PROTECTING EMPLOYEES, ADVANCING THE MISSION

Kyle Fuhrer prepares an N95 mask
for a fit test. (Photo by Sam Paik.)

AS the severe acute respiratory syndrome coronavirus 2 (SARS CoV-2, the virus that causes COVID-19) spread to the United States in early 2020, Livermore reacted rapidly, initiating a Pandemic Response Team (PRT) on February 3, 2020, to activate the Laboratory's pandemic plan. No one expected that the plan assembled in 2009 and updated every few years would be required for as long or have an operational impact as broad as the COVID-19 pandemic demanded. Since then, Livermore has worked diligently to keep employees safe while maintaining mission-critical operations to keep the nation safe.

Priority One: Safe Operations

Kathleen Noonan, a nurse practitioner with training in epidemiology and a shelf full of books about the 1918 Spanish Flu pandemic, stood ready to respond. As mission assurance manager for Livermore's Health Services Department (HSD), she was notified in January 2020 regarding an employee returning from China. "He was our first at-risk patient," says Noonan. "I met him at his Livermore home, asked him to quarantine, and provided him with a mask and cleaning supplies." From that point, HSD clinicians consulted a list of employees traveling outside the United States and isolated those returning from China and other at-risk areas.

On March 16, 2020, officials in Alameda County, California—which includes the city of Livermore—issued a shelter-in-place order to begin at midnight. The same day, then-Laboratory Director Bill Goldstein announced that Lawrence Livermore would move into minimum safe operations, reducing onsite staff to the minimal level required to operate the site and its facilities safely and securely, and to carry out a limited number of mission-critical activities. Overnight, the Laboratory's onsite population went from nearly 8,000 to just a few hundred. Employees who could telecommute were encouraged to do so, onsite visitors were limited, and business travel was restricted—all in an effort to prevent the virus from spreading.

Staff from the Operations and Business Principal Directorate addressed the formidable task of working through a checklist to ensure nonessential equipment and facilities were properly shutdown. The Security Organization implemented its standing plans to keep the Laboratory secure. Within a week, the shutdown was complete, leaving a skeleton crew of maintenance, facilities, and asset managers onsite to keep essential operations running.

Transition to Telecommuting

Shifting thousands of employees to telework placed new hardware and software demands on the Laboratory. While classified work must be conducted onsite, employees performing business functions and unclassified research working from home needed a virtual private network (VPN) to access the Laboratory's unclassified network. "Before the pandemic, about half of the Laboratory's population had VPN accounts," says chief information officer Doug East.

Signing up 3,000 people for a VPN account in one week is difficult. Prior to the shelter-in-place order, Livermore's Information and Technology (LivIT) Program had developed a simplified process to enable and create VPN accounts. LivIT dedicated many hours to add a second VPN service, more than doubling their capacity to meet the new demand. In addition, telecommuting employees required an at-home technology
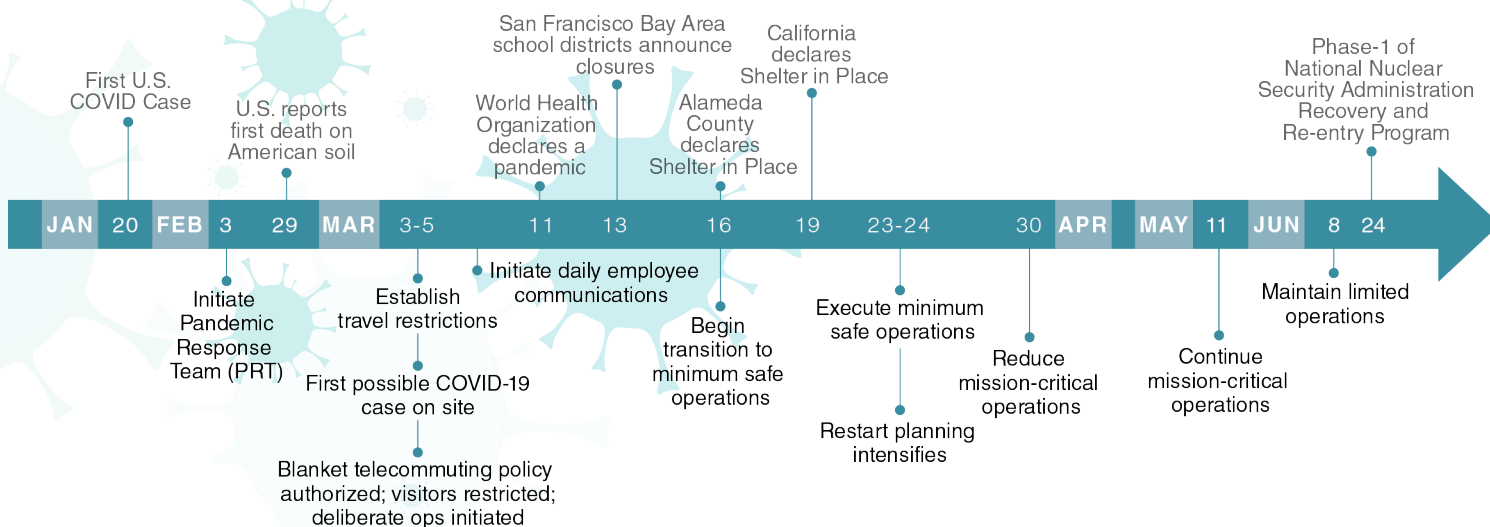
A timeline illustrates the Laboratory's early response to the pandemic alongside national and local actions.

