
The CREST project

Late last year, a consortium of 69 firms from across the equity industry subscribed the £12 million of capital needed to develop CREST, the new equity settlement system being developed by a Bank of England project team. CREST is now less than 12 months away from trialling with firms. Software development of the core system is under way, and with last December's publication of detailed standards for communicating with CREST, software firms and in-house development teams across the industry should now be well advanced in designing and building their own systems to interface with it. This article reviews the history of the project and its current state, and looks towards the transition next year from the current Talisman system to CREST.

Work on TAURUS, the London Stock Exchange's plan for dematerialised equity settlement, was suspended by the Stock Exchange's Board on 11 March 1993. The Exchange asked the Bank of England to set up a Task Force to 'consider the best way forward for the development of securities settlement, share registration and share transfer in the United Kingdom and to identify possible alternatives to TAURUS'.⁽¹⁾

The Task Force first met the following morning; 16 weeks later, it made its report, which was essentially a project brief. It recommended that work begin to specify a new system to replace the current Stock Exchange settlement system, Talisman: this was to be called CREST. In less than a year from that date, the business requirements of the CREST system had been specified in detail, and work on the overall computer design was almost complete.

It is still less than two years since the Task Force began its work. CREST has progressed to the stage where the software of the system is being written, and potential users have the information they need in order to change and develop their own systems. 69 shareholders have each provided between £30,000 and £390,000 of capital to CRESTCO—the company that will own and is financing the system. And detailed plans for the trialling of the system and the procedures for moving stocks from Talisman to CREST are already being made. With six months of trialling likely before the system is implemented in the third quarter of next year, the project remains on schedule to meet the deadlines set by the Task Force in June 1993.

In May last year, the Governor told the annual conference of the Association of Private Client Investment Managers and Stockbrokers that they 'should be in no doubt about the Bank of England's commitment to seeing the CREST project completed, on time and to budget'. That remains the project team's brief.

The project to date

The Task Force which the Bank brought together in March 1993 was not intended to represent the equity industry directly. Its members were chosen for their individual expertise and standing in a range of areas within the industry, from retail stockbroking to market-making to investment; it also included representatives of the regulatory authorities (the Stock Exchange, the Securities and Investments Board, and HM Treasury).

The Task Force quickly decided that it should not begin by formally reviewing the collapse of TAURUS. Rather, it considered settlement issues more generally, set out clear objectives to be met and addressed its solution to those objectives. In doing so, it consulted widely. In the weeks after its formation, it heard—in person or in writing—from several hundred firms and individuals, both in the United Kingdom and overseas, advocating a wide range of solutions.

The objectives

The primary objectives which the Task Force identified to improve settlement in the United Kingdom were:

- to increase the efficiency of settlement by reducing the volume of paper circulating in the course of settlement;
- to provide opportunities for streamlining and automating settlement processing, so reducing the risk;
- to provide opportunities for shortening the settlement cycle, so further reducing risk; and
- to establish a sound and effective delivery versus payment (DVP) system, to minimise the risk that any participant in the securities markets should lose the full value of stock traded.

(1) Task Force on Securities Settlement, 'Report to the Governor of the Bank of England', June 1993. This, and all the papers published by the project team, are available by writing to the CREST Project at the Bank's address. A regular newsletter is also available free of charge on request.

What CREST will provide

CREST is a mechanism for holding and transferring shares and other securities in dematerialised (electronic book-entry) form. It is therefore designed to settle obligations entered into elsewhere (eg on the Stock Exchange); it is not designed to provide post-trade functions—such as trade confirmation and contract notes for clients—or to provide complex management information systems for its users. Accordingly, CREST will:

- maintain a record of all its members' eligible holdings of stock, which will be dematerialised (ie no certificates will be issued for stock held in CREST);
- respond to electronic messages from members to transfer stock from one CREST account to another;
- authenticate the origin and content of messages it receives, compare the instructions input by the buyer and the seller and match them;
- check the availability on the settlement day of stock and cash in the CREST members' accounts, and move the stock from the seller's account to the buyer's. The buying member's bank will be instructed to pay the selling member's bank—and will be unconditionally obliged to do so, thus ensuring effective delivery versus payment (DVP); and
- notify the stock's registrar, who will have undertaken to register all valid transfers within two hours of the transfer in the system. As a result, the contents of a member's accounts on the register and in CREST will mirror each other.

