious BCM testing objectives in order to be as close as possible to real life, in terms of definition of scope and scenarios, and be comprehensive, in terms of coverage of critical resources, procedures and plans.

The test objectives are based on the following criteria:

- Functional effectiveness: validate that arrangements are technically functioning.
- Execution ability: ensure that staff are familiar and knowledgeable in the execution of plans and procedures.
- Recovery time: confirm that plans and procedures can be executed within the defined recovery time objective.

Business Continuity Plans are tested on a regular basis, at least annually, either announced or unannounced to the participants and up to several business days to provide best possible assurances of the BCM preparedness.

As BCP tests are taking place during normal business hours, in live production environment to be as close as possible to real life, customers, external suppliers and other FMIs are always indirectly participating to the BCM tests.

Examples of tests which are conducted are:

- the "workspace unavailability tests" which simulate the loss of one building or location and require the relocation of staff to the secondary site or activation of business transfer plans to other Clearstream locations, depending on what is defined in the respective unit recovery plans.
- the "staff unavailability tests" simulate the loss of all staff in one location and require the transfer of activities to staff of units in other Clearstream locations, as defined in the plans.

The Incident & Crisis Management process is also tested as part of major/large-scale tests to ensure effectiveness of the end-to-end recovery process.

Test results are consolidated as part of BCM test reports which are then provided to key stakeholders.

IT DR Testing

The systems unavailability tests are planned by the respective IT department and simulate the loss of one data centre. The disaster is simulated by isolating one data centre from the network. All systems are restarted in the second data centre and the capacity and capability to run processing on just one date centre is validated. Customers, CSDs and/or depositories/agent banks as well as critical service providers (CSPs) are invited to participate in this test

Review and continuous improvement

CBF satisfies itself of the business continuity preparedness of the linked FMIs (depositories/agent banks) by collecting annually information on their business continuity policies, planning and infrastructure including description of the incident and crisis management, training, awareness, testing and pandemic preparedness. The Business Continuity and disaster recovery plans of the CSDs and/or depositories/agent banks are also reviewed as part of the due diligence process.

Key consideration 7: An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.

Risks to the FMI's own operations

Risks relating to key participants:

Potential risks caused by key participants are mainly related to operational problems of the key participants themselves and have no direct and significant impact on CBF. Nevertheless, this may pose risks to their counterparts and subsequently pose risks to CBF's settlement systems efficiency. To appropriately identify, monitor, manage and report on the key participant risks the CSD has implemented a key participant procedure that primarily focuses on:

- the identification of key participants and their related material dependencies and

- the performance of periodic enhanced key participant due diligence reviews (which assesses key participants risk control and management capacities to address and manage fraud, cyber, information security, business continuity, disaster recovery, infrastructure technology and application system risk elements)
- monitoring potential key participant operational risk exposures and assuring the appropriate mitigation measures
- ensure their key participants have sufficient measures in place to properly manage and address the risks they pose to them and to thereby minimise to the maximum extent possible the potential risks posed for the CSDs, other participants and thus the market as a whole.

Additional measures include:

- Clear and stringent criteria to become a CBF participant; please refer to the website page "Becoming a Clearstream customer" and the Customer Access and Acceptance Policy published on this page, at the following link: https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer
- Continuous monitoring of system usage and the global settlement efficiency level
- Detailed Market Link Guides documenting the established rules for participants, market practice across the Clearstream network and instruction specifications as well as potential risks
- Choice between CBF proprietary connectivity or SWIFT
- Customer training support
- Clear and timely customer announcements for system changes with impacts on customers
- Periodic enhanced due diligence on identified key participants

Relating to risks posed by CBF to others:

The CSDs interconnectedness to other Financial market infrastructures (e.g. stock exchanges, CCPs) in principle makes substitution difficult thereby increasing its interdependencies and subsequent potential operational and financial risks that could be posed to others as a whole.

Additional measures include:

Due diligence reviews performed on the CSD by its customers and service providers to assess their risk and regulatory control framework capacities put in place to manage all related risks. A major element of these reviews is that CBF shares relevant information with other entities that allow them to adequately assess the risks posed to them by CBF.

To mitigate risks, CBF has implemented many layers of precaution and protection of its processes and services (business continuity plans regularly tested), and operates a comprehensive risk management framework built on established standards and best practices.

On an annual basis Clearstream Risk Management issues the Pillar III report where it discloses company's current risk situation to the public.

Outsourcing of critical operations

CBF in the provision to its customers is using a system of mainly intra-group outsourcing agreements to work effectively and efficiently. All entities within the group are subject to the same requirements on reliability and contingency. The service delivery between two Clearstream entities is subject to a framework agreement and a formal service definition agreement ("SDS"). The latter also defines qualitative requirements (e.g. service features, quality and performance standards, escalation mechanisms, etc.). The SDS also contain Key Performance Indicators (KPIs) to measure the quality of the respective service.

Any outsourcing is to be based on an initial analysis of the proposed outsourcing (including a pre-assessment, initial outsourcing risk assessment) ensuring compliance with at least current standards as well as fulfilling all legal obligations (i.e. being compliant with the existing regulation, ensuring banking secrecy, data protection requirements, etc.).

The outsourced services and documentation are constantly monitored, and a regular risk assessment is done according to the Outsourcing Policy. The Outsourcing Coordinator, as part of the Central Outsourcing Management, discusses the initial score of the risk assessment with the other second line of defence functions, which are

Compliance, Risk Management, Information Security, Data Protection and Internal Audit (as third line of defense). After the review of each participant the Outsourcing Coordinator informs CBF's Executive Board of the results.

Apart from the Central Outsourcing Management, Clearstream's Risk Management might in regular reviews identify several operational and business risks that could arise from service providers, as well as from other FMIs. The outsourced services are included in an appropriate manner in the operational risk management framework.

Principle 18: Access and participation requirements

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

Key consideration 1: An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.

Participation criteria and requirements

Introductory Remark: Principle 18 has been addressed by Art. 33(1) Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directive 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 (CSDR). Accordingly, CBF is, inter alia, required to have publicly disclosed criteria for participation that allow fair and open access for all legal persons that intend to become participants. Such criteria shall be transparent, objective, and non-discriminatory so as to ensure fair and open access to CBF with due regard to risks to financial stability and the orderliness of markets. Criteria that restrict access shall be permitted only to the extent that their objective is to justifiably control a specified risk for CBF.

Art. 33(1) CSDR and the mentioning of "to become participants" builds upon the definition of "participants" pursuant to Art. 2(19) CSDR and Art. 2 point (f) of Directive 98/26/EC. Consequently, access to a CSD and its settlement services are limited to participants as defined by Directive 98/26/EC but with the possibility of Member States of the European Union to designate further participants pursuant to Art. 2(f) of Directive 98/26/EC.

Art. 33(3) CSDR requires to deny access only where duly justified based on a comprehensive risk assessment. Moreover, Art. 89 Commission Delegated Regulation (EU) 2017/392 of 11 November 2016 (DR 2017/392) further stipulates the criteria and risks on which basis CBF may refuse access to a requesting party such as a participant or another CSD (slightly different rules may apply for deciding on a request for access by an issuer, a CCP or a trading venue). Accordingly, CBF shall only consider legal risk (as defined by Art. 89(2) DR 2017/392, financial risk (as defined by Art. 89(7) DR 2017/392) and operational risk (as defined by Art. 89(11) DR 2017/392) when conducting the risk assessment. In addition, requirements from rules on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing and financial sanctions are taken into account. The regulatory requirements under CSDR and DR 2017/392 mentioned above are applicable to CBF following its authorisation pursuant to Art. 16 CSDR on 21 January 2020 and a Customer and Access Acceptance Policy (CAAP) has been established and published on Clearstream's website: https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer.

