(Bor.Sor./Saw.02-01)

NOTIFICATION OF THE STOCK EXCHANGE OF THAILAND
Re: Standards of the Trading of Securities Through Internet, 2005

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By virtue of Clause 14 of the Regulations of the Stock Exchange of Thailand Re: Trading of Securities Through Internet, 2005 dated March 22, 2005, the Stock Exchange of Thailand hereby issues the following regulations:

      1.   This Notification shall come into force on May 3, 2005.

      *2.   The member shall perform in accordance with the standards of the trading of securities through Internet under the Attachment hereof.
      *(*Amended March 23, 2009)*

Notified on this 22nd day of March 2005.

      (Signed) Kittirat Na-Ranong

      (Mr. Kittirat Na-Ranong)
      President

Rationale of the Notification: The Exchange deems it appropriate to prescribe the standards of operation and security precaution of the computer system for Internet trading, the system for recording of trading orders through Internet, the storage of data related to the recording of trading orders through Internet, including the Order Screening System in order to support such trading of securities. Hence, it is advisable to issue this Notification.

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Computer Standards for Internet Trading
and Order Screening System

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*__I.   Computer Standards for Internet Trading__

__Form of Internet Trading__

1. Being the trading of securities through a Web Server, which is connected via an internet network (public network), and an Internet Service Provider (ISP) who provides public service.

2. The Broker Front-Office and Order Management Server must have separate functions and record the jobs for examination.

3. No application or method which is regarded as a terminal emulator by the Exchange shall be used.

4. The security system must be a standard system.

5. There must be a system for screening improper trading orders, as prescribed by the Exchange.

Transmission of trading orders via mobile phone or PDA is also regarded as internet trading, and must have the same system configuration as stated above.

Sample of System Connection

Figures 1 and 2 are samples of the system connection configuration for Internet trading, whereas

