



BANK OF GREECE

GOVERNMENT FINANCIAL OPERATIONS
AND ACCOUNTS DEPARTMENT

DISCLOSURE FRAMEWORK FOR SECURITIES SETTLEMENT SYSTEMS

Athens, April 2006

Introductory note

The following analysis constitutes the response of BOGS (the Bank of Greece Securities Settlement System) to the Disclosure Framework developed by the Committee on Payment and Settlement Systems of the central banks (CPSS) of the Group of 10 (G-10) and the International Organization of Securities Commission (IOSCO).

The present document constitutes an updated version of the analysis presented in December 1998 within the framework of the assessment against the standards for participation in the Eurosystem's credit operations.

Although every care has been taken for the accuracy of the information presented, the present document does not constitute a legal declaration and can only be used for informational reasons. The information provided within this version describes the state of affairs in April 2006.

Furthermore, following any future amendment to BOGS' operational Rules could render part of the present information invalid.

I. BASIC INFORMATION

A. What is the name of the SSS?

BOGS (Bank of Greece securities settlement System)

B. Where and in which time zone is the SSS located?

The BOGS (hitherto ‘the System’) is situated within the headquarters of the Bank of Greece.

21, E. Venizelos Ave., GR-102 50 Athens

The time zone is GMT+2.

C. What functions does the SSS perform?

1. Does the SSS serve as a securities depository and/or provide securities settlement services?

BOGS is the central depository and SSS for all debt instruments in EUR issued by the Hellenic Republic in the Greek market (instruments bearing a “GR ISIN”)

For the present, only Greek government securities are deposited and transferred in BOGS. However, the legal and regulatory framework of the System provides for the inclusion of securities issued by private institutions (corporate bonds etc).

Only book-entry securities are deposited and transferred in the System. No safekeeping or vault services are provided for physical certificates.

2. Does the SSS provide cash accounts and/or provide funds transfers in conjunction with securities transfers? If so, in what currencies?

The System itself does not provide any cash accounts services. Instructions for cash transfers, in conjunction with securities transfers, are sent to the national RTGS payment system (HERMES) where the participants of BOGS maintain their EUR cash accounts. The operator of HERMES is the Bank of Greece. For those participants of BOGS, which do not maintain an HERMES account, the Bank maintains specific payment cash accounts.

3. Does the SSS provide a trade matching service? Do others provide such services for securities settled at the SSS?

The System provides matching services for the settlement instructions related to the OTC market. Transactions concluded in the organized markets of Government securities (HDAT and Euro-MTS) are matched at the trading level.

4. Does the SSS provide a trade netting service (as distinct from undertaking the settlement of securities on a net basis)? Do others provide such services for securities settled at the SSS? In either case, what type of netting (bilateral or multilateral), if any, are performed?

BOGS does not provide a trade netting service.

5. Does the SSS offer a securities lending or borrowing program?

The SSS doesn't offer a securities lending program.

However, in the event of a debit position in the securities account of a participant, the manager of the system conducts an auction in the Electronic Secondary Market for Securities (HDAT) for the purchase of the securities through overnight buy/sell back transactions by the debtor.

6. Does the SSS provide custodial and/or related services such as the collection of interest, dividends, principal or withholding tax reclamation? Which types of services are provided?

The System gives early notice to the participants of the dates of maturity of the securities. On the date of payment of the interest coupons or maturity of the securities, the System proceeds automatically to their redemption and carries out the relevant entries in the securities accounts and the cash management accounts. Proceeds of redemption of securities pledged are transferred to a special non-interest bearing *blocked* account with the Bank of Greece until the expiry of the collateral unless it has been agreed to return the collateral before expiry. This account is held in the name of both contracting parties.

7. *Does the SSS act as a central counterparty or principal to transactions with its participants?*

BOGS does not act as counterparty or principal for transactions within its operations.

8. *Other? Please specify.*

N.A.

D. What type of organization is the SSS?

1. *Please indicate whether the SSS is a public sector or private sector entity.*

BOGS is a section of the Bank of Greece.

2. *Please indicate whether the SSS is organized on a for-profit or non-profit basis.*

The System operates on a cost-cover basis.