For access to, and participation in the settlement system, CBF considers access requests by applicants who are regulated financial institutions (credit institutions and investment firms), sovereign and supranational institutions (public authorities), and CCPs (trading venues have access rights to allow the trade feed generally to become settled via a CSD). CBF may however accept unregulated entities (other than sovereign and supranational institutions) as eligible for the limited purpose of receiving collateral from participants in the settlement system. Pursuant to No. 4.4. CAAP, CBF has defined criteria for persons who are prohibited from participating in the settlement system (e.g. natural persons, residents of any country that is the subject of a "call to action" by the FATF Task Force, participation by persons causing CBF to breach sanction regulation). Lastly, CBF does not foresee indirect participation.

Detailed Process Description: As a first step, CBF ensures that the applicants are validly incorporated and existing under the relevant jurisdiction of incorporation and have the capacity to enter into agreements with CBF and to perform the activities provided therein.

In this respect, CBF is requesting from its customers to be provided with the following documents together with the account application forms:

1. the articles of association and, if the articles are not available in German, English or French, a legal English translation
2. proof of regulation, e.g. business license or official authorisation to conduct (financial) business; if the license is not available in German or English, a legal English translation needs to be provided
3. the excerpt of the applicant's register including certificate of residency
4. the applicant's most recent audited annual reports. In the case, the applicant is a subsidiary, the latest audited annual report of the parent company
5. Due Diligence Questionnaire (Enhanced Due Diligence Questionnaire and ISSA Questionnaire or Financial Crime Compliance Questionnaire or the Wolfsberg CBDDQ or FCCQ) duly filled in and signed
6. the FATCA self-certification form, duly filled in and signed
7. the entity tax residency self-certification form duly filled in and signed
8. the controlling persons tax residency self-certification form, duly filled in and signed (if applicable)
9. the US Patriot Act certification (if applicable)
10. ownership structure / shareholding structure: indicating the natural person(s) who owns or controls 25% or more of the shares and the main shareholders who own 10% or more of the shares
11. organisational chart (diagram of the high-level management functions)
12. copy of the ID-card of the Ultimate Beneficial Owner/notional Beneficial Owner (if applicable)
13. copy of the ID-card of the person acting on behalf of the customer/proxy holders (if applicable)
14. a general, complete and up-to-date list of all of the applicant company's authorised signatories with specimen signatures.

Please also refer to the following page on Clearstream's website:
https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer.

Access to trade repositories

Not applicable to CBF

Key consideration 2: An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.

Justification and rationale of participation criteria

CBF's participation criteria are geared towards avoiding undue legal, financial and operational risk for the safety and efficiency of settlement systems CBF operates.

When assessing legal risks, CBF will take into account in particular the following criteria: (a) compliance with the legal requirements for participation in the securities settlement system, including any required legal opinions or legal arrangements; (b) assurance with the rules on the confidentiality of the information provided through the securities settlement system, (c) where a party is established in a third country, either of the following: (i) party is subject to a regulatory and supervisory framework comparable to the regulatory and supervisory framework that would be applicable to a party if it were established in the Union: (ii) rules of the CSD concerning settlement finality referred to in Art. 39 of CSDR are not enforceable in the jurisdiction of a party.

When assessing financial risks following a request for access by a party, CBF will take into account whether a party holds sufficient financial resources to fulfil its contractual obligations towards CBF. CBF will also assess the financial resources of a party in order to ensure that it has the capacity to contribute to a sustainable level of settlement efficiency. As to the financial conditions of a potential new customer, the applicant's credit standing is reviewed taking into account various qualitative and quantitative factors such as operating environment, liquidity, capitalisation, asset quality, profitability, financial support by the parent, etc.

When assessing operational risks following a request for access, the following criteria are relevant: (a) the operational capacity to participate in the settlement system, including connectivity, communication and cyber risk considerations; (b) compliance with the risk management rules (c) existence of business continuity policies or disaster recovery plans (d) potential changes of its operations and risk management procedures in order to ensure the smooth functioning of the settlement system.

As long as the applicant is meeting the criteria defined above, and once the application forms are validated internally, CBF's participants will have in principle access to the full range of services offered by CBF, under the specific terms of each service, subject to credit, operational and legal risk assessments that in some cases are product-specific. For example, a credit vote is given to assess the financial risk involved with a party requesting access and specific assessments are being regularly made for the granting of credit limits for customer relationship.

CBF cannot have relations with indirect participants. Indirect participants would be the underlying client of a customer of CBF whose contractual relation with and contractual obligations to is unique to the CBF customer. Such parties would therefore only benefit from the services CBF offers through CBF's customers, their own custodians, under the same terms. CBF endeavours to identify the participants' clients responsible for a significant proportion of transactions processed by the company and the participants' clients whose transactions, based on their volumes and values, are significant relative to the respective participants' risk management capacity.

CBF is considering the risks that an actual or prospective customer may represent and ensures that the applicants and the customers meet appropriate legal, financial and operational requirements to allow them to fulfil their obligations.

Least restrictive access

The implementation of the above-mentioned access criteria are also geared towards having the least-restrictive impact on access that circumstances permit: (i) a non-regulated party may be granted access for the limited purpose of receiving collateral from participants (ii) enhanced legal, financial operational risk assessment are applied for certain products and a party may therefore be denied access to certain products only, while access to the settlement system is generally granted. Additional risk assessments are performed when existing participants seek access to higher risk products. This is typically the case when an existing customer will request the opening of an additional account for a specific purpose. The whole relation will be considered in the decision to open or not such account. Such review process will trigger the review of the level of access restriction for the services offered, and the different requirements that may be imposed, or lifted, on the customer.

Essential required information on CBF's products and services is publicly available in the Customer Handbook, at the following link:
https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/customer-handbook

The Customer Handbook for the OneClearstream customers is available at the following link:
https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-oneclearstream/customer-handbook

For the CBF-i activity, customers should refer to the CBL Customer Handbook available at the following link:
https://www.clearstream.com/clearstream-en/keydocuments-1-/icsd-1-/customer-handbook

Disclosure of criteria

Please refer to the following page on Clearstream's website: https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer. Please note that Clearstream's Customer Access and Acceptance Policy is also published on this website.

Key consideration 3: An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.

Monitoring compliance

CBF has the obligation to ensure that the documents, data and information regarding a business relationship are kept up to date at all times. According to section 10 (1) no. 5 of the German Anti-Money Laundering Act, CBF must continuously monitor the business relationship and the transactions carried out within this relationship. In scope of the ongoing monitoring CBF must ensure that the relevant documents, data or information are updated at appropriate intervals considering the level of money-laundering and terrorist financing risk. Therefore, a periodic review cycle applies to all customer relationships and accounts and a prescribed set of documents are collected on an ongoing basis according to the Customer Due Diligence Requirements procedure. Such documents are also collected to review participation requirements and initial risk assessments (e.g. re-collection of proof of regulation, extract from company's register, annual reports, financial statements). The frequency of the review cycle depends on the risk classification of the customer.

