The Hong Kong University of Science and Technology (Guangzhou)

Laboratory Special Equipment Emergency Plan

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1	V1	--	Initially approved and released by the University Executive Committee for implementation	12-02-2024
2	V2	All chapters	Comprehensive revision based on updated policies and university restructuring	10-01-2026

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Chapter I General Provisions

Article 1 To effectively prevent special equipment accidents in laboratories, proactively respond to potential special equipment accidents, promptly control and eliminate the progression of accidents, assist in accident rescue and disaster relief efforts, and minimize the casualties and property losses caused by accidents.

Article 2 This plan is formulated in accordance with the Emergency Response Law of the People's Republic of China, the Special Equipment Safety Law of the People's Republic of China, the Regulations on Special Equipment Safety Supervision, the Opinion of the State Council on Comprehensively Strengthening Emergency Management, the Provisions on the Reporting and Investigation of Special Equipment Accidents, the Guidelines for the Formulation of Special Equipment Accident Emergency Plans, the Safety Manual, and other requirements, taking into account the actual circumstances of the University.

Article 3 This plan applies to the emergency response to incidents involving pressure vessels, boilers, and other special equipment during their use, inspection, repair, maintenance, and other processes within laboratories of The Hong Kong University of Science and Technology (Guangzhou).

Article 4 Guiding Principles

People-oriented, safety first. Safeguarding personal safety and health shall be the primary task. At the accident scene, rescue of

person shall take precedence, with focus on controlling the spread and escalation of the disaster, to minimize the losses caused by the accident.

Unified leadership, centralized command. When an accident occurs, all units must adhere to the unified leadership of the emergency command headquarters, actively cooperate according to their respective responsibilities, and pool collective efforts to ensure the coordinated and orderly conduct of emergency response operations.

Compliance with the plan, decisive response. All participating rescue forces at the scene shall act in unison and cooperate closely in accordance with the task assignments under the plan, seize favorable opportunities based on the type of accident, make decisive decisions, act swiftly, and effectively control the development of the situation.

Chapter II Overview of Laboratory Special Equipment

Article 5 Pressure Vessels. Some laboratories within the research buildings are equipped with autoclaves, compressed air storage tanks, liquid nitrogen dewar and gas cylinders; liquid nitrogen storage tanks are located outdoors. The shells, cylinders, and connecting pipes of these pressure vessels may develop cracks and leaks due to aging or corrosion; failure of seals in connecting pipes, valves, and flanges may cause leakage; malfunction of

pressure gauges or safety valves, or heating of the vessel body, may cause an increase in internal pressure, resulting in vessel explosion. For pressure vessels containing liquefied gas media, overfilling may cause bulging, deformation, or explosion of the container. Maintenance work on top of outdoor liquid nitrogen tanks may pose a risk of falls from height; inspection work inside outdoor liquid nitrogen storage tanks may cause asphyxiation.

Article 6 Boilers. Some laboratories within the research buildings have natural gas boilers used to supply steam for experimental equipment. Natural gas leakage may cause fire or explosion; boiler malfunction or incorrect parameter settings may lead to over-temperature and overpressure operation, and failure of safety accessories (such as safety valves and pressure gauges) may cause overpressure explosion; combustion exhaust gases (containing SO_2, NO_x, and particulate matter), if improperly treated, may cause environmental pollution. Excessively high or low water levels and scale formation may all lead to safety accidents.

Chapter III Emergency Organization Structure and Responsibilities

Article 7 The University establishes a Campus Emergency Command Headquarters, serves as the command organization for campus safety accidents, responsible for coordinating the

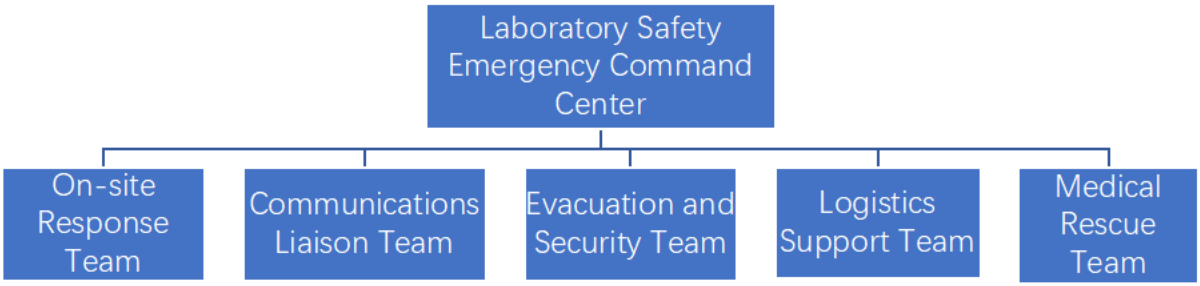
resources and materials of relevant functional departments and units, and organizing and commanding accident response operations.

