



MONITORING SYSTEM FOR MEDICAL SURVEILLANCE DURING HAZARDOUS WASTE OPERATIONS

PRODUCT BULLETIN

COMPLEX OSHA REGULATION

OSHA's standard addressing Hazardous Waste Operations and Emergency Response (29 CFR 1910.120) places extraordinary requirements on employers to monitor the health and safety of employees engaged in hazardous waste operations, including emergency response to the releases of hazardous substances. In addition to exposure monitoring, there are specific requirements to organize this monitoring information so that it can be part of an on-going program of medical surveillance.

Until now, these monitoring and surveillance requirements, and the related record maintenance and record keeping, have required complicated, extensive and expensive program integration. The development of the **Life•line** monitoring system has greatly simplified these OSHA requirements, and greatly decreased the cost of compliance. Developed with the assistance of Barry White, the former Director of Safety Standards in OSHA, whose office wrote the Hazardous Waste standard, **Life•line** integrates into one system all of the monitoring, surveillance and reporting requirements in the standard.

Life•line's ORIGIN

The **Life•line** monitoring system was developed by Safe Environment Engineering to create a means of monitoring employees in confined spaces without the need for a one-on-one standby attendant. To assure that **Life•line** met OSHA requirements it was developed with the assistance of Barry White, the former Director of the Safety Standards division of the United States Federal Occupational Safety and Health Administration (OSHA), whose office wrote the United States confined space entry standard. Mr. White also served as a member of the Marine Chemists' Qualification Board, and assisted the Navy to improve its Gas Free Engineering Program.

Mr. White will be available to assist each purchaser of the **Life•line** system to rewrite current written confined space entry procedures to encompass the use of **Life•line**, and to work with the Base's safety and health professionals to place the system in operation so that it meets all OSHA requirements.

COMPLIANCE WITH 1910.120 REQUIREMENTS FOR MONITORING AND MEDICAL SURVEILLANCE

Use of the **Life•line** system effectively meets each of the monitoring and surveillance requirements of 1910.120. For example:

1. Employee monitoring required as part of the site-specific safety and health plan.

1910.120(c) Site characterization and analysis.

(6) Monitoring. *The following monitoring shall be conducted during initial site entry when the site evaluation produces information that shows the potential for ionizing radiation or IDLH conditions, or when the site information is not sufficient reasonably to eliminate these possible conditions:*

(i) Monitoring with direct reading instruments for hazardous levels of ionizing radiation.

(ii) Monitoring the air with appropriate direct reading test equipment (i.e., combustible gas meters, detector tubes) for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

As a result of these findings, risk identification must be identified, and proper training planned.

2. Medical surveillance required by the standard.

1910.120(f). Medical Surveillance. (2) Employees covered. *The medical surveillance program shall be instituted by the employer for the following employees: (i) All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.*

(ii) *All employees who wear a respirator for 30 days or more a year;*

(iii) *All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation, and;*

(iv) *Members of HAZMAT teams.*

Employers whose employees do not work at hazardous waste sites, but will provide emergency response to hazardous substance releases, must meet the requirements of Subpart (q), which includes the requirement to monitor exposure and to provide the same medical surveillance required above. For example:

1910.120(q) (3) Procedures for handling emergency response, states in (iv): *Employees engaged in emergency response and exposed to hazardous substances presenting an inhalation hazard or potential inhalation hazard shall wear positive pressure self-contained breathing apparatus while engaged in emergency response, **until such time that the individual in charge of the ICS determines through the use of air monitoring that a decreased level of respiratory protection will not result in hazardous exposures to employees.***

The **Life•line** system can monitor every employee who is exposed to, or may be exposed to, a hazardous substance; can record every event; and can store the information to be produced in any format when required.

HOW DOES Life•line WORK?

Life•line consists of a main monitoring center, portable **Life•line** monitors and, as options, remote location satellites, environmental monitors, and ventilation control sensors. The main monitoring center integrates custom data base software with specialized communications and computer hardware which will transmit and display the status of workers monitored by the system.

The main monitoring center can be as small and mobile as a laptop computer, or integrated as part of a central fixed location monitoring center.

Each confined space entrant is required to check out a portable **Life•line** monitor which he/she will take with him/her to the work location. The main monitoring center will regularly poll each portable **Life•line** monitor for the purpose of uploading its current status. The polling process will utilize technology similar to that used by packet radio (a radio frequency modem).

The portable **Life•line** monitor checks on its user at preset regular time intervals by initiating an audible and visual status query. The audible and visual status query will continue until the acknowledge button is depressed by the entrant. Failure of the user to acknowledge the status query

within a preset period of time (as determined by the facility) will trigger an alarm warning tone from within the user's portable **Life•line** monitor. This warning tone and a visual signal will last for approximately 15 seconds to give the user sufficient warning of his/her pending alarm condition. Failure of the user to respond to both of these conditions will put the portable **Life•line** monitor into an alarm state. Upon being polled (at intervals of approximately every 30 to 40 seconds) by the main monitoring center, the portable **Life•line** monitor will download its alarm status which will cause an alarm condition at the main monitoring center.