Suspension and orderly exit

The termination of business relationship is stipulated in number VIII of the General Terms and Conditions of CBF (GTCs) in line with regulatory requirements. Possible suspension of the service to the participant is covered by number VI and XXII of the GTCs.

Principle 19: Tiered participation arrangements

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

Key consideration 1: An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.

Tiered participation arrangements

CBF has contractual relationships covering the delivery of its products and services, in particular settlement and custody services uniquely with its direct customers. It therefore maintains only direct participation arrangements. CBF neither opens accounts for, nor recognises any indirect or tiered participants. Hence, no material risks to CBF can arise due to the absence of any tiered participation arrangements.

CBF owes a duty of redelivery or restitution of assets deposited by a direct customer uniquely to that customer or to its legal successor even if CBF is aware that its direct customer owes generally corresponding duties to its clients and that its direct customers routinely deposit securities which are ultimately owed to other intermediary firms and to investors.

CBF's direct customers are obliged pursuant to number V (3) of CBF's General Terms and Conditions to segregate securities deposited for their own account (proprietary assets) from securities deposited on behalf of third parties (client assets). The key feature of the arrangements governing the deposit of client assets is that each customer account opened in CBF's system must be designated by its direct customer into one of three categories:

1. Proprietary
2. Client – Segregated
3. Client – Omnibus

Where a client account is segregated, the CBF direct customer is required to disclose to CBF the identity of its underlying client, i.e. the party for which the securities were deposited. The account name may or may not incorporate this disclosure at the discretion of CBF's direct customer.

Where a client account is opened in omnibus form, CBF's direct customer is commingling the assets of several of its underlying clients. CBF requires that no single interest in a client omnibus account should exceed 25% of the total value of assets deposited on that account over time as represented by its direct customer. When a single interest does exceed that threshold, CBF requires the direct customer to segregate the corresponding assets onto a client segregated account.

On specific occasions, CBF has a right to collect information on its customer's clients:

- CBF can gather information from CBF key participants' clients as defined by Art. 67 DR 2017/392 (cf. number IV GTC);
- CBF can request declarations and representations from the customer's client as to the purpose of an intended transaction and compliance with legal regulations.

CBF gathers information relating to assets deposited on client accounts through three primary mechanisms:

- The customer onboarding process;
- The opening of additional accounts of existing direct customers;
- The regular KYC review;
- Periodic key participant due diligence reviews.

The process is conducted by CBF's Relationship Management teams and reviewed by its Compliance team. In the case of client segregated accounts, CBF seeks to identify the party to whom its direct customer owes the securities deposited on the account and records this information in its KYC file.

In the case of any direct customer depositing assets on client accounts whether in segregated or in omnibus form, CBF collects information relating to the regulatory, business and control arrangements that its direct customer has in place in order to service or to support third party business. CBF also obtains information on the geography, products and type of client that its direct customer supports through any client accounts held with CBF. CBF aims to update this information on an annual basis.

CBF evaluates its risks arising from client accounts, in particular with regard to AML obligations and to sanctions compliance. CBF's compliance risk assessment identifies the conduct of the clients of its direct customers as a significant component of its overall operational risk.

These risks are mitigated in the following ways:

- At onboarding and during regular KYC review, the competence and the capacity of customers depositing client assets are assessed, including the regulatory capacity of the direct customer to accept client assets and, in the case of omnibus accounts, to commingle them. That assessment includes a determination of whether or not the direct customer is AML regulated in a jurisdiction applying standards equivalent to those that apply in Germany. New client accounts – whether of existing or of new customers – are subject to the prior review of CBF's compliance officers and the approval of the Executive Board.
- Deutsche Börse Group, including CBF as a subsidiary, implemented a group wide sanctions monitoring program based on industry leading technology for the monitoring of CBF client data and transactions. The systems receive two times per day updates of sanctions lists in order to screen client and transaction data against the most recent available lists.
- The sanctions monitoring systems screen relevant information such as counterparties, securities, transaction data (settlement and payment instructions, corporate actions, etc.) and security prospectuses (issuance of new securities) against EU, US, UN and other applicable sanctions lists as well as internal lists.
- Further checks are performed via adverse media lists and lists of politically exposed persons both at the point of onboarding, during regular KYC review and regularly in the course of customer relationship.
- A procedure defines roles and responsibilities of compliance teams for 1st and 2nd level review of alerts created by the monitoring tool. Sanctions hits and related issues will be resolved in accordance with CBF's compliance policies and applicable laws and regulations. Risk mitigation measures may include the blocking of transactions, segregation of assets into dedicated sundry accounts and notification to the authorities.
- CBF implemented several quality assurance measures to ensure the effectivity and efficiency of the sanctions monitoring systems such as SWIFT Sanctions Testing Services, alert sampling activities, independent audit function and others.
- CBF's screening strategy aims to ensure that the identity of such an investor does not expose it to undue compliance risk.

In cases where the identity of the underlying client or information relating to the direct customer's client franchise in general triggers heightened AML, sanctions or related risk concerns, CBF may employ a number of specific mitigation strategies including requiring the direct customer to disclose additional information (including where not previously known, the identity of the underlying client or the beneficial owner), blocking the securities entitlements and disclosure to CBF's regulators, foreign authorities or CBF's sub-depositories or paying agents involved in the custody or administration of specific securities. CBF's contractual right to pursue and to enforce such mitigation strategies is derived from its General Terms and Conditions (cf. number VI GTC).

Lastly, in respect of credit risk for the CBF's credit business, CBF does not permit assets deposited on client (as opposed to proprietary) accounts to be pledged as collateral to secure credit facilities enjoyed by its direct customers.

Risks to the FMI

The principal risks in particular from undisclosed beneficial owners result from potential violations of regulations relating to the prevention of money laundering and terrorist financing, and in particular financial sanctions.

Therefore, CBF continuously monitors all of its clients' transactions, including those resulting from underlying clients, with an IT-based compliance monitoring tool, which is supplemented in justified individual cases by manual checks conducted. If the review identifies irregularities, CBF will obtain further clarification as it deems necessary. CBF may cease or temporarily suspend execution of a client's instructions or the provision other services (such as collection and payment of interest, dividends, repayments of capital or other amounts owed by the issuer to the client), without notifying the client in advance, if – executing the instruction or providing another service violates applicable legal regulations relating to the prevention of money laundering and terrorist financing or financial sanctions (e.g., of the United Nations, European Union or United States of America); – executing the instruction or providing another service would, as a result of legal regulations relating to the prevention of money laundering and terrorist financing or financial sanctions, materially jeopardise the proper provision of CBF's services to its clients or, as a result of such requirements, put CBF's or its clients' assets at significant risk; or – CBF's client has not or has not yet provided the declarations and representations that CBF may request.

Key consideration 2: An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

As a central securities depository, CBF is under the obligation to:

- Identify, monitor and manage the operational risks it faces from key participants and ensure that the key participants duly meet the CSD's operational requirements in accordance with Art. 67(3) and (4) DR 2017/392 .
- Identify, on an ongoing basis, material dependencies between CBF customers and their clients that might affect it, and are responsible for a significant proportion of transactions processed through the CSD Securities Settlement Systems or whose transactions, based on their volumes and values, are significant relative to the risk-management capacity of the CBF customer, in accordance with Art. 67(1) DR 2017/392.

