



Next Generation BOK–Wire+ Development Project



2020.12

Payment & Settlement Systems Department

I Next Generation BOK-Wire+ Development Project Overview

Since its construction and commencement of operations in 1994, BOK-Wire+, the country's large-value payment system, has played a pivotal role in supporting smooth settlement between financial institutions and promoting the stability of the Korean financial system.

Nonetheless, since the system went live, the value and volume of funds processed through it have increased remarkably, and BOK-Wire+ has been expanded to support several additional operations, such as DvP transactions, liquidity-saving mechanisms, and intraday repos, causing a growth in system complexity.

In response to these circumstances, development began on the next generation BOK-Wire+ in 2015, with a focus on three main goals: enhancing settlement efficiency for BOK-Wire+ participants, offering greater convenience to users, and making the system capable of being flexibly adjusted in response to changes in the payment and settlement environment. The next generation BOK-Wire+ launched in October 2020, and has been successfully operating ever since.

II Major Improvements and Changes

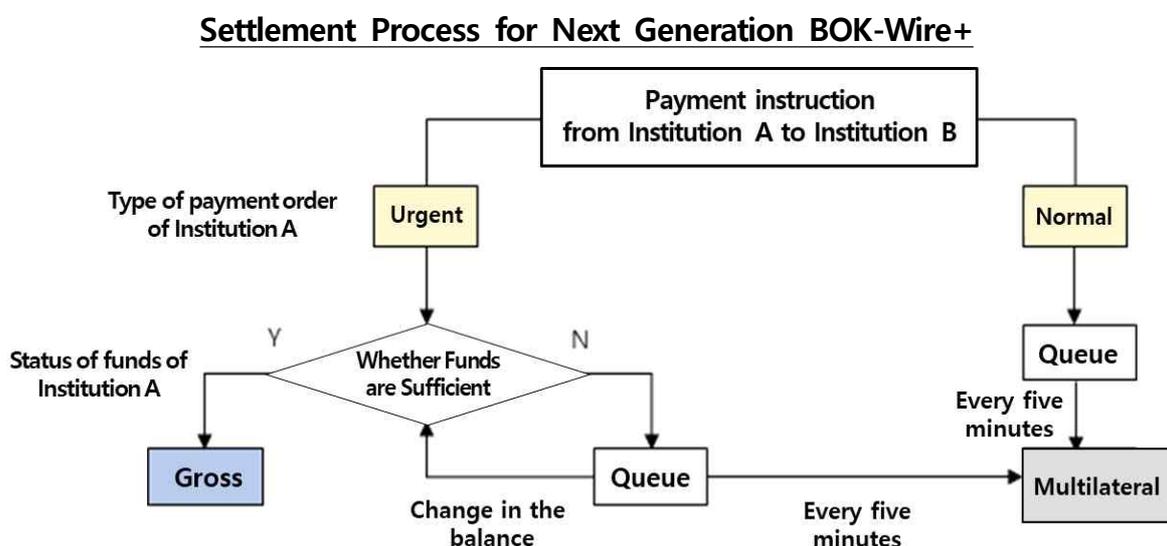
1. Improvements in Settlement Procedures for Liquidity Saving

Simplification in Settlement Mechanism

The complicated net settlement algorithm has been simplified with the launch of the next generation BOK-Wire+. While the current simultaneous multilateral settlement mechanism of the hybrid settlement system was maintained, the simultaneous bilateral settlement mechanism has been eliminated.

Shortening Simultaneous Multilateral Settlement Intervals

To increase the efficiency of settlements, the simultaneous multilateral settlement intervals of the system have been shortened, from the previous 30 minutes to 5 minutes. This shortening of the settlement cycle is expected to significantly alleviate the burden on the system caused by increases in the number of payment instructions in the queue.



Measures to Improve Settlement Mechanism of Next Generation BOK-Wire+

Measures	Before Changes	After Changes
Settlement Mechanism	Gross, bilateral and multilateral	Gross and multilateral
Simultaneous Multilateral Settlement Intervals	30 minutes	5 minutes

2. Separation of Funds Transfer System for BOK-Wire+ Participants

In addition to its original settlement services, including funds transfers between participants, BOK-Wire+ provides other services: BOK lending, issuance and redemption of treasury bonds, etc. Related accounting procedures for all the above services were carried out in the BOK' s accounting system.

To respond rapidly and flexibly to changes in the payment and settlement environment, and to ensure a stable system, the involvement of the BOK' s accounting system in the interbank funds transfer system(large-value payment system) of the new BOK-Wire+ has been minimized. The interbank funds transfer system now has its own infrastructure in part, its own account for settlement, and its own accounting processes.