- Internet Trading Terminal means a computer equipment, PDA or mobile phone used by a customer for recording trading orders;
- Order Management Server means a computer equipment which performs the functions of validating, logging and creating trading;
- Broker Front-Office means computer equipment which performs the function of connecting with the Exchange's trading system.
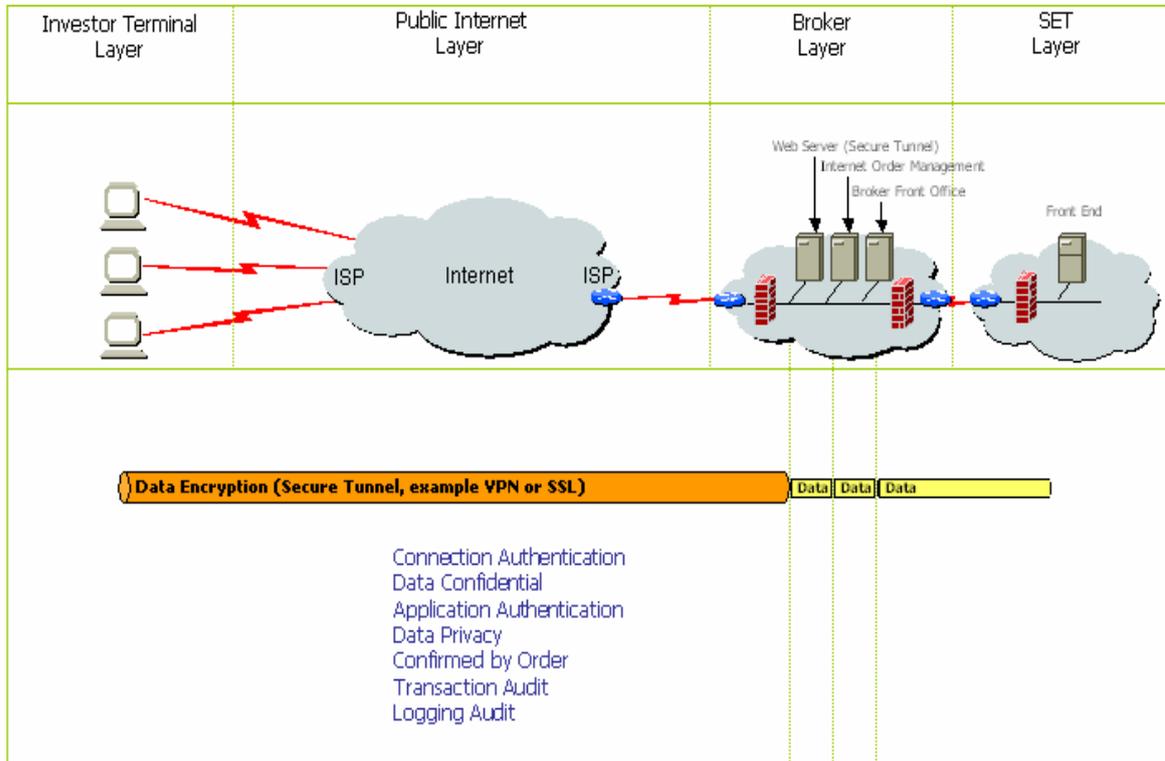
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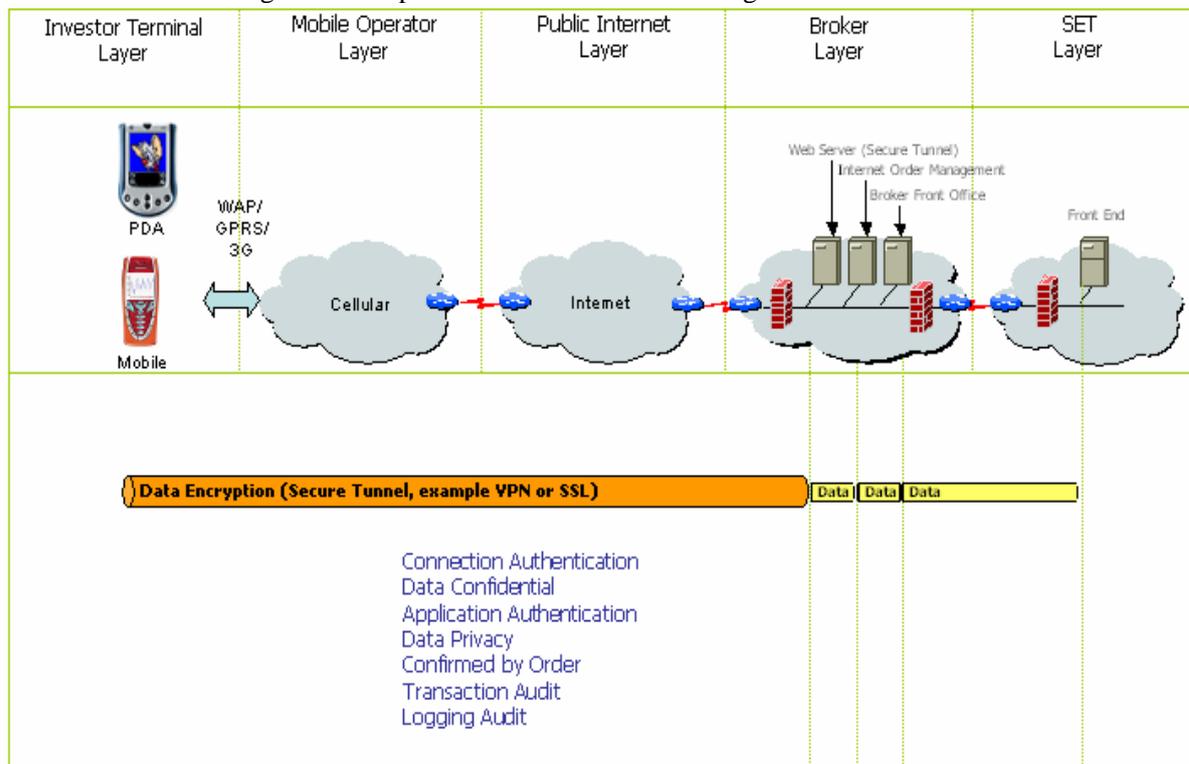

Figure 1: Sample of General Internet Trading Connection

Figure 2: Sample of Mobile Internet Trading Connection

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Security Management The management and control of security systems and computer system according to standards to ensure the availability of proper standards of security precaution in the performance of works in general, including any extra measures implemented for security precaution, which shall cover confidentiality integrity and availability such as user administration and security alert etc. The standard systems include:

❑ Physical Security A security system available in the installation site of equipment used in the provision of service.
  o A computer room must be specially allocated and separated.
  o A computer room must be installed with a standard security system; for example, the access to/exit from a computer room shall require the use of access control card and be monitored by an officer throughout 24 hours.
  o All accesses to/exits from a computer room and reasons for the accesses shall be recorded

❑ Network Security A system that prevents unauthorized persons from accessing to the network system and causing damage such as the hacking or change of data or disruption of the system, etc. to allow them to have access to or change data from the trading transactions.
  o Basic security precaution tool such as Firewall, etc. should be available in the Web Server, Order Management Server and Internet Network System.

  o Record of usages and event logs of various network equipment must be maintained for at least 1 month for the purpose of examination or resolution of problems, and should be immediately available for examination upon request by the Exchange.
  o The types of services of all kinds of security and network equipment that are connected in the network must be prescribed according to actual usage.

  Suggestion

  o Basic security precaution tool should be available between the Order Management Server and Broker Front-Office of the member.
  o Service level of various network equipment should be prescribed, such as the readiness for use, servicing or replacement schedule, etc.

User Authentication and Privacy The authentication of system users to ensure that they are the actual authorized users and not the false ones, including the protection to ensure that only personal data can be retrieved and recorded and that no person other than the owner will be allowed to have access to such data.

❑ System Security
  o Before accessing to the Server, all users must be authenticated to ensure that they are the actual authorized users and not the false ones. Any authentication measures or technologies may be implemented such as the identification of user and password. The password shall meet the minimum recommendations as follows:
    - Each password should consist of at least 8 characters and include letters, special and numeric characters.

- There should be a policy on change of password at every appropriate interval such as every 3 months.
- Password should not be displayed in a form of clear text.
- Software or technique that allows any computer equipment or device related to the trading system to record a password for its automatic retrieval in the future should not be used.

o In case of failure of login attempt for more than 5 times consecutively, the login of such account should be locked.

❑ Application Security

o Before the customers can access the internet trading system, they must be authenticated, to ensure that they are actual authorized persons and not false ones. Any authentication measures or technology may be implemented, such as identification of username and password. The password must meet the following minimum characteristics:

- Each password must consist of at least 6 characters and include both special and numeric characters.
- The password should not be displayed in clear text.
- Software or techniques that allow any computer equipment or devices related to the trading system to record a password for its automatic retrieval in the future should not be used.
- The process of allocation and delivery of username and password to customers must be adequately secure.

o Where login is unsuccessful after 5 consecutive attempts, the account must be locked.

o A customer may use only one user login name at any one time.

o At any particular time, the terminal that a customer uses for recording trading orders must be used for 1 customer, 1 account and 1 trading order, which is made for one particular security only. The customer must record an order from the beginning of the process until such order is completely recorded, before starting the transmission of the next order. When recording orders, the customer must confirm that he/she is an actual customer, order by order. The member may provide any method or technology to accomplish this, such as PIN ID, etc.

o For recording basket-order trading, the terminal that a customer uses for recording orders shall, at any particular time, be used for 1 customer and 1 account only, whereby the customer must confirm that he/she is an actual customer, order by order. The member may provide any method or technology to accomplish this, such as PIN ID, etc.

o The PIN ID shall be designated as follows:

- A PIN ID designated for a customer shall have at least 4 digits.
- In the case of a wrong PIN ID entry more than 5 consecutive times, the transmission of orders for such account must be locked.
- Storage of PIN ID data shall require encryption.
- PIN ID must be keyed in for every trading order, including for the change or cancellation of a trading order. One trading order means a bid or offer order for one particular security, at the specified volume and price (confirm order by order). However, the customer may cancel several trading orders simultaneously by keying his/her PIN ID only once.

- In recording basket orders, the customer must be able to key in the PIN ID for every transmission or cancellation of a basket order.

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- Software or techniques that allow any computer equipment or device, related to the trading system, to record the PIN ID for its automatic retrieval in the future may be used, provided that the member shall have in place proper security management. For example, the time-out should be set at no longer than 5 minutes after idle time, the customer must be prompted to key in his/her PIN ID after closing the order transmission screen, or there should be in place any other appropriate measure. The member shall also notify the customers of a higher risk.