Article 8 A Laboratory Safety Emergency Command Center is established under the Campus Emergency Command Headquarters, with the university leader in charge of laboratory safety serving as the Leader, the heads of the Department of Laboratory Facilities and Safety and the Laboratory Health and Safety Department serving as Deputy Leaders, and members including the heads of the Laboratory Services Department, Campus Security and Protection Department, Campus Facilities Management Department, Campus Space and Services Management Department, Information Technology and Data Intelligence Department, Laboratory Management Department, and other relevant departments. The Laboratory Safety Emergency Command Center serves as the laboratory safety command center, responsible for the overall coordination, arrangement, and deployment of emergency response to sudden laboratory safety incidents. When the Leader is not on site, the Deputy Leader may assume on-site command and coordination of accident response, with the following main responsibilities:

- Command and coordinate the work of various emergency response teams, promptly control the accident scene, and initiate rescue operations;

- Timely and truthfully report the accident scene and rescue situation to the emergency command headquarters;
- Cooperate with and assist the local fire rescue authorities, public security organs, and superior units in carrying out emergency rescue, accident investigation, and other related follow-up work.

Article 9 The Laboratory Safety Emergency Command Center establishes five emergency response teams, including the On-Site Response Team, Communications Liaison Team, Evacuation and Security Team, Logistics Support Team, and Medical Rescue Team, to promptly carry out on-site response, communications liaison, evacuation guidance, security cordoning, emergency rescue, and logistical support as needed.



1. On-Site Response Team

Lead Units: Laboratory Health and Safety Department, Campus Security and Protection Department

Members: Laboratory Services Department, Campus Facilities Management Department, the unit where the incident occurred, and other relevant departments

Main Responsibilities: Responsible for formulating specific emergency rescue and on-site response plans, following the instructions of the Leader/Deputy Leader of the Laboratory Safety Emergency Center to conduct on-site emergency rescue; urgently deploying specialized equipment and materials required for emergency rescue.

2. Communications Liaison Team

Lead Unit: Laboratory Health and Safety Department

Members: The unit where the incident occurred, and other relevant departments

Main Responsibilities: Responsible for communication coordination at the emergency rescue scene, ensuring smooth flow of information, timely reporting to the Leader/Deputy Leader of the Laboratory Safety Emergency Command Center on the response work of each team, and conveying the instructions of the Leader/Deputy Leader to each work group at the accident scene; timely reporting on the progress of on-site emergency rescue; responsible for coordinating with relevant departments to draft information briefings in accordance with the unified arrangements of the Leader of the Laboratory Safety Emergency Command Center, reporting accident information to the

University and superior units in a timely, accurate, and comprehensive manner, monitoring accident public opinion, and releasing information externally.

3. Evacuation and Security Team

Lead Unit: Campus Security Department

Members: The unit where the incident occurred

Main Responsibilities: Responsible for the emergency evacuation of personnel in affected areas on campus, guiding personnel in evacuation and self-rescue, arranging dedicated personnel to stand guard and provide guidance at safety exits and locations prone to misdirection; responsible for inspecting the incident location (point) and adjacent floors, areas, and rooms, verifying and searching for personnel who have not been evacuated in time, ensuring that all faculty, staff, and students are evacuated and assembled; cordoning off the accident scene to prevent unauthorized personnel from entering.

4. Logistics Support Team

Lead Units: Campus Facilities Management Department, Laboratory Services Department

Members: Other relevant departments

Main Responsibilities: Cooperate with on-site rescue requirements to ensure fire-fighting water supply, electricity, and the normal operation of fire-fighting facilities and equipment; promptly monitor the on-site status of water, electricity, gas, and

heating systems, and take measures such as partial power shutdown or gas shutoff as needed; responsible for the proper relocation and accommodation of affected personnel.

5. Medical Rescue Team

Lead Unit: University Clinic

Members: The unit where the incident occurred and other relevant departments

Main Responsibilities: Provide emergency medical care to the injured; coordinate with relevant medical institutions to carry out emergency medical rescue for the injured, with particular attention to providing comfort and psychological intervention for the injured.

When a laboratory safety accident occurs, before the arrival of the Laboratory Safety Emergency Command Center, the on-site responsible personnel of the unit where the incident occurred shall assume temporary on-site emergency command, seal off the accident scene, and fully utilize the available resources of the unit to carry out initial emergency rescue. After the University Laboratory Safety Emergency Command Center arrives at the accident scene, relevant accident information shall be promptly provided to its members, and the emergency response teams shall be organized to carry out emergency rescue.

