# *Pioneering MIRS*

**Norges Bank is the second central bank to adopt the Market Infrastructure Resiliency Service (MIRS), the RTGS resiliency service developed for central banks by SWIFT. Kjetil Heltne, who is leading the MIRS project at the Norwegian central bank, has already formed a favourable impression of the scope and functionality of the service, but thinks its real value will emerge as more RTGS systems gain experience of when and how MIRS capabilities can best be used.**

Norges Bank replaced its end-of-day net settlement process with its first Real Time Gross Settlement (RTGS) system in 1995. At the time, the primary concern of the bank was to mitigate the risk of a repetition of the losses it incurred during the Nordic banking crisis of the early 1990s. But in the 20 years that have elapsed since then, the importance of the RTGS system has increased enormously, and not just in terms of rising transaction volumes.

Expectations have risen dramatically too. The domestic and foreign banks and local market infrastructures active in the Norwegian payments and foreign exchange markets expect RTGS services to be available continuously. Likewise, foreign investors which own close to 40 percent of the capitalization of the Oslo stock exchange expect their purchases and sales to be settled in central bank money, and without the risk of delay, let alone failure.

“The importance to market participants of being able to trust in the RTGS system has increased, year by year,” says Kjetil Heltne, director, inter-bank settlement department at Norges Bank in Oslo. So far, the central bank has fulfilled that trust. Since the original mainframe-based RTGS system was replaced in 2009 with a platform based on technology developed by SIA subsidiary Perago, the RTGS system has achieved 100 percent availability. It has never failed to process an incoming payment.

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## Developing multiple defences against operational risk

Reliability of that kind depends on detailed management of operational risk. Naturally, the RTGS system is backed by a second remote site with full redundancy. This protects it against physical attacks, and the breakdown of physical components, but cannot provide security at a similarly high level against intentional and unintentional integrity breaches, such as errors introduced to the software, malware, the breakdown of a software component supplied by vendors, and cyber-attacks.

Norges Bank has long relied on defences against these threats developed by the IT industry. They are installed in the normal course of business by EVRY, the private IT company to which the central bank outsourced the operation of its RTGS system in 2003. But Heltne does not regard them as sufficient. “There is a risk that an error introduced to the software in the production environment, or malware, will be replicated immediately at our back-up sites,” he explains. “It was principally this risk that led us to add a further measure to protect the system.”

That measure is the Market Infrastructure Resiliency Service (MIRS) developed for central banks by SWIFT. Norges Bank had already made the decision to acquire an additional contingency solution for extreme circumstances by the time the principles for financial market infrastructures (FMIs) were published by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) in April 2012 (the CPMI-IOSCO principles). A year later, when the central bank conducted a self-assessment of its status relative to the CPMI-IOSCO principles, the test confirmed that the implementation of MIRS would be an important step towards meeting the requirements of Principle 17, which addresses operational risk.

Principle 17 sets a “recovery time objective” of two hours to establish the status of all transactions at the time of the disruption of an RTGS, and suggests central banks consider building a third site to guarantee this. “Before choosing MIRS, we had a long discussion about the need for a third site,” recalls Heltne. “MIRS is not equivalent to a full third site. But it does give us access to an RTGS settlement engine which is based on a totally different infrastructure and software from our own. Most importantly, in a situation where we cannot use our primary or secondary sites, MIRS allows us to continue to settle transactions securely on an automated basis. That is the main reason we chose it.”

## The shortcomings of manual contingency plans

Without MIRS, the recovery of the RTGS system would depend on a manual support system. This worked by downloading the positions of the banks using the RTGS system several times a day, adding unsettled transaction data from SWIFT, and settling payments in spreadsheets. The manual system was never tested in a live environment. However, after the implementation of the current RTGS system in 2009, simulations exposed difficulties in calculating the positions of banks at the time the system was disrupted, and again when normal service was resumed. MIRS, by contrast, will automatically upload positions in real-time with minimal impact on the participating banks.

However, as Heltne points out, MIRS is not a fully automated alternative to

a properly functioning RTGS system. Some manual routines will be retained to cover CLS foreign exchange payments. Nor does MIRS offer automated interfaces to the cash and collateral management systems, or the general ledger, of Norges Bank. If MIRS is invoked, the interfaces between all three systems will have to be operated manually. In addition, banks which are not users of SWIFT will have to be serviced manually by the central bank using the MIRS web service.

This is the price paid for keeping MIRS as simple as possible, since simplicity reduces risk. “It is a reasonable approach for a generic back-up system,” says Heltne. “If you started trying to cover every possibility, it would create a more complex system, which would inevitably be more risky. MIRS is an extreme contingency solution with reduced functionality compared to what we would expect of a third site. It replaces the manual support system.”

The word “extreme” is chosen carefully. Norges Bank planners have absorbed the findings described in the Deloitte report on the experience of the Bank of England, which has also subscribed to MIRS, in deciding whether or not to invoke the contingency system when the RTGS halted on 20 October 2014. In the event, MIRS was not activated, because Bank of England officials knew what had caused the RTGS system to fail, and reasoned that resolving the issue in the RTGS system would be quicker than switching MIRS on and then off.

## The challenge of deciding when to deploy a contingency solution

“Deciding when to activate MIRS is challenging,” says Heltne. “We would have to weigh the pros and cons of the actual situation. If we have a severe loss of both sites, and are unable to identify the exact nature of the problem, or how quickly it can be recovered, we would of course activate MIRS, but it will always be sensible to take time to decide. Every crisis is different from the previous one, and every incident will have specific aspects. ”

Obvious specificities include the time of the day and the day of the week on which the RTGS system is disrupted, since the severity of the immediate consequences will depend on how close the incident is to business cut-off times or if it occurs during peak hours. To help map the decision-making process, Norges Bank is in the process of establishing a Business Continuity Forum with its major participants. Heltne adds that meetings of central banks, convened and serviced by SWIFT, have also provided useful ideas on the implementation and operation of MIRS.

In fact, Heltne would welcome wider adoption of MIRS by central banks, to create opportunities to share knowledge of how it can best be deployed. “Obviously, central banks deploying MIRS will - if possible - be even more dependent on the SWIFT network continuing to operate normally, but we believe that SWIFT is well-supervised, and has an excellent track record. If there is a problem, our experience is that SWIFT will solve the problem quickly. In general, systemic risk should not be increased if more central banks use MIRS in addition to contingency solutions already in place.” For the participants in the RTGS system, adds Heltne, the advantage MIRS has over alternative extreme contingency solutions is that they can continue to use SWIFT messages as normal, even in a situation where the central bank has activated MIRS.

## Too soon to extend the concept to other markets

Heltne is more sceptical of the idea of adapting MIRS to other financial markets, such as fund accounting and transfer agency, before its value to RTGS systems is proven. Norges Bank has encountered delays of its own in adapting its RTGS system to MIRS, and in drawing up a service level agreement with SWIFT which reflects the criticality of the service once it is activated. “MIRS is an extreme contingency solution for an RTGS,” says Heltne. “It might be possible for other FMIs to adopt a similar concept, but we would prefer SWIFT to concentrate on supporting early adopters in developing rules and routines to ensure that it can be used effectively. In the short and medium term, SWIFT should focus on rolling out MIRS to other central banks first.”