



PRODUCT BULLETIN

WHAT ARE THE REQUIREMENTS OF THE AFOSH STANDARD 127-25 CONCERNING ATTENDANTS AND HOW CAN THE Life•line SYSTEM MEET THOSE REQUIREMENTS?

AFOSH STANDARD 127-25

The Air Force Occupational Safety, Fire Protection, and Health (AFOSH) standard requires that:

The supervisor will ensure an attendant is provided for all Class B space entry and work. The Entrant and attendant outside the space will establish and maintain communications. In addition, the attendant and the rescue team will establish communications if the rescue team is not stationed immediately outside the confined space.

The standard further dictates six duties and responsibilities of the attendant (AFOSH Standard 127-25 &5e(3)(a) - (f)) -- duties and responsibilities that must be accomplished regardless of whether there is one attendant for each entry, or one attendant monitoring up to one hundred entrants with the **Life•line** system.

&5e(3)(a) *Know to remain outside the confined space and not attempt rescue involving entry until the rescue team has been notified and assistance has arrived. Make rescue efforts by means of the lifeline until assistance arrives.*

The attendant would remain outside the confined space and not attempt entry. **Life•line's** ability to immediately summon a rescue team through either a remote alarm / display at the rescue team's station or via voice radio communication would allow for the swiftest of possible rescue efforts. The attendant would not perform rescue efforts unless the entrant needing assistance is the only entrant in a permit space at that time.

&5e(3)(b) *Maintain continuous communication with all authorized entrants within the permit entry confined space by voice, radio, telephone or other equally effective means.*

An individual standing outside a permit entry space cannot carry out this requirement with nearly the effectiveness of the **Life•line** monitoring system. The communications capability of **Life•line** are far in excess of what is required by AFOSH. The attendant may either communicate with the "global alarm" feature which sends an evacuation alarm to all users of the system, or he can selectively communicate with the entrants using a voice communication feature.

&5e(3)(c) *Have authority to order entrants to exit the confined space at the first indication of a not-permitted condition, an unexpected hazard, indication of a toxic reaction (i.e., unusual conduct by the entrants), or if a situation occurs outside the space that could pose a hazard to the entrants.*

The attendant at the main monitoring center is able to warn either specific entrants or all entrants to evacuate the permit space(s) immediately with either the global alarm or voice communication feature. The area outside the spaces(s) may be guarded by barriers or by a roving monitor if the area is not in view of the attendant at the main monitoring center.

Life•line is a continuous-monitoring system. The system is designed to prevent hazard exposure, not detect behavioral effects that indicate that a problem has already developed. The gas detection monitor and/or ventilation sensor in the confined space is polled approximately every 25 seconds, and the results uploaded to the main monitoring center. The portable **Life•line** monitor also

checks on its user at preset regular time intervals by initiating an audible and visual status query.

&5e(3)(d) *Know the procedure and have the means to summon immediate emergency assistance if needed.*

One of the most compelling features of **Life•line** is the ability of the attendant at the main monitoring center to identify an emergency and immediately summon rescue and/or other emergency services. A remote display can be located at various locations to inform groups such as fire and rescue of the entrant's location in the event of an emergency.

&5e(3)(e) *Remain at the attendant's post and not leave for any reason (except self-preservation) unless replaced by an equally qualified individual. Order the entrants to exit the space if the attendant must leave and there is no replacement.*

The attendant at the main monitoring center will not leave his post for any reason. **Life•line's** training dictates that the attendant shall have no duties other than monitoring the **Life•line** system. An audible and visual alarm system will alert the attendant the moment of an emergency. The significant impact of this alarm condition will keep an attendant from doing anything else but responding to this condition.

&5e(3)(f) *Warn unauthorized persons not to enter (or exit immediately if they have entered) and advise the authorized entrants and others (specified by the supervisor) of entry by unauthorized persons.*

The main source of warning are the signs and/or barriers outside the permit space. If the area is out of the sight of the attendant at the main monitoring center, the employer must provide a roving monitor in the vicinity. When an unauthorized entrant is identified, the attendant may alert authorized entrants by using **Life•line's** voice communication feature.

The entrant must log his/her portable **Life•line** monitor into the system before entering a permit space. The system display indicates the name of the entrant, the specific permit space entered, the time of entry, and the training level accomplished by the entrant. A potential unauthorized entrant without the training necessary for that particular space will be denied entry. Additionally a log of all activity (all log-on, log-off and work location changes) is kept as a permanent and printable record within the system and is always available for immediate viewing.

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.

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 users were evacuated from a common work location, the portable **Life•line** monitor will continue its 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

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

The remote location satellite will have the ability to communicate with the main control center by one of two methods. The simplest method would employ permanent remote locations whereby a smart terminal will be attached to a cabinet containing chargers for the portable **Life•line** monitors. The remote terminal will communicate with the main control center by either RS422 communication protocol or a network LAN-type configuration. By utilizing a smart terminal at the remote locations, access time for communications between the remote terminal and the main control center will be minimized.

If mobile remote locations are required, the same smart terminal/charger configuration will be used with spread spectrum technology communication utilized between the main monitoring console and the remote location.

A brief discussion of "spread spectrum technology" might be helpful here. Most familiar applications of RF communications, such as cordless telephones or CB radios, operate on a specific frequency. This is referred to as narrow band technology, since the signal occupies a very small part of the RF spectrum. While narrow band can be successfully used in some wireless data collection systems, its susceptibility to interference makes it unacceptable for many applications.

Spread spectrum technology is used to overcome the limitations imposed by narrow band technology. Instead of transmitting on a signal frequency, each spread spectrum technology channel uses an approximately 3MHz band of the RF spectrum. Spread spectrum technology achieves a maximum data rate of 122Kbps, compared to 9600 for narrow band.

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.

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 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 AFOSH and OSHA requirements.

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