

Business continuity planning and disaster recovery at Vanguard

Continuity planning

To help give our clients the best chance at investment success, we must plan carefully to ensure a quick, smooth recovery in the event of a disaster or emergency. To that end, Vanguard has invested significant resources and is committed company-wide—from Chief Executive Officer Salim Ramji to each employee—to ensuring that your assets are safe and that our service to you continues without interruption.

Our approach is simple. We think of our business as a chain. Each link—people, facilities, processes, infrastructure, and information—is an important component of our operation and must be accounted for and tested as part of an overall business continuity program.

To accomplish this, we established the Business Continuity Management (BCM) group within our Global Risk & Security Division. BCM is dedicated to leading and coordinating the planning, development, testing, and execution of a global program designed to ensure the recovery and restoration of critical operations following a disruption.

Our approach includes three major components: (1) detailed, written business continuity plans; (2) data security and technology recovery; and (3) business continuity tests.

Business continuity plans

- We have developed plans to respond to a range of incidents, from worst-case scenarios—such as loss of a data center, buildings, or staff—to occurrences such as a power outage or unprecedented phone volumes.
- We work with our business teams to refine plans for short-, medium-, and long-term pandemic, cybersecurity, and other crisis scenarios.
- We assess the design of mission-critical suppliers' and business partners' business continuity programs.
- We assist Vanguard's human resources, global security, environmental and occupational safety, and compliance teams in coordinating with appropriate law enforcement authorities, health and safety experts, and regulators.
- We work with Vanguard's communications teams and others to ensure employees receive training and necessary information about alternate business processes, external developments, and health and safety precautions.

Data security and recovery

- The security of our clients' accounts is extremely important to us. Accordingly, we have implemented a variety of sophisticated measures designed to protect client assets and account information.
- We ensure, through our information technology team, that systems are equipped with the appropriate hardware and software to secure client data. To mitigate computer virus attacks and other acts of cyberterrorism, we have implemented best-in-class controls monitored by a dedicated team of information security specialists.
- We maintain redundant systems and off-site data storage to enable recovery of data in the event of a disaster.

Business continuity tests

- We conduct continuity and recovery plan tests for all Vanguard business units throughout the year. These include communication (phone tree and emergency notification system) tests and alternate workspace exercises.
- We conduct workshops, tabletop exercises, and crisis response drills. These have included Vanguard-only exercises as well as collaborations with law enforcement to validate our ability to work together during an emergency.
- We assess response and recovery capabilities with key business partners, critical vendors, and other external organizations through periodic tabletop exercises.
- We conduct disaster recovery simulations with our information technology division to gauge readiness in the event of an emergency.

Continuing to serve our clients

In addition to regular planning and testing, Vanguard uses several routine business strategies to ensure that our operations are both flexible and resilient.

To reduce the potential impact of global events (such as a pandemic) and regional incidents (such as a major power outage or winter storm), we maintain geographic diversification by running key business functions from multiple locations. Moreover, significant buildings have redundant or emergency power-supply capabilities. In addition, we are able to shift our operating model to manage business-as-usual operations remotely in most cases. This ensures that our most critical resources and employees are available to all clients during an emergency.

Complementing our multiple campus locations in the U.S., Vanguard offices outside the country offer additional recovery options. Our global locations can transfer trading between regions as necessary (which also facilitates follow-the-sun trading) and provide critical support functions such as IT incident management and cybersecurity operations. Should events warrant, our executive enterprise incident response and communications teams are prepared to lead our response.

Business disruption information

In the event of a significant business disruption, please visit our website at vanguard.com for additional information, including instructions to ensure prompt access to your assets.

Ascensus notice of business continuity plans

For clients of Vanguard Brokerage Services® and Ascensus College Savings

The following is a general description of plans in place at Vanguard, Vanguard Brokerage Services ("Vanguard Brokerage"), and Ascensus College Savings to maintain business continuity in the event that operations are disrupted for any reason.

At Ascensus*, we know how much our Plan participants rely on our systems and services. We also recognize that business disruptions of varying scope can and do occur. Ascensus wants you to know that we have plans in place designed to safeguard your assets and protect vital account information in the event of a business disruption. Ascensus and its affiliated companies have developed plans to recover from situations including, but not limited to, facilities failures that may cause business interruption. These plans are designed to account for interruptions of varying length and scope and require that Ascensus is able to recover mission-critical functions according to their time criticality. In order to maintain secure and effective plans, Ascensus does not provide the specific details in this notice, but you should be aware that Ascensus' corporate disaster recovery planning includes the following:

1. Identification of all mission critical systems and backup facilities and arrangements
2. Setup of alternate communication channels between Ascensus and its customer and business partners
3. Alternate physical site location and preparedness
4. An ongoing review of financial and operational risks
5. Employee safety strategies and communications

Ascensus mitigates risks to reduce the potential impact on customer service. In addition to following the guidelines stated above, Ascensus' recovery plans also include the following:

- **Designated Contingency Sites**—Ascensus maintains designated contingency sites to provide for the backup and recovery of data, maintenance of mission critical applications, and business resumption activities for key business personnel and critical business functions.
- **Notification to Clients**—Procedures for notifying Plan Participants have been established for Ascensus associates to follow in the event of an outage. Notification will include information regarding length of outage, instructions for contacting Ascensus, and support information (e.g., where to send faxes, and issues pertaining to data transmissions and communications).
- **Access to Your Funds**—A site outage should not impact your ability to access your investments, as Ascensus' business continuity plans are designed to facilitate sustained service. However, your ability to trade securities may be impacted by market events outside of Ascensus' control. Our business continuity plans are designed to ensure necessary personnel are available to assist with transactions.

Please note that Ascensus' business continuity plans are reviewed as necessary, and at least annually, to ensure they account for technology, business, and regulatory changes, operations, structure, or location. The plans are subject to change, and material changes will be reflected in an updated "Notice of Business Continuity Plans" that will be posted on our website, <https://www2.ascensus.com/college-savings-plans-ascensus-inc/>. You may obtain a current written copy of this notice by contacting an Ascensus representative or by visiting our website at <https://www2.ascensus.com/college-savings-plans-ascensus-inc/>.

*Ascensus consists of Ascensus College Savings Recordkeeping Services, LLC, Ascensus Investment Advisors, LLC, and Ascensus Broker Dealer Services, LLC.