3. Realignment of Settlement Account and Improvement of Intraday Overdraft

Realignment of Settlement Accounts

Previously, participants in BOK-Wire+ used the Deposit Account for Settlement as their main settlement account with BOK-Wire+. The Deposit Account for Settlement was used for funds transfers between participants, and the balance was maintained only during the operating hours of BOK-Wire+. At the closing time of BOK-Wire+, the balance was automatically transferred to the current account.

However, under this system, intraday liquidity supplied by the BOK was not deposited directly into the Deposit Account for Settlement in cases of temporary funds shortfalls, but to the current account, requiring them to transfer intraday liquidity from the current account to the Deposit Account for Settlement.

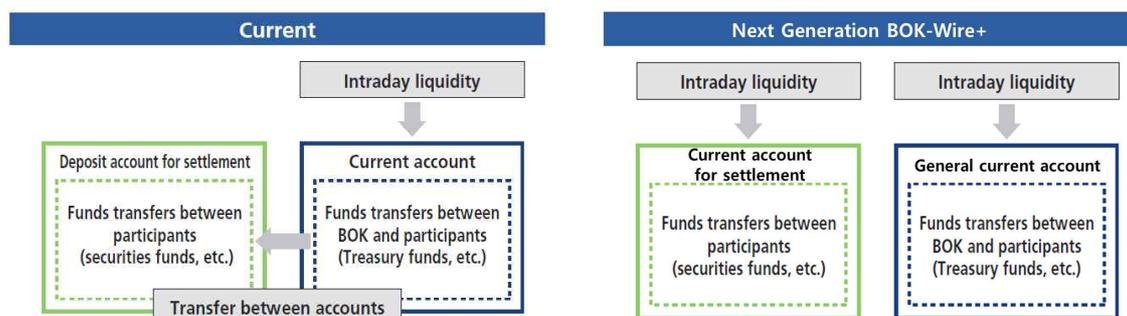
In order to solve this inconvenience, the Deposit Account for Settlement has been changed into the Current Account for Settlement in the next generation BOK-Wire+.

Under the new system, BOK-Wire+ participants hold two types of current accounts with the BOK: an existing current account, which is named the “General Current Account” , and the “Current Account for Settlement” . The former is used for transactions between the BOK and participants, and the latter for transactions between participants.

Improvements in Intraday Overdraft

Accordingly, intraday liquidity is supplied by the BOK through both the General Current Account and the Current Account for Settlement, so account-to-account transfers are no longer needed, thus increasing the speed of settlement and resolving the settlement delay risk issue.

Improvement of Intraday Liquidity Supply



Other Changes in Realignment of Accounts

Funds transfers involving CLS and designated time net settlement, which were handled through the (general) current account, are now processed through the Current Account for Settlement in the next generation BOK-Wire+.

Major Features^{1),2)} of Next Generation Current Accounts

General Current Account		Current Account for Settlement	
System	Features	System	Features
Treasury	• Treasury funds transfers	Large-value Payments	• Net settlement, CLS funds transfers
Securities	• Issuance and redemption of MSBs, government and public bonds		• General funds transfers, call transactions
Deposits	• Funds transfers between HQ and branches		• DvP
Loans	• Provision and repayment of collateralized loans	Loans	• Linked settlement
	• Provision and repayment of intraday overdraft		• Funds transfers between HQ and branches
			• Provision and repayment of intraday overdraft

Notes: 1) Features in the dotted-line box are currently processed in the current account. Those in the dashed-line box are processed in the current account for settlement.

2) The shaded parts refer to features operated both in the large-value payment system and in the loan/deposit system.

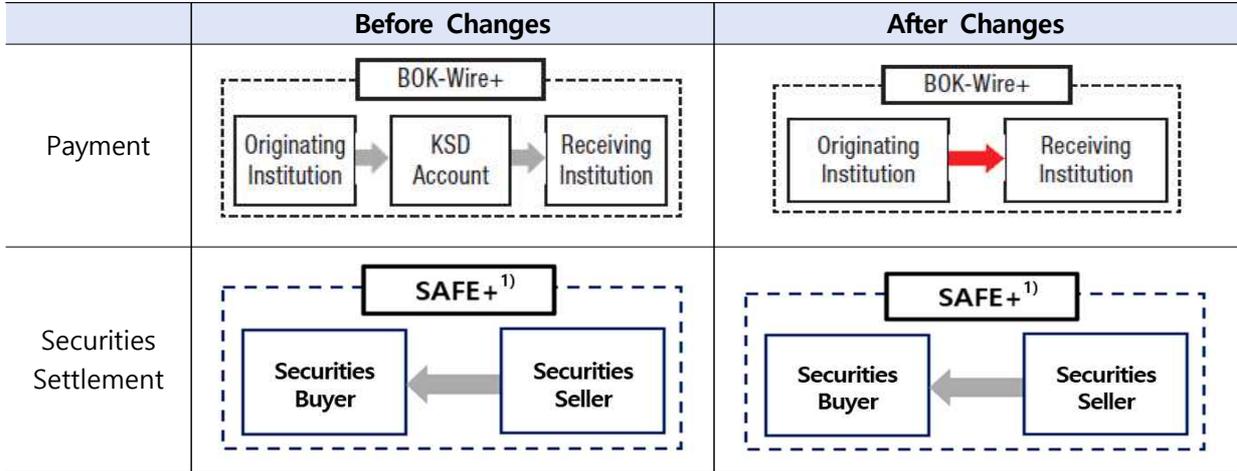
4. Increased Efficiency of Delivery Versus Payment(DvP)

