



# 24/7 Emergency Response

Providing around-the-clock expertise and technical capabilities in support of civil emergencies and military and intelligence operations.

## Scientific Expertise on Call

LLNL maintains capabilities in areas that are relevant to emergency preparedness and operations. In particular, LLNL is a long-established partner with DOE/NNSA and the interagency nuclear/radiological emergency preparedness and response community. These efforts encompass assessment, planning, exercises, and post-disaster response. Our capabilities include assessment and scenario planning for potential threats against the U.S.; support to governmental emergency response capabilities; and support during and after incidents of national concern.

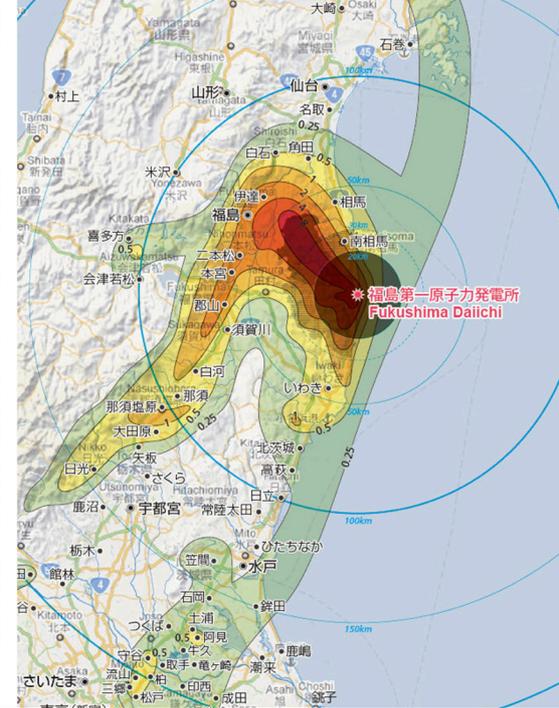
LLNL marshals multidisciplinary science, engineering, and computational resources to help the national response to emergencies that have the potential for massive casualties and damage. LLNL has expertise in chemical, biological, radiological, nuclear, and explosive (CBRNE) threats, as well as sophisticated facilities and laboratory-analysis capabilities.

The Laboratory's trained and certified personnel can be deployed 24/7, on- or offsite, and are supported by equipment and logistics that can be deployed within minutes to hours in response to potential and actual incidents.

## Accomplishments

LLNL's strong record of emergency response and preparedness relies on a clear understanding of the risks and threats; preparation of policies, plans, and procedures to respond to incidents and emergencies; and development of technologies to enable prevention, mitigation, and response. LLNL supported the U.S. government in major emergencies, providing technical expertise to address the full range of CBRNE threats, including:

- **Hanford (2018):** NARAC provided assessment of contamination during Hanford Plutonium Finish Plant Demolition.
- **Apex Gold (2016):** LLNL hosted the first-ever minister-level gathering to identify national and international actions to address a nuclear crisis and help advise heads of government during a nuclear security crisis or emergency.
- **PG&E Substation Sniping (2013):** Conducted after-action analysis, assessed security vulnerabilities, and recommended security enhancements.
- **Fukushima Daiichi Nuclear Disaster (2011):** Deployed Radiological Assessment Program team, developed plume modeling predictions, analyzed Japanese environmental samples, and analyzed radionuclides.
- **Deepwater Horizon Oil Spill (2010):** Predicted smoke plumes, provided engineering red team support, and estimated the amount of released oil.
- **Cerro Grande Fire (2010):** NARAC developed wind forecasts and estimates of potential radiological hazards when the fire swept through parts of Los Alamos National Laboratory.
- **Libyan WMD (2003):** Assisted in dismantlement, removal, and inspection of the nuclear weapons program in Libya.
- **9/11 Attacks (2001):** Provided hyperspectral data gathering and analysis, microimpulse radar for survivor search and rescue, and continued intelligence reachback through 2012.
- **Anthrax Letters (2001):** Provided sampling equipment, assays to inform the response, and forensic analysis. Helped set engineering parameters to optimize facility decontamination and cleanup.



## Scientific Underpinnings

LLNL draws on the following centers and programs, as well as core basic and applied science expertise, to provide timely and critical operations support and response:

- **National Atmospheric Release Advisory Center (NARAC):** NARAC provides plume modeling predictions and analyses for hazardous atmospheric releases. NARAC is the DOE modeling center for nuclear/radiological incidents and provides National Response Plan capabilities for national and international emergencies.
- **Nuclear Incident Response Programs:** This DOE-funded emergency response capability is ready for potential and actual nuclear/radiological incidents. Trained and certified personnel can be accessed 24/7 along with deployable equipment and logistics support that can be rapidly marshaled.
- **Forensic Science Center (FSC):** This all-CBRNE Weapons of Mass Destruction laboratory provides microsampling and analysis capabilities. FSC is also the lead Environmental Protection Agency Environmental Response Laboratory Network Laboratory for chemical and biological weapons and is certified by the Organisation for the Prohibition of Chemical Weapons and ISO.
- **Biodefense Knowledge Center (BKC):** This DHS-funded, 24/7 center provides analysis and recommendations regarding biological emergencies and incidents.
- **Counterproliferation, Analysis, and and Planning System (CAPS):** Provides reachback support to combatant commands/warfighters in CBRNE mission areas.
- **Critical Infrastructure Protection and Security:** LLNL experts evaluate the physical and cyber security of electrical grids, oil refineries, natural gas transmission networks, rails, ports, and waterways.
- **International Nuclear and Radiological Security:** LLNL works worldwide to secure nuclear and radiological material to detect and deter trafficking of this material. Experts advise on how to protect, control, and train security staff to protect against theft, sabotage, and terrorism.
- **Intelligence Analysis (Z Program):** LLNL provides all-source intelligence support with emphasis on WMD and emerging S&T threats, including detailed analytical with rapid reachback, as requested.
- **Nuclear Forensics:** LLNL is an ISO 17025 accredited partner laboratory in DHS's Bulk Special Nuclear Material Analysis Program that provides and maintains laboratory analysis capabilities commensurate with specific interagency requirements.

## The Future

LLNL has an ongoing responsibility to provide 24/7 emergency operations and response capabilities. To satisfy this mission, the Laboratory must continue to improve technical capabilities and help shape a credible national response posture.

LLNL is investigating ways to apply advances in high-performance computing to better interpret gathered intelligence and to anticipate and assess which threats are most credible. Whether planning a response to a natural disaster or terrorist event, it is vital that federal decision makers are provided with the best possible science-based and intelligence-informed conclusions, recommendations, supporting rationale, and other relevant observations—which LLNL can provide.

Our researchers seek innovative technology breakthroughs to improve emergency response capabilities, which need to be effective and broadly applicable in many potential CBRNE scenarios. LLNL also closely interacts with the first-responder community.

## Principal Sponsorship

- DOE/NNSA, DHS, DOD, DOE/IN, and U.S. intelligence agencies

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