setup—laptop, monitor, and peripherals. Information technology organizations within each directorate and LivIT worked together to distribute computers as needed, and LivIT assisted with software and account setup.

The next challenge: addressing changes in the way telecommuting employees communicated with one another. In response, applications supporting video conferencing and collaboration such as WebEx, Microsoft Teams, and Jabber were expanded to serve all telecommuters. By late March, most Laboratory employees were teleworking effectively. "Everyone came together and, as a result of our efforts, telecommuting has proved to be a successful and viable form of work, opening the eyes of a lot of managers," says East.

Other innovations included the implementation of cloud-based cyber protections for Laboratory email and networks and remote updates of software used at the National Ignition Facility (NIF). A secure, online platform to facilitate document review—replacing hard copy review—also came online quickly to keep projects running smoothly.

Planning for Onsite Returns

Just as quickly as the Laboratory moved into minimum safe operations, PRT and senior management began planning for a return to normal operations. Associate Deputy Director for Operations Sandra Brereton managed the Laboratory's operational response to COVID-19. In that role, Brereton coordinated steps to safely restart mission-critical activities with the National Nuclear Security Administration. She partnered with HSD, the Biosafety Office, and the Environment Safety and Health Directorate to ensure safe onsite return.

Fully masked and maintaining social distancing, groups of managers and biosafety specialists, including Biosafety Office Leader Carolyn Hall, toured essential laboratory facilities to begin calculating how many people could work together in each setting given COVID-19 concerns, assuming everyone was properly masked. Next, the Laboratory adapted its facilities-planning software to determine the appropriate density of employees in shared spaces and to develop a customized plan for every work environment. With the help of the Laboratory's Emergency Operations Center and the Procurement Department, each department was equipped with personal protective equipment, such as masks and hand sanitizer.

Hall led the effort to create a COVID-19 hotline running 24 hours a day, 7 days a week, which enables any employee exposed to COVID-19 or infected by the virus to call the Laboratory for help. "From the early days of the pandemic, our priority was keeping people safe," says Brereton. "We were surrounded by uncertainty, asking ourselves 'How can we ensure physical and mental well-being of the staff and help them navigate the pandemic's challenges?'" HSD created a COVID-19 case-management team, providing counseling for employees with COVID-19 and implementing additional steps to prevent onsite coronavirus transmission. Employees confirmed to have COVID-19 (or unconfirmed but experiencing COVID-19 symptoms) were required to remain offsite until cleared by HSD to return to work, as were employees exposed to confirmed COVID-19 cases and those who had traveled or attended large social gatherings.

The COVID-19 team recruited and trained employee volunteers to handle contact tracing for employees who reported a positive diagnosis either while working at the Laboratory or within a short time after leaving the site. Livermore developed a database to track COVID-19 cases, providing data on positive cases among Laboratory employees and helpful resources on Laboratory procedures, telecommuting, and coping with COVID-19 at home. For cases confirmed among Laboratory employees, contact tracing suggested that less than a dozen cases may have been attributed to onsite transmission. For those incidences, the team reviewed steps to reduce the likelihood of similar conditions that could lead to reoccurrence.

