



BANK OF PAPUA NEW GUINEA

Request for Proposals
for a Central Securities Depository and an
Auctions Management package or service

Release Date.....26 August 2019

Deadline for Questions..13 September 2019

Closing Date 27 September 2019

1 Summary

1.1 What this RFP is for

This RFP is for the supply and implementation of a central securities depository (CSD) and a possibly separate auctions management package or service. We are seeking proposals for a CSD alone, for auctions management alone or for a combined system that performs both services.

This depository is for debt instruments only. It will not be hosting equities.

1.2 What is Important to us

The most important factor for BPNG is meeting our business requirements as set out in the schedules to this RFP. We want to automate and simplify our processing of securities transactions, use repos to provide liquidity and open up access to a wider range of investors.

Track record is also important. We want an established system that is already working as a central securities depository and/or an auctions management system for government debt.

Finally, we want to host the CSD in our own data centres. We will consider an auction system hosted in a cloud service but only if this can be shown to give us the resilience and security we need.

1.3 About BPNG

The Bank of Papua New Guinea (BPNG) is the central bank of the Independent State of Papua New Guinea (PNG). We issue and run the registry for PNG government bills and bonds. We also issue and redeem central bank bills for monetary policy purposes.

We currently use a bespoke securities registry that no longer meets our evolving business requirements. While our focus is on government and central bank securities, we may also require the CSD to hold corporate bonds during the early stages of development of a corporate bond market.

2 Request for Proposals

This RFP is structured as follows:

Section 1 – Summary

Section 2 – Request for Proposals sets out the context for this RFP, the process and timeline expected and a glossary of terms used.

Section 3 – Background Information sets out the reason for this procurement and what we hope to achieve. It also provides information about BPNG and the environment into which we wish to implement.

Section 4 – Information to Include in Your Proposal provides a template for your technical proposal.

Section 5 – Investment required provides a template for your financial proposal.

Section 6 – Evaluation Approach describes how we intend to evaluate your proposals

Section 7 – Terms and Conditions sets out the specific conditions applying to this RFP, proposals to be received and any contract formed as a result.

Schedule A –CSD Requirements sets out our requirements for a central securities depository and invites you to state whether and how you can meet them.

Schedule B –Auction Management Requirements sets out our requirements for auctions management and invites you to state whether and how you can meet them.

2.1 Context

This is an open RFP that is part of a single-stage procurement. It follows an extensive evaluation of BPNG's needs for a central securities depository and auctions management package that was conducted by the World Bank Group and others. This RFP is published on BPNG's website [<here>](#)

2.2 Timeline

The following timeline is anticipated. BPNG reserves the right to vary this timeline as it sees necessary to achieve its desired outcomes.

Release of RFP:.....	26 August 2019
Closing date for questions:	13 September 2019
Close of RFP (proposals to be received):.....	27 September 2019
Shortlist:	25 October 2019
Vendor presentations (in Port Moresby).....	11-15 November 2019
Site visits:.....	18 November - 06 December 2019
Preferred supplier(s) notified	31 January 2020

2.3 Registration

You can register to receive answers to questions as set out under *Questions on this RFP* below. Register by emailing CSD_Project@bankpng.gov.pg with the subject line REGISTRATION.

Registration is optional and does not commit you to submitting a proposal.

2.4 Contact

All contact about this RFP must be made through BPNG's point of contact:

➤ CSD_Project@bankpng.gov.pg

Emails will be acknowledged as soon as reasonably possible and in any case within one PNG business day. If email goes unacknowledged you may confirm its receipt by telephoning:

➤ Stephen Nicholls on +6421 167 9787

It is not appropriate to approach other BPNG staff members or contractors about this RFP. Failure to comply will be considered a probity breach and will invalidate your proposal.

2.5 Questions on this RFP

BPNG will accept questions on this RFP until the Closing Date for Questions set out in the timeline above. Questions should be emailed to CSD_Project@bankpng.gov.pg

We will endeavour to answer all questions quickly. If, in BPNG's opinion, a question or answer is applicable to all potential vendors, we will remove any identifying information from the question and circulate it with its answer to all parties who have registered as described above.

2.6 Submission of Proposals

Two separate proposals are required: a technical proposal and a financial proposal, each to be sent to a different address as set out below:

The technical proposal should contain the answers to all the questions in this RFP, including the schedules, except the Investment required section. It should be sent to:

- CSD_Project@bankpng.gov.pg

The financial proposal should comprise your answers to the investment required section. We will not open this proposal until after we have selected a shortlist. It should be sent to:

- CSD_Tenders@bankpng.gov.pg

Proposals are to be provided in PDF format by email with a subject line of PROPOSAL. If a proposal exceeds email size limits it should be split and sent in parts. Proposals must be received by the deadline, which is 12 noon PNG time on the Closing Date set out above. Proposals will be acknowledged by return email by COB the same day. If this does not happen, please confirm receipt using the telephone contact above.

Printed proposals are not required and will not be accepted.

2.7 Terms Used in this RFP

The following terms are used in this RFP without further explanation.