REACTING TO AN ALARM

When an alarm is initiated by a user's portable **Life•line** monitor, a computer screen at the main monitoring center will display the user's name and work location as a flashing emergency identifier. Both a system alarm horn and strobe light will alert the system attendant monitoring the system.

The system attendant will then have the option of either opening a voice channel to the user in alarm to inquire as to his/her condition, and/or immediately dispatching a rescue team to the user's location. Should the user need help, a "help-request" switch can be depressed on the portable **Life•line** monitor. In this mode of operation, an alarm request is transmitted back to the main monitoring center where the attendant can open a voice channel to the user.

If the user is incapacitated in either alarm condition, the system attendant at the main monitoring center can control the microphone of the portable **Life•line** monitor which is in alarm. In this condition, the attendant will be able to listen to the user without the need for user intervention.

Following any alarm condition where multiple users were evacuated from a common work location, the portable **Life•line** monitor will continue its user status query to ensure the safety of all workers after the evacuation, i.e., the system will take attendance.

As an additional option, the system will integrate with the facility's and/or work area ventilation system. In the event of failure of the ventilation system, the main monitoring center will transmit an evacuation alarm to users working in the affected area. The ventilation system's "off" or "stop" buttons would also be defeated by **Life•line** until such time as all users have left the area that the ventilation system supports, and either logged off the system or changed their work location.

MULTI-GAS DETECTION SYSTEM

The **Life•line** system can handle all atmospheric monitoring required by the Hazardous Waste Operations standard while monitoring all entrants.

A modular gas detection system may be installed and/or integrated with the portable **Life•line** monitor as an option. In many facilities this interface can be accomplished with the employer's existing gas detection equipment. This system will provide real-time information of gas levels in the environment. These levels will be transmitted to a data base contained in the main monitoring center so that exposure limits of the users may be tracked over time.

The gas detection module will also interface with the portable **Life•line** monitor's alarm should the environment become contaminated or deprived of oxygen. If the gas detection system goes into alarm, an audible and visual alarm signal will be produced by the portable **Life•line** monitor. Both the alarm condition and concentration levels will be transmitted back to the main monitoring center where the concentration levels, affected user, and work location will be displayed on the system's computer screen. If there are other workers in the affected area, an evacuation alarm will be automatically initiated on all of those users' portable **Life•line** monitors.

USE OF REMOTE SATELLITE LOCATIONS

The **Life•line** system will also provide the option for users to access the system from remote satellite locations. This satellite configuration will allow a user to input his work location, through the

use of bar coding equipment, upon checking out a portable **Life•line** monitor. The user may also gain access to the system for changing his work location or to log out of the system at the completion of his duties.

The remote satellite terminal will communicate with the main control center by a network LAN-type configuration. By utilizing a computer at the remote locations, access time for communications between the remote terminal and the main control center will be minimized.

The satellites can also function as the main monitoring center during emergency conditions and as such are powered by a 4 hour UPS.

Life•line was designed to be a system that can be customized allowing for extensive versatility in its end configuration. Custom features such as integrating specific company or industry jargon within its displays and remote monitoring and/or displaying of specific levels or pressures of various substances are just some of the examples of **Life•line**'s capabilities.

Life•line MONITORING HAZARDOUS AND/OR REMOTE LOCATIONS

Many individuals employed by municipalities, utilities and refineries are required to work in locations where they must work alone and at some distance from assistance. If they should have an emergency such as a fall, a heart attack, or some danger that develops in the environment, communication is often dependent upon a radio in a vehicle which may not be easily reached.

The **Life•line** system's ability to regularly poll the worker can maintain a level of safety and security by providing continuous monitoring of employees in these hazardous or remote locations.

TRAINING AND MAINTENANCE

Each **Life•line** system is available in a range of capacities from a minimum of no less than two monitored employees, to a maximum of over one hundred monitored employees. The cost of the system is a function of the number of employees to be monitored. A system lease program is available.

The **Life•line** technology is supported by a detailed program of user training in the operation and maintenance of the system and the requirements of safe confined space entry. We provide a program of monthly service and recertification, as well as on-call maintenance and on-line software diagnostics.

ADDITIONAL INFORMATION

For additional information on the **Life•line** system, and to arrange for a demonstration of the system in your facility, please call Safe Environment Engineering at (661) 295-5500.

Developed by SAFE ENVIRONMENT ENGINEERING
25061 W. Avenue Stanford, Suite 30, Valencia, CA 91355
(661) 295-5500 (661) 294-9246 FAX