In addition to these mechanisms for settling transactions between its members, CREST will also provide:

- An efficient mechanism for the deposit and withdrawal of stock in paper form, to enable those who wish to do so to sell or buy share certificates through a CREST member quickly and economically.
- The ability to segregate holdings of shares into a number of separately designated accounts, both in CREST and on the register.
- A range of functions to facilitate stock borrowing and lending. There will be a new mechanism for providing collateral,⁽¹⁾ which will significantly improve the security against stock loans. All the benefits of electronic book-entry settlement will be available to lenders, so that making stock loans and receiving loan returns will be faster and cheaper than at present.
- A mechanism for moving securities and money between participants in settlement of any obligation. Since participants include registrars, CREST will thus ease members' involvement in a range of 'stock events'—such as the payment of cash distributions and dividends, and the receipt and trading of new securities, including allotment letters. Where desired by users, these mechanisms will provide effective delivery versus payment.
- An automated system for the calculation and settlement of claims arising from stock events.
- Access to all system data for relevant regulators.

(1) This will be known as 'deliveries by value' (DBVs), and will replace the current short-term collateral certificates. With a DBV mechanism—such as that in the Central Gilt Office operated by the Bank since 1986—securities offered as collateral for a loan are actually delivered to the lender. The current arrangements rely on a floating charge being taken over securities which remain in the borrower's possession.

The Task Force expected that the achievement of these objectives would result in a deeper, more liquid equity market, making the primary market more useful to businesses trying to raise capital and the secondary market more attractive both to small and large investors.

But it also recognised the importance, while achieving these objectives, of preserving the right of shareholders to retain their paper share certificates or to receive certificates on purchasing shares, if they so wish. A cardinal principle of the design for CREST is that it will be voluntary. CREST will therefore not disadvantage such shareholders; but equally it will only deliver the full benefits of cheaper settlement to those who choose to adopt the new methods it makes possible. This approach has made it easier for a wide range of interested parties to accept the preferred design, and to keep the regulatory approach relatively simple.

Rolling settlement

The Task Force's recommendations for achieving these objectives were, in the long term, to be achieved by the CREST system; but there were also short-term recommendations on introducing rolling settlement in the UK equity market, initially on a 'ten days after trade date' (T+10) cycle and later on a T+5 cycle. These changes are entirely separate from the design of CREST. Responsibility for making them has accordingly remained with the Stock Exchange, which is implementing rolling settlement using the current Talisman system. The move to a T+10 cycle was successfully achieved, as recommended, on 18 July last year; and the Exchange has set the date of 26 June 1995 for the move to a T+5 cycle, subject to the readiness of the market. The Bank fully supports the Stock Exchange's decisions in this area.

CREST and the Bank

The timetable recommended by the Task Force was deliberately ambitious. The Governor, accepting the Task Force's recommendations, therefore agreed that the Bank would lead (and initially fund) the next stage of work on CREST—the project specification. It was felt that this would maintain the momentum and also help to provide disinterested leadership for the project.

Accordingly, a project team was formed from Bank staff in the middle of 1993 and it began educating itself on the methods and procedures of the equity market, and educating the market on the CREST proposals. At the same time, a CREST Steering Committee was drawn together. Like the Task Force, its members were chosen in their personal capacity, to provide wide experience and coverage of the full breadth of the industry. Though not appointed to represent their particular sectors of the industry, in practice many took on the additional role of bringing wider views to the Committee. The project team and the Bank remain extremely grateful for their taking on this wider role, and for the enormous amount of open and constructive debate which took place direct with firms and individuals across the industry in the latter half of 1993.