AIX	IBM Operating System used within BPNG
AML/CFT	Anti-Money Laundering / Countering the Funding of Terrorism
API	Application Programming Interface
ATS	Automated Transfer System for domestic interbank payments
BI	Business Intelligence
BPNG	Bank of Papua New Guinea
BSS	Banking Support System, BPNG's core banking system
CSD	Central Securities Depository
DvP I, II & III	Delivery versus Payment – a set of models for effecting low risk transfer of ownership of securities in exchange for cash payment
FoP	Free of Payment
FSDS	Financial Sector Development Strategy for PNG issued in 2018
GPS	Global Payment System
ICT	Information & Communications Technology
ISIN	International Security Identification Number as defined by ISO 6166
KATS	Kina Automated Transfer System, an interbank payments system operated by BPNG that offers RTGS
KYC	Know Your Customer
MT	Message Type
NBFI	Non-bank financial institution
OMOs	Open Market Operations – money market transactions performed by a central bank
OTC	Over The Counter – trading securities directly between counterparties without using a central exchange

PFMI	Principles for Financial Market Infrastructures, a set of prudential standards
PwD	Payment without delivery
REPO	A Repurchase Agreement
RMS	BPNG's existing CSD solution
RTGS	Real Time Gross Settlement, domestic interbank
SAN	Storage Area Network
SLA	Service Level Agreement
STP	Straight-through processing, between computer systems without manual intervention
Tap	Tap issue, i.e. a bond sold after issue for the market price at time of sale, used in PNG for retail investors
TLS 1.2	Transport Layer Security version 1.2
UAT	User Acceptance Testing

3 Background Information

3.1 Development of Financial Markets in Papua New Guinea

In 2018 the Bank of PNG, the Department of Treasury in the PNG Government and the World Bank Group collaborated to produce the Financial Sector Development Strategy (FSDS) for PNG. The FSDS is in line with the PNG Government's development priorities stipulated in the documents Vision 2050, the PNG Strategic Development 2030, the Medium Term Development Plan, the Medium Term Fiscal and Debt Strategies and other sectoral policy objectives.

The FSDS recognises the need for a broader primary market in government bonds and the need to develop a secondary market in them, which is currently non-existent. To achieve these objectives, the FSDS recommends far greater automation of processes around the primary market, greater use of repos and developing automated clearing, settlement and custody facilities.

As the issuer of government debts and the operator of the registry, BPNG has started a project to implement these recommendations. Replacing our existing registry is a major part of this.

3.2 Securities Market Participants

In outline, there are the following participants in the PNG debt securities market:

1. The Bank of Papua New Guinea. As central bank and as financial agent for the PNG government, BPNG:
 - Runs the registry for all government and central bank securities
 - Issues central bank securities, and issues government securities on behalf of the PNG government
 - Is a purchaser and holder of debt securities through open market operations
 - Provides collateralised loans to market participants for liquidity (repos)
 - Operates RTGS and other interbank payments systems
 - Is banker to the government

More detail about BPNG is set out under *About the Bank of Papua New Guinea* below.

2. The four commercial banks licensed and supervised by BPNG:
 - ANZ
 - Bank of South Pacific
 - Kina Bank
 - Westpac

These banks each have a settlement account at BPNG and use KATS to exchange payments. All are investors in government and central bank securities. All have

access to overnight interbank loans from each other and from BPNG that are collateralised using securities in the registry.

3. Non-bank financial institutions (NBFIs). There are a range of these including microbanks, superannuation funds, trustees, fund administrators, life insurance companies and brokers, savings and loans societies and finance companies. Some have settlement accounts at BPNG but only for the settlement of switched retail transactions. None currently have access to KATS. All are investors in government and central bank securities. They settle the cash legs of their sale and purchase transactions through the commercial banks.
4. The general public of PNG. BPNG has made available a Tap facility to encourage members of the public, including individuals and institutions, to invest in government debt securities.

3.3 Securities in the Registry

The current registry is used for the following types of debt securities:

- Government Inscribed Stock which is a long term government debt security with interest coupon payments, normally issued monthly and sold at auction
- Treasury Bills, a short term government security normally issued weekly and sold at auction
- Central Bank Bills, short term central bank securities used for monetary policy
- Treasury Bond Tap, long term government security available to the public, with interest coupon payments
- Treasury Bill Tap, a short term government security available to the public

The registry handles issuance, sales, purchase, interest payments and redemptions as well as repos.

The CSD will be required to handle these as well as other types of debt securities.

3.4 Volume Information

Please use the following to estimate sizing, bearing in mind that we anticipate a substantial increase of transactions after the implementation of the CSD.

Number of parcels..... 10,000

Transactions.....50 per day

Number of holders..... 10,000

3.5 About the Bank of Papua New Guinea

BPNG is Papua New Guinea's central bank. BPNG's headquarters is in Port Moresby, PNG's capital city. There is also a BPNG branch and currency distribution centre in the city of Lae.

BPNG's objectives and functions are listed on its website at <https://www.bankpng.gov.pg>. The CSD is important for many aspects of BPNG's role, including the implementation of monetary policy, acting as banker and financial agent for the government of PNG and the maintenance of safety and stability in the PNG financial system.