3. *What is the legal basis for the establishment of the SSS and for securities transfers made through it?*

The Bank of Greece was appointed by Law 2198/94, Section B, (Government Gazette 43/A/22.3.94) to *manage the System of Monitoring of Transactions in Securities in Book-Entry Form (BOGS).*

According to Article 3 of Law 2789/2000, transfer orders and netting are legally enforceable and binding on third parties, even in the event of insolvency proceedings against a participant of the System, provided that transfer orders were entered into the System prior to the initiation of the insolvency proceedings.

E. Please describe and provide a diagram outlining the organizational and ownership structure of the SSS?

1. *Who are the owners of the SSS?*

The owner of BOGS is the Bank of Greece.

2. *What entity or entities operate the SSS? Which functions of the SSS, if any, are*

outsourced to third parties?

BOGS is operated by the Bank of Greece.

No functions are outsourced. The complete operation of the System takes place within the organizational as well as physical establishment of the Bank.

3. Does the SSS have a Board of Directors?

No, the System is a section of the organizational structure of the Government Financial Operations and Accounts Department of the bank.

F. Please describe the financial resources of the SSS.

There are three different channels of financing BOGS operational costs:

- a) Transaction fees charged to participants.
- b) A managing commission from the issuer of the securities (and for the time being this refers only to the Hellenic Republic).
- c) Any costs still not covered from the above sources are nevertheless covered by the Bank of Greece.

G. Please describe whether the SSS or its operator is subject to authorization, supervision or oversight by an external authority.

By Law, the System is subject only to the authorization, supervision and oversight of the Bank of Greece. See also VIII. B.

II. RULES AND PROCEDURES OF THE SSS

A. Does the SSS maintain a complete list of the rules and procedures governing the rights and obligations of participants and the duties of the SSS?

The rules and procedures governing the rights and obligations of the participants are clearly stated in the document “*Operating Rules of the System for Monitoring Transactions in Book-entry Form*”.

1. How can participants obtain a copy of the rules and procedures?

The participants obtain a copy of the “Rules” upon their signature of participation to the System. Furthermore, the “Rules” are published in the web page of Bank of Greece (www.bankofgreece.gr/Statistics/Markets/ Bank of Greece Securities Settlement System (BOGS)).

2. Does other documentation provided to participants (e.g. user guides) have the same status as the rules and procedures?

The documentation concerning all aspects of BOGS is incorporated within the “Rules” and its amendments.

3. Describe the process for changing rules and procedures, including any need for regulatory approval.

By Law, any type of amendment or addition to the above mentioned Rules have to be introduced by an Act of the Governor of the Bank of Greece. No further or external regulatory approval is required.

BOGS welcomes any comments from the participants regarding the Rules of the System, or any proposed changes of them, but the ultimate authority on these amendments is, by Law, the Manager of the System, i.e. the Bank of Greece.

B. Are the rules and procedures binding on the SSS as well as its participants? Under what conditions and on whose authority can written rules and procedures be waived or suspended by the SSS?

Rules and procedures are binding on BOGS as well as the participants but the Manager of the System (the Bank of Greece) is entitled - at any time - to amend the provisions of the present Rules, on condition that notification of the amendment is given to the participants 8 working days prior to the commencement of its implementation, unless the urgency of the matter is well grounded. These amendments have to be introduced by an Act of the Governor of the Bank.

III. RELATIONSHIPS WITH PARTICIPANTS

A. Please describe the types of membership offered by the SSS.

Institutions eligibility to participate in the System shall be subject to the approval of the Bank of Greece, by Governor's Act. For those institutions admitted as participants, the System maintains securities accounts while cash accounts are also maintained in the Bank of Greece. End-investors hold securities accounts with the participants as their clients. Participants are not permitted to hold securities accounts as clients of other participants.

More specifically, the following (apart from the Bank of Greece and the Ministry of Finance) are eligible to participate directly to the System:

- Financial or credit institutions of the euro area
- Investment companies either located in Greece or permitted to offer investment services to Greece
- The Athens Stock exchange's Central Securities Depository (CSD)
- International Central Securities Depositories
- EU SSSs/CSDs eligible for participating in Eurosystem's credit operations
- Other institutions selected by a Governor's Act

All direct participants to the systems are subject to the same rules and procedures.

