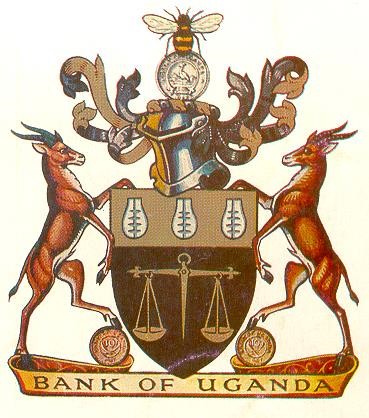
**BANK OF UGANDA**



**Central Securities Depository (CSD) assessment against the Principles for Financial Market Infrastructure (PFMI)**

**Draft, 2024**

|  |  |
| --- | --- |
| **Responding institution:** | Bank of Uganda (BOU) |
| **Jurisdiction(s) in which the financial market infrastructure** | Ugandan Jurisdiction |
| **Authority(-ies) regulating, supervising, or overseeing the FMI:** | NPSD Payment Systems Oversight and  Policy Division & Payment System Policy  Sub-Committee (PSP-SC) |
| **Version:** | 2.0 |
| **Date of this disclosure:** | September 30, 2022 |
| **Where to find this disclosure:** | http://www.bou.or.ug |
| **Where to find further information:** | Telephone no.: +256 414 258 441-6  Email address: info@bou.or.ug |

Comments and enquiries relating to this publication are welcomed and should be addressed to:

**Director National Payment Systems Department**

**Bank of Uganda 37/45 Kampala Road**

**P O Box 7120**

**Kampala, Uganda**

1

**Table of Contents**

[Acronyms and Abbreviations 3](#_Toc84249)

[Preface 4](#_Toc84250)

[Executive summary 5](#_Toc84251)

[Chapter 1: - Background 11](#_Toc84252)

[1.0 Introduction 11](#_Toc84253)

[1.1 Summary of major changes since the last assessment 14](#_Toc84254)

[Chapter 2: – Detailed Assessment of the Principles 15](#_Toc84255)

[Principle 1: Legal Basis 15](#_Toc84256)

[Principle 2: Governance 18](#_Toc84257)

[Principle 3: Framework for the Comprehensive Management of Risks 22](#_Toc84258)

[Principle 4: Credit Risk 24](#_Toc84259)

[Principle 5: Collateral 27](#_Toc84260)

[Principle 6: Margin 30](#_Toc84261)

[Principle 7: Liquidity Risk 30](#_Toc84262)

[Principle 8: Settlement Finality 35](#_Toc84263)

[Principle 9: Money Settlements 37](#_Toc84264)

[Principle 10: Physical Deliveries 39](#_Toc84265)

[Principle 11: Central Securities Depositories 39](#_Toc84266)

[Principle 12: Exchange of Value Settlement Systems 39](#_Toc84267)

[Principle 13: Participant Default Rules and Procedures 40](#_Toc84268)

[Principle 14: Segregation and Portability 42](#_Toc84269)

[Principle 15: General Business Risk 42](#_Toc84270)

[Principle 16: Custody and Investment Risks 44](#_Toc84271)

[Principle 17: Operational Risk 45](#_Toc84272)

[Principle 18: Access and Participation Requirements Risk 52](#_Toc84273)

[Principle 19: Tiered Participation Arrangements 55](#_Toc84274)

[Principle 20: FMI Links 55](#_Toc84275)

[Principle 21: Efficiency and Effectiveness 56](#_Toc84276)

[Principle 22: Communication Procedures and Standards 57](#_Toc84277)

[Principle 23: Disclosure of Rules, Key Procedures and Market Data 58](#_Toc84278)

[Principle 24: Disclosure of Market Data by Trade Repositories 60](#_Toc84279)

2

# Acronyms and Abbreviations

**ACH:** Automated Clearing House

**BCP:** Business Continuity Plan

**BIS:** Bank for International Settlements

**BRS:** Business Resumption Site

**CCP:** Central Counterparty

**CPSS:** Committee on Payment and Settlement Systems

**CSD:** Central Securities Depository

**DNS:** Deferred Net Settlement

**DRS:** Disaster Recovery Site

**DVP:** Delivery Vs Payment

**FMD:** Financial Markets Department [of the BOU]

**FMI:** Financial market infrastructure

**IAD:** Internal Audit Department

**IOSCO:** International Organization of Securities Commissions

**ITO:** Information Technology Operations

**LVPS:** Large value payment systems

**NPSD:** National Payment System Department [of the BOU]

**PSP-SC:** Payment Systems Policy Sub-Committee

**PFMI:** Principles for financial market infrastructures

**PvP:** Payment versus Payment

**RCD:** Risk and Compliance Department [of the BOU]

**RTGS:** Real-Time Gross Settlement

**SLA:** Service Level Agreement

**SWIFT:** Society for Worldwide Interbank Financial Telecommunication **TR:** Trade Repository

3

# Preface

CSD, is a settlement infrastructure owned by the Bank of Uganda which enables the simultaneous exchange of securities and cash on a delivery-versus payment basis in central bank money. CSD participants can exchange securities against cash that is held in accounts with a central bank, so the money used to settle transactions is central bank money. As a result, principal risk (the risk of losing core capital invested) is greatly reduced.

In 2023 the CSD turnover amounted to a total value of <TBD>, corresponding to a daily average of <TBD>. In volume terms, CSD processed a total of <TBD> transactions, corresponding to an average of over <TBD> transactions settled per day against the UGX <Annual-Report-2023-for-Publish.pdf>

Investing in high yield obligations (such as high-yield bonds or high-yield T-Bills) issued by a central bank or government comes with various risks, and investors should be aware of these risks before making investment decisions. The specific risks associated with high-yield obligations can include:Credit Risk: Even though they are issued by a central bank or government, there is still a credit risk associated with these instruments. In the case of high-yield obligations, the risk of default or delayed payments may be higher compared to lower-yield, more secure government securities.Interest Rate Risk: Changes in interest rates can affect the value of fixed-income securities. If interest rates rise, the market value of existing high-yield bonds or T-Bills may fall.Liquidity Risk: High-yield obligations may have lower liquidity compared to more widely traded government bonds. This means it may be harder to sell these securities in the secondary market, potentially impacting an investor's ability to convert them to cash.Inflation Risk: If the yield on high-yield obligations does not keep pace with inflation, investors may experience a decrease in purchasing power over time.Exchange Rate Risk: If these securities are denominated in a foreign currency, changes in exchange rates can affect their value when converted back to the investor's home currency.Market Risk: The prices of high-yield bonds and T-Bills can be subject to market fluctuations and sentiment, which can impact their value.It's important to note that the term "high-yield" typically implies a higher level of risk, and these investments are often considered riskier than lower-yield, more secure government securities. Investors seeking higher yields should carefully assess their risk tolerance, perform due diligence, and consider diversifying their portfolio to manage these risks.

Only UGX can be used for settlement in CSD.

The management of CSD is based on <TBD>.

The main risks to which CSD is exposed are legal, liquidity, [[1]](#footnote-1) operational and information security, and general business risks. The CSD Operator[[2]](#footnote-2) applies the generic risk management frameworks of the Bank of Uganda.

Extensive documentation on CSD has been made publicly available on the websites of the Bank of Uganda. This includes the following.

# Executive summary

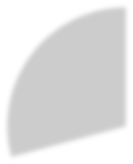
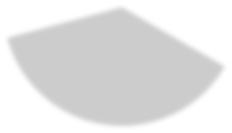
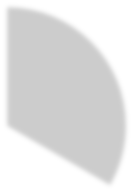
The purpose of this document is to provide an independent assessment for the CSD services against the Principles for Financial Market Infrastructures (PFMIs). The assessment was conducted by the Payment Systems Oversight and Policy Division.

A ‘financial market infrastructure’ (FMI) is ‘a multilateral system among participating institutions, including the operator of the system, that is used for the purposes of clearing, settling or recording payments, securities, derivatives or other financial transactions. In April 2012, the Committee on Payment and Settlement Systems (CPSS) - now referred to as the Committee on Payments and Market Infrastructures (CPMI) of the Bank for International Settlements (BIS) as well as the Technical Committee of the International Organization of Securities Commissions (IOSCO) published the Principles for Financial Market Infrastructures(PFMI) which serve as the international standards for FMI risk management. The PFMI are designed to ensure that the infrastructure supporting global financial markets is robust and able to withstand financial shocks. The principles apply to the systemically important FMIs, namely SIPS, Central Securities Depositories (CSDs), Securities Settlement Systems, Central Counterparties, and Trade Repositories.

In June 2021, the Bank of Uganda (BOU) published the oversight framework. Under this framework, the Bank formally adopted the PFMI as the risk management standard for systemically important FMIs in Uganda. Central banks should apply the same standards to their FMIs as those that are applicable to similar private-sector FMIs. However, there are exceptional cases where the principles are applied differently to FMIs operated by central banks…” In this regard the report should make explicit reference to, and benchmark, the CPMI document ‘Application of the Principles for financial market infrastructures to central bank FMIs’ (August 2015) (<https://www.bis.org/cpmi/publ/d130.htm>), which indicates that some key considerations in respect of certain principles (2, 3, 4, 5, 13, 15 and 18) of the PFMI do not apply or are applied differently to central bank operated FMIs.**Table 1: Summary of the independent assessment against the PFMI**

|  |  |
| --- | --- |
| **Assessment Findings** | **Assessed Principle** |
| Observed | 1, 4, 8, 9, 15, 16,18, 22 |
| Broadly Observed | 2,3, 5, 7,13,17,20,21,23 |
| Partly Observed |  |
| Not Observed |  |
| Not Applicable | 6, 10, 11, 12, 14, 19, 24 |