Clearstream CSDs have thereby established a new Key Participant procedure applicable to the Clearstream CSDs (CBL/CBF and LuxCSD) to adequately fulfil the stipulated CSDR key participant requirements and thereby ensure compliance.

Identification of CBF key participants and related material dependencies:

- The identification of CBF key participants and related material dependencies (underlying clients who constitute 10% or more of their settlement transaction activity) is driven by volumes and values of their transactional trades settled in the CBF Securities Settlement System in accordance with CSDR key participant regulatory requirements.
- Once identified as a CBF key participant this status is held for 12 months and an annual recertification of the key participant status is thereby performed to assess whether the existing key participants are still eligible to retain this status.
- The CBF key participants identified with material dependencies are thereby requested to disclose to CBF their underlying clients who constitute 10% or more of their overall settlement transaction activity.

Reinforced Customer Documentation & GTCs:

- CBF has updated the respective customer documentation and GTCs with the applicable operational standards and measures required from CBF key participants in order to support CBF settlement efficiency and soundness.

- CBF key participants have also been made aware of enhanced due diligence measures applicable to them (including material dependencies) and remediation measures to be assured on their side based on the key participant enhanced due diligence reviews performed.

Further information is given in the answer to Key consideration 3.

Key consideration 3: An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.

Where a client account is opened in omnibus form, the direct CBF customer is commingling the assets of several of its underlying clients. CBF requires that no single interest in a client omnibus account should exceed 25% of the total value of assets deposited on that account over time as represented by its direct customer. When a single interest does exceed that threshold, CBF requires the direct account holding customer to segregate the corresponding assets onto a client segregated account.

In line with CSDR, the established CBF key participant procedure ensures the identification on an ongoing basis of material dependencies between CBF customers and their clients that might affect it, who are responsible for a significant proportion of transactions processed through CBF Securities Settlement Systems; or whose transactions, based on their volumes and values, are significant relative to the operational risk-management capacity of the CBF customer. This procedure foresees as well as the performance of monitoring analysis and management of the operational risks that CBF key participants may pose to CBF's operations.

Analysis reviews performed:

Clearstream Risk management runs on an ongoing basis (generally quarterly report analysis) a process to identify the CBF key participants and related material dependencies in the CBF securities settlement system that it operates based on the following factors:

- their transaction volumes and values
- material dependencies between its participants and its participants' clients, where the clients are known to CBF and that might affect CBF
- their potential impact on other participants and the securities settlement system of CBF as a whole in the event of an operational problem affecting the smooth provision of services by CBF.

The analysis to identify potential material dependencies of the indirect participation is performed at the level of all participants of CBF i.e.: taking into account all settled volumes and values for all participants.

Upon identification of a key participant with material dependencies, Clearstream's Risk Management sends out a formal notification letter to the participants identified as CBF key participants to duly inform them of their new CBF key participant status as well as to request them for the disclosure of their underlying clients (material dependencies). This disclosure targets primarily their indirect participation client scope that represents a threshold of at least 10% or more of the overall volume / value of transactions processed by the legal entity. In this case, the identified CBF key participant is requested to provide details on these clients and confirm that appropriate measures have been imposed on their customers to ensure operational risks potentially stemming from the key participant's clients are adequately managed.

In addition, an enhanced key participant due diligence review will be carried out. With the above, CBF is able to determine material dependencies between its key participants and its key participants' clients, where the clients are known to CBF, that might affect CBF.

CBF can also identify the following:

- the participants' clients responsible for a significant proportion of transactions processed by CBF
- the participants' clients whose transactions, based on their volumes and values, are significant relative to the respective participants' risk management capacity.

Clearstream Risk Management typically identifies and monitors the CBF key participants on a quarterly basis. A report is run at the end of each quarter and it covers the last 6 months of settlement activities. When a CBF key participant is identified, they shall retain this status for at least the next 12 months. In addition to the above report, Clearstream Risk Management may, on an exceptional basis, run ad-hoc reports under abnormal market conditions or events (e.g. this could be the case when a financial crisis is ongoing, high volatility is observed or geopolitical changes are foreseen).

- In addition, reconciliation breaks caused by CBF key participants are closely monitored. In the event of reconciliation breaks identified for CBF key participants, a potential provisioning allocation may be required.

- The key participant operational risk exposures (i.e. operational incidents, issues, risk loss history and events) are reviewed for the purpose of assessing the evolutions in the CBF key participants risk profiles. In this regard measures are currently ongoing to create a dedicated CBF key participant operational risk scenario. The purpose is to ensure CBF derives a concise view of its key participants risk profile and can assure relevant mitigation measures to manage the key participant operational risks.

Key consideration 4: An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

As explained above no tiered participation arrangements are permissible at CBF. However, participants maintaining client segregated or omnibus accounts are reviewed on a periodic basis (so called KYC review), and the periodicity depends on the risk classification of the participant

- High Risk → Review Cycle: one year
- Medium Risk → Review Cycle: two years
- Low Risk → Review Cycle: three years

Key Participants are reviewed on a quarterly basis. In addition, ad-hoc reviews are being pursued and mitigating measures taken where appropriate. As an example, when it is detected that assets deposited by a direct client and held in a client omnibus account might expose CBF to the violation of financial sanctions, CBF can transfer the securities to a separate securities account opened for such client. Such detection also leads to an ad-hoc review of the client and its arrangements for compliance with regulations in the area of financial sanctions.

Principle 20: FMI links

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

Key consideration 1: Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.

CBF has processes in place to identify all potential sources of risk arising from new market links which are described in further detail below. Before opening a link, CBF conducts a general assessment of the prospective link that is presented for assessment to the Clearstream Material Change Working Group (MCWG). If decided that the change is to be considered as material, which is the case for entering in a new link the file is presented to Clearstream Risk Committee (CRC).

If the CRC approves to move ahead with the link development, a full risk assessment process is coordinated by Network Management with the input from other departments, such as f.ex. Legal, Credit, Treasury and Operations. It covers several aspects such as:

- criteria on securities registration, ownership restrictions, reporting obligations and disclosure requirements.
- all agents, where appointed, are evaluated against criteria with regard to anti-money laundering, operational readiness, good reputation and financial soundness.
- market assessment including legal (legal opinion), tax and regulatory issues as well as risks related to the market infrastructure (CSDs, stock exchanges, CCPs) and operational risks (use of SWIFT, business continuity).

Ultimately, CBF's Executive Board is responsible for the approval of a link.

In case the risk assessment identifies major risks in the local market that cannot be mitigated and/or no agent meets CBF's criteria, no link will be established with that market.

Risks from existing direct links are assessed on an ongoing basis, through CBF 's continuous oversight of market developments in the areas of procedures, practices, regulations or other infrastructure related developments.

In addition to the annual Due Diligence visits, CBF may also choose to visit a supplier at any time to review the relationship and ascertain that all governing documents remain relevant to the activities and regulations of the market or request that the supplier visits CBF's premises.

Contractual documentation consisting of the legal main agreement and the operational agreements (Service Level Agreement, SLA) are monitored on an ongoing basis. The main agreement is renewed in case of legal or regulatory changes, the SLA is renewed in case of new or enhanced processes.

The review of the legal framework is done at least annually.