3.5.1 BPNG Existing Systems

The following BPNG systems are relevant to the CSD:

- Kina Automated Transfer System (KATS) – this provides RTGS functionality, with an integrated Automated Clearing House function for clearing batched direct credit transfers and batched electronically truncated cheque records. KATS is used for all domestic cash settlements. It is an implementation of the Montran ATS. Currently RTGS transactions are submitted by MT-style messages (ISO15022); this is planned to be replaced by the use of ISO20022 messages. KATS is used by its participants that include the commercial banks in PNG and BPNG itself.
- Banking Services System (BSS) is BPNG's core banking system, used primarily to provide banking services to the government of PNG. It is a highly customised version of Montran's GPS software. BSS is used within BPNG and by its government customers.

KATS and BSS run on IBM Weblogic servers.

- RMS is BPNG's existing registry and depository system. It will be replaced by the new CSD.
- Oracle Financials General Ledger module. This runs all BPNG accounting functions.

All the systems described above are hosted on IBM pSeries hosts and use databases held on Oracle Exadata machines.

In addition, BPNG uses the Bloomberg market information service.

3.5.2 BPNG Platforms

BPNG systems are hosted primarily in the Bakani Data Centre in BPNG's head office building. There are disaster recovery hosts in a commercial facility elsewhere in Port Moresby.

Most BPNG systems are hosted on BPNG's own hardware using:

- IBM pSeries servers running AIX and Power VM for virtualisation
- Oracle Exadata

BPNG also runs:

- Red Hat Enterprise Linux
- IBM SANs for non-database storage.

BPNG is open to the use of other platforms if this will provide the closest fit to its functional requirements.

4 Information to Include in Your Proposal

Please use the headings in this section for your proposal.

4.1 Checklist to answer this RFP

BPNG has some specific points that are essential to us in procuring a CSD and an auctions management system. These points represent mandatory qualifying criteria for bidders on this RFP. We wish to be clear about them to avoid wasting time on both sides.

Therefore, we ask that you complete the following check list and supply it as the front page of your technical proposal. If you cannot tick 'yes' to the relevant items in this list, we will not evaluate any proposal you might send.

All proposers:

1. Are you proposing an established system that is operational and can be demonstrated?	YES <input type="checkbox"/>
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If your proposal includes a CSD:

2. Can you demonstrate experience of implementing a CSD that is coupled to an RTGS or ATS to enforce DvP?	YES <input type="checkbox"/>
3. Is the CSD compliant with PFMI?	YES <input type="checkbox"/>
4. Is the CSD available for us to host in our data centres, i.e. not a cloud-based offering?	YES <input type="checkbox"/>
5. Does the CSD support ISINs (ISO 6166)?	YES <input type="checkbox"/>

4.2 Summary of Proposal

Outline what you are offering us in a few paragraphs.

In addition, please provide:

- a) A statement that your proposal constitutes an offer to supply and that the offer has a validity of at least 120 days.
- b) A confirmation of your willingness to enter into a contract and any special conditions you would require on this contract.
- c) A confirmation that, if awarded the contract, you will accept responsibility for successful integration and interoperability of all proposed products, including interfaces to external systems.

4.2.1 Other Customers

Please provide a brief list of other customers for whom you have provided similar services. They should be as similar as possible to BPNG, especially if they run similar systems (Montran's ATS and/or Oracle Financials) to us. We will not contact them at this stage, but if your proposal is short-listed we will ask you for relevant references, so we can ask them about their experiences working with you, and possibly visit them.

4.3 Company Information

Please provide the following:

- Company name and contact details
- Details of company ownership and size
- A brief history of the company
- A list of locations from which the company operates
- An indication of the range of products and services and markets served
- A list of staff proposed to deliver the offering in your proposal with their names and roles including nominated backup people for key positions

4.3.1 Subcontractors

If you propose to use subcontractors to deliver some of the services you propose, please provide an explanation of the roles and responsibilities of each party. Provide the company information set out above for each subcontractor.

4.4 Functionality

Use Schedule A as a response template for a CSD. Use Schedule B as a response template for an auction management package or service. You may submit either or both of these.

4.4.1 Additional Information

Please provide any further information that you believe to be relevant. This might include opportunities to better streamline our processes, to reach a wider pool of investors or other items we might find useful.

4.5 Implementation Services

BPNG would like to understand how you intend to implement the system(s) into our environment. Please describe this using the headings below.

4.5.1 Timeline

What timeline do you propose for implementation of the system(s)? Please provide milestones and note the requirements on BPNG and its contractors that are needed to achieve these milestones.

4.5.2 Project Management

Identify a single point of contact within your organisation who will lead the project and provide details of their credentials. Please provide details and credentials for other project members and describe their role on the project.

Outline how you will manage the project including:

- Methodology
- Roles and responsibilities
- Risk and issue management
- Project communications

4.5.3 Migration Services

A data dictionary for the existing registry (RMS) will be made available to the successful bidder(s) for the purpose of migration.

Explain how you will support the migration of securities and counterparties from RMS to your CSD. What other assistance will you need from its supplier and from BPNG?