### Figure 1: Assessment Findings by category



**Observed**

**33**

**%**

**Broadly**

**Observed**

**38**

**%**

**Not Applicable**

**29**

**%**

**OVERALL FINDINGS**

***Observed***

### Principle 1: Legal basis

The two material legal aspects needed for T2S to provide services to the participating CSDs and central banks are settlement finality and default procedures. As concerns finality, the moment of entry of a transfer order into a system and the moment of its irrevocability are defined in each participating system’s rules, as required by the Settlement Finality Directive, and these moments are harmonised across the participating systems and made binding by the Collective Agreement signed by each participating CSD and the central banks. Settlement finality of transfers is achieved upon the simultaneous bookings in securities and cash accounts in T2S, given that CSDs commit to making all necessary arrangements with regard to their operational processes and contractual terms, in particular their rules, to ensure the unconditionality, irrevocability and enforceability of settlements processed on the T2S platform. Defaults of CSDs’ participants are handled under individual CSDs’ rules and national legislation as far as the participating CSDs are concerned, and under Annex IIa to the Guideline on TARGET2 as far as the central banks are concerned. In the event that another currency area decides to use the T2S platform, any default of a CSD’s participant would be dealt with under the national legislation and rules of the respective CSD. The provision of services by the T2S platform to participating CSDs and central banks is regulated by the T2S Framework Agreement, which must be signed by each participating CSD and its national central bank on behalf of the Eurosystem in the case of a euro area CSD, and by the participating CSD and the ECB in the case of a non-euro area CSD. The T2S Framework Agreement is governed by German law. The relationship regarding the provision of T2S services between the Eurosystem and the non-euro central banks is regulated by the T2S Currency Participation Agreement, which is also governed by German law. The governance and other relevant legal arrangements for T2S are set out in the T2S Guideline which is binding on each participating national central bank. The legal framework for the immobilisation or dematerialisation of securities and the transfer of securities by book entry are addressed under the general requirement Disclosure report T2S assessment against the Principles for Financial Market Infrastructures 11 introduced by the Central Securities Depositories Regulation.8 As such they are not addressed in the T2S legal framework. T2S, as a platform, only offers its services for immobilised or dematerialised securities and functions on a book-entry basis, 9 thus supporting the compliance of CSDs in this respect. When the legal documentation supporting T2S is initially produced and every time it is revised it is reviewed by two Eurosystem committees: the MIB, consisting of payment and settlement system senior officials, and the Legal Committee (LEGCO), consisting of senior legal representatives. In addition, the CSDs using the T2S platform are part of the T2S governance structure and processes, and as such also actively contribute to the drafting of any revisions. All parties check the documentation in order to ensure consistency with national laws and regulations. The T2S Framework Agreement and the T2S Currency Participation Agreement are implemented under German law and all signing parties have agreed to the jurisdiction of the Court of Justice of the European Union. Therefore, Germany is the only relevant jurisdiction for these agreements, ensuring enforceability.

Uganda has in place a comprehensive payments system law, the National Payments Systems Act, 2020, which provides legal certainty for the Bank of Uganda’s mandate to regulate, supervise and provide oversight of payment systems. BOU also has in place clear rules and procedures governing participation in the NPS by system operators and system participants. For RTGS, the operations are governed by the UNISS rules issued in 2017. However, following the enactment of the NPS Act, 2020 there is need to review the rules since the last review was done in 2017.

### Principle 4: Credit Risk

Payments are settled using funds held in participants’ settlement accounts at BOU. Some credit risk exposure to the Bank arises through the provision of the intraday liquidity facility to participants, to support their payments activity. This risk is however mitigated by taking collateral in form of treasury bills at a haircut. In addition, the funds taken under the facility must be paid back before end of the business day.

### Principle 8: Settlement Finality

RTGS payments are settled individually in real time. As laid out in the UNISS rules and Procedures, payment instructions in UNISS are deemed to be final and irrevocable once the sending participant's account is debited and the receiving participant is credited with the amount specified in the payment instruction. In the event of insolvency, such a payment instruction or settlement shall be valid, enforceable and binding against third parties, including the central bank or insolvency practitioner as provided for by Section 28 of the NPS Act 2020.

**Principle 9: Money Settlements**

UNISS conducts its money settlements in central bank money.

### Principle 15: General Business risk

Given the operator’s inherent financial soundness (Central Bank), UNISS does not face any significant business risk. The associated costs are partly covered by the monthly maintenance and support fees charged to participants as well as the transaction charges.

### Principle 16: Custody and investment risks

UNISS accepts only government treasury bills securities as collateral therefore, the system does not face investment risks.

### Principle 18: Access and participation requirements

Participation in the UNISS is open to any financial institution or entity/Institution approved by the Bank of Uganda (BoU), provided it meets the eligibility criteria. The requirements are defined in the Rules and Procedures which are publicly available.

### Principle 22: Communication procedures and standards

UNISS uses internationally accepted message standards and communication protocol with participants and system operators. The system is currently under upgrade from MT messaging to ISO 20022 compliant MX message types.

***Broadly observed***

### Principle 2: Governance

The BOU owns and operates the UNISS under the National Payment Systems Department. The system is run by the operations Division while oversight is provided by the Payment Systems Oversight and Policy Division. The National Payment Systems Department reports to the Executive Director Finance. Regarding system governance, the oversight reports are submitted to the Payment Systems Policy Sub-Committee of the Executive Committee (EXCOM). Thereafter, the reports are submitted to EXCOM for consideration and finally to the Financial Stability Committee of the Board. The governance of the RTGS is therefore embedded within the BOU’s governance structure. This notwithstanding, there is need to strengthen the NPSD staffing needs to strengthen oversight and to frequently convene the participants forum as an avenue to discuss matters pertaining to the FMI. The amendment of the BOU Act, 2000 should also be expedited to give the Bank solid legal basis for the supervision and regulation of payment systems

### Principle 3: Framework for the comprehensive management of risks

BOU has a well-established risk management framework for all its operations but lacks a specific risk management plan for the UNISS. Under the Bank’s Risk Management Policy, the National Payment Systems Department (NPSD) provides a risk register of all risks that might impact its ability to operate UNISS in a safe and efficient manner. However, this risk management framework covers the entire department and lacks a separate customized plan for the UNISS.

### Principle 5: Collateral

In order to ease the liquidity requirements for a participant, Bank of Uganda may extend intra-day liquidity support credit to a bank on condition that it has reserved collateral. However, the valuation of collateral uses primary market rates creating room for potential variances. Valuation does not put into consideration the securities’ time-to-maturity. The 2 percent haircut has been in use since inception of UNISS and has not been adjusted even in periods of increased market interest rates. Consultations are underway for an adjustment to be effected on the haircut to reflect the prevailing interest rate environment. The valuation methodology should be periodically revised to keep it in sync with market developments.

### Principle 7: Liquidity risk

Participants are required to sufficiently pre-fund their settlement accounts. In addition, BOU assists participants in their liquidity management, through the provision of the intraday liquidity facility. Nevertheless, challenges exist with regard to settlement of positions arising from local foreign clearing transactions.

### Principle 13: Participant Default rules and procedures

The rules specify that participants shall ensure that there are sufficient funds in their account to allow immediate processing of the payment Instructions. A transaction that would reduce the balance below the minimum is rejected and a penalty levied for insufficient funds as laid out in Schedule E of the rules. Whereas the procedures provide for periodic review and at a minimum annual testing of the default provisions, this has not been done.

### Principle 17: Operational Risk

During the period under review, the business resumption site was in some incidences unable to assume operations within the recommended two hours following disruption at the primary site. This failure was often due to power failure, systems malfunction and network issues among others. In addition, the Business Resumption Site (BRS) is located within a 3 km distance from the primary site. There is need to ensure that the recovery time objective of 2 hours is observed and to conduct a distinct operational risk assessment for UNISS, different from the general BOU risk profiling.

Furthermore, the Bank should consider relocation of the BRS to a distant area that has a different geographical risk profile.

### Principle 20: FMI Links

Whereas BOU as the operator of the UNISS has a solid legal basis for operating and linking the other related FMIs such as the ACH and the CSD, none of the linked FMIs had been subjected to PFMI assessment as at the date of this assessment.

### Principle 21: Efficiency and effectiveness

Onsite visits conducted for the ten largest participants revealed that there are delays by these banks in effecting customer’s instructions which compromised the effectiveness of RTGS. The study revealed tendencies to process transactions as a batch towards cut off time for the processing windows. There is need to enhance oversight to ensure that participants follow the rules and procedures. Periodic self assessment of the system efficiency and effectiveness should also be considered.

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

The UNISS Rules and Procedures and associated contractual arrangements, which are available on the Bank’s website, are supplemented by service level agreements and user guides that explain the operations. However, BOU has not yet completed the CPSS–IOSCO disclosure framework for the UNISS. The disclosure framework will help participants assess the risks they would incur by participating in the RTGS.

# Chapter 1: - Background

# Introduction

CSD is aimed at facilitating post-trading integration by offering core, neutral and borderless pan-European cash and securities settlement in central bank money so that CSDs can provide their customers with harmonised and commoditised deliveryversus-payment settlement services in an integrated technical environment with crossborder capabilities. The objective is to achieve harmonised and commoditised delivery-versus-payment settlement in central bank money in euro (and possibly other currencies)[[3]](#footnote-3) for substantially all securities in Europe. This is performed via a single technical platform integrated with central banks’ Real-Time Gross Settlement (RTGS) systems for all participating currencies.

## Settlement

Settlement in CSD is carried out exclusively in central bank money. Reliability, scalability and robustness are key parameters for CSD, in view of the substantial volumes of transactions to be settled and will become ever more important as volumes settled in CSD continue to increase.

## Participation

CSDs are the gateways through which market participants can access CSD services. CSDs’ participants continue to contract with one or more CSDs for the settlement (across the accounts of those CSDs) of securities eligible for such settlement.

Some CSD participants have chosen to establish a direct connection to CSD – i.e. to access and use CSD services without using the relevant CSD/central bank as a relay or proxy. These so-called directly connected parties (DCPs) have no contractual relationship with the Bank of Uganda but only with their respective CSD. The contract with the CSD establishes what the rights and obligations of the DCP are, and the CSD remains legally responsible vis-à-vis the Bank of Uganda for the DCP’s actions.

The Bank of Uganda has concluded the CSD Framework Agreement for the delivery of the CSD services exclusively with the CSDs participating in CSD.

Bank of Uganda central banks and non-euro central banks whose currencies are available for settlement in CSD are the gateways through which market participants access the liquidity services provided in CSD, maintaining the cash accounts of their RTGS participants for all securities-related payment transactions in their currency in CSD.

