

technology



DTC's information services must evolve in response to the demands that will be placed on our systems in the future. On the horizon are straight-through processing in a global environment, compressed settlement cycles in many markets, and the adoption of increasingly sophisticated









technologies by the industry. Responding to these trends requires a careful balance between preserving the safety, reliability, and integrity of depository systems and increasing the flexibility and openness of DTC's systems as they interact with those of Participants and other users.

DTC's key technology mission is ensuring the ongoing stability and safety of its systems. This systems integrity was reinforced in 1998 as a fully state-of-the-art backup data center and business recovery facility was brought online. This Alternate Data Center replicates DTC's systems production facilities in a site off Manhattan Island, supporting rapid recovery of DTC's systems in the event of a major disaster at the primary site. The recovery site also provides space to accommodate the relocation of all critical DTC operations in the event of a disaster, permitting quick resumption of transactions processing and other activities. The site was carefully designed so that it can be expanded to provide a fully redundant infrastructure. All supporting equipment can be replicated to permit continuous operation, even as normal maintenance needs are met.

DTC's ability to operate without interruption was further reinforced by the implementation of technology permitting the replication of a fourth complete copy of DTC production databases at the recovery site. This will ensure that two exact copies are available at each site, providing additional protection in the event of a disaster. Following its installation early in 1998, the fourth copy was used for part of the year to provide a clone of DTC's production system to support our extensive internal Year 2000 testing. During 1998, DTC also proceeded with a limited implementation of Parallel Sysplex technology, which permits the linking of two independent processors to function as a single, greater-capacity processing system. Further progress with Parallel Sysplex will provide additional system redundancy and support for around-the-clock operation.

Significant progress was made providing for more openness and flexibility in DTC's systems.

Plans were announced for a major revision in the DTC TradeSuite™ product line to open its







The opening of DTC TradeSuiteSM architecture helped make possible the link between Canadian-headquartered Financial Models Company (FMC) and DTC, two of the largest ETC providers in North America. Pictured, from top to bottom, are James R. Colvin, Vice President; Robert T. Shaw, Manager, Global ETS Product Management; and Yolanda Willett, Vice President, Global Development—all from FMC.

architecture, enabling users to connect with counterparties worldwide—regardless of format or protocol choices. This interoperability will provide DTC users with a single point of access to the evolving global straight-through processing model.

The depository's conversion to frame-relay technology in its network lays the groundwork for a further opening of DTC's systems. The implementation of frame relay, which began in 1998, greatly enhances Participants' connections with DTC, while lowering their costs. At the same time, it permits support of multiple standard telecommunications protocols over a single network connection, playing a key role in preparing for Participant Terminal System (PTS) modernization. In a related development, DTC also began supporting Messaging and Queuing and the File Transfer Protocol for certain applications, with broad application of these telecommunications methods to be implemented in 1999.

DTC's commitment to greater flexibility is also represented by its 1998 work on modernizing PTS. Initial phases of the modernization will be rolled out in 1999. This effort ultimately will convert PTS to an interface based on an Internet browser. In a parallel effort, the depository began delivering user documentation, such as PTS manuals, electronically. An internal document management system, based on the Standard Generalized Mark-up Language (SGML), will support distribution of DTC service manuals through such media as CD-ROM and, in 1999, via the Internet.

Participants continue to use DTC's Web site to obtain Important Notices and other information about depository activities. In mid-year, DTC began piloting a closed, password-controlled site, which will become the depository's primary vehicle for Internet-based communications with Participants. Additional services for Participants will be implemented through the closed site in 1999.

The increasing use of the Internet—and the depository's movement toward more open systems generally—will pose difficult information-security issues. In 1998, a Corporate Information Security Office was formally created to centralize DTC's approach to security issues and plan for the adoption of newer security technologies.

The rapidly accelerating pace of change requires DTC's technology to become increasingly flexible. At the same time, the cost of maintaining DTC's systems must be controlled, while systems stability remains assured. To meet these demands, DTC launched an overall assessment of its applications portfolio in 1998. A specially created senior officer committee is charged with recommending applications architecture standards and a strategy for their implementation in 1999.