4.5.4 Knowledge Transfer and Training

We see sufficient training and a high degree of knowledge transfer to BPNG and external stakeholders as a critical success factor for this implementation. Please explain in detail how you will go about this.

Please include a training plan showing, for each system element to be supplied, and for the project overall, all proposed training modules, the recommended number and (if applicable) prior knowledge of people to be trained in each institution, the duration of each training module and the number of times each module is proposed to be delivered. The plan should specify any prerequisites for each training module. It should cover BPNG and all affected organisations.

We would expect to see specific modules for:

1. Management level personnel
2. Supervisory and operational staff
3. Audit staff
4. Technical training for systems development and testing staff
5. Technical training for systems operations and maintenance staff

6. Training in the creation of reports, and in the use of a report writer as applicable
7. Any other relevant training for users.

Where relevant this training should be made available to external stakeholders, for example to staff of institutional investors who will be bidding on securities in the primary market.

4.6 Documentation

Please provide a list of documentation for the system that you propose to deliver. At minimum, we would expect documents aimed at:

- System users, both ordinary and administrative
- ICT technical staff
- External stakeholders
- Documents to support testing including UAT scripts

We also expect a database description so we can extract data into a business intelligence (BI) tool. Please confirm that you will supply this.

4.7 Ongoing Support

Explain how you propose to assist BPNG to manage and maintain the system for the warranty period (see section 5.1 below) post go-live and thereafter. Include:

- Post launch support and maintenance
- Software security patches, updates and upgrades
- Hosting of an auctions management system if this is not to be done by BPNG
- Custom changes for BPNG (such as interfaces) if we request them
- Any other areas you expect to deliver support.

What options do you offer for ongoing support after the warranty period? Is there an SLA available? Please provide a sample SLA.

Do you provide a 24*7 email and telephone support?

4.8 Escrow

BPNG requires that the source code and supporting technical documentation be held in escrow against the eventuality that your company becomes unable to support the system at some future point. The code will remain in escrow and not be accessed unless this happens. BPNG may waive this requirement in the case of an externally-hosted auctions management system.

Please indicate your acceptance of this point.

5 Investment Required

This section should be used as a template for your financial proposal. Please complete this and send it separately from your technical proposal to:

- CSD_Tenders@bankpng.gov.pg

5.1 Warranty Period

BPNG requires a minimum warranty period of 12 months from go-live. During this period, we require you to deliver support and software updates at no cost to us.

Please confirm your acceptance of this point.

5.2 Requirements for BPNG

You are asked in your technical proposal to include sample architectures and lists of suitable hardware and system software, bearing in mind our expected volumes and resilience requirements. After contract signature, BPNG's ICT Department will agree with the successful proposer the final specification of all items and an installation timetable to match the agreed project plan. The successful proposer will be required to provide contractual assurances that the agreed total configuration (hardware, networking and software) will support the system in processing expected workloads for at least three years after acceptance.

Please indicate your acceptance of this point.

Beside hardware and system software, what other resources and support will BPNG need to provide for the implementation?

5.3 Investment Breakdown

Please use the table below to provide a breakdown of the investment your proposal will require BPNG to make in USD. The categories are:

- software licensing and/or service charges
- implementation costs i.e. your time in implementing the system
- training costs
- data migration from our existing system
- any hosting costs for systems hosted outside BPNG
- ongoing support costs payable to you. This should include, but not be limited to, additional licenses, upgrades and enhancements.
- any third party costs you believe we will need in addition to the hardware and system software needed to run the system. Please provide an explanation of these.

USD	One-off	Year 1 (warranty)	Year 2	Year 3	Year 4	Year 5
<i>Software licensing</i>						
<i>Implementation costs</i>						
<i>Training costs</i>						
<i>Data migration</i>						
<i>Hosting costs (if outside BPNG)</i>						
<i>Support costs</i>						
<i>Third party costs</i>						
TOTAL						

Document any assumptions that you make for pricing purposes.

BPNG will not pay over and above this quote.

6 Evaluation Approach

BPNG will form an evaluation panel to score each technical proposal against the functional requirements in this RFP. The panel will also assess other aspects of each proposal including the implementation plans and ongoing support. On the basis of this evaluation the panel will select a shortlist of potential suppliers.

The financial proposals will not be provided to the panel. Financial proposals will not be opened until the shortlist is established.

Shortlisted vendors will be invited to provide further information, a presentation to BPNG and may be asked to assist in providing contact with customer reference sites. Bidders that are not shortlisted will be notified. BPNG intends to select a preferred supplier for the CSD and a preferred supplier for auctions management (these may or may not be the same bidder) based on these investigations and on possible site visits to reference customers.

BPNG will advise the preferred supplier or suppliers and open contract negotiations with them.