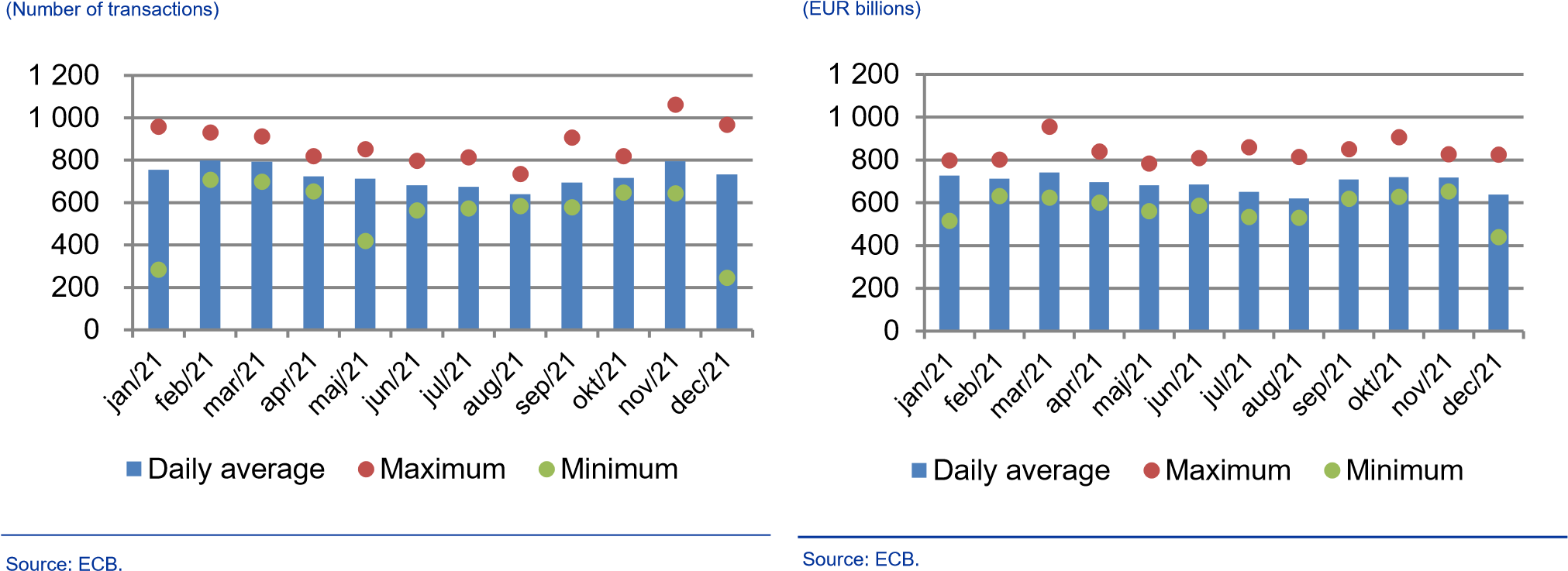
The Bank of Uganda central banks and the one non-euro central bank (so far) that has authorised its currency to become settlement currencies in CSD have signed the Currency Participation Agreement for the provision of the CSD services. DCPs that have chosen to establish a direct connection to CSD access and use CSD services without using the relevant central bank as a relay or proxy.

## Key indicators

As per Chart 1, in 20215 CSD settled on average 726,271 transactions per day. The daily average volume per month ranged from 639,876 (in August) to 798,571 (in February). The highest daily volume settled was in November (1,061,928 transactions) and the lowest in December (245,181 transactions). In 2021 CSD settled an average value of €691.10 billion per day. Chart 2 shows the evolution of daily average CSD traffic in value terms. The daily average value per month ranged from €620.04 billion (in August) to €741.88 billion (in March). The highest daily value was recorded on 10 March (€955.75 billion) and the lowest on 29 December (€438.34 billion).

**Chart 1 Chart 2**

Daily average CSD volumes Daily average CSD values



## General organisation of CSD

The CSD platform is owned by the Bank of Uganda. It is operated on behalf of the Bank of Uganda by four Bank of Uganda national central banks (4CB) – the Deutsche Bundesbank, the Banco de España, the Banque de France and the Banca d’Italia – and with the CSD Coordination at the ECB providing a coordination function. The groups listed below support the Bank of Uganda in running CSD as part of the governance framework.

5 Updated figures will be available in the forthcoming 2022 CSD Annual Reports published by the Bank of Uganda.

The management of CSD is based on a three-level governance scheme: level 1 is the Governing Council of the ECB which has ultimate responsibility for CSD; level 2, consists of the MIB, which has been mandated by the Governing Council to manage the daily operations of the platform; and level 3 consists of the four Bank of Uganda national central banks that provide the service (4CB), as well as the CSD Coordination function at the ECB.

## Legal and regulatory framework

Each CSD that participates in CSD needs to be designated under the national legislation implementing the Settlement Finality Directive.[[4]](#footnote-4) The details of the legal framework are described in the section on Principle 1 of the PFMI.

CSD is overseen by the Bank of Uganda, which assesses it against the applicable principles[[5]](#footnote-5) and key considerations of the CPMI-IOSCO PFMI. In addition, the Bank of Uganda has set up the CSD Cooperative Arrangement to ensure that all authorities with a legitimate interest in the smooth functioning of CSD are adequately involved, i.e. overseers of securities settlement systems operated by CSDs and payment systems using CSD services, central banks of issue for currencies settled in CSD, national competent authorities for the supervision of CSDs which have signed the CSD Framework Agreement, and the European Securities and Markets Authority as the coordinator of these authorities.

## 3.4 System design and operation

CSD is based on a technically centralised platform and all participants, irrespective of their location, have access to the same services, functionalities and interfaces.

CSD is a service that the Bank of Uganda offers to CSDs that allows for the core, neutral and borderless settlement of securities transactions on a delivery-versus-payment basis in central bank money. Settlement is performed on a single technical platform connected to central banks’ RTGS systems for all participating currencies.

Dedicated cash account services are provided in CSD by the Bank of Uganda central banks and the non-euro central banks who have authorised the participation of their currencies in CSD as settlement currencies.

Communication between CSD and its participants is harmonised and based on ISO 20022 standards, and is provided by either SWIFT or SIA.

The CSD platform has been developed and is operated by the four service-providing central banks known as the 4CB (the Deutsche Bundesbank, Banco de España, Banque de France and Banca d’Italia), or level 3 of the CSD governance structure, which includes as well the CSD Coordination function at the ECB.

Any market participant wanting to settle securities transactions using the CSD platform needs to have access to a securities account with one of the CSDs connected to CSD, and a dedicated cash account with one of the central banks connected to the platform. These accounts are operated simultaneously on CSD – i.e. the settlement model is integrated for fast, low-risk and efficient settlement. For each transaction, the delivering and receiving legs are matched by CSD and contain the relevant securities and cash information for each counterpart (i.e. each leg can contain securities and cash information). CSD then settles most transactions on a delivery-versus-payment basis so that the money and securities transactions are settled simultaneously.

Securities settlement can take place during two CSD periods: (a) night-time settlement (NTS) and (b) daytime real-time settlement (RTS).

1. The NTS runs from 20:00 CET and is divided into two cycles – the first cycle and the last cycle. The first cycle is subdivided into five sequences and the last cycle into four sequences. Within each of the different sequences certain types of transactions are settled. At the end of the last NTS cycle, CSD submits, for partial settlement, all eligible transactions that failed to be settled in an earlier attempt during the night.
2. The RTS process starts after the completion of the NTS and runs until 18:00 CET but may be interrupted by the maintenance window. CSD Release 5.0 in June 2021 made the daily maintenance window optional. When activated, the maintenance window starts at 03:00 CET and ends at 05:00 CET. During the maintenance window CSD is closed for all settlement activities. Once the maintenance window is over, settlement and booking activity resumes and runs throughout the settlement day until 18:00 CET. During the RTS period, partial settlement takes place at 08:00 CET, 10:00 CET, 12:00 CET, 14:00 CET and 15:45 CET.

CSD offers the highest possible level of reliability and resilience, as well as sophisticated business contingency arrangements commensurate with the systemic importance of the CSD platform. The basis of the business continuity concept of CSD consists of a two-region/four-site architecture, whereby CSD is operated in two regions for settlement processing and accounting services, and each region has two separate sites. Regular rotations within and between the regions ensure that both regions are fully ready and prepared to switch-over in the event of any incident. This architecture enables CSD to fulfil the highest service levels, minimise operational risk and avoid systemic risk.

## 1.1 Summary of major changes since the last assessment

TBD

# Chapter 2: – Detailed Assessment of the Principles

## Principle 1: Legal Basis

* 1. **Principle narrative**

RIGHTS

OBLIGATIONS

MANNER

TIME

LEGAL FRAMEWORK (LF) + RULES, PROCEDURES & CONTRACTS=LEGAL BASIS

Laws may be general e.g. consumer protection or specific to the FMI for LF e.g., Securities Law, Collateral etc

• **The enforceability** of rights and obligations relating to an FMI and its risk management should be established with a high degree of certainty ✓ So both the legal framework and the rules, procedures, and contracts related to an FMI’s operation should be enforceable …in all circumstances ✓ Rules, procedures, contracts • Clear, understandable, and consistent with the legal framework • Consistent with relevant industry standards and market protocols • Enforceability confirmed, e.g. through independent legal opinions or analyses • The legal basis should support the enforceability of the default rules & procedures that an FMI uses to handle a defaulting or insolvent participant

* An FMI should have a well-founded, clear, transparent and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.
* As a robust legal basis for an FMI’s activities in all relevant jurisdictions is critical to an FMI’s overall soundness, this Principle should be reviewed holistically with the other Principles.

**1.2 Assessment of compliance**

**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.**

Rights and Interests • Define and protect rights and interests of all stakeholders, e.g. with respect to collateral, or assets held in custody, including in the event of insolvency (of FMI, or participant) • Required for the FMI as well as participants and other stakeholders Settlement Finality • Legal basis on finality (timing) with no possibility to revoke transaction thereafter • Address risks from insolvency law e.g. No zero-hour rules\* Netting Arrangements • Ensure netting is legally enforceable, otherwise risk of unwinding transactions to gross amounts due, creating liquidity and other problems

Auction Procedures

CSD Agreement

Guidelines for borrowing from the central Bank of Uganda

National-Payment-Systems-Policy-Framework

National-Payment-Systems-Regulations

PAYMENT-SYSTEMS-MANAGEMENT-AND-OVERSIGHT (Education)

GUIDELINES FOR BORROWING FROM THE EMERGENCY LIQUIDITY ASSISTANCE (ELA) FACILITY

Rules-Governing-the-Lombard-and-the-Rediscount-window.