B. Can participants establish accounts for their customers' assets that are segregated from their own accounts at the SSS?

The System maintains an omnibus customer account for the clients of each participant. Following the Governor's Act 277, 19/03/00, the participants may open sub-accounts in the name of their individual customers, subject to prior approval by the Bank of Greece. These specific accounts are restricted only to wholesale institutional customers, usually foreign ones. The beneficiaries of these accounts do not benefit from the same rights (and obligations) applicable for direct participants.

All customers' accounts are fully segregated from the securities held by direct participants in their own accounts.

C. Please describe participant requirements for each type of membership.

According to the Rules of the System and as far as financial institutions are concerned only those eligible for opening a cash account with the Bank of Greece are eligible to participate in the System. Therefore the System follows a level playing field policy and no discrimination is exercised against foreign investors, other than the membership criteria applied in the payment system level.

As far as SSSs and CSDs are concerned, including ICSDs, they should be based in EU and furthermore been assessed by the Eurosystem.

Finally, a minimum capital requirement of €2,9 million is required for brokers in order to be eligible to operate a special payment account with the Bank of Greece.

D. Does the SSS engage in oversight of its participants to ensure that their actions are in accordance with its rules and procedures? If so please describe.

BOGS in itself is not involved in any oversight activities as such. However the Bank in its function as manager and operator of the System ensures that participants act according to the Operating Rules. The same Rules states that the Bank of Greece, as Manager of the System, has the following principal tasks:

- the examination of applications for participation in the System and the opening of the relevant accounts,
- the general supervision of the System, consisting in:
 - ensuring the unhindered functioning,
 - monitoring the smooth completion of the transactions,
 - informing the participant agencies on the day's transactions and on certain transactions of the following days
- to determine the fees of the services provided,
- the supply of aggregated statistical data,
- the undertaking of studies on the improvement and further development of the System.

E. Under what conditions can participants terminate their membership in the SSS? Does this mark the end of all liabilities of the participant? If not, please describe what liabilities could remain.

See III F

F. Under what conditions can the SSS terminate a participant's membership in the SSS?

Termination of the participant's membership may occur:

a. on the initiative of the participant. This can take place at any time, on condition that it is preceded by written notification to the manager of the System fifteen (15) days prior to the termination of participation,

b. on the initiative of the manager of the System. This may take place at any time, on condition that it is preceded by written notification to the agency concerned three (3) days prior to termination. Included in this written notice are the reasons, in summary form, for the expiry of participation.

In the event of termination of participation as stated above, the manager of the System shall notify all other participants without revealing on whose initiative the termination has occurred.

The termination becomes effective as from the date of final settlement of all instructions for transactions of the participant sent to the System, at the latest by the date of this termination's announcement. On the date on which the termination comes into force the manager of the System returns or transfers the securities to the participant's account provided that there are no liabilities pending either towards other participants or towards the System itself.

Termination occurs ipso jure and gives rise to results independently of any notification in case of one of the following instances:

- bankruptcy,

- appointment of a trustee,
- liquidation,
- revocation of authorization,
- revocation of its license to participate in the System.

Furthermore in the following cases,

- change in the financial standing of the participant capable of leading to cessation of payments or to insolvency,
- imposition of attachment or seizure,
- permanent or temporary failure in fulfilling the obligations stemming from the present Regulations of the System,
- in any event capable of undermining the confidence of the manager of the System towards the participant or in the value of the collateral provided to secure its obligations,

the manager of the System is authorized to terminate the participation of a credit institution, unilaterally and without prior notification, by the mere notification to the member concerned.

G. Please describe the scope of the SSS's liabilities to participants, including the standard of liability (negligence, gross negligence, wilful misconduct, strict liability or other) the force majeure standard, and any limitation to the scope of liability of the SSS (e.g. indirect or consequential damages). Where are these liabilities and their limitations set out (e.g. in statute or contract)?

The Bank of Greece acting as Manager of the System, has no liability, contractual or non-contractual, except in the cases of wilful conduct and gross negligence.