Those months of discussion led to the publication of the team's first Green Book,⁽¹⁾ which described in greater detail than had been possible in the Task Force Report the nature of the CREST design which the Bank expected to implement.

The blueprint was at that stage deliberately minimal. It included those functions needed for settlement and related market activity, but excluded some associated functions which were required only by a minority, which were not deemed critical to a settlement system or which, the team suggested, could adequately be performed by users of the system locally.

The Green Book appeared at the beginning of November 1993. In the following two months, the members of the project team were involved in several hundred discussions with firms and individual practitioners to establish where this minimal prescription needed enhancement. As a result of these, in January/February 1994 the team produced a revised—and substantially enlarged—design document, offering a near-definitive description of the business requirements for CREST. In the following months, increasing emphasis was given to the way in which the system would be used by the market, to allow the team to define the business requirements more precisely, in order that the detailed computer design could be produced.

Developing the project

The publication of the business design at the beginning of May 1994 concluded the specification phase of the project. By that date, the team had produced: the business design;

(in conjunction with HM Treasury) a list of the legal issues to be addressed by the new Regulations under the Companies Act that would be needed; an outline of the manual procedures necessary to allow sales of certificated stock to be dematerialised efficiently to allow delivery through CREST; and a series of papers on the procedures for using CREST to manage related activity in corporate securities, such as dividend and rights issues, take-overs and other stock events. The team also proposed an industry-wide ownership structure for CREST, and was able to publish a list of potential shareholders.

With this evidence of industry commitment to the proposed solution, several streams of work were pursued in the second half of 1994—the start of the implementation phase. The detailed design work on the *computer system* produced first a design document (the 'functional specification' of the system) and subsequently the detailed specification of CREST messages, which enables future users of CREST to begin designing their back-office systems. Both were made widely available. Work also began on a series of software releases which will, by the end of April this year, have enabled recipients to see and comment on the design of the Windows™-based software being provided by CREST for terminal-based access.

Further work was undertaken on the *business requirements*, developing in more detail the procedures for handling paper and executing stock events. Drafting work was undertaken by HM Treasury on the *legal structure*, so that draft Regulations under the Companies Act could be issued this February; and in parallel detailed discussions went ahead with the Securities and Investments Board, whose authorisation will be required before CREST can begin operating.

Two *network providers* were chosen to build communications networks to a high standard of security and resilience, and to carry CREST messages between users and the CREST system. They are the Society for Worldwide Interbank Funds Transfer (S.W.I.F.T.), and Syntegra (the systems integration arm of British Telecom) in a strategic alliance with Thomson Financial Services. They will be subject to a high degree of monitoring, with regular checks during 1995 to ensure that their plans fit the agreed standards for service and security, and are implemented to the required timetable.

Finally, the *ownership structure* was established, with 69 shareholders subscribing £12 million of capital to CRESTCo, the company set up to own and run the system. The project team also worked to reinforce this market commitment to the project. Pen Kent, in his role as chairman of CRESTCo, told the first shareholders' meeting last year that 'the launch of CRESTCo is not just a financial milestone, it signals the commitment of these 69 firms to help build CREST; and to use the system when it is inaugurated in the second half of 1996'.

(1) 'CREST—Principles and Requirements', November 1993, now superseded by 'CREST—the Business Description', December 1994.