CBF also monitors the performance of its network of CSDs and/or depositories/agent banks via an annual internal review of operational areas, the results of which can be shared with the agent. The Network Management team has access to a number of statistic-based reports that provide an overview of the operational performance of the supplier in relation to the SLA and in relation to other providers. CBF maintains a database of incident reports that are used to document deviations from expected procedure. These statistics and data are used in scheduled service reviews undertaken by Clearstream's Network Management team.

The above performance monitoring and reviews include:

- Ongoing monitoring of the creditworthiness of Clearstream's network of agent banks which is performed by Clearstream's Credit department.

- Ongoing review of the risk profile of every link with a special focus when there are operational, legal, creditworthiness or regulatory changes or changes that affect the appointed agent.
- The relevant CPMI-IOSCO standards are used in the relevant assessments.
- The risk assessment of a new market link includes as well questions on compliance with market standards.

Key consideration 2: A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.

All types of links are contractually documented between CBF and the CSD and/or depository/agent bank and generally include the following:

The Link Agreement:

- For direct links, the terms and conditions are set out in the CSD rules, which are generally drafted in the form of standardised general terms and conditions governed by the laws applicable to the issuer CSD;
- For direct links operated by a local agent, which contractual framework is composed by the CSD rules and the account operator agreement setting out the rights and obligations of the agent operating CBF''s account with the local issuer CSD. These contractual documents are generally governed by the laws applicable to the issuer CSD;

The Link Agreement sets forth the contractual expectations and responsibilities between CBF and the CSD, local depository, and/or the agent, as the case may be. It clarifies the choice of law and the rights and obligations of the parties. The Link Agreement with the depository/agent bank furthermore identifies and clarifies:

- Eligible instruments and authorised parties;
- Defined terms and procedures for settlement, safekeeping/recording and administration;
- Required insurance coverage;
- Establishing the depository/agent bank's standard of care;
- Liability of CSD, depository/agent bank to CBF;
- Representation and warranties and confidentiality requirements;
- Incorporation of Service Level Agreement.

The legal opinion:

The legal opinion is requested from an external counsel on an annual basis to represent independent and neutral confirmation of the CSD's / depository's/agent bank's ability to perform as required under the Link Agreement and the Service Level Agreement (SLA) without the risk of being superseded by local regulations or practices. It represents a confirmation of key legal requirements in respect to the market served, including:

- Enforceability of the CSD's / depository's/agent bank's obligations
- Non-allowance of upper tier attachments;
- recoverability of assets in case of bankruptcy;
- Legal status and authority of the depository/agent bank.

The monitoring of the legal framework of the partner CSDs and/or depositories/agent banks/CCBs and/or respective jurisdictions is made by such partner CSDs and/or depositories/agent banks/CCBs. It is a contractual obligation of the partners to keep us informed of any changes affecting CBF's deposit with them.

In its contractual relationship with both the issuer CSDs and/or depositories/agent banks, the liabilities remain subject to the usual force majeure and indirect damages clauses. Concerning in particular, the intermediaries, they generally also exclude their liability for losses caused by the issuer CSDs.

The SLA:

This document sets forth the expected action, reaction, deadline and communication format for each individual operational process. It specifies the operational procedures to follow including:

- Authorised instructions and deadlines with regard to settlement and asset servicing;
- Expected actions and contingency action plans;
- Reporting structures related to reconciliation, position management, exceptions with their resolution and inquiries.
- Notification of market information related to custody operations.

CBF has an internal audit function which is audited annually by the external auditors to validate the operating effectiveness of its internal controls and to obtain the sign off for the accounting and operational audit records, a copy of which will be sent to CBF's regulators, the BaFin and the Bundesbank. Their activities include a review of the management controls exercised over both accounting and operational activities. Ad-hoc visits by both BaFin and Bundesbank may be conducted when considered appropriate.

CBF's platform makes it possible, at all times, to clearly distinguish between accounts and the financial instruments held by different customers. The assets of CBF's customers are also completely segregated in separate accounts from CBF's own assets. Securities deposited in Clearstream are booked on accounts in the name of CBF.

Further information on market practice for each of CBF's domestic links is available in comprehensive Market Profiles and Market Link Guides on the Clearstream website: www.clearstream.com

In addition, based on customer request, CBF has developed a network

reporting service to supplement the already extensive information. This reporting provided in the form of the Domestic Markets Monitoring Report (DMMR) helps depositaries to monitor the performance of their underlying custody chain and support their due diligence obligations.

Key consideration 3: Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.

CBF performs an annual full credit assessment of any depository and agent it has appointed. These assessments include but are not limited to an evaluation of annual accounts, the management structure as well as the liquidity, their external credit rating and the quality of assets. On this basis, CBF makes an internal rating.

Clearstream's Credit department monitors the nostro balances of all CCBs for the CBF-i activity on a daily basis and sets thresholds for every nostro account. If a threshold is reached, it triggers reporting to management and implements actions accordingly. The system is set up to identify large cash balances to be aware of possible credit risk.

As CBF is also a regulated bank, high level of protection and the highest standard of care are guaranteed.

Key consideration 4: Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.

Provisional transfers are not part of the services offered by Clearstream. Only in rare cases, when this is a market practice that cannot be avoided, this will be possible. In all cases, if CBF was faced to provisional transfers, it will be duly documented and customers will be informed via the market documentation.

Key consideration 5: An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.

CBF respects a strict procedure while setting up a new link. The procedure includes, but is not limited to, risk, compliance, credit reviews, an external legal advice and a strong contractual framework. Each step of the new link set-up is reported and approved by senior management comittees such as MCWG, CRC, CBF Executive Board.

Please see the detailed answers to the Key Considerations 1 to 3) of this Principle.

Key consideration 6: An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.

CBF reviews its suppliers (intermediaries to support the operation of a link) at least on an annual basis, this review consists of:

- Review of the creditworthiness
- Review and analysis of the AFME questionnaire and underlying documents. The analysis is based on a fixed evaluation grid to be applied in the same manner to all suppliers.
- Review of the contractual framework
- At least annual review of the suppliers performance related to the services agreed in the SLA by Clearstream Operations. In case of any issues or weak services detected a close monitoring and follow up is ensured, until the supplier has reached again the level of agreed services.
- At least annual or if needed more frequent Service Review

Please refer also to the answers to the previous Key Considerations 1 – 3.)

Key consideration 7: Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP.

If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

Linked CCP default

Not applicable to CBF.

Collective link arrangements (three or more CCPs)

Not applicable to CBF.

Key consideration 8: Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.

Exposures and coverage of exposures

Not applicable to CBF.

Management of risks

Not applicable to CBF.

Information provided to participants

Not applicable to CBF.

Key consideration 9: A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

Not applicable to CBF.

Principle 21: Efficiency and effectiveness

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

Key consideration 1: An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.

CBF follows a proactive approach towards its customers by structuring feedback and dialogue with its customers in a number of ways – including a series of industry surveys, organised senior executive sessions, specific customer validation during the product/service developmental cycle and one-to-one customer sessions during due diligence visits. Furthermore, CBF works closely with the members of the CSDR user committee. The Committee shall advise the Executive Board on key arrangements that impact its member, including the products and services it offers to its participants in the securities settlement systems "CASCADE" and Creation as well as on service level.

CBF has been consistently recognised by respected third parties for its outstanding leadership in a variety of areas. Details are available on the website at the following link: https://www.clearstream.com/clearstream-en/about-clearstream/awards-and-achievements.