6.1 Evaluation criteria

Proposals will be assessed on the basis of:

- Functional Requirements
 - Ability to meet the functional requirements set out in the schedules to this RFP
 - Ability to integrate with existing BPNG systems
 - Capability to securely extend access to investors over the Internet
 - Ease of integration between CSD and auctions management package or service
- Vendor Capability
 - Track record in delivering similar systems in environments like BPNG's
 - Capability to install the system in an environment such as BPNG
 - Capability to support the system on an ongoing basis
 - Capability to migrate data from the existing system
 - Demonstrated transfer of skills & knowledge
 - Understanding of the context into which the CSD and/or auctions management system will be implemented
 - Project management approach
 - Risk management approach
- For short-listed responses, the investment required for the solution and supporting components, one-off and ongoing

Assessment of the above will take account of evidence of past performance and capability, however the quality and suitability of the proposal for BPNG will be paramount.

7 Terms and Conditions

7.1 Acceptance of Proposal

BPNG intends to select a supplier or suppliers following receipt of proposals as set out above. However, BPNG:

- may accept the whole or part of a proposal
- will not necessarily accept the lowest priced proposals or any proposal
- reserves the right to negotiate with any potential supplier or to seek clarification of the contents of a proposal from any potential supplier
- reserves the right to obtain products and services from any party, whether that party has submitted a proposal or not
- reserves the right to stop or vary the Request for Proposal process, or request further proposals, at any time.

Nothing in this document, or in any proposal, or both, shall be construed to create any binding contract (express or implied) between BPNG and any potential supplier.

BPNG intends to rely on your proposal and any other information you provide, e.g. in correspondence, presentations and negotiations. In submitting a proposal, you warrant that all information you provide to us:

- is true, accurate and complete, and not misleading in any material respect
- does not contain Intellectual Property that will breach a third party's rights.

7.2 Contact

No contact is to be made with BPNG staff about this RFP during the evaluation process without receiving a request for additional information. Failure to comply will be considered a probity breach and will invalidate your proposal

Confidentiality

If your proposal is marked COMMERCIAL IN CONFIDENCE, BPNG will only make the proposal available to the Evaluation Panel.

7.3 Contract

Successful proposers will be expected to enter into a contract with BPNG. The supplier will be taken to agree or comply with all conditions of all parts of this document unless specified otherwise, giving reasons. Suppliers are responsible for taking all necessary steps to inform themselves of BPNG's requirements in regard to proposing a solution for this project. The proposal will form a schedule to this contract.

7.4 Costs of Responding

BPNG is not liable for any costs you may incur in responding to this document.

7.5 Applicable Law and Jurisdiction

The laws of PNG shall govern this RFP. Each Respondent agrees to submit to the exclusive jurisdiction of the PNG courts in respect of any dispute concerning the RFP or the RFP process.

Any contract arising from acceptance of a proposal made in response to this RFP will be governed by the laws of PNG and subject to the exclusive jurisdiction of the PNG courts.

Schedule A: CSD Requirements

Use this section as a template if you are proposing to supply a CSD, whether it includes an auction management solution or not.

Please repeat each numbered requirement in your response and mark it COMPLY/PARTIAL COMPLY/NON-COMPLY, then provide a detailed explanation of how your proposal meets our requirement so we can evaluate your level of compliance. If you cannot comply, please explain any steps you will take to achieve compliance.

A.1 CSD Overview

- Q01 The CSD must manage the primary market in the debt securities it holds.
- Q02 The CSD must facilitate a secondary market in the debt securities it holds.
- Q03 The CSD must facilitate sale, buy-back, OTC transactions and maturity for the debt securities it holds.
- Q04 The CSD must support debt servicing on behalf of issuers including redemptions and coupon payments.
- Q05 The CSD must be able to connect to BPNG's RTGS for DvP using ISO 20022 standard messages.
- Q06 The CSD must be able to connect to BPNG's RTGS for DvP using SWIFT MT- style messages.
- Q07 The CSD must integrate with external auctions management systems – please provide a list of these that have been integrated with your CSD.
- Q08 The CSD should be capable of supporting a linkage to any future electronic inter-bank collateralised funds market trading system.
- Q09 The CSD must generate and retain a full audit trail for each security and each transaction, including interest calculations, payments and associated tax payments.

A.2 Registry

- R01 The CSD must maintain a register of all government and BPNG securities issued, as well as some private sector debt securities, by amount, interest rate, maturity date, holder and other pertinent information.
- R02 The CSD must provide automatic coupon calculation and automated crediting of withholding tax to government tax account in BSS and settlement of net interest to registered holder through KATS RTGS.
- R03 The CSD must support redemption functions including full, partial and rollover.

- R04 The CSD must identify trades that have been executed but not settled due to non-payment.
- R05 The CSD must provide a function to register any OTC securities movement on the secondary market.
- R06 When input directly by holders, an OTC security movement must be registered on receipt of instructions from the 'From' and 'To' parties to the movement.
- R07 The CSD must identify unmatched OTC security movement instructions for clarification by BPNG, and with the option of cancellation or confirmation by BPNG.
- R08 The CSD must have the ability to send printed or PDF confirmations to holders who request them.
- R09 The CSD must provide statements regularly or on demand at a holder's request.
- R10 The CSD should have the ability to charge holders for statements on request.
- R11 The CSD must support fungible and non-fungible securities.
- R12 The CSD must offer automated calculation and collection of fees and charges.
- R13 The CSD should provide the ability to manage government loans.
- R14 The CSD should facilitate recovery of any third-party charges, e.g. depository charges or debt management charges.