Chapter IV Prevention and Early Warning

Article 10 Establish a prevention system featuring "responsibility at each level, focused prevention and control," implementing differentiated prevention management for special equipment such as boilers, and pressure vessels. Adhere to the combination of routine inspections and special inspections, emphasizing both technical prevention and control measures and management measures, with a focus on implementing the following requirements:

- Operational Management: Operators must hold valid certificates, strictly comply with operating procedures, and establish an operational record system.
- Safety Accessories: Regularly calibrate safety valves, pressure gauges, water level indicators, and other safety protection devices to ensure their sensitivity and reliability.
- Maintenance and Care: Develop an annual maintenance plan, regularly maintain and service equipment, and establish equipment archives.
- Hazard Investigation: Regularly conduct safety hazard investigations, and promptly rectify any issues discovered.
- Emergency Preparedness: Equip necessary emergency rescue apparatus, conduct regular inspection and maintenance to keep them in good and effective condition.

Article 11 Early Warning Mechanism

1. Warning Classification

Based on the potential degree of harm, urgency, and development trend of special equipment accidents, warnings are classified into three levels:

Level 3 Warning (General): Minor abnormality in equipment that does not affect safe operation.

Level 2 Warning (Moderate): Obvious abnormality in equipment that may affect safe operation.

Level 1 Warning (Severe): Serious abnormality in equipment that may lead to an accident at any time.

2. Warning Response

Level 3 Response: Increase inspection frequency, notify safety management personnel, and prepare for emergency response.

Level 2 Response: Immediately notify safety management personnel and the maintenance unit to arrive on site for handling; reduce operating load or shut down equipment if necessary.

Level 1 Response: Immediately shut down equipment, evacuate personnel, and initiate the emergency response procedure.

3. Warning Management

Establish a warning information reporting system, with the person responsible at the corresponding level issuing and lifting warnings based on the warning level. Warning information shall be promptly communicated to relevant responsible departments

and personnel to ensure the effective implementation of response measures.

Chapter V Accident Reporting Procedures

Article 12 Internal Reporting

If situations such as elevator passenger entrapment, over speeding, car overshoot at top or compression at bottom, electric shock, mechanical shearing, boiler/pressure vessel medium leakage, explosion, or deformation are discovered, on-site personnel shall immediately call 8833 0110 to report.

After receiving the alert, the Fire Control Center shall immediately call 88339099 to report to the Laboratory Health and Safety Department. Upon receiving the report, the Laboratory Health and Safety Department will notify the head or deputy head of the Laboratory Safety Emergency Command Center. Depending on the severity of the situation, the head or deputy head of the Laboratory Safety Emergency Command Center will decide whether to report the incident to the Campus Emergency Response Command Headquarter.

The content of the accident report includes: an overview of the unit where the accident occurred; the time, location, and conditions at the accident scene; a brief description of the accident sequence; the number of casualties already caused or likely to be caused (including the number of person unaccounted

for) and preliminary estimates of property damage; measures that have been taken; and other information that should be reported.

Article 13 External Reporting

The Campus Emergency Command Headquarters shall decide whether external rescue is needed based on the severity of the accident. If external rescue is required, promptly call 110 or 120. After receiving the accident report, the Leader of the Emergency Command Headquarters shall report to the Guangzhou Municipal Market Supervision and Administration Department and relevant authorities within one hour, with the following content:

1. The time, location, unit, and type of special equipment involved in the accident;
2. A brief description of the accident sequence, the number of casualties and person exposed to danger already caused or likely to be caused, and preliminary estimates of direct economic losses;
3. Measures that have been taken;
4. Reporter's name and phone number;
5. Other information that is necessary to report.

If new developments arise after an accident has been reported, or if the circumstances have not yet been clearly reported, follow-up reports shall be submitted promptly through the appropriate channels.

If there is a change in the number of casualties within 30 days of the accident, a follow-up report shall be submitted within 24 hours of the change.

Chapter VI Emergency Response and Handling

Article 14 Depending on the type of incident, implement the appropriate emergency response and mitigation plan as outlined in the relevant appendix.

Chapter VII Termination of Emergency Response and Resumption of Operations

Article 15 The basic conditions for terminating an emergency response include: the on-site emergency has been effectively brought under control, and safety risks have been eliminated or controlled within acceptable limits; emergency response tasks have been completed; emergency resources have been fully utilized or are no longer needed; and the necessary information collection, assessment, and reporting have been completed during the emergency response.