CREST and its users

CREST and the private investor

There has been a recurrent concern, in the press and elsewhere, that CREST might disadvantage the private investor. CREST and the associated moves to improve settlement are clearly aimed mainly at high-value transactions, where the risk of financial instability is greatest. But the flow of high-value institutional investment is an invaluable source of market liquidity, which benefits all investors. And the project team has given a great deal of attention to ensuring that private investors have a genuine choice. They will not be obliged to hold their shares in CREST, nor will they be forced to use a nominee who does so. Many who trade rarely will no doubt continue to hold share certificates. They will not receive the full benefits of electronic settlement but there is no reason why, as a result of CREST, their settlement costs should be higher than today. And CREST will provide an efficient mechanism for handling the paperwork generated by their transactions.⁽¹⁾

The paper-based investor is also likely to find it useful to trade on a more extended settlement timetable than the institutional market. Paper-based messages between investor, broker and registrar are dependent on postal services, and inevitably take longer than electronic messages. During the early period of rolling settlement, many market-makers have given their retail customers the facility to deal for settlement on dates up to T+25 at the same price as T+10 settlement. The project team believes that the market will continue to provide longer-dated settlement at little or no additional cost for private investors, both when the market standard becomes T+5 settlement later this year and once it is reduced further when CREST is operational.

However, private investors will also be able to benefit from the efficiencies of electronic dematerialised settlement if they so choose. One way will be through a nominee, although this route may impede the flow of benefits and ownership rights stemming from company membership.

But it is important that all investors should have the opportunity to reap the benefits both of company membership and of cheaper electronic settlement. For that reason, the concept of ‘sponsored membership’ has been developed. By nominating an agent within CREST—a sponsor—a sponsored member can retain his name on the register and so gain the benefits of company membership, and have the full advantages of operating in CREST, but without the need to invest directly in the computer links necessary to communicate with CREST.

Sponsored membership of CREST is an important additional option for private clients, particularly those who regularly make transactions. CREST has also contributed to work being done by ProShare⁽²⁾ seeking a voluntary way to

maintain communication between companies and shareholders. The object is to develop proposals to allow companies and their shareholders (when shares are held in nominee holdings) to work together on a voluntary basis to sustain the direct relationship between owner and company.

The legal and regulatory infrastructure

Because CREST will be voluntary and will be used to carry out operations which are the electronic equivalent of those performed today in a paper-based system, it is possible to a large extent to rely on the existing law governing shareholding. There are, however, some additional needs, mainly to disapply the requirements on companies to issue paper share certificates where shareholders do not require them, and to provide for an electronic message to be a valid instruction to transfer stock (replacing for electronic settlement the stock transfer form). The Companies Act 1989 contains provisions⁽³⁾ for Regulations to be made to effect this; and the Treasury is issuing a draft of the Regulations that it proposes should be made for CREST.

These will, for example, ensure that listed companies do not need to change their articles of association so as to have their shares eligible for CREST: a simple Board resolution will be adequate. The Regulations will need to be supplemented with a range of contracts, freely entered into, between CREST and its users, and between users (eg between a settlement bank and its client).

Under the provisions of the Financial Services Act 1986, CREST must gain the status of a Recognised Clearing House (RCH). In practice, authorisation as an RCH will need to be obtained from the Securities and Investments Board (SIB). The SIB will need to be satisfied (among other things) that CREST has adequate security measures to protect the assets of those using the system. Additionally, the proposed Regulations contain further tests to be applied before CREST can be authorised. To contribute to this process, an independent review of CREST security will be undertaken. On behalf of CRESTCo, the project team has also commissioned independent auditors to monitor aspects of the project, including security.

Because CREST provides an electronic equivalent of the current arrangements and gives investors the choice of whether they use the system or not, it is also possible to rely on the existing compensation arrangements. Just as investors can at present be exposed to an agent’s abuse of his authority to act for them, that possibility will exist with CREST. So investors will in most circumstances have recourse to the Investors’ Compensation Scheme administered by the SIB.

CREST’s high degree of electronic security reflects the seriousness with which the project team and the authorities take the need to protect those using the system. But the team has also agreed with HM Treasury that CREST will accept

(1) Described in ‘CREST—the Paper Interface’, December 1994.

(2) ProShare is an organisation, funded by the private sector, which aims to promote wider and deeper share ownership among individuals.

(3) In Section 207.