The-National-Payment-Systems-Oversight

(a) UNISS/RTGS activities are conducted across the country and the services are provided in Uganda, governed by Ugandan law. The regulatory frameworks cover the RTGS/UNISS activities which include the following;

* + - 1. the appointment of the BOU as the UNISS-RTGS operator.
      2. the authorization of participants.
      3. settlement finality and irrevocability of settled instructions.
      4. participant failure; and
      5. settlement failure.

* + 1. The Bank of Uganda was established by section 2 of the Bank of Uganda Act, which along with the National Payment Systems Act mandates the Bank to oversee the regulation of the payment systems and to ensure their safety and efficiency. However, the BOU Act does not have an explicit mandate for the Bank to regulate and supervise payment systems.

* + 1. Section 2(1), Section 6 and Section 24 of [the](https://www.bou.or.ug/bou/bouwebsite/bouwebsitecontent/acts/supervision_acts_regulations/Payment-Systems-Act/The-National-Payments-Systems-Act-2020.pdf) National Payment Systems Act, 2020 provide for the regulation of payment systems in Uganda including the RTGS/UNISS.

* + 1. The Bank of Uganda is appointed as the operator of the RTGS under section 5(a) of the NPS Act 2020.

* + 1. Section 19 mandates the Bank of Uganda to establish oversight structures for the payment systems including the RTGS. The oversight function is supported by the oversight framework.

* + 1. The NPS Act, 2020 is supported by the NPS Regulations, 2021 which detail the licensing, reporting and risk management obligations for operators of payment systems.

* + 1. The operations of the RTGS are further supported by the UNISS Rules and Procedures as required under Section 11 of the NPS Act, 2020. All participants are required to execute the UNISS rules and regulations as a pre-condition for being admitted.

* + 1. Clause 2.2 of the UNISS Rules and Procedures provide that participation in the RTGS (UNISS) is open to a financial institution, or any institution approved by the Bank, provided it meets all the eligibility criteria and conditions provided in subsections (a) to (e). Clause 3 lays out the suspension and general exit procedures.

* + 1. Clause 6 of the UNISS Rules and Procedures provides that payment instructions in UNISS are deemed to be final and irrevocable once the sending participant's account is debited and the receiving participant is credited with the amount specified in the payment instruction.
    2. The applicable law, being the Ugandan law, provides for a well- founded legal basis that supports the finality and irrevocability of settlement. Sections 25(1), (2) and (3) of the NPS Act 2020 provide for settlement in a designated settlement system to be final and irrevocable.
    3. Participant failure is provided for under Clause 3.5 – 3.7 of the UNISS Rules and Procedures. A participant that undergoes business rescue or insolvency may continue to participate in the RTGS until its participation is withdrawn by the UNISS operator upon receipt of written notification from the Central Bank, indicating that the participant can no longer participate in the RTGS. Funds that are available in the accounts at the time insolvency procedures are initiated against the participant, and instruments and deposits that come into these accounts after that time may be deployed by the BoU to facilitate settlement and avoid disruption. The provisions of the NPSA supersede those of the Insolvency Act in this regard. [check]

**Key consideration 2:**

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

The legal basis should provide certainty for each material aspect, in all relevant jurisdictions, e.g. ✓Where the FMI is conducting business ✓Where its participants are incorporated, located, or otherwise conducting business ✓Where collateral is located or held, and ✓Those indicated in relevant contracts Relevant jurisdictions 12 • Conflict-of-laws may arise if an FMI is subject to the laws of other jurisdictions ✓Its participants are established in those jurisdictions ✓Collateral (securities) held in multiple jurisdictions ✓Business is conducted in multiple jurisdictions • Analyze potential conflict-of-laws issues and develop rules and procedures to mitigate this risk ✓Obtain reasoned and independent legal opinions and analysis in order to properly address uncertainty related to conflicting laws

UNISS Rules and Procedures as well as UNISS agreements are clear and understandable. The rules were developed through a participative process involving the key stakeholders such as the financial institutions. These rules are reviewed every 2 years for consistency with the relevant laws and regulations. However, the rules have not been reviewed since 2017.

An agreement has been entered into between the ACH and UNISS on the submission and settlement of clearings and on notification and processing procedures in contingency situations. The ACH and UNISS participants are the same settlement banks. Based on this agreement, there is a contingency and notification plan for the execution of clearing and settlement in the event of operational disruption, insufficient funds, changes in banks’ participation, etc. The rules governing settlement in UNISS are consistent with the operating schedules for both the ACH and UNISS.

**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.**

1. The legal basis for the RTGS is well articulated in the NPS Act, 2020, the NPS Regulations and the UNISS rules and procedures. These provisions have been the basis of public awareness campaigns aimed at promoting the UNISS.
2. The NPS law, regulations and rules are available for public reference via the BOU website. Www.bou.ug

**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.**

Section 5 (a) of the NPS Act, 2020 designated BOU as the operator of the RTGS in Uganda. The operating rules were issued pursuant to Section 11 of the Act and are binding on all system participants. Participants commit to complying with the rules when they execute the Participant Agreements which form part of the rules. To ensure that the agreements the BoU enters into with participants in UNISS comply with applicable laws and regulations, and that the BoU’s interests are adequately addressed, legal experts are consulted when drawing up the agreements or changes thereto. The BoU legal department is first consulted. External experts are also consulted if necessary.

The Bank’s system for internal control is based on three lines of defence. Responsibility for compliance with applicable laws, regulations and rules rests with the UNISS operator as the first line of defence. A central Compliance Unit (Risk Management?) is the second line of defence, advising the first line and monitoring compliance. The Internal Audit Department is the third line of defence. Rules and procedures that impact other systems/external parties, such as the ACH or CSD, are coordinated with these participants. In the event of major changes to the rules, the proposed changes are circulated for consultation among the parties concerned. Final approval is given by the BoU before changes take effect. This process helps to protect the integrity and enforceability of the rules.

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.

Q.1.5.1: If the FMI is conducting business in multiple jurisdictions, how does the FMI identify and analyse any potential conflict-of-laws issues? When uncertainty exists regarding the enforceability of an FMI’s choice of law in relevant jurisdictions, has the FMI obtained an independent legal analysis of potential conflict-of-laws issues? What potential conflict-of-laws issues has the FMI identified and analysed? How has the FMI addressed any potential conflict-oflaws issues?

**Conclusion:**

**The National Payment Systems Act, 2020 provides a clear legal basis for the operation of the RTGS. The law is supported by the NPS Regulations,2021 and the UNISS rules and procedures which are binding on all participants. The Act also designates the oversight responsibility for payment systems which is supported by the BOU oversight framework. This notwithstanding, the UNISS rules have not been reviewed since 2017, three years before the coming into force of the NPS Act, 2020.**

**Overall, the Principle is considered observed.**

**Recommendations:**

1. NPSD should conduct a review of the UNISS Rules and Procedures.
2. The BOU Act 2000 should be amended to further buttress the role of BOU in the promotion of the safety and efficiency of payment systems.

## Principle 2: Governance

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**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.**

1. The UNISS is operated by the National Payments Systems Department of BOU whose mission is to promote the safety and efficiency of payment systems.
2. The RTGS was introduced as one of the measures to support the distribution of liquidity in the financial system in support of overall financial stability.

**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.**

1. The UNISS is operated by the National Payments Systems Department of BOU which reports to the Executive Director Finance.

zz8z

1. The Department is also charged with the oversight of payment systems, a responsibility assigned to the Payment Systems Oversight and Policy division. The operator and oversight functions are clearly distinguished.
2. Whereas the Operations and Oversight division both report to the

Director National Payment Systems Department, the oversight activity is overseen by the Payment Systems Policy Subcommittee of EXCOM. On a quarterly basis, the committee considers the operations in the payment systems with the report thereof submitted to the Financial Stability Committee of the Board through the EXCOM.

1. The oversight activity is also subjected to review by the risk management function of the Bank as well as periodic internal audits and external audit reviews on an annual basis.
2. The governance arrangements are considered adequate.

**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.**

1. The Bank's compliance with principles of good corporate governance is reflected through a properly constituted Board of Directors. The board functions through various committees, including the financial stability committee which receives the quarterly oversight report and the audit and governance committee which receives risk management review reports, internal and external audit reports.
2. As noted in the Annual Report 2021/2022, the Board conducts self performance evaluation[[6]](#footnote-6).

**Key consideration 4:**

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

According to the Annual Report 2021/2022, the Board of Directors is comprised of seven (7) directors namely: the Governor, who is the Chairman of the Board; the Deputy Governor who is the Deputy

Chairman; and five non-executive Directors. All Directors of the

possess the requisite qualifications, skills, and experience in economics, finance, and banking and are persons of integrity[[7]](#footnote-7).

**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**.

1. Director NPSD is responsible for managing the day-to-day operations of UNISS. All staff in NPS have clear roles and responsibilities outlined in the job descriptions. Detailed business processes are also laid out in the operational manuals for the Department. The Bank also has a Human Resources Department which has the responsibility of recruiting, developing, and managing human resources.

1. However, as at the time of review, the NPS Department was short of staff following the expansion of the mandate to cover financial inclusion and payment systems oversight. The Department staff head count was 20 out of a total complement of 34, leaving 14 vacant slots.

1. All Bank staff are subject to the staff rules and regulations and the staff code of conduct as laid out in the BOU Administration Manual.

**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.**

1. Bank of Uganda implemented an Enterprise Risk Management Framework. It covers 4 distinct risk areas namely, Operational,

Financial, Compliance and Policy and Strategic Risk. The

framework is supported by an Operational Risk Management Framework and a Compliance Policy. As part of the framework, NPSD has a designated risk champion who coordinates the Department’s risk management activities, including convening the risk management meetings and update of the risk register.

1. The Risk and Compliance Department of BOU is charged with taking the lead in promoting risk awareness and ensuring that the bank appropriately manages risk.
2. The Risk and Compliance Department reports functionally to the Board Audit and Governance Committee.
3. Similarly, the internal control processes and the general governance processes are subject to review by internal and external auditors who report to the Audit and Governance Committee of the Board.

**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.**

1. The key developments about the RTGS are communicated by the Bank to the participants through circulars and other routine communication channels such as email.

1. The Operator also periodically engages the Heads of Operations and Chief Executive Officers on matters pertaining to the UNISS. However, the meetings are not regular.