Moreover the manager of the System shall not be liable for any losses which may be sustained by participants as a result of events caused by force majeure, such as war, strikes (including those of its own staff), lock-out, insurrections, rebellions, social unrest, epidemics, failure of electricity supply, lack of fuels, raw materials or other shortages, requisitions, fires, floods, impossibility of transport, exercise of sovereign power or acts of the public authorities or other causes independent of its will.

IV. RELATIONSHIPS WITH OTHER SSSs AND COMMERCIAL INTERMEDIARIES

A. Does the SSS maintain linkages (including sub-custodian or cash correspondent relationships) or other relationships with other SSSs?

BOGS does not maintain direct links or other relationships with other SSSs. The Athens Stock Exchange depository (ASE's CSD) and the Athens Derivatives Exchange Clearing House (ADECH) maintain securities accounts in BOGS in order to achieve final settlement on Government securities transactions executed in ASE and Athens Derivatives Exchange (ADEX).

B. Does the SSS use securities custodians (other than the other SSSs addressed in the previous question) and/or commercial cash correspondents? Please identify the custodians or cash correspondents used and the duties that each performs.

N.A. See IV.A.

C. Please describe the standards used in approving or reviewing relationships with other SSSs, custodians or cash correspondents, including any financial or operational requirements or the presence of insurance or public supervision.

N.A. See III.A

D. Does the SSS advance funds or securities to or on behalf of other intermediaries such as issuing or paying agents? If so, please identify the circumstances in which such exposure could arise.

See I.C.

E. Please describe the measures in place to protect the SSS and its members against the failure of other SSSs or commercial intermediaries to meet obligations to the SSS, including risk controls, collateral or alternative sources of funds and securities.

In the case of an SSS or ICSD opening an account with BOGS the same standards and management risk measures are used as with domestic participants. Additionally the foreign SSS has to prove that it fulfils certain standards regarding the participation of its own counterparties.

V. SECURITIES TRANSFERS, FUNDS TRANSFERS AND LINKAGES BETWEEN TRANSFERS

A. Please discuss whether and how settlement instructions are matched between participants prior to processing by the SSS.

BOGS does not oblige its direct participants to maintain mechanisms for inter-agent matching. The only prior-settlement matching executed by the BOGS is the mechanism of matching of double notifications.

All notifications referring to OTC transactions between two direct participants require the System's notification matching. For transactions executed in HDAT and Euro-MTS, matching of notifications is achieved at the trading level. In the case of mismatching the System consults the relevant parties informing them on the problem occurred and requiring the review of the content of the sent notifications. By the end of the settlement day the System informs participants on the mismatched notifications. Furthermore, the participants can continuously monitor the status of their notifications through the relevant web page of BOGS or through a software console that is connected to Electronic Secondary Securities Market (HDAT) network. Upon matching, notifications' instructions become immediately binding for both parties, unless cancellation instructions are provided bilaterally (and in any case prior to final settlement).

Matched instructions are binding on the participants. Sanctions are imposed on the default participant who is, ipso facto and without reminder, liable to pay a fine to the System as well as a penalty on the amounts overdue to the counterparty.

Additionally, enforcement of obligations is achieved through the general pledging of all assets (monies and securities) of the participants kept by the Bank of Greece as manager of the System to guarantee performance of the participants' obligations under any transaction in the System (article 16 of the System's Operating Regulations). In the event of default of a participant, the Bank of Greece is authorised to take such assets in its custody, to realize them and to allocate their proceeds towards satisfaction of the

defaulting participant's obligations (capital, interests, expenses).¹

B. Are securities transferred within the SSS registered?

No registrar is used for the securities deposited in BOGS.

C. Please describe how securities transfers are processed within the SSS.

The System accepts and processes notification of transactions in securities for same day or future value date (up to 365 days). Notifications for transactions in securities with retrospective value date are not accepted. The dispatch of the notifications by the participant agencies to the System must be carried out as soon as possible. For this purpose, Proposal No.1 of the Group of Thirty, according to which notifications must reach the System on the day following the date of agreement of the transaction, has been accepted.

Notifications of transactions in securities with value date identical to or later than the redemption date of the relevant securities are not accepted.

Final settlement is achieved by Delivery versus Payment (DvP) mechanism, i.e. final delivery of securities is achieved if and only if final payment is also achieved.

1. Please indicate whether the transfers are processed as debits and credits to member's accounts or via some other method.