CBF's product management teams engage with customers in order to determine which new products and services require development either in response to the changing market environment or in order to respond to specific (bespoke) customer needs. In addition, ongoing assessment of the product portfolio inventory and monitoring of competition allows us to anticipate customer needs before approaching them for feedback. Customer contact and therefore obtaining the voice of the customer is an integral part of CBF's product teams' activities. New products and services are announced to customers well in advance (in principle 6 months prior to implementation) and customers have the possibility to test new releases with a technical and/or operational impact.

CBF has procedures in place to review its operational reliability. Key Performance Indicators are monitored on a weekly basis, and any deviations are tackled directly.

Furthermore, CBF launches a general survey once a year in addition to a transactional request for customer feedback based on day-to-day contact with Client Service. In 2020, for the 15th year, CBF asked around 9,410 customer contacts from customer institutions around the globe to give feedback on how satisfied they were with CBF service and how much they felt that CBF had improved since last year's survey. Satisfaction levels remained above benchmark across key service dimensions: telephone availability, professionalism, courteousness, understanding of customers' business, ability to listen and language skills. The Net Promoter Score (NPS) for the transactional survey is 66%, compared to a market average of 20%.

Key consideration 2: An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk- management expectations, and business priorities.

The business strategy (ref. to objectives and goals) is reviewed on a continuous basis and adapted according to the business conditions CBF faces over time.

CBF's focus on high margin business and cost discipline in its core services allows for investment in collateral management and investment fund services. Clearstream's strategic goals are encapsulated by the Compass 2023 strategy with implementation focusing on strengthening its services, ensuring regulatory compliance and fostering effectiveness in sales and client services by pursuing innovation and operational excellence.

Furthermore, CBF defines its service level and consequent goals and objectives in depository service level agreements which reflect market standards and are the basis for operational procedures and publications of applicable operational processes to CBF customers. Minimum services levels are highly variable according to the market rules and time zones for the securities eligible for deposit and delivery within the CBF systems.

CBF's risk strategy is aligned to its business strategy and its goals of continuously developing new services, enhancing the efficiency of its operations and reducing overall processing costs. CBF's risk strategy defines the risk appetite as a risk limitation, which protects and ensures continuity of operations. CBF's risk appetite framework constitutes the tools and concepts that are used to manage risks. The aim is to be able to monitor risks continuously and thereby manage risks according to the risk appetite.

Key consideration 3: An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

CBF has engaged and works on the basis of a continuous improvement process and has established a very strict service level measurement discipline and measures KPIs including operational and service level indicators. These are regularly reported to the CBF Executive Board and the most significant ones also to the User Committee and constitute the basis for the continuous improvement of the service. The tools used for continuous improvement are the following:

- Forum for structured, systematic and creative solution identification. This includes a post-claim analysis and identification of appropriate measures.
- Key performance indicators (KPI): quantified, objective view on service delivery of Operations and outsourced business activities with indicators for e.g. effectiveness, efficiency, operational quality, and operational risk
- KPI engine: Data pool, enabling automatic and accurate feed from Operations in order to provide standard and ad-hoc reporting and detailed data analysis

By applying all of the above tools, a systematic process is set-up to ensure a comprehensive detection of quality deficits, leading to their resolution.

KPIs have been defined to measure adherence to the SLA specifications. CBF measures operational KPI STP target rates to ensure the monitoring of customer instruction processing at the highest possible system standard. The KPIs quantify different dimensions of the operational service delivery, mainly quality (e.g. error rates, degree of automation, turnaround times, etc.) including risk elements and capacity utilisation.

Some IT Operations KPIs are also defined to measure business applications availability, response time and adherence to contracted internal and external deadlines. If the KPIs are risk related, they are the basis for Key Risk Indicators (KRIs), which are monitored by Risk Management on a monthly basis. In a continuous process, KPIs / KRIs are measured, analysed and reported to management. At least yearly, target reviews ensure adoption towards a changed market environment, customer demands or a changing internal focus.

Furthermore, CBF strives to provide products and services with utmost reliability. It thus gives the highest importance to the resilience of its business to safeguard it against incidents and disasters, as the unavailability of core processes and resources represents a substantial risk for CBF and potential systemic risk to the markets as a whole. Therefore, CBF aims to satisfy itself and the markets of its ability to continue to operate under adverse conditions or in the face of unexpected events or disasters.

In case of business interruption, operations must be resumed within appropriate time scales primarily in order to:

- Safeguard CBF from significant losses, maintain revenue generation and shareholder value;
- Maintain customer confidence, market stability and liquidity and minimise systemic risk;
- Maintain management control, fulfil contractual obligations and regulatory compliance.

The functions, which are indispensable for the critical daily operations in view of the above objectives, are called mission critical and are designed and implemented in such a way that they can be resumed within a Recovery Time Objective (RTO) of 2 hours following a disruptive incident, crisis or disaster. The RTO is the time period following a disruptive incident within which products, services or activities must be resumed or resources must be recovered.

In order to minimise the impact of unavailability of key resources i.e. information (electronic or other), IT systems and networks, workspace and facilities, staff, and suppliers, CBF implements and maintains effective and efficient business continuity plans in line with its needs and regulatory requirements. The business continuity plans specify how services, processes and resources will be reinstated to a predetermined level within pre-defined time scales after an incident or disaster. Thereby the RTO for mission critical functions must be observed. The resilience and disaster tolerance of critical processes and resources is commensurate with the business impact and the prevailing risks.

Business continuity plans are used, tested or exercised regularly in the most realistic way, without causing unacceptable business impact, to ensure their effectiveness and viability and in order to provide assurance that a real incident could be successfully managed. All relevant staff is trained to be competent in the execution of incident and crisis management plans and business recovery procedures.

To ensure that CBF is able to respond to an incident in a rapid, controlled and effective manner, an incident and crisis management process is in place for the timely detection, escalation and assessment of incidents and the prompt activation of the business continuity plans.

Additionally, CBF implemented a default management process in order to successfully weather the default of a major CBF customer in an orderly manner, even under stressed market conditions. For further details, please refer to Principle 13.

The systems architecture is designed to satisfy high availability requirements. The systems infrastructure is duplicated between two distant data centres. Components such as network communications, servers and storage are running in parallel in the two centres. Core systems are clustered and load-balanced between the two centres to allow quick take-over in case of failure. All data is synchronously mirrored in real-time between the two centres.

The design described above in combination with the RTO of 2 hours facilitates the completion of settlement by the end of the day also in extreme circumstances such as the full loss of one data centre. The last systems unavailability test, based on the scenario of the full loss of one data centre, was conducted in October 2020. The availability of CBF's business critical applications was validated within the RTO period and the infrastructure's security was maintained at all times. The average system availability during 2020 was 100%.

Principle 22: Communication procedures and standards

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

Key consideration 1: An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

Communication procedures

CBF fully endorses standardisation and has been leading in standards implementations. All connectivity channels are fully ISO15022 (and ISO20022 for Investment Funds) compliant, IP based, and in line with EPTF (European Post Trade Forum) Barrier 2 (former Giovannini barrier 1) on communication protocols as stipulated in the "Giovannini File Transfer Rulebook" of 2007.