**Conclusion:**

**The management and operation of UNISS fall under the BOU governance structure and therefore is subject to the BOU decision making and audit processes. The operations are overseen by the Payment Systems sub Committee, EXCOM and the Financial Stability Committee of the Board. The risk and compliance Department, internal and external auditors provide assurance on the operations of the UNISS through periodic reports that are submitted to the Audit and Governance Committee of the Board. The operator periodically engages the participants however the meetings are not regular owing to staff constraints and other pressing assignments.**

**Overall, the Principle is considered broadly observed.**

**Recommendations:**

1. Management should expedite filling the staffing gaps in the NPSD.
2. The RTGS operator should increase the frequency of the meetings held with the participants.

## Principle 3: Framework for the Comprehensive Management of Risks

**1.1 Principle narrative**

An FMI should have a sound risk management framework for comprehensively managing legal, credit, liquidity, operational and other risks. In reviewing this principle, an assessor should consider how the various risks, both borne by and posed by the FMI, relate to and interact with each other. As such, this principle should be reviewed holistically with the other principles.

**1.2 Assessment of compliance**

**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.**

1. As mentioned in Principle 2, the BOU views risk management as an integral part and an essential element of good corporate governance. The UNISS is well designed and well-structured to minimize risks to the participants and the financial system in general.
2. The BOU Risk Management Framework is documented and reviewed periodically to ensure that all potential risks relating to FMI operations can be identified, assessed, measured, monitored, and reported.
3. The risk management process involves five steps that include; i) establishment of the context, ii) risk identification, iii) analysis of risks, iv) risk evaluation, and v) treatment and management of the risks. The framework also provides for communication and consultation at each stage of risk management process and independent review by Internal Audit.
4. As part of the first line of defence, the Operator prepares a risk register, which is reviewed every quarter to reflect any new material changes in terms of risks, controls or risk ratings. However, this risk management framework covers the entire department and is not specific to UNISS operations. The Risk register describes operational risk faced by the systems in general but not those that are specific to the UNISS.

**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.**

1. Participants do not pose liquidity or credit risks to the Bank as operator of UNISS given the design of UNISS (see Principle 4 and 7). However, they pose operational risk which could lead to system disruption. Accordingly, all participants are subject to specific UNISS rules and procedures that aim to reduce the likelihood that an individual participant would disrupt the operation. All participants are required to sign the UNISS rules and procedures prior to admission.
2. To minimise disruption, the operator adopted financial incentives for timely submission of payment instructions whereby transactions that are submitted during Window1 (08.30hrs – 13.00hrs) receive a discount whereas those that are submitted during Window3 (15.00hrs – 16.30hrs) attract a surcharge. However, this incentive is not effective as most payment instructions are submitted during Window3 with occasional extensions.

**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.**

1. Since settlement is in central bank money for which prefunded accounts are held at the Central Bank, no major liquidity risks exist. However, rejection of payments from participants may affect other participants whose liquidity planning is based on other players. This could potentially lead to systemic liquidity stress during times of market distress.
2. The system faces a high risk of operational downtime given the reliance on SWIFT for messaging, with no alternative arrangements.
3. Related to (b) above, occasional cases were noted during the review period when the system down time significantly delayed settlement. However, the Business Continuity arrangements are tested biannually to ensure risks are mitigated by processes and procedures.
4. These risks are monitored on a regular basis with progressive actions taken for emerging exposures.
5. The system is also monitored throughout the business day using the Opsmon dashboard.

**Conclusion:**

**The Bank has a well established risk management framework which details the overall approach to risk management. Pursuant to this framework, NPSD prepares a risk register highlighting all the envisaged risks that might impact its ability to operate payment systems in a safe and efficient manner. However, this risk management framework covers the entire department and is not specific to UNISS operations.**

**Overall, the principle is considered broadly observed**

**Recommendations:**

i) The operator should develop a UNISS specific risk register to support a detailed thought process for risks that are unique to the RTGS.

## Principle 4: Credit Risk

**1.1 Principle narrative**

* 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.

**1.2 Assessment of compliance**

**Key consideration 1:**

**A payment system 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.**

1. UNISS participants prefund their settlement accounts and these accounts cannot be overdrawn. Participants are advised to monitor and ensure that their settlement accounts are sufficiently funded prior to submitting payment instructions. Any failure to settle is penalized as laid out in the participation rules and procedures.

1. A certain level of credit risk exposure to the participants arises through the provision of the intraday liquidity facility (ILF) to participants, to support their liquidity needs. This risk is mitigated by taking collateral in form of treasury bills of not more than 91 days. The valuation of the pledged collateral is based on the most recent market rates and at a haircut of 2% or as determined by the bank from time to time.

1. The responsibility for reviewing and approving the collateral is done by NPSD, however, the liens are created by the Central Securities Depository team of the Banking Department.

1. Although the funds must be paid back by end of day, there is a residual risk in the event that the collateral value were to fall below the amount of credit extended to the participant.

**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.**

a) Bank of Uganda is exposed to credit risk through the provision of the intraday liquidity facility to UNISS. See Key consideration 1 above.

**Key consideration 3:**

**A payment system 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).**

1. Credit risk assumed by the Bank in providing Intra-day liquidity

Facility (ILF) to UNISS participants is mitigated by accepting high-

quality collateral in form of treasury bills which could be liquidated in case of default.

1. If by final cut off time there are still insufficient funds to fully pay off the intra day liquidity facility, UNISS automatically treats the transaction as a permanent trade and ownership transferred to BOU at a specific valuation.

**Key consideration 4:**

**A Central Counterparty (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).**

This does not apply to UNISS since the system is not a CCP.

**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.**

This consideration does not apply to UNISS as the system is not a CCP.

**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.**

This consideration does not apply to UNISS since the system is not a CCP.

**Key consideration 7:**

**A payment system 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 payment system. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds a payment system may borrow from liquidity providers. These rules and procedures should also indicate the payment system’s process to replenish any financial resources that the payment system may employ during a stress event, so that the payment system can continue to operate in a safe and sound manner.**

The UNISS is supported by clear rules and procedures which must be signed off by the participants. The rules lay out the default management procedures and associated penalties. These provisions are supported by Section 43 and 44 of the NPS Act which grants superior rights to a collateral taker over any other creditors and section 40 of the Act which lays out the enforceability of financial collateral arrangements in case of default.

**Conclusion:**

**Payments are settled using funds held in participants’ settlement accounts at BoU, and these accounts cannot be overdrawn. The mode of settlement in UNISS is designed to ensure that the FMI bears minimal credit risk. there is no credit risk between the participants. Credit risk exposure between the participants and the Operator arises through the provision of the ILF. However, this is mitigated by the designation of eligible collateral in form of treasury bills. In addition, the funds must be repaid before end of day short of which the collateral is liquidated.**

**Overall, the Principle is considered Observed.**

## Principle 5: Collateral

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

**Key consideration 1:**

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

1. Bank of Uganda only accepts Government of Uganda Treasury

Bills, as collateral for intraday liquidity facility. Only Treasury bills of not more than 91 days with not less than 2 days to maturity are eligible as collateral.

1. These treasury bills have low credit, liquidity and market risks. The collateral valuation is based on the most recent market rates and a hair-cut of 2 percent to protect BoU against unfavorable price movements of the collateral.

**Key consideration 2:**

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

1. The bank values securities accepted as collateral using the most recent primary market rates obtained from the Financial Markets Department.

1. Whereas a haircut of 2% is applied on the collateral used to secure the intraday liquidity facility, the valuation does not put into consideration the securities’ time-to- maturity. In addition, the 2 percent haircut has been in use since inception of UNISS and has never been adjusted even in periods of market stress or during periods of high interest rates.

1. Consultations are underway with the Financial Markets Department for an upward review of the haircut.

**Key consideration 3:**

**In order to reduce the need for pro cyclical adjustments, a payment system should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.**

Whereas a 2% haircut has been in use since inception of UNISS, the rate has not been recalibrated to reflect marked developments over the years, including interest rate changes. The rules and procedures should be amended to provide for periodic review of the haircut.

**Key consideration 4:**

**A 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.**

BOU only takes Government of Uganda treasury bills, as collateral. While the concentration in this holding is thus inevitable, the securities are considered high quality and easy to liquidate without significant loss.

**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.**

This does not apply as no cross-border collateral is admissible to UNISS.

**Key consideration 6:**

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

1. BoU operates both the Central Securities Depository for government securities and UNISS. When UNISS participants pledge securities, a lien is placed on the pledged securities in the CSD. In parallel, the security is designated in UNISS as collateral for the intra day liquidity facility. On payback, the collateral is automatically released in UNISS.

1. The system is operationally flexible and well designed to manage the collateral.

**Conclusion:**

**The UNISS works on the principle of pre-funded accounts. In order to ease the liquidity requirements for participants, Bank of Uganda may extend intra day credit to a participant on condition that it has reserved collateral. Only Treasury bills of not more than 91 days and not less than 2 days to maturity are eligible as collateral. These treasury bills have low credit, liquidity, and market risks. Additionally, the collateral is subject toa haircut and must be paid back before close of business or else the transaction becomes a permanent sale of the underlying security. However, the haircut has never been revised despite the changes in market conditions over the years. Additionally, the valuation does not consider the prevailing secondary market conditions.**

**Overall, the Principle is considered broadly observed.**

**Recommendations:**

i) The valuation should consider the securities’ time-to- maturity. ii) The valuation methodology should be periodically reviewed to keep it in sync with market developments.

## Principle 6: Margin

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

Principle 6 is not applicable to the UNISS-RTGS.

## Principle 7: Liquidity Risk

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

Settlement in the UNISS is based on the prefunding principle, in terms of which any interbank funds transfer will be effected only if sufficient funds are available in the paying bank’s settlement account. All settlement is in central bank money.

**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.**

1. UNISS conducts its settlements on a gross basis with participants

pre-funding their accounts at the central bank. Therefore, there are no liquidity needs for the operator. However, participants must ensure that they manage their liquidity to ensure prompt settlement of payment instructions.

1. Participants are required to prefund their settlement accounts as UNISS has the capability to monitor availability of liquidity in the system. BOU assists participants in their liquidity management, through the provision of the intraday liquidity facilities.
2. Nevertheless, challenges exist with regard to settlement of positions arising from local foreign clearing transactions. The messages prefunding the foreign currency account on RTGS at times delay either to be received by Bank of Uganda or to be posted on the RTGS and therefore by the time of settlement the funds on account are inadequate to settle the clearing position(s). On other occasions, the participant simply doesn’t have enough liquidity especially if the claims are emanating from cheques that are yet to go through the clearing process. Policy proposals are being considered to address this matter.