Transfers are processed only as debits and credits to participants' accounts.

¹ These provisions are supplemented by those contained in Article 18 of Law 2832/2000 (introducing Article 57 A to the Bank of Greece Statute) whereby "If obligations of credit institutions or enterprises in general, financed by the Bank of Greece through the conduct of monetary policy operations or through transactions in the context of the systems referred to in Article 55 no.5 become overdue for more than 24 hours, the Bank may, in order to secure its claims and by derogation from provisions on pledge and realization thereof, proceed to the sale of the pledged securities, either on the Stock Exchange, through a member of the ASE designated by the Bank, or over the counter or, if the securities are due and payable, cash them on its own behalf. The Bank shall select, at its discretion, the pledged securities to be sold or cashed in order to satisfy its secured claims. The proceeds of such sale or cash collection shall be used to satisfy the secured claims, in terms of charges, interest and principal, prior to the claims of any other creditor. The Bank shall withhold the amount required to satisfy its secured claims and shall credit the remainder to the account of the debtor. Prior to initiating sale or cash collection, the Bank shall communicate to the debtor a written notice thereof, bearing a certain date". This realisation procedure is significantly simplified compared to its domestic law equivalent for the realisation of pledged assets (as sanctioned by the Greek Civil Code and the Greek Civil Procedure Code), to the extent that it does away with the need for a court decision.

2. On a continuous (real-time) basis, or in one or more batches?

All the transactions are processed in a continuous basis (RTGS), i.e. DvP model 1 according to BIS definition. In addition, three netting cycles are performed during the day.

3. If continuous, during what hours does the processing occur? If in batches, at what time or times is the processing initiated and completed?

For transactions directly connected to Eurosystem's monetary policy and TARGET's intraday liquidity RTGS settlement is available between 07:00-18:00 CET (Central European Time). For commercial transactions RTGS settlement is available between 07:30-14:30.

The three netting cycles are executed and completed (execution time less than 2 seconds) at 07:30, 10:15 and 14:30.

4. Do securities settlements occur daily? Please identify securities for which occurs only on specific days of the week or month.

Yes securities settlements occur daily.

There are no securities for which settlement occurs in specific days.

D. Please describe whether final funds transfers in conjunction with the SSS are made as debits and credits to balances held at the SSS, at one or more commercial banks, at the central bank, or via some other method.

For accounts regulations see IIIA.

E. Is the SSS a DVP system? If so, please describe the DVP model used according to the models outlined in the DVP Report. Please also provide a diagram indicating the

timing of events in the processing of securities and funds transfers in the SSS. Where the SSS provides more than one alternative for settlement processing, please provide a response for each alternative and indicate the relative importance of each alternative.

BOGS uses DvP models 1 and 3 for all the transactions. For the timing of settlements see V.C.3.

1. Are funds transfers and securities transfers processed within the same system or in different systems? If different, how are they linked?

All transfers take place within the same system.

2. When do securities transfers and funds transfers become final?

See V.C. and V.C.3.

3. Please discuss whether participants are notified of securities or funds transfers while they are still provisional, only when they are final or both.

Only when they are final. Notifications are sent for provisional transfers only in case of inadequate amount of securities or cash in participants' relevant accounts.

F. Does the SSS itself “guarantee” funds or securities transfers?

The rights, obligations and liabilities of the SSS are set forth clearly in the relevant Statutes introducing the System (more specifically Law 2198/1994) as well as in the Operating Regulations thereof (remitted to participants prior to their entry into the Accession Agreement).

The System provides real-time Delivery versus Payment (DvP) settlement on a bilateral gross basis as well as netting cycles during the day for all the transactions

It must be noted that according to Article 3 of Law 2789/2000, transfer orders and netting are legally enforceable and binding on third parties, even in the event of insolvency proceedings against a participant of the System, provided that transfer orders were entered into the System before the opening of the insolvency proceedings.