In particular, instructions, be it for securities or cash, can be processed via CBF's suite of connectivity products as described below:

- CASCADE via SWIFT: CASCADE is available via SWIFT. This solution is used by customers that have large transaction volumes and automated interfaces between their in-house back office systems and CBF, as CBF´s processing is fully STP. In the vast majority of cases for correctly formatted instructions, no manual intervention is required.
- CASCADE via LIMA/File Transfer offers bi-directional high-volume data transfer, both ISO 15022 and 20022 messages as well as human readable messages. It can be seamlessly integrated with a customer's in-house systems and is fully automated, making it an ideal component in a STP environment using VPN with standard messaging technology. This solution is used by customers that have large transaction volumes and automated interfaces between their in-house back office systems and CBF for their messages.
- CASCADE is a mainframe user to application (U2A) connectivity channel based on proven, up-to-date technology. The harmonised security and user management streamlines your access to a range of services. CASCADE is based on ISO 15022 and ISO 20022 message terminology.
- Xact Web Portal: The Xact Web Portal is a screen based, user to application (U2A) connectivity channel based on proven, up-to-date portal technology. The harmonised security and user management streamlines your access to a range of services. Xact Web Portal is based on ISO 15022 and ISO 20022 message structure and terminology.
- Xact File Transfer offers bi-directional high-volume data transfer, both ISO 15022 and 20022 messages as well as human readable messages. It can be seamlessly integrated with a customer's in-house systems and is fully automated, making it an ideal component in a STP environment. Xact File Transfer can also be used via internet, VPN or SWIFTNet.
- Xact via SWIFT: ClearstreamXact is also available via SWIFT. This solution is preferred by customers that have large transaction volumes and automated interfaces between their in-house back office systems and CBF. As CBF´s processing is fully STP, in the vast majority of cases for correctly formatted instructions, no manual intervention is required.
- CreationOnline[2] is a secure, web browser based, central management tool available over a choice of public

[2] Please note that CreationOnline is planned to be decommissioned. Clearstream Banking strongly recommends that customers migrate to Xact Web Portal as soon as possible to start benefitting from the new and unique features of Xact Web Portal. Please also note that there will be no further enhancements on CreationOnline, although it will still be accessible, and any new or updated functionality will be added to Xact Web Portal.

internet or Virtual Private Networks (VPN). It is ideal for manual instruction input, corporate action management, query and exception handling and can be used alone or in combination with any of the other connectivity solutions. CreationOnline is based on ISO 15022 message structure and terminology.

CBF´s settlement services are fully STP compliant.

From a global ISO perspective, CBF is a liaison institution to the Securities Evaluation Group and the Registration Management Group.

When considering messaging standards, CBF has helped develop and has implemented ISO15022 since its inception. CBF participates in the Maintenance Working Group. This body decides on the yearly evolution of the standard. The other main messaging norm for CBF's industry is ISO20022. In this area, CBF is already supporting ISO20022 formats for SRDII Shareholder Identification Requests and will continue to expand its ISO20022 offering according to the market standards and timelines for adoption of the new format. CBF also participates to the yearly maintenance of this standard.

In terms of reference data standards, CBF has adopted all the main applicable ISO standards. Cross-border operation is at the heart of CBF's activity. The only way to make processes and systems work efficiently in such an environment is to use ISO standards and to mandate its providers to only use such standards. CBF applies the same communication standards for cross-border operations as for all other operational activities.

Communication standards

For CBF customers acting in ICP (Indirect Connected Participant) mode or DCP (Direct Connected Participant) mode:

- Online via CASCADE-Host and CASCADE-PC/HOB RD VPN;
- Xact File Transfer for the transmission of ISO 15022 and ISO 20022 messages to CBF;
- SWIFT ISO 15022 messages to CBF via the SWIFT network;
- ISO 15022 messages to CBF via MQ; Xact Web Portal (based on ISO20022 standards and terminology);
- Xact via SWIFTNet FINplus (also supports Shareholders Identification Disclosure Requests seev.045 and seev.046 in ISO 20022 format).

Additionally, for CBF customers acting in DCP mode:

- Online via the web-based T2S GUI via SWIFT or SIA-Colt;
- ISO 20022 messages to T2S via SWIFT or SIA-Colt network

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

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

Key consideration 1: An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

Rules and procedures

CBF's rules and procedures are set out in a series of documents as defined in Principle 1 that enable the customers to identify clearly and understand fully the risks and responsibilities as participant in CBF's system. These documents are written in comprehensive and clear manner to help the customers understanding:

- the fees applied to the services (the fees are published in the Fee Schedule);
- system design and operations (these are set out in the Customer Handbook, the Market Link Guides, Connectivity Manuals);
- customers' rights and obligations (the GTCs and Special Conditions); and
- the risks of participating in the system (the Customer Handbook(s), the Market Link Guides).

The documents are made available publicly to all current and prospective customers and updated regularly and can be found on Clearstream's website www.clearstream.com.

The main indicators used by CBF to determine whether its rules and procedures are clear and comprehensive are the following:

- Training offers: For new products or major changes to the system, Relationship Managers provide detailed information to customers, via presentations and - if needed - also in meetings. During these sessions and via direct access to Client Services, CBF collects the comments and takes the necessary steps to rectify any perceived lack of understanding by the customers. Especially for connectivity products CBF offers its customers dedicated training sessions, to which they can subscribe.
- German GTC law requires GTCs to be clear and comprehensible, section 307 para. 1 German Civil Code. CBF GTCs are the legal basis of the contractual relationship between CBF and its customers. The process for changing CBF GTCs is described in number 2 CBF GTCs.
- Operational information review: Review of operational information is performed at least twice per year, whenever there is a major IT release bringing new and enhanced product and service functionalities, but can also be updated on an ad hoc basis, when customers via Client Services or internal control bodies request a clarification. The same applies to Market Link Guides as well as the Tax Guides.
- CBF publishes webinars and videos on its website in order to provide punctual and specific information on CBF's products and services as well as CBF events.

CBF has published an overview of its default rules and related procedures. The default management process is available at the following link:
https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management

CBF furthermore publishes some general information on its Business Continuity Framework in both the CPMI IOSCO Disclosure Framework and the Association of Global Custodians questionnaire; both documents are available on Clearstream's website. Links are:

https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/cpmi-iosco-disclosure-framework-1278124

https://www.clearstream.com/clearstream-en/products-and-services/association-of-global-custodians-disclosure-1277124

Disclosure

Please refer to the CBF Customer Handbook, section 10. Annex, 10.1 – Reference documents, available at:
https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/customer-handbook/cbf-customer-handbook--1274824 and to the additional documents listed under Key Consideration 2 for this Principle.

Key consideration 2: An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.

CBF's as well as the customers' contractual rights and obligations are clearly described in CBF's General Terms and Conditions (GTCs). These rules comprehensively consider CBF's role as the German Central Securities Depository ("CSD") in accordance with the German Securities Deposit Act (Depotgesetz, "DepotG"), Regulation (EU) No 909/2014 of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories (CSDR), as a credit institution according to the provisions of the German Banking Act (Kreditwesengesetz) and as a recognised SSS (the main legal provisions relevant for the establishment and the operation of CBF are described under Principle 1).

These can be downloaded in German (binding version) or English (convenience translation) from the following website: https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-

The descriptions and information provided in the Customer Handbook are Technical Rules according to number I of the General Terms and Conditions of Clearstream Banking AG. Such information can be consulted in conjunction with other CBF publications (CASCADE Online Handbook, CASCADE-PC User Manual, Xemac® User Manual and Connectivity Handbook), CBF's announcements and other user manuals on connectivity, which contain further details concerning the use of CBF's services.