Article 16 Specifically, for Level I responses, the head or deputy head of the Emergency Command Headquarter or the Laboratory Safety Emergency Command Center shall declare the emergency over; for Level II and Level III responses, the relevant emergency

task force or the responsible personnel of the local laboratory shall declare the emergency over.

Chapter VIII Accident Investigation

Article 17 After the emergency response has been terminated, the entity where the accident occurred shall organize an accident investigation team to investigate. For accidents classified as particularly serious, serious, relatively serious, or general under the Regulations on the Safety Supervision of Special Equipment, the accident investigation shall be conducted in accordance with the requirements of the Provisions on the Reporting, Investigation, and Handling of Special Equipment Accidents.

Chapter IX Safety Measures

Article 18 Communications and Information Support

Video surveillance systems have been installed in all key areas of the campus.

Smoke detectors, heat detectors, and fire alarm broadcast systems have been installed in the campus buildings.

Campus emergency response personnel communicate via walkie-talkies and cell phones. Members of the campus fire safety task force and its various working groups must keep their phones on 24 hours a day; any changes to phone numbers must be promptly updated with the Fire Control Center.

The Fire Control Center shall regularly update the contact information for the fire safety task force, its working groups, and emergency response teams to ensure that communication channels remain open with the departments, units, and individuals involved in emergency responses.

Article 19 Personnel Support

Emergency response team support shall be provided by establishing functional emergency response task forces based on the nature and characteristics of the incident, as well as the actual needs of emergency rescue operations. Teams shall be formed and personnel assigned in accordance with the principles of matching professional expertise, facilitating leadership, and ensuring ease of mobilization and rescue operations, with appropriate adjustments made in response to changing circumstances.

To ensure the smooth implementation of rescue operations and the effective functioning of the rescue organization, new personnel shall be promptly recruited and trained to replace any personnel who leave the organization. Each working group shall strengthen the development and training of on-site rescue teams to ensure they can fulfill their respective responsibilities during emergency rescue operations. A coordination mechanism shall be established to enlist various social rescue forces, such as nearby organizations, to participate in emergency rescue operations.

Article 20 Material and Equipment Support

In accordance with the emergency rescue requirements outlined in this plan, a comprehensive emergency material supply and support system shall be established and improved, with the university serving as the primary source of emergency material reserves and social rescue supplies serving as a supplementary source. Specifically, emergency supply rooms have been designated on certain floors on the east and west sides of the university's core area, stocked with emergency supplies relevant to laboratory operations; relevant emergency supplies have also been stocked in some medium- and high-risk laboratories. Each department and laboratory is responsible for managing its own emergency supplies, including conducting inspections and performing maintenance. Emergency supplies must be replenished or replaced promptly upon expiration or after use.

Article 21 Support for Public Awareness, Education, Training, and Drills

The Laboratory Safety Emergency Command Center and relevant functional departments shall make full use of campus broadcasts, the university website, bulletin boards, and new media platforms such as Weibo and WeChat to organize and carry out public awareness campaigns on emergency laws and regulations, as well as emergency knowledge including prevention, risk avoidance, self-rescue, and self-protection. They shall vigorously promote

the integration of safety education into the classroom to enhance the safety awareness and basic emergency response skills of faculty, staff, and students, thereby meeting the needs of emergency response.

Training for emergency response teams shall be the responsibility of the Laboratory Health and Safety Department, the Campus Security Department, the University Health Clinic, and other relevant departments. Emergency response training shall be conducted on a regular and ad hoc basis as needed to enhance the overall operational capability of the emergency response teams;

The Laboratory Safety Emergency Command Center organizes emergency response teams to conduct emergency rescue drills on a regular basis as needed. Emergency drills consist of three phases: preparation, implementation, and debriefing. Through these drills, emergency response teams are trained, positional accountability systems are enforced, and participants become familiar with emergency command mechanisms, decision-making, coordination, and response procedures; resource needs are identified, emergency situations are assessed, and emergency response plans are tested and refined.

Chapter X Supplementary Provisions

Article 22 This emergency plan is formulated by the Laboratory Health and Safety Department, which is responsible for its

interpretation. All university departments shall comply with this plan and shall formulate and revise their own departmental contingency plans in accordance with this plan.

Article 23 This plan shall take effect on the date of issuance.

Appendices

Appendix 1 On-site Emergency Response Plan for Pressure Vessel Anomalies in Laboratories

Appendix 2 On-site Emergency Response Plan for Accidents in the Liquid Nitrogen Tank Area

Appendix 3 On-Site Emergency Response Plan for Boiler Accidents