Resuming Mission-Critical Work

A core group continued working onsite throughout Minimum Safe Operations to ensure essential nuclear facilities remained safe and operable and that activities essential to the nation's security such as weapon modernization programs and the stockpile review process were uninterrupted. As early as March 2020, the Weapons and Complex Integration (WCI) Principal Directorate initiated planning for the return of other key personnel. Phil Pellette, WCI's associate deputy director for operations, led the Directorate's COVID-19 planning efforts. He joined HSD and Biosafety Office staff for walkthroughs of critical facilities, developing a checklist of procedures to bring staff back to each area. Pellette met with other directorate

leaders via WebEx to support their return-to-site planning. "One of the biggest challenges we faced was meshing together different restart procedures and operational methods, as every principal associate director and associate director has unique considerations when managing their facilities," he says.

Cindy Atkins-Duffin, the principal deputy associate director for the Global Security Prinicpal Directorate, adds, "Balancing mission priority with safety under pandemic constraints was the biggest challenge at hand. Global Security maintains facilities required by the federal government to be available at all times, such as the National Atmospheric Release Advisory Center and the Forensic Science Center." Lydia Camara, deputy principal associate director for operations in NIF and Photon Science Principal Directorate, adds, "One of our biggest operational challenges was communication. We wanted to give everyone up-to-date and accurate information, and we had to learn to navigate virtual communication methods and outlets together."

Between April and June 2020, most of the essential facilities returned to operational status. By mid-July 2020, the Laboratory entered "normal operations with maximum telecommuting," and an average of 3,500 to 4,000 people worked onsite every week. While the Laboratory opened to more staff, HSD and Biosafety experts continued monitoring COVID-19 data. An emphasis on safety and public-health protocols, such as wearing masks and social distancing, kept the virus under control at the Laboratory.

Expanding Health Services

In April 2020, as the demand for COVID-19 testing increased and community testing options remained backlogged, Biosciences and Biotechnology Division's Thomas Bunt began exploring onsite testing options. Rapid, onsite testing capabilities would enable HSD case managers to make faster, more informed decisions about safeguarding employees. Bunt's team acquired the equipment and reagents to perform real-time polymerase chain reaction (RT-PCR) SARS-CoV-2 tests, which had been authorized by the Food and Drug Administration during the pandemic. To meet the state of California's legal requirements for administering the SARS-CoV-2 tests, the team applied for a Clinical and Public Health Laboratory License, registered as a Clinical Laboratory Improvement Amendments (CLIA) "high complexity testing" laboratory, and hired clinical laboratory scientists and a qualified CLIA laboratory director.

After receiving the California Department of Public Health certification, Bunt and others worked with HSD to establish and pilot an end-to-end process of patient scheduling, testing, laboratory analysis, and data reporting.

On December 3, 2020, the Laboratory began onsite testing up to 20 tests a day, usually with same-day results. Over the following months the team ramped up to 100 tests per day. In January 2021, the Laboratory received authorization to provide onsite COVID-19 vaccinations to employees (federal employees and federal contractors) when vaccine supplies became available. As of the end of August 2021, HSD had dispensed well over 4,000 shots of the Pfizer vaccine. Vaccinations ramped up again in fall 2021 as the Laboratory supported its remaining unvaccinated employees in advance of a mandate requiring vaccination of federal employees and contractors.

The Laboratory's Site Occupational Medical Director for the Laboratory, Patrick Keller, points to expanded services addressing unique needs during the pandemic. For example, HSD's WorkingWell program titled "Health Talks" engages employees in virtual seminars and information sessions, providing updated information and findings on the virus, transition, and treatments. In time, the Laboratory reinitiated health-related activities that had been deferred in the earlier days of the pandemic such as hearing tests, in-person clinical visits, random drug testing, and assurance-testing protocols, among other services.

The Laboratory continues to maintain its COVID-19 operations and carry out its national security missions while maintaining maximum telecommuting where possible. Leaders credit the unified, laboratory-wide effort for such an effective response. "Livermore has exemplified an incredible amount of teamwork," says Atkins-Duffin. "The entire Laboratory has come together and persevered through all the uncertainty and changes that COVID-19 brought about."

—*Allan Chen*

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