A.3 Participants and Holders

- H01 Every individual or organisation that interacts with the CSD is a participant. Each participant must be issued a unique identifier that can be validated using an appropriate validation routine.
- H02 The CSD must provide a facility to check for possible duplicates to reduce the possibility of one person or organisation having more than one participant record.
- H03 The participant record must include externally-provided documentation, which may be scanned copies of paper documents, to meet KYC obligations and for other purposes.

- H04 The CSD must provide support for different, and multiple, roles by participants including, but not limited to:
- Registrar
 - Broker
 - Issuer
 - Dealer
 - Fund manager
 - Administrator
 - Regulator/overseer
 - Holder.
- H05 The CSD must maintain a register by different layers of all participants, detailing whether direct or indirect, and all relevant static information such as: name, physical address, email address, telephone and tax registration number. Participants must be searchable by all these fields.
- H06 The participant record must include tax domicile information and an indication as to whether the participant is tax exempt.
- H07 The CSD must be able to record ownership registration records against the lowest level of issue component recorded.
- H08 The CSD should distinguish between the beneficial owner of a security, which may comprise a group of individuals and/or organisations, and a holder which is a single individual or organisation.
- H09 The CSD must hold a record of each beneficial owner of a security. The beneficial owner record must include:
- a) A unique identifier referencing the beneficial owner. If there is only one holder this could be the holder's unique identifier. If there is more than one holder, the beneficial owner record must identify the holders
 - b) An indication if the beneficial owner is a single holder or a group of holders
 - c) Who may request a change to beneficial owner record or authorise the trading of securities, or if such activity requires all holders to agree
 - d) Payments instructions for coupons and maturity payments and a record of who may change these.
- H10 A dealer should be able to view only those beneficial owners and holders for whom that dealer is the custodian.
- H11 Any securities movement instruction must include the beneficial owner and holder references.
- H12 The CSD must be capable of generating messages to the holder when any securities movement has occurred.

- H13 The CSD must allow authorised BPNG officers to see all holdings in the CSD by beneficial owner and holder.
- H14 The CSD must provide the facility for BPNG to suspend a participant account. A suspended account cannot buy or sell securities. Any holdings must remain until maturity or until the suspension is lifted.
- H15 The CSD must provide a facility to mark holder records as inactive if there has been no holdings in their account for a period. Reactivation to be possible but only by explicit action by BPNG.
- H16 The CSD must be able to record relationships between participants.
- H17 The CSD must allow constituent accounts to be held by fund managers in order to manage securities holdings on behalf of multiple holders. The CSD must require that the actual ownership of all securities in these accounts is recorded.
- H18 The CSD should permit 'trust accounts', e.g. for a minor, where the signing authority for the account is not the holder.
- H19 The CSD must be able to categorise holders into customisable groups such as individuals, professionals, companies or charities.
- H20 The CSD should be able to impose limits on an individual participant or on the participant and related parties.

A.4 Issuing Securities

- I01 The CSD must offer configurable issuer types such as government issuers, subdivided into national, provincial and local governments, government departments and others, as well as supranational, corporates and central bank.
- I02 As well as domestic currency (PGK), the CSD must support securities denominated in any foreign currency.
- I03 The CSD must require new securities to be serialised on the basis of ISIN.
- I04 The CSD must handle fixed rate bonds and the re-pricing of variable rate bonds according to the algorithms determined by the issuing authorities.
- I05 The CSD must provide for the same bond issue to be re-opened for further subscription until some pre-determined maximum size is reached. For such re-opened issues, the CSD must update all relevant issue identification and summary data, including the addition of the numbered units of value in the additional re-opened issue.
- I06 The CSD must allow for issues to be allocated on a 'tap' basis, i.e. remaining open until either fully subscribed or manually closed.

I07 The CSD must allow for liability management operations including buybacks and switches.

A.5 Money Market

M01 The CSD must facilitate money market operations, i.e. OMOs, including secondary market trading, repos and auctions.

M02 The CSD must enforce dealing limits that are configurable for each dealer.

M03 The CSD must provide a single, integrated view of each dealer's position for monitoring, supervising and controlling their liquidity.

M04 The CSD must contain a comprehensive range of standard portfolio monitoring and management functionality to allow BPNG to define and manage its own portfolio of financial assets, including a valuation (mark-to-market) function; and calculation of accrued interest (gains and losses on the portfolio), interest and coupons and calculation of the yield curve.

M05 When revaluing BPNG's portfolio, the CSD must automatically submit journal entries through an interface to BPNG's general ledger.

M06 The CSD must record the activities of dealers in the "type of trade" record. Each dealer must be able to buy and sell.

M07 The CSD must prevent short-selling of securities.

A.6 Collateral

C01 The CSD must handle repos and reverse repos, including the ability to handle multiple securities in a single repo, by recording the change of ownership and the associated obligation to sell or buy back in the agreed period.

C02 The CSD must offer a repo-based collateral mechanism for funds settlement for all types of security settlements.

C03 The CSD must offer automated repos to provide liquidity to KATS participants.