Improvements in DvP Settlement Method

With the existing BOK-Wire+ system, DvP transactions that were settled through real-time gross settlement (RTGS) on a transaction-by-transaction basis, called “DvP1”¹⁾, transited through the Korea Securities Depository(KSD)’s bank account before being processed. As a result, these transactions could not participate in the BOK-Wire+’s simultaneous multilateral settlement procedure for liquidity saving.

Given the accelerated growth trend in DvP transactions, it was expected that liquidity demand for settlement would increase. To raise the efficiency of DvP settlements, and to alleviate liquidity burdens on BOK-Wire+ participants, a new method was designed in which payments for DvP1 transactions are now directly sent to transaction counterparties. As part of the next generation BOK-Wire+, these transactions are included among those settled through the BOK-Wire+’s simultaneous multilateral settlement procedure.

Improvements in DvP Settlement Method for Next Generation BOK-Wire+



Note: 1) SAFE+ is the KSD’s IT system for securities depository and settlement.

1) DvP1 transactions are currently used for the settlement of institutional investor OTC bond transactions (bonds, CDs, CPs, etc.), inter-institutional repo transactions, and transactions in electronic short-term private bonds.

Adjustment of DvP Closing Time

Since the launch of DvP transactions in 1999, the closing time for DvP settlement had been the same as the closing time of BOK-Wire+. In the meanwhile, the size of DvP settlements has risen sharply, and transactions tended to concentrate around closing time, posing risks to the system. To secure system stability at or around closing time, and to enhance participant convenience in terms of fund management near the closing time of BOK-Wire+, the closing time for DvP settlements has been moved up by 10 minutes, from 17:30 to 17:20, and has been separated from that of BOK-Wire+ in the new system.

5. Enhancement of the Payment and Settlement Information System

To ensure the smooth operation of BOK-Wire+ and the stable management of settlement risk, the existing monitoring system has been enhanced. It is now called the Payment and Settlement Information System, and it is now based on a large data repository(the Data Warehouse).

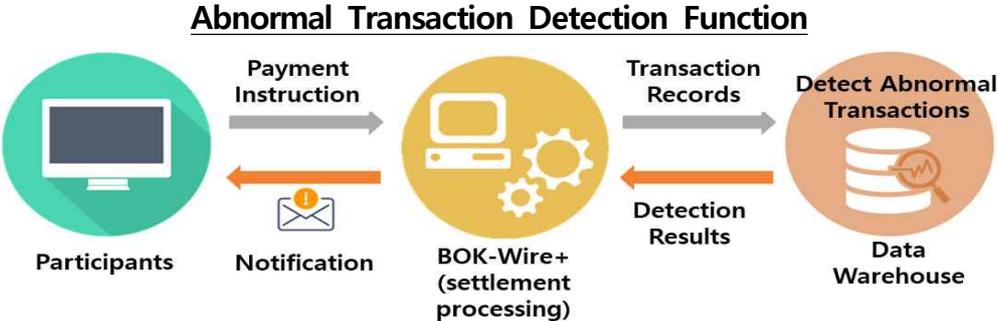
Under this new system, users can effectively conduct real-time monitoring, analyze payment and settlement data, and manage statistics and operating information of BOK-Wire+, among other activities.

Real-time Monitoring

For more effective real-time monitoring, many new indicators, such as available intraday liquidity and the intraday liquidity usage rate, have been added.

In addition, an abnormal transaction detection function has been newly-developed. The system sends an alarm to the BOK and to the concerned participants when it detects funds transactions that exceed a certain range above and beyond past transactions, or when it detects new funds transactions to an institution that has no record of transactions with the originating institution.