25

DTC's governance, policies, and practices are designed to meet the needs

of its diverse users. DTC is owned and controlled by its Participant stock-

holders through a Board of Directors elected through cumulative voting.





The maintenance of reliable and secure operations and systems is a fundamental

expectation of DTC's users. To fulfill this expectation, the depository has in place

a comprehensive program of internal and external safeguards and practices.

The amount of DTC's capital stock each Participant may purchase is recalculated every year to reflect variations in depository use. Because DTC stock ownership offers limited financial incentive, and the depository does not distinguish between stockholder and non-stockholder Participants, many Participants have not exercised their annual entitlement to purchase DTC stock. A substantial portion of DTC stock available to broker-dealer Participants therefore remains with the New York Stock Exchange, Inc. (NYSE), the original owner of the depository's stock, and other self-regulatory organizations that became owners in 1975.

At year end 1998, after retirement or merger of certain stockholders during the year, there were 127 DTC stockholders: 69 broker-dealers, 52 banks, and 6 self-regulatory organizations and clearing agencies. Broker-dealer Participants owned 17.8% and bank Participants owned 37.3% of DTC stock. Ownership interests of the self-regulatory organizations, on behalf of broker-dealer Participants, were 35.5% for the NYSE, 4.7% for the American Stock Exchange, and 4.7% for the National Association of Securities Dealers. Current stockholders are identified at the end of this report.

A basic policy of the depository is to limit its annual profit, so that the depository returns to its Participants excess income not required for its operations.

As a registered clearing agency, DTC is regulated by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as amended. A member of the Federal Reserve System and a New York State limited-purpose trust company, DTC is also regulated by the Board of Governors of the Federal Reserve System and the New York State Banking Department.

The National Clearance and Sentement System

A close working relationship between DTC and NSCC permitted hundreds of broker-dealers that participate in both organizations to clear and settle the record trading volumes experienced in 1998. Established in 1976, NSCC provides centralized trade recording, trade

guarantee, netting, and settlement services for broker-dealers' streetside activity in equities, bonds, and Unit Investment Trusts from all the nation's exchanges and marketplaces. NSCC feeds computer files to the depository for seamless processing of book-entry changes in custody. NSCC also provides processing services for mutual fund, defined contribution, and annuity transactions. DTC provides direct interfaces to NSCC mutual fund services for those low-volume DTC Participants that desire easy access.

A DTC account for The Options Clearing Corporation (OCC) enables banks and broker-dealers to pledge securities satisfying segregation and margin requirements for put and call option contracts and obligations to OCC's clearing fund. This eliminates repeated paper movements between the parties and provides an alternative to escrow receipts. Through the OCC Stock Loan Hedge System, an OCC clearing member can borrow stock underlying an option contract from another clearing member using DTC's deliver order (DO) service, with OCC acting as the middleman in the transaction. OCC acts as the borrower to the lender and the lender to the borrower.

DTC's interface with the Federal Reserve's Book-Entry System allows Participants to maintain securities positions of U.S. Government and agency securities in their DTC accounts. Participants may deliver and receive these securities free of payment to and from other members of the Federal Reserve's Book-Entry System over the interface.

S A F E T Y and Soundness

Critical to DTC's performance are secure and reliable operations and systems. To ensure this, a comprehensive program of internal and external safeguards are continuously monitoring the movement of all securities and funds as well as the control and balancing of DTC's records. Because of these controls, DTC has never placed a claim against its extensive insurance policies.

DTC's Risk Management Committee conducts ongoing assessments of DTC's operations, data processing systems, facilities, and services. This committee of six corporate officers reviews all areas of risk, complementing the reviews of the internal auditors, independent accountants, and regulators. The committee reports to the Audit Committee of the Board of Directors.

Independent of that process there is a dedicated Corporate Information Security Officer responsible for reviewing the security controls of DTC's computers and data network. Outside data security experts conduct biennial tests on different aspects of DTC's systems.

Another element of the risk management process is a rigorous review of Participant applicants. Before admitting a firm as a Participant, DTC reviews its financial history, operational ability, and the potential liability to which it may expose other Participants or the depository. Each Participant makes a mandatory contribution to the Participants Fund, which could be used if the Participant were unable to meet its daily settlement obligation or became insolvent.