**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.**

1. UNISS provides a position monitor so that its participants are able to monitor their liquidity positions. In addition, BOU as the operator monitors the consolidated position for the system and use of the Intra Day Liquidity.
2. To manage and mitigate liquidity risk from late submission of payments, UNISS adopted financial incentives for timely submission whereby transactions that are submitted during Window 1 (08.30hrs – 13.00hrs) are charged at a discount whereas those that are submitted during Window 3 (15.00hrs – 16.30hrs) attract a surcharge. However, the final operating window (Window 3) is routinely extended which potentially poses liquidity and operational risks.

**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.**

UNISS settles transactions in Uganda shillings and major foreign currencies i.e USD, EUR, GBP, KES, TZS and RWF on a prefund basis. BOU is thus not exposed to liquidity risk and participants are required to sufficiently pre-fund their settlement accounts. However, there are some risks associated with failure to fund foreign currency accounts to support local foreign currency clearing. Policy proposals are being considered to address this matter.

**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.**

Key consideration 4 is not applicable to the UNISS which is not a CCP.

**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.**

This key consideration does not apply since the BOU owns and operates the UNISS and so does not assume liquidity risk. All settlement is done in central bank money.

**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.**

Key consideration 6 does not apply since the BOU owns and operates the UNISS and so does not assume liquidity risk.

**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.**

Key consideration 7 does not apply since BOU owns and operates the UNISS and so does not assume liquidity risk. All participants are deemed to have acceptable liquidity management systems and this is assessed prior to admission.

**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.**

Key consideration 8 does not apply since the BOU owns and operates the UNISS and so does not assume liquidity risk. **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.**

No stress tests on the liquidity needs in the RTGS system have been done by the operator. However, the Financial Stability Department of the BOU has conducted liquidity stress tests and recommended appropriate mitigation measures.

**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.**

1. UNISS Rules and Procedures emphasize that participants should ensure that there are sufficient funds in their account to allow immediate processing of the payment instructions. The only challenges faced relate to settlement of foreign currency related positions arising from local clearing of foreign currency transactions.
2. Since the Bank does not assume liquidity risk as operator of UNISS, the requirement to establish rules and procedures to address unforeseen and potentially uncovered liquidity shortfalls and replenish any liquid resources do not apply.

**Conclusion:**

**Through its RTGS design, the UNISS helps protect the payment system from liquidity risks.** **The BoU has instituted time-of-day pricing within the UNISS to encourage timely initiation of payments throughout the day so as to avoid bottlenecks towards end of day. However, the final operating window is routinely extended which exacerbates both liquidity and operational risks. In addition, failure to settle cases continue to be noted for foreign currency transactions.**

**No stress tests on the liquidity needs in the RTGS system have been done by the operator. However, the Financial Stability Department of the BOU has conducted liquidity stress tests and recommended appropriate mitigation measures.**

**The Principle is considered broadly observed**

## Principle 8: Settlement Finality

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**Key consideration 1:**

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

1. Clause 6 of the UNISS rules and procedures requires that payment instructions in UNISS are deemed to be final and irrevocable once the sending participant's account is debited and the receiving participant is credited with the amount specified in the payment instruction. Even in the event of insolvency, such a payment instruction or settlement shall be valid, enforceable and binding against third parties, including the central bank or insolvency practitioner as provided for by Section 28 of the NPS Act 2020.
2. Payments are settled in the UNISS-RTGS in central bank money. The settlement of payment instructions across the books of the BOU as well as the funding between settlement members and the BOU via central bank accounts is final and irrevocable once the relevant accounts have been appropriately debited and credited.
3. Section 25 of the NPS Act, 2020 provides for the following settlement finality and irrevocability of payments provisions:
   * A payment instruction or settlement shall be valid and enforceable by and against a payment system operator or participant and shall be final and irrevocable from the time the payment instruction or settlement is determined under the rules of the payment system to be final.
   * Notwithstanding any other law to the contrary, an order shall not be made by any court for the rectification or stay of a payment instruction or settlement that is determined by the rules of the payment system to be final and irrevocable.
   * A payment system operator or payment service provider shall with the approval of the central bank prescribe the manner of recovering an equivalent amount of transfer arising from a payment instruction or settlement made in case of fraud, mistake, error or similar vitiating factors.

**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.**

1. RTGS payments in UNISS are settled individually in real time provided the account is funded.
2. Any payments that are not settled at the end of the last session during which the transaction was eligible for settlement are automatically removed from UNISS but may be resubmitted for settlement when the system reopens.

**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. As provided in the NPS Act, any credit payment that settles in the UNISS-RTGS is final and irrevocable and may not be withdrawn by the paying party. Should the payer require the return of funds, this can only be done or refunded by mutual agreement between the two transacting parties and with the issuance of a new payment instruction.
2. Payment instructions in UNISS are deemed to be final and irrevocable (see key consideration 1). Clause 5 of the UNISS rules and procedures provides that a sending participant may withdraw a queued payment instruction from its settlement queue. A participant may request return of a payment from a receiving party by using formal means of communication giving reason(s). A return payment is initiated as a new instruction and any costs or claims arising thereof are dealt with by the participants bilaterally.

**Conclusion:**

**RTGS payments in UNISS are settled individually in real time. As per the UNISS rules and Procedures, regarding finality and irrevocability of payments, payment instructions in UNISS are deemed to be final and irrevocable once the sending participant's account is debited and the receiving participant is credited with the amount specified in the payment instruction. However, in case of insolvency, there is a risk that some transactions can be reversed for the day a participant becomes insolvent if the ‘zerohour rule’ is applied.**

**The Principle is considered observed**

## Principle 9: Money Settlements

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**Key consideration 1:**

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

Settlement in the UNISS occurs in central bank money.

**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.**

This key consideration does not apply as all money settlements in UNISS are conducted in central bank money.

**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.**

Key consideration 3 is not applicable to the UNISS-RTGS. All money settlements in UNISS are conducted in Central Bank Money.

**Key consideration 4:**

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

Key consideration 4 is not applicable to the UNISS as all settlements in UNISS are conducted in Central Bank Money.

**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.**

Key consideration 5 is not applicable to the UNISS as all settlements in UNISS are conducted in Central Bank Money.

**Conclusion:**

**All settlement on the UNISS is done in central bank money. This limits the credit and liquidity risks that could arise from the use of other private settlement options such as commercial bank money.**

**The Principle is considered observed.**

## Principle 10: Physical Deliveries

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

Principle 10 is not applicable to UNISS

## Principle 11: Central Securities Depositories

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

Principle 11 is not applicable to the UNISS.

## Principle 12: Exchange of Value Settlement Systems

**1.1 Principle narrative**

If an FMI settles transactions that involve the settlement of two linked obligations (e.g. 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.

**1.2 Assessment of compliance**

Principle 12 is not applicable to the UNISS.

## Principle 13: Participant Default Rules and Procedures

**1.1 Principle narrative**

1.1. 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. **1.2. Assessment of compliance**

**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 provide as follows;

1. Default is mitigated by the requirement to of participants to prefund their settlement accounts in UNISS with the accounts monitored on an ongoing basis
2. The rules specify that participants shall ensure that there are sufficient funds in their accounts to allow immediate processing of the instructions. Otherwise, these participants are charged different penalties for insufficient funds and default. Schedule E of the rules defines the penalties given in case of a default by a participant.
3. The rules also agree that the Bank may require each participant to maintain its Settlement Account(s) above the current zero minimum balance. A transaction that would reduce the balance below the minimum is rejected and a penalty levied for insufficient funds as per Schedule E.

**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.**

1. UNISS Rules and Procedures are binding to all UNISS participants who have signed the UNISS Participation Agreement. BOY may suspend a participant in UNISS upon the failure of the participant to comply with any of the provisions of these Rules and Procedures.
2. BOU implements the monetary penalties as laid out in Schedule E of the rules and procedures. The fees, charges and penalties are reviewed periodically with the participants input obtained prior to agreement.

**Key consideration 3:**

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

The key aspects of the default management rules and procedures are set out in the UNISS Rules and Procedures which are publicly available on the bank’s website. These Rules and Procedures are public documents kept open for public inspection at the offices of the bank and the head offices of every participant bank.

**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.**

The UNISS Rules and Procedures are periodically reviewed in conjunction with the participants. However, the rules have not been reviewed since 2017, neither have the default procedures been tested on an annual basis.

**Conclusions:**

**UNISS rules and procedures govern the management of participants’ default. Default is mitigated by the requirement to of participants to prefund their settlement accounts as UNISS has the capability to monitor availability of liquidity in the system. In case of default, the participants are penalized as laid out in schedule E. Whereas the procedures provide for periodic review and at a minimum annual testing of the default provisions, this has not been done.**

**The Principle is considered broadly observed**

## Principle 14: Segregation and Portability

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

Principle 14 is not applicable to the UNISS.

## Principle 15: General Business Risk

**1.1 Principle narrative**

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 always be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

**1.2 Assessment of compliance**

**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.**

1. The BOU has a robust framework to identify, monitor, and manage its general business risks under the overall risk management framework. As a central bank owned and run FMI, UNISS does not hold ring fenced liquid net assets to cover general business risk given the central banks inherent financial soundness framework for all its operations.

1. UNISS operational costs are covered by the monthly maintenance and support fees that are paid by participants. The participants also pay for the tokens that are used to access UNISS. Additional revenue is obtained from penalties on participants for late fund application, requests for window extension and insufficient funds among others. Charges are periodically reviewed in line with market developments.

**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.**

Key consideration 2 is not applicable to the UNISS as an FMI owned and run by the central bank.

**Key consideration 3:**

**An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets 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.**

Key consideration 3 is not applicable to the UNISS as an FMI owned and run by the central bank.

**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**

Key consideration 4 is not applicable to the UNISS as an FMI owned and run by the central bank.

**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.**

Key consideration 5 is not applicable to the UNISS as an FMI owned and run by the central bank.