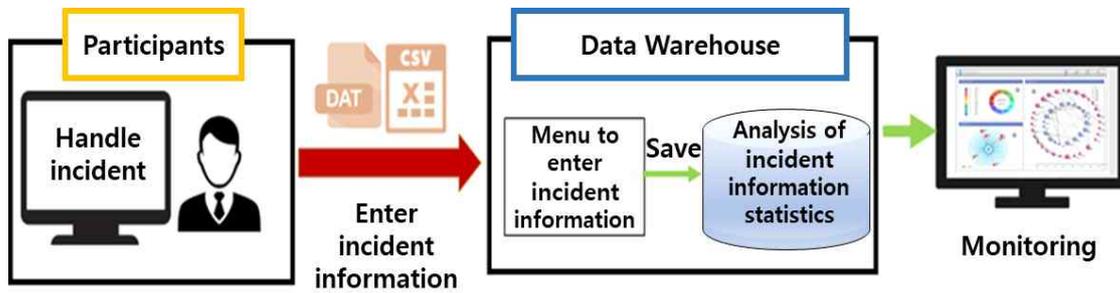
Also, a warning indicator dashboard has been set up to help identify the overall risk level of BOK-Wire+.



Payment and Settlement Analysis

In order to analyze the impact of stress conditions, such as the potential default of some participants and its effects on other participants and on the overall payment system, a liquidity stress test model has been implemented.

In the event of a failure in a participant’s system related to BOK-Wire+, participants are required to report details of the incident to the BOK. Under the enhanced Payment and Settlement Information System, participants are able to report those details through the BOK-Wire+, and the BOK can monitor and analyze those data more conveniently.



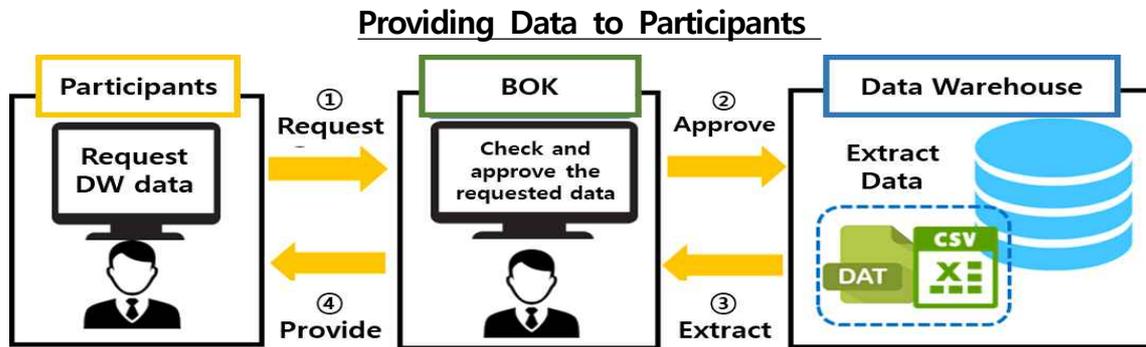
Management of Statistics and Operating Information of BOK-Wire+

The Payment and Settlement Information System offers a time series inquiry function in order to make it easier for users to use long-term statistics of BOK-Wire+. By linking up with systems at other institutions, these statistical data are automatically collected so that users can compile them more efficiently.

Moreover, to ensure the smooth operation of the BOK-Wire+ and the management of participants, information about participants, service fees, and the history of BOK-Wire+ operating hour extensions, will all be available for analysis.

Providing Data to Participants

When a participant requests information through the new BOK-Wire+, such as the status of a funds transfer by time and transaction in queue, the BOK extracts the information and provides it to the participant after approval. This is expected to help participants evaluate the adequacy of their liquidity management.



6. Other

1) Enhancing End-point Security of Large-value Payments

To prevent funds transfer incidents and to strengthen system stability, some functions, such as blind checks and restriction settings on funds transfers, have been added.

Blind Checks

For funds transfers (general funds transfers, funds transfers for a designated beneficiary) that exceed a certain threshold (KRW 200 billion), participants are required to reenter the amount following approval by a person in charge, to ensure that participants check the exact amount of the funds transfer one more time and to prevent mistakes in advance.

Notification of Abnormal Transactions

For transactions that show an unusual pattern compared to previous transactions, such as funds transfers that exceed a certain level compared to past records, the system sends a notification to the participants concerned.

Setting of Restrictions on Funds Transfers

If needed, participants are able to designate other participants as funds transfer restriction institutions. By doing so, participants can prevent mistakes in transferring funds²⁾ to designated institutions and improve the overall safety of funds transfers in the BOK-Wire+.

2) Digitalizing the Consent for Cancellation of Transactions Reserved or in Queue

When an originating institution cancels a funds transfer³⁾ reserved or in queue, it is required that it obtain prior consent from the receiving institution. This rule has been in place since March 2019, following an IMF recommendation. This process of obtaining prior consent, which in the past was possible only through the telephone, is now possible through the new BOK-Wire+. The inconvenience, where each participant had to separately record and store the requests for consent for cancellation and the responses to those requests, has now been resolved.

2) General funds transfers, funds transfers for a designated beneficiary, etc.

3) General funds transfers, funds transfers for a designated beneficiary, call transaction transfers, etc.