CREST and companies

CREST must win an adequate base of companies willing to allow their shareholders the option of transferring their stock through the system. As noted above, it will require only a Board resolution to enable shareholders to do this; and the project team has already had helpful indications that several major companies are considering passing such a resolution at an early date.

What will CREST offer companies, as opposed to their shareholders? By providing cheaper settlement and wider access to book-entry transfer of stock, it will encourage a deeper and more liquid market. This should in turn improve the terms on which companies can raise capital. With its emphasis on rapid registration of settled trades, CREST will ensure that company registers are more up to date. And by allowing all investors to hold stock in their own names electronically, it may counter the drift into nominee companies. This would reduce the need for companies to issue Section 212 notices,⁽¹⁾ and for nominee companies and company registrars to process the resultant information, reducing the costs for the whole industry of establishing the underlying shareholding structure. (Of course, the ProShare initiative mentioned above may provide other ways of reducing the need for Section 212 notices.)

The Bank's project team has made initial contacts with a large number of company secretaries, which it will follow up in the early part of this year, to ensure that companies are aware of the impact that CREST may have on them and their shareholders.

(1) Section 212 of the Companies Act 1985 empowers a company to issue a notice requiring a shareholder to reveal the names of beneficial owners on whose behalf it is holding shares.

limited liability (capped at £50,000 per message) for messages that it processes which are subsequently proved to have been forged—ie not to have originated from the user from whom they purported to come. CREST (in co-operation with the two selected network providers) has sophisticated mechanisms to confirm that all messages originate from a valid source.

Ownership and management of CREST

The provision of £12 million of finance by 69 firms has not just signalled their commitment to help build CREST; it has also changed the nature of the relationship between the Bank's project team and its customers, the equity industry. In the project phase following the delivery of the core software, control of CREST will pass from the Bank to CRESTCO. In this later phase, it will remain important to avoid changes to the design, with the consequent risks to the project timetable; and continuity will be required in the

management of training, the trialling of the system and the transition to settlement in CREST. These processes will also need to be funded (the £12 million covers only the costs of the present phase), either by the shareholders or from the capital market.

To CRESTCO, too, fall decisions on the operations and management of the system. Until the control of the project passes to CRESTCO, an Advisory Committee drawn from shareholders will continue to make recommendations on business decisions to the project team, which in turn has bound itself to follow these recommendations. The Advisory Committee has already made significant decisions about the management of the system, about contracting out some aspects of the computer operations and about the staffing implications for CRESTCO. It will also be the body which sets tariff policy.

All market participants will have an opportunity to share in the ownership and governance of CREST, through a shareholding in CRESTCO. There are limits on sectoral and individual participation to prevent undue concentration of ownership. Shareholdings will be adjusted over time to reflect usage, either through formal biennial rebalancings of shareholdings once CREST is operational or through transfers in the secondary market agreed by buyer and seller.

Tariffs

The tariffs to be charged for using CREST will be decided later this year, but some important principles have already been established:

- CRESTCO will pay a reasonable, but not excessive, return on capital in line with the core principle of seeking to recover its costs;⁽¹⁾
- CRESTCO's pricing policy will aim to be equitable across customers, and across sectors of the equity industry; and
- all members will pay for the resources they consume, taking account of the capital and running costs of providing those resources.

The timetable ahead

The timetable for the inauguration of the system is tight and demanding. CREST will be ready for operation well before the end of 1996, and its users will also need to be ready. Their work is under way, following the issue of the specification of CREST message requirements by the project team. The final target is implementation of the system—in the third quarter of 1996—but there are a number of important interim targets.

Software development began last November; the project team will deliver the core software for CREST to CRESTCO fully tested by the end of 1995. In parallel, the two network providers will, by the same date, have developed the systems

(1) The return to shareholders is fixed at 4% over the yield on the subscription date on a reference gilt-edged security, amounting to some 12.7% per year.

necessary to support their role in CREST. Before the end of 1995, the networks and the CREST software will have been tested separately and together; and it is very likely that they will also have undergone initial tests with third-party users in the handful of locations chosen for testing—beta test sites.