**Conclusions:**

**Given the central bank’s inherent financial soundness, the requirement to hold ring fenced liquid net assets funded by equity to cover business risk and support a recovery or a wind-down plan does not apply. The UNISS is operated by BOU in accordance with section 5 of the NPS Act, 2020. The BOU has a robust framework to identify, monitor, and manage its general business risks under the overall risk management framework, as discussed under Principle 3**

**The UNISS operational costs are covered by the monthly maintenance and support fees that are debited from each participant bank account at BOU.**

**Overall, the Principle is considered observed**

## Principle 16: Custody and Investment Risks

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**Key consideration 1:**

**A payment system 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.**

Collateral used by UNISS is only government securities which are kept in the CSD at BOU. The operator is a direct participant and as an owner/ operator of UNISS, has direct control over the financial instruments held in the CSD. THE overall custody of the assets is under the mandate of the operator (central bank).

**Key consideration 2:**

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

The UNISS operator is a direct participant and as an owner/ operator, has direct control over the financial instruments lodged with the CSD.

**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.**

Whereas BOU has an investment policy, the provisions therein are not directly linked to the UNISS operations. This key consideration is considered not applicable to UNISS.

**Key consideration 4:**

**A payment system’s investment strategy should be consistent with its overall risk- management strategy and fully disclosed to its participants. The 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.**

BOU’s investment strategy is not linked to the UNISS operations. The key consideration was considered not applicable

**Conclusions:**

**Collateral used by UNISS is only government securities which are kept in the CSD at the central bank. The operator (BOU) has direct control over the government securities held in the CSD. Accordingly, there are no custodial or investment related risks.**

**The principle was considered observed.**

## Principle 17: Operational Risk

**1.1 Principle narrative**

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 the timely recovery of operations and fulfilment of the FMI’s obligations, including in the event of a wide-scale or major disruption.

**1.2 Assessment of compliance**

**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.**

1. The Bank has established a robust operational risk management framework, with systems, policies and procedures to identify monitor and manage operational risk. Operational Risk Management focuses on four broad categories that include people, processes, technological system and external events.

1. Since the inception of UNISS, the bank has put in place policies, processes, and controls to manage or mitigate any potential operational risks. These arrangements include; a service level agreement with the BOU Information and Technology department to manage systems related risks by ensuring that operational reliability objectives (i.e. availability and recovery time and recovery point objectives) are met.

1. NPSD and Information Technology and Operations departments also have a dashboard Opsmon that helps monitor the health of the UNISS system in real time. Other measures in place to mitigate operational risks include; enforcing four eye principle of having a capturer and authorizer in the UNISS. BOU has put in place a business resumption site arrangement so that in case of system failure from the primary site, operations can continue at a disaster recovery site.

1. The ITO department also carries out a security assessment test or vulnerability test to ascertain system vulnerability and thereafter hardening of the same. The servers are locked with access restricted at the server points or locations.

**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.**

1. The governance is set out under Key Consideration 2.6. The responsibility of risk management is done by the Risk and Compliance Department. The Department Risk Committee (DRC) meetings are held every quarter and risk registers are discussed in these meetings. The responsibility of risk management is done by the Risk and Compliance Department.

1. The first level risk management is where the roles and responsibilities of all the system users and administrators are clearly defined. Escalation of risk and or disaster is by routing it from the NPSD to the Director, then to the Director Information Technology Operations (ITO) department, Director Business Automation Department (BAUD), Disaster Recovery Committee chaired by the Deputy Governor and to the Governor.

1. The risk management framework is approved by the Board of Directors.

1. Tests are done biannually that is once after every 6 months with a switch over from primary site to Business resumption site to test smooth performance of operations without interruptions in the UNISS.

1. Periodic risk management reports are submitted to the Board Audit and Governance Committee while the internal audit team conducts periodic reviews to provide assurance on the robustness of the internal controls and risk governance processes.

**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.**

1. UNISS has clearly defined operational objectives set out in the Service Level agreements between NPSD and ITO department. These include ensure uninterruptible availability of payment system by having primary and secondary providers of Internet Service, primary and secondary links for SWIFT, primary and secondary sites (BRS).
2. The operator ensures that highly skilled and trained human resource carries out the maintenance and support of the payment system. This also ensures that incidents have clearly defined procedures for it to be logged and to be followed up-to resolution.
3. The availability targets of UNISS are clearly defined and documented. UNISS target availability is 99.6 per cent for BOU controlled components. Availability is measured as a percentage of the actual uptime of the service during the month relative to the total expected uptime. This target is set out in Service level agreements with ITO department and is assessed on a quarterly basis. The agreement pertains to the level of support that will be provided for the RTGS service during peak hours. Support outside these hours will be provided on a best effort basis. The RTGS service is available between 8:30am to 6:30 pm (East African Standard Time). Peak hours for the RTGS service are 8:30am to 5:00pm on official workdays.

**Key consideration 4:**

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

The system was subjected to stress testing as part of testing prior to implementation. No additional volume stress tests have been done.

**Key consideration 5:**

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

1. Responsibilities for information security cut across different departments in BOU with the Risk Management committee in charge of the management direction for Information Security including staff awareness. Internal Audit is responsible for providing an independent assessment on compliance with standards and guidelines outlined in the BOU Information security guidelines. The risk managers in the respective departments facilitate the implementation of the BOU Information security policy and guidelines. ITO department implements Information security tools, applications and standards as well as advises the Bank on technical matters pertaining to implementation of Information Security controls.

1. ITO department is also responsible for the following; determine the security requirements for BOU Information assets, acquire and implement tools to enforce Information security, monitor, assess and mitigate IT Security related risks, vulnerabilities and threats to Information Assets, conduct periodic security assessments related to BOU’s Information Technology Assets, and propose risk mitigation measures, supervise the implementation and day-to-day operations of measures to ensure data confidentiality, integrity, report security breaches on BOU Information Assets to RCD.

1. Bank of Uganda provides physically secure environments to house and protect the Information assets and people. All payment system servers are kept in a place that has restricted dual control access, a room with controlled temperatures as per system specifications. In addition, all payment systems are subjected to hardening to ensure they meet the security requirements. UNISS has in place security facilities to protect data, payments in transit, and to control user access. Participants are also responsible for ensuring the integrity of transactions, data and user access within their own organizations. Any actual or suspected breach of security is reported to the UNISS Help Desk immediately.

1. Login to UNISS by a Web Browser requires the use of two-factor authentication (Secure RSA Token), which establishes a secure dialogue with the UNISS server at the Bank site. UNISS provides access security with User-IDs, passwords and functionality limitations that may be controlled by the appropriate authority in each participant organization. For the purposes of maintaining standardization and consistency, the Bank acquires and distributes secure RSA Tokens to participants.

**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.**

1. The Bank has a detailed business continuity plan (BCP). The objective of this plan is to provide documented procedures to guide the Bank to; respond, recover, resume, and restore to a predefined level of operation for the critical business processes following disruption or disaster. The approved BCM framework guides the development, exercising, testing and maintaining plans for the resumption and recovery of business operations in case of a disaster. Protecting business processes focuses on resuming operations and providing stake holders with key services in the shortest time possible. Internal Audit conducts regular reviews of the BCP to provide reasonable assurance to the Board and Senior Management on the Bank’s ability to recover, resume and restore the time critical business processes in the event of a disaster.

1. The NPSD provides first level support to UNISS including resumption of operations of the system and extends operating windows, provides BCP solutions for external and internal participants and monitors system for exceptional business transaction status and alert relevant parties accordingly.

1. These plans cover lines of authority, means of communications and failover procedures, and are updated annually or more frequently if required. The recovery time target for the UNISS critical business processes for all major business processes is set for two hours within primary and secondary time.

1. All BOU systems have primary and secondary servers one at the primary site and another at the disaster recovery site. The two servers are supposed to replicate data after every 10 seconds and it is up to date for usage at any time. Mock testing of the secondary site is carried out bi-annually. Switch overs is also carried out bi-annually. All the operational equipment’s are available at the Disaster recovery site and they are tested and used bi-annually. A report is prepared and shared with management once testing is done bi-annually.

1. However, the BRS is located within 3km of the primary site which means that the secondary site does not have a distinct risk profile from the primary site based on an infrastructure perspective, including factors such as the electricity grid and telecommunications lines. An area that is about 80km from Kampala would present a different risk profile for the BRS.

1. During the period under review, the business resumption site

was in some incidences unable to resume operations within the recommended two hours following a disruption. This failure was often due to a power failure, systems failure and network issues. In such cases, processing is done manually, or participants are advised to use EFTs which settles the following day after the system is presumably restored.

**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.**

1. The Bank monitors participants’ transactions in real time using a dashboard. If a potential problem is detected, the BOU will contact that participant for further information. In case of any system incidents, a participant is required to provide the Bank with a detailed report on the causes and remedial actions of the disruption. Each participant maintains a written record of all contingency events and system issues. The record includes; details of date, time, nature of issue, action taken to rectify and time of rectification. This is submitted to BOU for review on a monthly basis.

1. Participants also perform a periodic self-assessment of the integrity and resilience of their own internal UNISS arrangements. This self-assessment covers such issues as, physical site security, system problems and downtime, occurrences of fraud, adequacy of throughput capacity, adequacy of contingency arrangements and facilities. The selfassessment report signed by two authorized signatories is submitted to the Bank biannually.

**Conclusion:**

**BOU manages the operational risks arising from UNISS within the BOU’s risk management framework (see Principle 2 on Governance and Principle 3 on Risk Management). Risk management at the bank covers all operational processes across the bank. UNISS has clearly defined operational objectives set out in the Service Level agreements between NPSD and ITO department. The Bank maintains detailed business continuity plans (BCPs) which are periodically reviewed by the risk and compliance team and internal audit with the findings submitted to the Board of Directors.**

**All BOU systems have primary and secondary servers one at the**

**primary site and another at the disaster recovery site. The two servers are supposed to replicate data after every 10 seconds such that it is up to date for usage at any particular time. However, the BRS is located relatively close to the primary site (3 km radius) which poses risks of interruption at both the primary and secondary sites. Furthermore, some cases were noted where the business resumption site was in some incidences unable to resume operations within the recommended two hours following a disruption.**

**Overall, the Principle is considered broadly observed.**

**Recommendations:**

1. There is need to ensure that the recovery time objective of 2 hours is met at all times. The backup systems ideally should commence processing immediately there is significant disruption to the primary site.

1. The Business Resumption site should be located at a geographical distance from the primary site that is sufficient to have a distinct risk.
2. There is need for the conduct of a detailed operational risk assessment for the UNISS, distinct from the general assessment of the BOU systems.