The Market Link Guides give details of the links that have been established between CBF and domestic markets for which CBF offers settlement and custody services. Details include, but are not limited to: types of securities traded, types of link, depositories and agents, cash correspondent banks, settlement rules and times, custody services and foreign exchange. In accordance with CSDR, Clearstream has enhanced the information provided to customers in the Link Guides and in addition to the operational arrangements and provides information on the legal terms and conditions of the link arrangements including key elements of the local legislation such as recognition of nominee concept, nature of rights on the securities and impact of insolvency laws. The information is based on legal opinions issued by external law firms appointed by Clearstream. In this context, Clearstream also provides information on the rules governing the finality of transfers of securities and cash (settlement finality).

The connectivity manuals provide details of the communication processes and messages supported by CBF., including the messages that customers use for sending and processing instructions and the messages that CBF uses for reporting to customers.

Announcements give details, in English and for the majority, in German, of changes in custody and clearing and settlement information, changes in taxation, changes to fees and charges, and other information about changes in the markets and CBF's products and services. The information given to customers in Announcements is integrated, where applicable, into the Customer Handbook, the Market Link Guides, the Market Taxation Guides and other reference documents as appropriate.

Finally, CBF discloses information on its governance (composition of the management bodies, articles of association and the shareholding structure, internal control framework), the regulatory status, its annual accounts, the annual reports of the ultimate holding company as well as its ratings. This information helps customers to evaluate the risks regarding the services, but also on CBF's legal, regulatory, corporate, commercial and operational environment.

On a non-binding basis, CBF provides also information related to tax regime in connection with the services provided in relation to each market, highlighting that the customers shall make their own tax assessment with respect to any aspects of the activities performed with CBF.

Additional information and documentation supporting participants in their risk assessment include:

- Pillar III Disclosure report: https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114
- Default management process: https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management
- Business Continuity management: https://www.clearstream.com/clearstream-en/about-clearstream/due-diligence/business-continuity-management/business-continuity-management-1630876
- CSDR Article 38 disclosure document: https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/csdr-article-38-disclosure
- Internal Control Framework: https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/internal-control-framework-1763664
- AFME and AGC questionnaires: https://www.clearstream.com/clearstream-en/about-clearstream/due-diligence/agcquestionnaire https://www.clearstream.com/clearstream-en/about-clearstream/due-diligence/afme

Key consideration 3: An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.

The documentation made available through the website provides information related to, without limitation:

- full range of activities and operations performed in CBF's environment;
- the accounts (opening and closing of accounts), the segregation of the assets;
- the type of assets, their eligibility and any circumstances that could affect their fungibility;
- the execution of the instructions and communication means, including the key times and dates;
- the liability regime (including the degree of discretion under which CBF is exercising its rights, the exclusion of liability and the mitigating measures);
- the securities interest that CBF may have over the assets held in custody, such as the rights of pledge, retention and set off;
- the record keeping and data protection regimes;
- the settlement services, including the settlement finality and cancellation;
- cash financing services;
- new issues and custody business services, including the timelines, the procedures and dates;
- the fees applicable to the services;
- the markets covered and the specificities of each market, including the local settlement rules and times;
- the impact on customers' assets;
- the conditions leading to a suspension or a termination of the services by CBF;

- the termination of the services by the customer;
- the disclosure requirements applicable in each market.

Within its world-wide Client Services structure, CBF maintains a proactive relationship model. Customers are constantly informed about any changes and enhancements to CBF systems via announcements on Clearstream's website. Customers can also subscribe to receive alerts via email of the publication of such announcements. The Client Services team is the general contact point for daily operational queries. The Client Services Officers – available on a 24-hour basis through Clearstream's global network of offices - provide a single, accessible point of entry for queries and issues. Customers are also given the possibility to perform a due diligence visit on CBF, which would allow them to increase their understanding of CBF's rules and procedures. CBF Relationship Managers meet with their clients in person on at least an annual basis. This provides an opportunity for clients to bring to their attention potential issues. Furthermore, a regular statistical report, showing for example the customer's STP rate puts relationship management in the position to proactively address possible lack of understanding at the customer's side.

Clients are offered training on ad-hoc basis on subjects of their choice. Specific training is offered by the Client Connectivity to help clients understanding the technical setup in place and to ensure they are fully aware of the functionalities available and their limitations, contributing in establishing risk awareness on Clearstream's products.

Relationship Managers produce call reports of their interactions with clients. These reports form documentary evidence of the judgment of Relationship Managers based on these interactions, and where relevant will include elements demonstrating whether customers have a clear understanding of CBF's rules, procedures and understanding of risk, and would lead to further interaction on the part of the Relationship Manager or escalation within CBF where any of these elements were felt to be insufficient.

Key consideration 4: An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.

Fees are published – in accordance with Art. 34 para. 1, 2 CSDR – at the level of individual services in the Fee Schedule and are intended to help customers understanding the fees applied to the services:
https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/fee-schedule/clearstream-banking-fee-schedule-1577174

The Fee Schedule also contains a statement on CBF's pricing policy and available discounts.

Key consideration 5: An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

CBF publishes its reply to CPMI-IOSCO disclosure framework every second year.

CBF also publishes its monthly figures; please refer to the most recent publication at the following link:
Clearstream's monthly figures.

V. List of publicly available sources

General website:	www.clearstream.com
General Terms and Conditions	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/general-terms-and-conditions
Customer Handbook(s)	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/customer-handbook https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-oneclearstream/customer-handbook https://www.clearstream.com/clearstream-en/keydocuments-1-/icsd-1-/customer-handbook
Fee Schedule	https://www.clearstream.com/clearstream-en/keydocuments-1-/csd-1-/fee-schedule/clearstream-banking-fee-schedule-1577174
Pillar III	https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/pillar-iii-disclosure-report/pillar-iii-disclosure-report-1278114
Information about governance	https://www.clearstream.com/clearstream-en/about-clearstream/company-governance
Association of Global Custodians disclosure	https://www.clearstream.com/clearstream-en/products-and-services/association-of-global-custodians-disclosure-1277124
Information on remuneration	https://www.clearstream.com/clearstream-en/about-clearstream/regulation-1-/remuneration-information
Annual accounts	https://www.clearstream.com/clearstream-en/about-clearstream/reports-and-ratings/annual-reports
Cash Timings Matrix	https://www.clearstream.com/clearstream-en/products-and-services/asset-types/cash/cash-timings-matrix-1290324
Market Coverage section	https://www.clearstream.com/clearstream-en/products-and-services/market-coverage
Default Management Process	https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/clearstream-default-management
Becoming a Clearstream customer, Customer Access and Acceptance Policy	https://www.clearstream.com/clearstream-en/about-clearstream/becoming-a-clearstream-customer
List of depositories	https://www.clearstream.com/clearstream-en/products-and-services/market-coverage/sub-custodian-listings-1291442
CSDR Article 38 disclosure document	https://www.clearstream.com/clearstream-en/strategy-and-initiatives/asset-safety/csdr-article-38-disclosure
Gender Diversity Policy	https://www.clearstream.com/clearstream-en/about-clearstream/company-governance/gender-diversity