Settlement methods are enforceable according to Article 9 paragraph 1 of Law 2789/2000 and to Article 57A of the Statute of the Bank of Greece, as amended by Article 18 of Law 2832/2000 (*supra*, under paragraph 1.1). Furthermore, paragraph 3 of Article 57A of the Statute of the Bank of Greece provides as follows:

«The rights of the Bank arising from its involvement (in the BOGS) as manager or simple member, with respect to any type of collateral guarantee established in any manner whatsoever by or in favour of an enterprise participating in such systems shall not be affected by the bankruptcy of such enterprise. With regard to its effect on the rights and obligations of the bankrupt enterprise arising from participation in the system, bankruptcy status shall not be antedated to a time earlier than the date of publication of the bankruptcy order of the court. Bankruptcy shall be understood to include any other proceedings by which creditors can collectively pursue the satisfaction of their claims. The provisions of this Article shall also apply where the Bank acts on behalf of the European Central Bank or a National Central Bank participating in the European System of Central Banks».

VI. DEFAULT PROCEDURES

A. Please discuss the events and circumstances that would constitute default of a participant under the rules and procedures of the SSS or that would lead the SSS to make use of exceptional settlement arrangements or unwind procedures.

See section VIII.

B. What procedures are followed by the SSS once it has determined that a default event has occurred or that exceptional settlement arrangements are to be employed?

Exceptional settlement arrangements and special procedures are managed through the general risk management framework of the System. See Section VIII.

C. Has a participant in the SSS ever been declared in default or become insolvent?

No there is no instance in which a participant was declared in default or became insolvent.

VII. SECURITIES OVERDRAFTS, SECURITIES LENDING AND BACK-TO-BACK TRANSACTIONS

A. Is it possible for debit positions (overdrafts) in securities accounts at the SSS to arise?

No there is no possibility for overdrafts in securities accounts.

B. Under what circumstances does the SSS provide for the lending of securities to ensure settlements?

The SSS doesn't provide for the lending of securities to ensure settlements

However, if one hour after the cut-off time for receiving notices of transactions with same-day value, a debit position in the securities account of a participant has occurred, the Manager of the System shall conduct an auction in the HDAT for the purchase, through overnight buy/sell back transactions, of an amount of securities equal to the ascertained debit position.

Such an auction may also be conducted at the request of any participant who, although not in debit position at the System closure, seeks to cover an open position caused by his failure to deliver securities in time under transactions previously conducted with his counterparties, provided that he can furnish the System with the appropriate supporting documents in proof of such transactions. The relevant requests shall be submitted within thirty minutes after the cut-off time for receiving notices of transactions with same-day value.

As far as transactions resulting from the auction are concerned, the counterparty (or counterparties) of the participant (or participants) with the debit or open position shall be the best bidder (or bidders). The bid rate shall not exceed the Lombard rate effective at that date, minus 10 percentage points. The auction shall be completed -and its results announced- within 75 minutes after the cut-off time for receiving notices of transactions with same-date value. Bids shall be listed in diminishing order of offered rates. The allotment rate shall be equal to the value of the last bid at which the amount of securities to be allotted is exhausted. In the event that the aggregate bid is lower than the amount of securities to be allotted, the Manager of the System shall attempt settlement of the

pending transactions that give rise to a debit position, by order of matching, as long as the remaining amount to be allotted is sufficient to cover a transaction in full; otherwise the Manager shall proceed to settle the next transaction. Then – provided that there still remains a sufficient amount to be allotted – the Manager shall proceed, by the same method, to cover the open positions by order of announcement of the corresponding notices to the System. If the amount to be allotted has been exhausted, but there are still debit and/or open positions, the Manager shall seek coverage in any appropriate manner, but shall not be obliged to attain this goal. In the event of full or partial coverage of the remaining debit or open positions by actions of the Manager, the applicable rate shall not exceed the allotment rate, though it can be lower.

Transactions resulting from auction or Manager's actions shall be automatically entered into the System for settlement and the participants involved shall be notified thereof accordingly. It is self-evident that if a debit position occurs in the securities account of a participant who settles his transactions in securities through a custodian, the amount to be paid for the securities acquired through the auction or the Manager's intervention shall be drawn from the custodian's cash management account.

The procedure of auction for a debit position for the same participant and the same issue code number may continue up to (10) consecutive days.

The provisions of this section shall not apply if a participant is under an accession agreement which does not permit the occurrence of debit and/or open positions.

C. How does the SSS settle for back-to-back transactions?

A back-to-back transaction is settled only when double (matched) notifications of all parties involved (buyers and sellers) are received by the System.