Suggestion

- The time-out should be set at no longer than 60 minutes after idle time in order to force the user to have an automatic logout.

❑ Information Security Standard

o System Security
   - Storage of PIN ID data shall require encryption.
   - All Servers shall have only necessary services for the Internet trading transactions.
   - For security purpose, a trading order recorded from a mobile phone or PDA (mobile trading) shall require data encryption from the mobile phone or PDA to the Web Server whereby such data cannot be decrypted at any point along the connection route as shown in figure 2 above.
   - Record of usages and event logs of all Servers, such as user logins, use of Web Server, use of database, should be maintained for the purpose of examination for at least 1 month, and should be immediately available for examination upon request by the Exchange.

   Suggestion
- Security precaution tool should be available between the Web Server and Order Management Server, such as encryption or Firewall.

o Application Security
   - Storage of password data shall require encryption.
- Data recorded from the Internet Trading Terminal to the Web Server must be encrypted as follows:
   - at least 128-bit code must be keyed in for a computer equipment, and
   - at least 40-bit code must be keyed in for a PDA or mobile phone.
- Order log of the application must be maintained for examination for at least 2 years. The log shall include details of the orders i.e. office of the member or place of the customer, date, time, IP, Customer ID, Designated Trader ID, details in case an order is recorded by an authorized officer on behalf of the customer and trading information. Such log should be immediately available for inspection upon request by the Exchange.

(Amended June 26, 2007)*

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II. Order Screening System

In the transmission of Internet trading orders by customers, the Exchange has established an Order Screening System for screening some types of improper orders of which the forms can be predefined. **However, for the transmission of orders in a such a manner as to avoid detection by the Order Screening System or for some types of improper orders for which an Order Screening System cannot be implemented, the Exchange will monitor the trading transactions executed by the customers by taking into account the trading behavior, intent and prevailing market condition according to its normal procedures**.

The types of improper trading orders for which a screening system is implemented are as follows:

1. Orders which intervene the queue of and conceals another person's order
2. Orders which is entered and subsequently cancelled
3. Wash sales
4. Orders which direct the price

1. Orders which intervene the queue of and conceals another person's order

This refers to the transmission of a bid or offer at a price substantially higher or lower than the projected price, which cannot be matched, or the transmission of a bid or offer which is not intended to give rise to trading at such price, irrespective of whether such order is cancelled later or not, with the intent to intervene the queue or conceal another person's order. An order of this type is as described below.

	Type of Securities	Examination Period	Examination Criteria
1	Securities traded on the <u>main board</u>, in the case of the first trading day (IPO), or in other cases where there are no ceiling and floor.[1]	Pre-opening and pre-closing sessions.	The trading system will not accept orders transmitted at the prices which are 50% higher than or 50% lower than the following prices: 1. the projected opening price or the projected closing price; 2. if there is no projected opening price or projected closing price during such time, the last sale price shall be used; 3. if there is no last sale price: • the IPO price shall be used in the case of securities on the first trading day, • the system will not make an examination in other cases where there is no ceiling and floor[1].

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[1] For example, securities that are traded on the first day after a period of more than 1 year from the SP, or securities that are subject to capital decrease by means of reduction in number of shares, etc.

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	Type of Securities	Examination Period	Examination Criteria

2	Securities traded on the <u>foreign board</u> and having characteristics as follows:
	- Being the first trading day (IPO) of such securities on the main board.
	- Other cases where such securities that are traded on the main board have no ceiling and floor[1].
		Pre-opening and pre-closing sessions.	The trading system will not accept orders transmitted at prices which are 50% higher or 50% lower than the following prices:
			1. the projected opening price or the projected closing price;
			2. if there is no projected opening price or projected closing price during such time, the last sale price shall be used;
			3. if there is no last sale price during such time, the last sale price of such securities on the main board shall be used;
			4. if there is no last sale price of such securities on the main board:
			  • the IPO price shall be used in the case of securities on the first trading day;
			  • the system will not make an examination in other cases where there is no ceiling and floor[1].

