

## **BAHTNET System Payment System Innovation Year 2001**

### **1. Introduction**

1. The Bank of Thailand (BOT) developed the BAHTNET (Bank of Thailand Automated High-value Transfer Network) System as an infrastructure for electronic funds transfers between financial institutions and other organizations in Thailand. The BAHTNET System has been in operation since May 24, 1995 by supporting high-value funds transfer on the real time gross settlement (RTGS) system. Transactions are completely settled on a transaction by transaction basis in order to reduce the settlement risk and perhaps more importantly, to enhance financial stability.

2. The BOT has realized the importance of developing the government's domestic securities market, reducing the government's securities-related costs and risk as well as ensuring that system infrastructure conforms to an international settlement standard. Consequently, BOT has upgraded the existing BAHTNET system by enhancing the facility for the settlement of Thai government securities on a real-time basis or in a Delivery versus Payment (DVP) manner. Moreover, the upgraded system uses S.W.I.F.T. Interface as the main interface for sending and receiving messages between BAHTNET members and BOT.

3. Throughout the development of the BAHTNET System, the BOT worked closely with BAHTNET members and the related internal departments, as well as external organizations, in order to explore and define the consensus on the BAHTNET requirement specifications. The recommendations on business and technical requirements from the World Bank consultants as well as from the professionals from the Reserve Bank of Australia, are beneficial to the BAHTNET Development Project and will lead to the efficient development of the system, which should meet the needs of BAHTNET members while conforming to international standards.

4. The upgraded BAHTNET system has been in operation since December 11, 2001 and the official opening, presided by the Governor is on December 21, 2001.

## **2 BAHTNET Functions and Members**

### **2.1 Linkage between BAHTNET members and the BOT**

5. The BAHTNET System is an electronic high-value funds transfer network, which links BAHTNET members and the BOT for the purpose of sending and receiving messages. BAHTNET members can link to the BAHTNET System either via the S.W.I.F.T. network or via the BAHTNET Webservice. The functions provided by the BAHTNET System are high-value funds transfers, securities transfers, inquiries, general messaging, message broadcast and daily reports.

6. S.W.I.F.T. members and Non - S.W.I.F.T. members can send transaction instructions via the S.W.I.F.T. and BAHTNET Webservice respectively. Both types of member may also enquire about all transaction information via BAHTNET Webservice.

### **2.2 Funds Transfer and Securities Transfer**

7. The BAHTNET System provides funds transfer services on RTGS basis and securities transfer services on the Real Time Gross Settlement - Delivery versus Payment (RTGS - DVP). Transaction are completely settled on a real time basis and on a transaction by transaction basis. Thus, whenever payment instructions and securities transfer instructions have been executed and accounts have been completely updated, the settlement will be finalised and become an irrevocable transfer order.

### **2.3 Liquidity Facilities**

8. There are 2 methods to support the liquidity demand within the BAHTNET System as follows;

2.3.1 The Queuing Mechanism & Gridlock Resolution - To reduce BAHTNET members' liquidity needs. BAHTNET Members can manage their own queue to facilitate their liquidity. In addition, the BAHTNET System provides a queue management algorithms to undertake gridlock resolution with an aim to facilitate the settlement of transfer instructions in the queue. The Queuing Mechanism and Gridlock Resolution are tools that have been developed to handle the queue of the funds transfer instructions that cannot be settled due to insufficient funds in the sending institution's account. When several instructions from various institutions stand in the queue, the system will search for groups of instructions and calculate the net position of each institution. If the net balance of each related institution is a positive amount, the system will then process all the related instructions simultaneously.

**2.3.2 Intraday Liquidity Facilities (ILF) –** The intraday liquidity facilities credit line, available to each BAHTNET member, depends on the amount of collateral pledged to BOT. However, usage of ILF is restricted to transfer instructions via BAHTNET only and specifically in cases where the cash account balance is not enough. Penalties will be applied in the case of overnight usage.

## **2.4 BAHTNET Members**

9. As of December 2001, there are 59 BAHTNET members consisting of commercial banks, specialized banks, non-bank financial institutions, some government organizations, Thailand Securities Depository Co., Ltd., Thai Asset Management Corporation (TAMC), and internal departments of the BOT. BAHTNET members can be classified into 2 categories as follow;

1. 57 Direct members; 34 S.W.I.F.T. members and 23 Non- S.W.I.F.T. members
2. 2 Associate members; Non- S.W.I.F.T. members

## **3. The benefits of BAHTNET**

10. The BOT developed the BAHTNET system as a financial infrastructure in Thailand. Based on RTGS, the BAHTNET system increases the efficiency and safety in the payment system, and should prove invaluable in the development of the money market and capital market.

### **3.1 Reducing risk in securities transactions**

11. Currently, most sellers receive their payments via cheques, and payments are finalized on the following day after delivery of the securities to the buyers. BAHTNET will deliver payments at the same time as the securities are delivered.

### **3.2 Increasing efficiency for securities transactions**

12. Previously, securities transfers were a time-consuming affair, as clients would have to prepare and submit the relevant documents to the BOT. Now however, with the BAHTNET system, members will be able to send the securities transfer instructions automatically and autonomously. Those transactions will be settled if data in the instructions are correct and clients have enough securities or cash in their accounts.

### **3.3 Reducing the process and cost for input data**

13. The SWIFT interface is the main interface for sending messages which should accommodate members via Straight Through Processing (STP)

### **3.4 Getting more capability in cash management**

14. Members can enquire about the balance and movement of both the current account and the securities account. Furthermore, changing a priority of the funds transfer and securities transfer transactions can be done by members themselves. This will be useful for them in terms of cash management.

### **3.5 Standards**

15. Message type and message format of both funds transfer and securities transfer follow SWIFT standards. Specifically, securities transfers meet ISO15022 standards. In addition to this, institution codes, or BIC codes (Bank Identifier Code), ISIN codes (International Identification Securities Number) and security access systems, or PKI (Public Key Infrastructure) also conform international standards.

16. In addition to this, BIS Core principles for Systemically Important Payment Systems were applied in the design and development of the BAHTNET system owing to the fact that it is a high-valued funds transfer system

17. This system has also been designed to meet international standards and to be compatible for use with other foreign payment systems in the future.

## **4 Security**

18. Security of BAHTNET has been developed to assure members of the integrity and strength of the system, which includes confidentiality, authentication, integrity and non-repudiation. In addition to this is the continuous recording and registration of messages being sent in and out of the system, to provide a record should it be needed.

19. The BOT set up a backup site at the Surawong office with the same hardware and software, to be used in the event that the main center fails. In addition, there is also a contingency plan in case the

BAHTNET system cannot perform properly. Members are also required to arrange hardware and software backups as appropriate.

#### **5. Volume and value of BAHTNET transactions during December 11-14, 2001**

20. During the first week of implementation of the BAHTNET system, the volume of funds transfer was approximately 3,000 transactions while the value was approximately 300 billion Baht. For the securities transfer, volumes were 120 transactions and value were 3,400 million Baht.

#### **6. Summary**

21. Bank of Thailand developed the BAHTNET system to be the financial infrastructure supporting Thailand's capital market and money market, including limiting risks in the payment system. Those will be factors in maintaining financial stability and strengthening Thailand's payment system. The BAHTNET system will be developed continuously in order to respond to the rapid changes of business needs and advanced technology.