## Principle 18: Access and Participation Requirements Risk

**1.1 Principle narrative**

A payment system should have objective, risk-based, and publicly disclosed criteria for participation which permit fair and open access.

**1.2 Assessment of compliance**

**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.**

a) Participation in the UNISS is open to a financial institution or any entity/Institution supervised by the Bank, provided it meets all the eligibility criteria and conditions provided or as may otherwise be prescribed by the Bank from time to time. These conditions are laid out in clause 2.2 of the UNISS rules and procedures. They include • Having a settlement account(s) at the BoU in operational currencies,

* Meeting the SWIFT connectivity requirements for Real Time Gross Settlement System.
* Having appropriate technical capacity, including adequate contingency arrangements to enable it to participate in the UNISS without hindering the UNISS's smooth operations.
* Demonstrating the ability to ensure that in the event of a problem with its system it can be able to resume payment processing through the system within a period of five (5) working days.
* the participant shall execute, undertake and agree to be irrevocably bound by the terms and conditions of the Agreement for Participating in UNISS and these Rules and Procedures.

**Key consideration 2:**

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

1. UNISS participation requirements are designed to reduce the likelihood that an individual participant experiences an operational or financial problem that disrupts the system more broadly. The requirements and the processes to be followed in order to participate in UNISS are publicly available on the bank’s website. The BOU may accept or reject an application provided that before a rejection is made the BOU informs the applicant its intention to reject and has given the applicant reasonable opportunity to amend its application where necessary and must revert to the applicant within thirty (30) days of the receipt of an application with an appropriate response.
2. If an application is accepted; the applicant is required to execute the agreement for UNISS participation agreeing to be irrevocably bound by it and its Rules and Procedures.
3. The Bank may delay the admission date of the applicant until it is satisfied that all provisions above have been fully complied with. The BOU also provides an implementation schedule that includes among others, users’ training and exchange of SWIFT keys.

**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.**

1. The Bank closely monitors participants’ activity in UNISS, to ensure that participants have the operational capacity and

sufficient liquidity to manage their payments activity on an ongoing basis.

1. UNISS participants may withdraw from participation in UNISS in such manner and upon such terms as the Bank shall permit or require, provided that a thirty (30) days’ notice of intention to withdrawal is submitted to the Bank.
2. The UNISS Rules and Procedures clearly set out the conditions under which a participant can be suspended. They include;.
   * The failure of the participant to comply with any of the provisions of these Rules and Procedures
   * The participant fails to have SWIFT connectivity for seven (07) days that causes it not to be able to communicate with UNISS.
   * The failure of the participant to effect payment through the UNISS for six (6) consecutive months.
   * The participant breaches a provision of the Agreement to Participate in UNISS.
   * If in the Bank's opinion, the participation in UNISS is likely to cause unacceptable risk to the UNISS, to the Bank, to other participants or to the National Payments System as a whole; or cause a system fault or otherwise hinder the satisfactory functioning of the UNISS.
   * If in the provision of the Financial Institutions Act, and any other subsequent amendments there to; the Participant's License is revoked, or the Participant is directed to suspend all its banking business, or the Participant has been granted the approval by the Bank for voluntary liquidation.

**Conclusion:**

**The UNISS rules, which are publicly available, define the requirements for initial and continuing participation in the RTGS. Upon joining, participants are continuously monitored for compliance with the regulatory framework. Failure to abide by these regulations could result in suspension from the system.**

**Overall, the Principle is considered observed.**

## Principle 19: Tiered Participation Arrangements

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

Principle 19 is not applicable to the UNISS.

## Principle 20: FMI Links

**1.1 Principle narrative**

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

**1. 2 Assessment of compliance**

**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.**

The UNISS has links to other FMIs such as the AH and the CSD. All these links are owned and operated by the Central Bank and are subjected to the same operational and governance standards as the UNISS. However, as at the date of this assessment, none of the linked FMIs had been subjected to PFMI assessment

**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.**

Both the ACH and CSD which are linked to the UNISS have legal foundations in the National Payment Systems Act, 2020. Section 5 of the

Act grants the Central Bank the mandate to operate these FMIs

Key consideration 3 – 9 are not applicable to the UNISS-RTGS.

**Conclusion:**

**Whereas BOU as the operator of the UNISS has a solid legal basis for operating and linking the other related FMIs such as the ACH and the CSD, none of the linked FMIs had been subjected to PFMI assessment as at the date of this assessment.**

**Overall, the Principle is considered broadly observed**

**Recommendation:**

The linked FMIs - CSD and ACH should be subjected to assessment against the PFMIs

## Principle 21: Efficiency and Effectiveness

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

**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.**

1. There is engagement with relevant stake holders and participants to obtain their views and opinions, before decisions regarding UNISS are made. The Payments Systems Policy Sub-Committee of EXCOM approves any changes before they are put into effect.
2. Although the UNISS rules require that customer payment instructions are executed within 2 hours of receiving them Onsite assessment visits conducted during the period under review indicated that some participants did not process customer transactions in real time, but rather processed them under batches.

**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 Bank’s business objectives operating UNISS are clearly defined as set out in the Service Level agreements that NPSD has with ITO.

**Key consideration 3:**

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

Although the central bank monitors participants’ payment flows in real time with defined mechanisms of dealing with disruption, no proactive review has been done to assess effectiveness and efficiency. The participants forum could be used as an avenue to conduct a formal review. Nevertheless, the UNISS operations are subject to periodic Internal Audit reviews to provide assurance on the business objectives, governance processes and robustness of internal controls.

**Conclusions:**

**BOU engages the participants to obtain their views and opinions, before decisions regarding UNISS are made. The Bank also monitors the system and participants to take note of any incidents that could affect functionality. However, proactive review of the system effectiveness and efficiency has not been done. In addition, targeted onsite assessments revealed that some participants processed transactions in batches as opposed to the 2 hours provided for in the UNISS rules and procedures.**

**Overall, the principle was considered broadly observed.**

**Recommendations:**

1. The operator should consider a periodic assessment of system effectiveness and efficiency.
2. There is need to enhance oversight to ensure that RTGS rules regarding timelines of executing are followed such that the efficiency of UNISS is improved.

## Principle 22: Communication Procedures and Standards

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**Key consideration 1:**

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

1. The UNISS-RTGS supports internationally accepted standards for the communication of financial instructions. All messaging is supported by SWIFT and the formats comply with the SWIFT message standards for the UNISS closed user group.

1. AS at reporting date, the UNISS was under upgrade to move from the

MT messaging protocol to the ISO 200022 compliant MX message type.

1. Each Participant must maintain a single current Bank Identifier Code (BIC) for use in UNISS.

**Conclusion:**

**UNISS uses internationally accepted message standards and communication protocol with participants and system operators. As at reporting date, the system was under upgrade to ensure compliance with ISO 20022 messaging protocols.**

**Overall, the Principle is considered Observed**

## Principle 23: Disclosure of Rules, Key Procedures and Market Data

**1.1 Principle narrative**

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.

**1.2 Assessment of compliance**

**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.**

UNISS operations are supported by clear rules and procedures which are signed by all participants to guide in the operation of the UNISS. The rules are disclosed to the participants the entire public.

**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.**

1. UNISS Rules and Procedures that are available on BOU website clearly define the participation procedures as well as some operations of the system.
2. BOU also provides participants with user guides that contain detailed descriptions of UNISS features and instructions on how to use them. The bank issues notices and instructions to participants prior to implementation of planned system changes, accompanying amendments to the Rules and Procedures and other system documentation can be issued where appropriate.
3. Any modifications are run in a test environment prior to implementation in a production environment. Participants are required to assist the Bank in conducting this test. However, information on the participant’s rights, obligations and risks incurred in participation are not clearly defined in the rules and procedures.

**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.**

BOU provides participant training and monitors participants’ operations to ensure UNISS rules, procedures and features are well understood and followed. Training is provided to all new participants and is offered to all participants when new functionality is introduced. Participants also have access to a UNISS test environment on an ongoing basis to help them gain familiarity with UNISS. Participants get in touch with the UNISS Help Desk to assist them with their UNISS needs and any service difficulties encountered.

**Key consideration 4:**

**An FMI should publicly disclose its fees and 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.**

1. In accordance with the UNISS participation agreement, the Bank calculates the fees and charges these to participants' accounts.

Penalties are charged upon occurrence of an event that requires penalty in the use of UNISS services, as per Schedule E of the Rules and Procedures that is available on the bank’s website.

1. The Bank reviews the fees, charges and penalties from time to time by giving a prior notice to the participants. All these fees and charges are clearly described on Schedule E (RTGS/UNISS System Charge Structure/Rates) of UNISS rules and procedures that is available publicly.

**Key consideration 5:**

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

**Conclusions:**

**The UNISS rules and procedures lay out the expectations and obligations of participants on the system. These rules are public documents available on the bank website. In addition, the Bank discloses the performance statistics for the UNISS through various reports published on the website. The Bank also holds regular stakeholder meetings that involve all UNISS participants, and also monitors participants’ activity and operations to confirm that UNISS rules, procedures and features are well understood and to identify any potential issues. However, BOU has not yet published responses to the CPSS–IOSCO disclosure framework for the UNISS. In addition, information on the participant’s rights, obligations and risks incurred in participation are not clearly defined in the rules and procedures.**

**Overall, the Principle is considered broadly observed.**

**Recommendations:**

i) There is need to complete and publish the CPSS-IOSCO disclosure framework The disclosure framework will also help participants assess the risks they would incur by participating in the RTGS.

## Principle 24: Disclosure of Market Data by Trade Repositories

**1.1 Principle narrative**

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

**1.2 Assessment of compliance**

Principle 24 is not applicable to the BOU-RTGS.

1. [↑](#footnote-ref-1)
2. [↑](#footnote-ref-2)
3. Participants have also been able to settle in Danish krone in T2S since 29 October 2018. [↑](#footnote-ref-3)
4. 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 [↑](#footnote-ref-4)
5. See th[e Applicability of CPMI-IOSCO Principles for Financial Market Infrastructures to TARGET2Securities.](https://www.ecb.europa.eu/paym/pol/activ/critical/shared/pdf/CPMI-IOSCO_Principles_TARGET2-Securities.pt.pdf)  [↑](#footnote-ref-5)
6. BOU Annual Report 2021/22; Page 14 [↑](#footnote-ref-6)
7. BOU Annual Report 2021/22; Page 11 [↑](#footnote-ref-7)