Remarks: The last sale price means the last executed price on a day on which orders are recorded, excluding the closing price on the previous business day (previous closing price).

2.   <u>Orders which are entered and subsequently cancelled</u>

This refers to the transmission of a bid or offer that is subsequently cancelled and resent at the equivalent volume, price, and approximate time, with no intent to actually execute the trading, but with the intent to mislead other persons by indicating that there is a substantial volume of demand for the buying or selling of such securities at any given time. When a partial matching occurs or even if there is no matching, such order will be cancelled immediately and resent within a short time, at the same or approximate volume as the transaction recently cancelled.

<u>Examination period</u>: During the opening session.

<u>Examination method</u>: The system will not accept an order worth 3 million baht or more which is resent within 1 minute after the previous order is cancelled, if such later order is sent at the previous price and at a volume higher than or equivalent to 50% of the cancelled volume.

3.   <u>Wash Sales</u>

This refers to the transmission of a bid or offer by the same customer at prices and volumes that can be matched in order to mislead the public about the trading price and volume of securities.

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	Type of Orders	Examination Period	Examination Criteria
1	Limit Price Orders	All the time	The trading system will examine the order transmitted by the same customer and having characteristics as follows: • bid price $\geq$ offer price: the system will reject such bid order if the previous order is not yet matched; • offer price $\leq$ bid price: the system will reject such offer order if the previous order is not yet matched

2	Orders At the Open (ATO) Price or At the Close (ATC) Price	Pre-opening and pre-closing sessions.	The trading system will examine the order transmitted by the same customer and having characteristics as follows:
			
			1. ATO or ATC order both buying and selling sides
			• the system will reject ATO/ATC order if there is the previous opposite of ATO/ATC order.
			2. ATO or ATC order on one side and Limit Price Order on another side
			  2.1 the following order is on the buying side ;
			    ▪ Limit Order Price $\geq$ Projected Open/Close Price: the system will reject the limit price bid order if there is a previous ATO/ATC offer order.
			    ▪ Limit Order Price $\leq$ Projected Open/Close Price : the system will reject the ATO/ATC bid order if there is a previous limit price offer order.
			  2.2 the following order is on the selling side ;
			    ▪ Limit Order Price $\leq$ Projected Open/Close Price: the system will reject limit price offer order if there is a previous ATO/ATC bid order
			    ▪ Limit Order Price $\geq$ Projected Open/Close Price: the system will reject the ATO/ATC offer order if there is a previous limit price bid order.

3	Orders at the Market Price (MP)	Opening session	• The trading system will reject an MP bid order if the Best Offer at the first rank is equivalent to a limit price offer order

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	Type of Orders	Examination Period	Examination Criteria
			previously transmitted by the same customer • The trading system will reject an MP offer order if the Best Bid at the first rank is equivalent to a limit price bid order previously transmitted by the same customer

4. Orders which unduly influence the price of securities

This refers to the transmission of a bid or offer at a price which is substantially higher or lower than the projected price, in order to control the price of securities. The member must have in place an examination system as follows:

	Type of Securities	Examination Period	Examination Criteria
1	Securities traded on the <u>main board</u>.	Pre-opening and Pre – closing session.	The member must prepare a warning message for any trading orders transmitted by investors at prices which are 10 spread higher or 10 spread lower than the following prices: 1. the projected opening price or the projected closing price; 2. if there is no projected opening price or projected closing price during such time, the last sale price shall be used; 3. if there is no last sale price, the prior closing price shall be used.
2	Securities trade on the <u>main board</u> in the case of the first trading day (IPO), or in other cases where there is no ceiling and floor[1].	Opening session.	The member must prepare a warning message for any trading orders transmitted by investors at prices which are 30% higher than or 30% lower than the last sale price.
3	Securities traded on the <u>foreign board</u> and having characteristics as follows; - Being the first trading day (IPO) of such securities on the main board. - Other cases where such securities that are traded on the main board have no ceiling and floor[1].	Opening session.	The member must prepare a warning message for any trading orders transmitted by investors at prices which are 30% higher or than 30% lower than the following prices: 1. the last sale price; 2. if there is no last sale price during such time, the last sale price of such securities on the main board.

**Amended March 23, 2009.

Market Control Department
The Stock Exchange of Thailand