The beta testers' own software will be linked to their chosen networks and thence to the CREST software, to ensure 'end-to-end' performance of the CREST system as a whole. This will require the development work on the beta sites to have been completed well before the end of 1995 (perhaps three to six months ahead of other users). Many potential users of CREST have expressed interest in being beta test sites; later this month a handful will be selected, representing most types of CREST user. The project team will be working closely with the network providers and chosen beta sites during 1995 to ensure their readiness for the tests.

Trialling

During the first few months of 1996, a further phase of user trialling will begin, to ensure that CREST registrars are capable of functioning effectively. After this, it will be possible to move to full-scale user trialling with all potential CREST users. The important decision on the length of this trialling period will be made by CRESTCo. CREST could be inaugurated as soon as a critical mass of users is ready; on the other hand, more extensive trialling could be offered to maximise the opportunities for users to address any problems identified.

System management

At the same time, CRESTCo's own staff will increasingly be taking over from the Bank team. This transition will need to be as carefully managed as the transition of settlement from Talisman to CREST, and planning has already begun.

CRESTCo will not need to provide its own staff to operate its computer systems; it will appoint a facilities manager to do so. At the end of 1994, three firms were invited to tender for this job; one response was received by the due date, and it is currently being reviewed. A decision on the way forward will be made by March to allow the initial hardware configuration to be installed—and staff to be available to operate it—by the beginning of September, when network providers will install their own communications systems at the CREST site. The facilities manager will have a closely-defined role in operating the CREST computers, but the management of the system will be provided by CRESTCo staff.

Training

CRESTCo will also need to help up to several hundred users prepare for the inauguration of the new system. Proposals

for a training strategy have been put to the Advisory Committee; these envisage a mix of face-to-face and computer-based training. The first element in the latter has already been made available: demonstration packs have allowed future users to experiment with a 'working model' of the terminal-based access mechanism which CRESTCo will provide.⁽¹⁾ This PC-based software provides a set of input and enquiry screens that allow users to familiarise themselves with CREST's functions and data. Future training packages are likely to be built around this interface package.

Transition to settlement in CREST

Another prerequisite for the live operation of the system is implementation of the Regulations under the Companies Act. These are scheduled to be brought into effect in the spring of 1996. The supporting network of contracts, user agreements and the operating manuals which define procedures will need to be completed in the same period; and the detailed tariff policy must be decided.

Once these and training and trialling have been completed, CREST will begin to settle real transactions. There will not be a 'big bang'.⁽²⁾ Stocks will be added to the new system gradually, but once experience of and confidence in the system have been established, this movement will be accelerated. Since December, a working party drawing on a wide range of experience has been considering the details of the transition mechanisms, to inform the decision about how quickly migration is likely to occur.

Conclusion

The Bank took on the role of project manager for CREST because the blueprint set by the Task Force imposed a tight schedule and consequently a need for tight control over the design. The Bank's team has delivered the design on time and has continued to meet its deadlines. The team operates on a slim budget financed by a range of firms from the industry to whom it accounts regularly. So in terms of both time and money, it has little scope to hide problems or failures. It has deliberately sought to make the progress of the project as public as possible; only by demonstrating its own adherence to a tight schedule can it maintain the industry-wide momentum necessary to implement CREST on time. CREST's success is dependent on its users developing their own systems to a timetable quite as demanding as the CREST team's own.

The development period—from the issue of the interface specification to the beginning of user trialling—was set at only some 15 months; trialling will begin only 12 months from now. There is every indication at this stage that potential users will be ready for trialling when CREST is. That this is so is a credit to the securities industry, which has shrugged off past uncertainty and is now working towards a clear and common goal.

(1) A Windows™-based product, known as the Graphical User Interface (GUI).

(2) The approach is set out in a working paper in the project team's publication 'CREST—bad deliveries, and transition', November 1994.