There are no amount limits in the back-to-back transaction provided that the above mentioned matched notifications do not extent the amount of securities available in the counterparties accounts.

Provided that the matched double notifications are received within the timetable described in V.C3 transactions are settled for same day value.

VIII. RISK CONTROL MEASURES

A. Please describe the roles and responsibilities of those areas of the SSS responsible for risk management and control.

The only body responsible with the risk management and control of the System is the Government Financial Operations and Accounts Department of the Bank of Greece.

The Regulations documentation together with its amendments provide the risk management framework of the System. The Bank of Greece is the sole responsible agent (through its Governor's Acts) for the revision of this framework.

B. Please describe any internal and external audits or supervisory/regulatory examinations that are performed with respect to the SSS.

The BOGS is subject to control by the Bank of Greece Internal Auditing Department. The audit and reporting procedures ensure that there is no risk of fraud or negligence from the part of the Bank.

As an internal section of the Bank of Greece the System is also subject to the external audit control of the Bank as a result of its participation in the Eurosystem.

C. Please discuss whether the SSS has the capacity to value (i.e. mark to market) the securities that it holds.

At present BOGS' operations are executed in nominal values. However the System being an internal part of the Bank uses mark to market procedures for the provision of correspondent services it provides to other central banks of the ESCB.

D. Please discuss whether the SSS has a lien on the securities held in or transferred through it.

The BOGS has a lien only for securities owned by the direct participants of the System and not for those owned by the participants' customers.

However, there is a specific case, for risk management reasons, where a lien is applicable on participants' securities. This is achieved through the general pledging of all assets (monies and securities) of the participants kept by the Bank of Greece as manager of the

System to guarantee performance of the participants' obligations under any transaction in the System (article 13 of the System's Operating Regulations). In the event of default of a participant, the Bank of Greece is authorised to take such assets in its custody, to realise them and to allocate their proceeds towards satisfaction of the defaulting participant's obligations (capital, interests, expenses).

E. Please discuss the circumstances in which the SSS requires collateral to limit or mitigate risks.

There are no circumstances in which the SSS requires collateral to limit or mitigate risk

F. Please describe the SSS's use of limits on exposures to monitor or control risks.

See VIII.G

G. Please describe other controls to mitigate or reduce risks at the SSS.

The Bank of Greece being the operator of the BOGS considers that settlement risks are minimal since it exercises a close and direct supervision of the system and thus is always aware of the conditions prevailing in it. Nevertheless a credit, liquidity or systemic risk cannot be ruled out in the event of the default of a member of the system. The bank believes that the subsequent risk management mechanisms as well as the introduction of RTGS procedures will minimize such risks.

The Operating Regulations of BOGS provides for the following risk prevention measures:

- DVP. The clearing system operates according to DVP models 1 and 3 for all the transactions.
- Securities auction. Debit positions in securities accounts can be covered through auctions procedures run by the operator of the System. The procedure can be activated one hour after the last cut-off time of the day. Counterparties to those participants with debit securities positions can be only participants of the System. The procedure is compulsory for those participants in debit securities position at the time of final settlement (at the end of day).
- If the cash management or deposit (securities) account of a participant does not have an

adequate balance the transactions shall be cancelled to the extent that they are not covered in cash.

- In both of the above cases sanctions are imposed on the default participant who is ipso facto and without reminder liable to pay a fine to the System as well as a penalty on the amounts overdue to the counter party.

Another important aspect of risk management measures is their enforceability:

Risk management of the System finally achieved through a general pledging of all assets (money and securities) of the participants kept by the Bank of Greece as manager of the System to guarantee performance of the participants' obligations towards the manager and generally of their obligations under any transaction followed by the System (article 16 of the System's Operating Regulations). In the event of default of a participant, the Bank of Greece is authorized to take such assets in its custody, to realize them and to allocate the proceeds towards satisfaction of the defaulting participant's obligations (capital, interests, expenses). These provisions are supplemented by the provisions of article 11.3 of Law 2548/1997 according to which the Bank of Greece may, in case of default of credit institutions or other participants in the System, realize pledged securities held in the System by auction selling the pledged securities OTC or through a Stock Exchange broker, subject only to giving formal prior notice of the forced sale to the debtor. This realization procedure is significantly simplified, compared to the procedure for realization of pledged assets set forth by the Greek Civil Code, which requires a court decision.