C04 The CSD should facilitate all operations for the pledging of securities including registration, substitution, subdivision, release and execution of pledge contracts.

C05 The CSD must allow repos and pledges between participants, not just when the central bank is a counterparty.

C06 The CSD should facilitate securities lending for a fee between participants.

C07 The CSD should provide facilities for collateral management

A.7 Settlements

- S01 The CSD must support settlement using all three types of DvP – I, II and III – for any type of security settlement - primary, secondary and OTC and any type and any number of funds settlements. Must also allow for FoP and PwD.
- S02 The CSD must effect settlement functions through RTGS for the settlement of primary and secondary market operations, open market operations of BPNG and intraday liquidity operations, to guarantee that the principles of DvP and STP are respected.
- S03 The CSD must settle interest, maturity and tax payments through our RTGS or our core banking system BSS as appropriate.
- S04 When servicing government debt, i.e. when paying coupons or maturities for government securities, the CSD should check the source account which is held in BSS and raise an alert if there are insufficient funds for the payment to be completed immediately.
- S05 The CSD must provide options for the set-up of accounts to handle flows associated with security sale, purchase, redemption and interest payments including separate accounts for each type of security.
- S06 The CSD must provide a table- or parameter-driven approach for generating accounting entries.
- S07 The CSD must provide auto-reconciliation functions for the accounts it contains.
- S08 The CSD must provide an interface to BPNG's general ledger. (Oracle Financials).

A.8 Portals

- P01 The CSD must offer an Internet portal for use by members of the public to view their holdings and request purchase (especially of tap) or sale of securities.
- P02 The public-facing portal must offer registration functionality for tap or retail purchases including verification of bank account, tax numbers.
- P03 The CSD must offer a portal for institutional investors.
- P04 The CSD must offer an API for STP for use by large investors and commercial banks.
- P05 The CSD must offer a portal for issuer use.
- P06 The portals provided by the CSD must record OTC sale and repurchase transactions.
- P07 The portals provided by the CSD must facilitate receipt of non-competitive bidding such as private placements.

P08 The CSD must offer a mechanism for BPNG staff to make entries on behalf of a stakeholder that is unable to use the portal.

A.9 Tax

T01 The CSD must provide for tax types and tax rates that can be configured and adjusted by authorised BPNG staff.

T02 The CSD must provide automated tax computation and recovery in respect of coupon payment and maturity payment on any type of security.

T03 The CSD must collect taxes and record them in a form that can be reconciled by the tax department.

A.10 Operational Requirements

D01 The system must be parameter-driven, allowing administrative users to create any product, create issuers, create any category of account holders, merge account holders, demerge account holders and generate ad-hoc reports.

D02 The parameters that configure the CSD must be hierarchical with cascading subcategories of securities and of Holders.

D03 The CSD should provide the capability to download direct batch files from the system and upload files into it, to cover securities as well as funds, for instance to be sent or received by a future central counterparty or external stakeholder, for all market settlements.

D04 The CSD must provide real-time monitoring of funds and activities.

D05 The CSD must allow enquiries by authorised BPNG personnel.

D06 The CSD must offer a standard and ad-hoc report generation facility (in PDF, XLS and CSV) on parameterised filter values such as from and to dates and category of issuer.

D07 The CSD must have the ability to define a report in the system and save the definition for later production.

D08 The CSD must have the ability to generate and view reports online before printing or downloading to external applications.

D09 The CSD should offer a mechanism to extract data into a BI tool for external analysis.

D10 The CSD must analyse and quantify refinancing risk for all securities, including calculating relevant yield curves.

D11 The CSD must provide an operational diary in the system to ensure that users and the system perform all the operations scheduled for a day and time without fail.

- D12 The CSD must prove a calendar, with reminder capability, for future events such as maturities, coupons payments.
- D13 The CSD must provide audit trails with drill down facility to reveal granular details of each activity or transaction in the system.
- D14 The CSD must generate alerts and notifications to internal users and participants.
- D15 The CSD must be user-friendly in that the options available to each user should be clear and easy to understand.
- D16 All screens, reports and messages in the CSD must be in the English language.

A.11 Security Requirements

- Y01 The CSD must offer a well-defined and robust role-based access control system incorporating the principle of least privilege.
- Y02 The CSD must support a hierarchical user structure, such that at each participant and also in BPNG's operational area there can be a local administrator with certain additional rights, e.g. for password reset, for users in that area only.
- Y03 The CSD must log all access, including physical device identification, user identification and the time of each access in order to provide a clear audit trail for review in case of accidental or deliberate violation of security controls.
- Y04 CSD users must not see menu options for those functions they are not authorised to use.
- Y05 Workstations logged into CSD must be logged off automatically if idle for more than a specified but variable period that can depend on the class of user.
- Y06 The CSD must require that significant operations are made on the basis of a 4-eyes principle (maker - checker) and critical operations on the basis of 6-eyes principle (maker-first checker - validator/second checker). Separation of duties shall be strictly enforceable for all sensitive programs and functions.
- Y07 The CSD must offer appropriate authentication mechanisms for BPNG staff, investors, government and the general public. This must include a mechanism to control password complexity for passwords selected by the user.
- Y08 The CSD must be capable of enforcing multifactor authentication for some classes of users.
- Y09 The CSD must enforce encryption of data in transit between its various components, on system interfaces, to workstations and, where relevant, over the Internet. The expected cryptographic level is TLS1.2.