DTC's systems automatically block and recycle any transaction that would cause a Participant to exceed its intraday net debit cap in its Same-Day Funds Settlement (SDFS) account and/or its SPEED (MBS Division) account. At the same time, DTC's controls also ensure that each Participant has sufficient collateral to satisfy its liability in the event of insolvency. If a Participant fails to satisfy its net debit, DTC would use the Participants Fund and \$1 billion line of credit (in the MBS Division, the Participants Fund deposit of the failing Participant and \$2 billion line of credit) to complete settlement. If the failing Participant did not repay DTC the following day, securities delivered to the failing Participant could be returned to the original deliverer against payment (not applicable in the MBS Division) or sold on the open market, or other securities designated by the failing Participant as collateral could be liquidated to repay the line of credit loan or the Participants Fund.

DTC shares information regarding Participants' operational and financial soundness with self-regulatory organizations such as the New York Stock Exchange, the National Association of Securities Dealers, and NSCC. In the event of a reported problem, DTC carefully monitors a

Participant's daily activity and may require additional collateral or limit the Participant's access to DTC services.

As part of the system of checks and balances, Participants also play an integral role. Each day, they review all security and money activities affecting their accounts, alerting DTC to any discrepancies.

Capacity Planning

The Information Services Department's Capacity Planning group monitors the use of DTC's computer resources and forecasts normal and peak requirements. Periodic stress and volume testing is conducted on key application systems and network facilities to ensure effective processing of volume surges. The depository's capability was demonstrated by a peak double settlement date on November 16, which was generated by over 3.3 billion shares traded on the New York Stock Exchange, The American Stock Exchange, and The Nasdaq Stock Market. DTC systems easily handled the surge, which resulted in over 2.1 million updates to Participant securities accounts and the generation of almost 900,000 DTC TradeSuites trade confirmations.

Backup Facilities

As previously noted, a new backup and recovery site was completed and brought online in 1998, and will function periodically as the primary data center. Improved technology and disaster recovery procedures allow the depository to maintain a real-time copy of its production files, recover processing within one hour, and run the computers unattended from any of three locations. Noncomputer disaster recovery procedures related to securities processing are tested regularly.

Independent Oversight

DTC's internal audit department and its independent accountant, PricewaterhouseCoopers LLP, regularly review internal controls, procedures, and records. The Federal Reserve Bank of New York, the New York State Banking Department, and the Securities and Exchange Commission also regulate and routinely examine the depository.



Thomas A. Williams, DTC President and a member of the Board of Directors, passed away on April 25, 1998.



Mr. Williams had served as President of DTC since October 1994. Previously, he spent 31 years, 23 as a partner, with the international law firm of Milbank, Tweed, Hadley & McCloy, outside counsel to the depository since its creation in 1973. Mr. Williams was an expert in corporate finance, securities law, self-regulatory organizations, and banking law. He participated in writing DTC's Rules and By-laws in its formative years and was involved in every important legal question and many business issues since.

In May, DTC's Board passed a resolution praising Mr. Williams: "As our President since October 1994 and as our counsel since before our founding a quarter of a century ago, his leadership, vision, counsel and guidance were essential to this Corporation's success. He was the architect who designed the structure and drew the plans for the system that has brought the safety and efficiency of modern, automated systems to make possible today's enormous securities trading volumes. As our counsel and later our President, he provided the energy and enthusiasm that implemented these plans. His passing is a great loss; he will be sorely missed."



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In Memoriam

Senior Vice President Thomas C. Cardile, a key member of DTC's senior staff, passed away on June 16, 1998.



Mr. Cardile joined DTC in July 1988 as the head of Human Resources and during his tenure with the company, was also responsible for General Services and Internal Security. Prior to joining DTC, Tom had a distinguished career in a variety of other Human Resources positions. His years of service with DTC were marked by his initiation of many innovative programs and policies that strengthened staff efficiency and productivity. His efforts and dedication to the company and its employees will be greatly missed by all who worked with him.

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