IX. OPERATIONAL RISKS

A. Please provide assessments of the operational reliability of the computer and other systems used by the SSS, including any criteria that the SSS uses internally for this purpose.

NOTE: All audit, security and operational assessments of BOGS are only for internal use within the Bank of Greece.

1. What is the percentage uptime of the systems used by the SSS?

The percentage uptime of the systems used is 100%.

2. Has the SSS experienced major operational problems during the past two years?

No.

B. Please describe contingency or disaster recovery planning at the SSS

1. Data management (backup and audit trails)

In order to protect the application database (which includes business data) from hardware and software failures (including human errors) the following plan of daily and weekly procedures is in place:

Daily procedures:

1. At the end of the business day, a backup of the database is taken, including all data of the same day's transactions

Weekly procedures:

Every Friday a full database backup is taken and kept in a safe site (other than the main bank's headquarters).

Both backups are stored into both the IBM Enterprise Storage Server and a tape. For security reasons the tape is kept outside the bank's headquarters.

2. Emergency plan

The new production system is IBM p-series 630 servers, which work in High Availability Cluster Multi Processing Mode. In this case if one server fails, the other one takes over automatically with no interruption for the users.

The application runs on a set of 2 IBM 6H1 p-series servers. All components of the servers (disk, CPUs, controllers, power supplies, batteries, fans) are configured in pairs for fault tolerant operation. All servers have two local mirrored disks where the operational system resides. The mirror disk has exactly the same data as the primary disk. This implies that in case of the primary disk failure this is replaced by the mirror disk preventing any data loss while at the same time the availability of the system continues uninterrupted.

Another system of 2 servers, which run in clustered mode, used for test purpose exists. The test system has exactly the same characteristics as the production system.

In case of an emergency (i.e. system, double disk or double controller failure) two plans are followed depending on the hardware availability. If no extra hardware is immediately available or in the case of a total system failure disaster or *force majeure* (commonly associated with natural disasters such a fire, flood, earthquake etc) a Disaster Recovery System is operating in a different site (at the Information Systems Department of the Bank of Greece in Halandri – Athens). This is tested every three months without the involvement of the participants of the SSS.

In case of data loss the daily and weekly database backups are used to restore the data. Data recovery scenarios include complete database recovery, incomplete or partial recovery of specific data and point-in-time recovery. This is also tested every three months.

3. Disaster recovery

The Disaster Recovery System (itself a mirror system of the Production System) is operating in the Information Systems Department of the Back of Greece (10 KM distance from the headquarters). The disaster recovery system has 2 IBM p-series servers. One system used from database installation and the other for the Application software. The data are stored in IBM Enterprises Storage Server with RAID 5 and RAID 10. The two systems are on the same TCP\IP network allowing online information transferring between Production system and the disaster system. The line used is a dedicated line (10 Mbs\sec) single access dual home. There is also a telecommunication line in operation, which can be used for transferring data between the two systems. It is estimated that in case of a serious breakdown, it will take about 30 minutes to start using the Disaster Recovery, which is the time required for the personnel to move to the Disaster Recovery site.

C. What are the key features of the internal controls covering operations and security at the SSS (e.g. change controls or those covering remote access)?

BOGS is located within the Bank of Greece installations and it is operated and controlled by its staff. That guarantees the confidentiality and security of the transactions during the processing and prevents the risk of unauthorized access on the physical data (e.g. messages) and the hardware. BOGS is subject to a well defined and structured operational and controlling procedure with various checks performed during the user entry, with each user defined at a different level of authorization depending on the nature of his/her job, until a transaction is settled. The hardware configuration and backup tapes are kept in a secure and protected computer room within the EDP Department of the Bank, where access is restricted to authorized and trained personnel only.

D. Does the SSS impose minimum operational or performance standards on third parties (e.g. communications providers)?

The BOGS imposes its operational standards on the contracts signed between the Bank of Greece and third parties regarding the provision of products and services. These standards are viewed on a case-by-case base. Obviously the central bank has the power to impose these standards on the market agents.