Y10 The CSD must integrate with Active Directory for the management of access and authentication.

A.12 Additional Questions

Please repeat these numbered questions in your response and provide a detailed answer below each one.

N01 Provide a list of platforms and database management systems the CSD is implemented on.

N02 Provide an architecture diagram for the CSD showing external portals.

N03 Provide an indicative architecture for disaster recovery capability for the CSD.

N04 Provide a sample hardware and software configuration for the CSD, preferably consistent with BPNG's existing platforms, with model numbers and sizing, that will meet the transaction volumes. What are the implications of increasing these volumes? Allow for resilience with a cold or warm backup host(s) in a remote location.

N05 What APIs does the CSD offer for interfacing with external systems?

N06 Explain how the CSD could be linked to any electronic trading system which may be introduced in PNG in future, implementing DvP and STP for settlement of trades.

N07 What options does the CSD offer for more complex structures of ownership of securities? For example, Holders comprising multiple beneficial owners. How can these be administered within the system?

Schedule B: Auction Management Requirements

Use this section as a template if you are proposing to supply an auctions management package or service, described below as 'the system', whether as part of a CSD or not.

Please repeat each numbered requirement in your response and mark it COMPLY/PARTIAL COMPLY/NON-COMPLY, then provide a detailed explanation of how your proposal meets our requirement so we can evaluate your level of compliance. If you do not comply, please explain any steps you will take achieve compliance.

B.1 Specific Requirements

- A01 The system must facilitate setting up a primary auction, registering bids, executing the auction and allocation/refund on completion.
- A02 The system must accommodate multiple price and single price auctions.
- A03 The system must support competitive and non-competitive bidding.
- A04 The system must accept bids submitted over the Internet.
- A05 The system must ensure that bids received are not visible to any other party within or outside BPNG before bid closure.
- A06 The system should provide for BPNG to set prudential limits on the total bid value to be accepted from any particular bidder in respect of any particular issue.
- A07 The system must allow BPNG to include or exclude any listed available bidder so that certain issues can be restricted in the primary market to a subset of all registered primary market traders.
- A08 The system must automatically cut-off bid acceptance at the time published for bid closure as notified in the issue by BPNG. This time must be able to be set by BPNG for each issue and must be able to be adjusted during an auction if required.
- A09 On bidding closure, the system must calculate the allocation of the issue to bidders according to the prices bid, to bidder financial limits and any percentage of the issue which may be reserved for special sale to selected institutions at other than full market rates.
- A10 The system must calculate the acceptance and rejection of bids according to the highest prices offered and the total value and composition of the issue to be allocated.
- A11 The system should offer the ability to use alternative forms of auctions, not just based on yield offered. Please describe the auction types supported.
- A12 At bid closure time, the system must show a provisional result allowing the options of confirmation, cancellation or re-running the auction with corrected rules.

- A13 After an auction, the system must provide advice to BPNG of issue components by amount, unit value, price, with a summary of the type and nature of the issue, interest payable, maturity date and the reference/identity numbers allocated to the new issue components.
- A14 After an auction, the system should provide advice to dealers of issue components by amount, unit value, price, with a summary of the type and nature of the issue, interest payable, maturity date and the reference or identity numbers allocated to the new issue components by dealer.
- A15 The system should automatically produce and send acceptance and rejection notices, payment advices and receipts.
- A16 At the end of an auction the system must provide advice to BPNG of the composition and rates of the issue allocation by various factors including buyer, amount and rate. This must include calculation and display of the yield curve.
- A17 After auctions have taken place, the system must provide detailed data for analysis, including bidding by counterparty type.
- A18 The system must offer a report generation facility where reports can be pre-configured by users or configured when required. Output should be available in, at minimum, PDF, CSV and XLS formats.
- A19 The system should offer a mechanism to extract data for analysis in an external BI tool.
- A20 The system should offer the ability to publish market data such as yields in the primary market to market information systems in real time.

B.2 Additional Questions

Please repeat these numbered questions in your response and provide a detailed answer below each one.

- B01 If the system is hosted by its supplier externally to BPNG, please provide details of:
- Location of data
 - Resilience
 - Security
- B02 If the system is to be hosted by BPNG, please provide a list of platforms the system is available on. What database requirements does the system have?
- B03 If the system is to be hosted by BPNG, please provide an architecture diagram.
- B04 If the system is to be hosted by BPNG, provide a sample hardware and software configuration, with sizing, that will meet the transaction volumes. What are the implications of increasing these volumes?

- B05 How will the system be integrated with the CSD? Please provide a diagram showing information flows.
- B06 If your system is to be hosted by BPNG, provide a list of hardware and system software that we would require. The configuration you propose should provide resilience through at least a cold or warm backup in a different location. Please give model numbers and sizing, if possible, of equipment that is compatible with BPNG's existing platform described above.
- B07 Please explain any fees that might apply to bidders for our securities using this service.