Δ *TABLE A.5.1.9.2* *(Continued)*

Alarm Condition	*Manifold for Gas Cylinders (5.1.3.5.12)*	*Manifold for Cryogenic Liquid Cylinders with Reserve (5.1.3.5.13)*	*Cryogenic Bulk with Cryogenic Reserve (5.1.3.5.14)*	*Cryogenic Bulk with Cylinder Reserve (5.1.3.5.15)*	*Medical Air Proportioning System (5.1.3.6.3.13)*	*Medical Air Compressors (5.1.3.6)*	*Instrument Air Compressors (5.1.13.3.5)*	*Medical–Surgical Vacuum Pumps (5.1.3.7)*	*WAGD Producers (5.1.3.8)*	*Oxygen Concentrator (5.1.3.9)*
Carbon dioxide main line pressure low	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)						
Carbon dioxide changeover to secondary supply	5.1.3.5.12.6 5.1.9.2.4(1)	5.1.3.5.13.9(1) 5.1.9.2.4(1)								
Carbon dioxide main supply less than 1 day (low contents)			5.1.9.2.4(2), 5.1.3.5.14.4(1)	5.1.9.2.4(2), 5.1.3.5.14.4(1)						
Carbon dioxide reserve in use		5.1.3.5.13.9(3), 5.1.9.2.4(3)	5.1.9.2.4(3), 5.1.3.5.14.4(2)	5.1.9.2.4(3), 5.1.3.5.14.4(2)						
Carbon dioxide reserve supply less than 1 day (low contents)		5.1.3.5.13.9(4)	5.1.9.2.4(5), 5.1.3.5.14.4(3)	5.1.9.2.4(5), 5.1.3.5.14.4(3)						
Carbon dioxide reserve pressure low (not functional)			5.1.9.2.4(6), 5.1.3.5.14.4(3)							
Medical air main line pressure high	5.1.9.2.4(7)					5.1.9.2.4(7)				
Medical air main line pressure low	5.1.9.2.4(7)					5.1.9.2.4(7)				
Medical air changeover to secondary supply	5.1.3.5.12.6 5.1.9.2.4(1)									
Medical air dew point high						5.1.3.6.3.13(1) 5.1.9.2.4(10)				
Medical air production stop					5.1.9.2.4(13)					
Oxygen main line pressure high	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)						
Oxygen main line pressure low	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)						
Oxygen changeover to secondary supply	5.1.3.5.12.6 5.1.9.2.4(1)	5.1.3.5.13.9 (1) 5.1.9.2.4(1)								
Oxygen main supply less than 1 day (low contents)			5.1.9.2.4(2), 5.1.3.5.14.4(1)	5.1.9.2.4(2), 5.1.3.5.14.4(1)						

Δ ***TABLE A.5.1.9.2*** *(Continued)*

Alarm Condition	*Manifold for Gas Cylinders (5.1.3.5.12)*	*Manifold for Cryogenic Liquid Cylinders with Reserve (5.1.3.5.13)*	*Cryogenic Bulk with Cryogenic Reserve (5.1.3.5.14)*	*Cryogenic Bulk with Cylinder Reserve (5.1.3.5.15)*	*Medical Air Proportioning System (5.1.3.6.3.13)*	*Medical Air Compressors (5.1.3.6)*	*Instrument Air Compressors (5.1.13.3.5)*	*Medical–Surgical Vacuum Pumps (5.1.3.7)*	*WAGD Producers (5.1.3.8)*	*Oxygen Concentrator (5.1.3.9)*
Oxygen reserve in use		5.1.3.5.13.9(3) 5.1.9.2.4(3)	5.1.9.2.4(3), 5.1.3.5.14.4(2)	5.1.9.2.4(3), 5.1.3.5.13.9(4) 5.1.3.5.14.4(2)						
		5.1.9.2.4(5)								
Oxygen reserve supply less than 1 day (low contents)			5.1.3.5.14.4(3)	5.1.3.5.14.4(3)						
Oxygen reserve pressure low (not functional)			5.1.9.2.4(6), 5.1.3.5.14.4(3)							
Nitrous oxide main line pressure high	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)						
Nitrous oxide main line pressure low	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)	5.1.9.2.4(7)						
Nitrous oxide changeover to secondary supply	5.1.3.5.12.6 5.1.9.2.4(1)	5.1.3.5.13.9(1) 5.1.9.2.4(1)								
Nitrous oxide main supply less than 1 day (low contents)			5.1.9.2.4(2), 5.1.3.5.14.4(1)	5.1.9.2.4(2), 5.1.3.5.14.4(1)						
Nitrous oxide reserve in use		5.1.9.2.4(3), 5.1.3.5.13.9(3)	5.1.9.2.4(3), 5.1.3.5.14.4(2)	5.1.9.2.4(3), 5.1.3.5.14.4(2)						
Nitrous oxide reserve supply less than 1 day (low contents)			5.1.9.2.4(5), 5.1.3.5.14.4(3)	5.1.9.2.4(5), 5.1.3.5.14.4(2)						
		5.1.3.5.13.9(4)								
Nitrous oxide reserve pressure low (not functional)			5.1.9.2.4(6), 5.1.3.5.14.4(4)							
Medical–surgical main line vacuum low								5.1.9.2.4(8)		
WAGD main line vacuum low									5.1.9.2.4(11)	
							5.1.13.3.4.11	5.1.3.7.8	5.1.3.8.3.2	
Local alarm					5.1.9.2.4(9), 5.1.9.5.2, 5.1.3.6.3.14(C)(9)	5.1.3.6.3.12 5.1.9.2.4(9) 5.1.9.5.2	5.1.9.2.4(9) 5.1.9.5.2	5.1.9.2.4(9) 5.1.9.5.2	5.1.9.2.4(9) 5.1.9.5.2	

(*Continued*)

Δ *TABLE A.5.1.9.2* *(Continued)*

Alarm Condition	*Manifold for Gas Cylinders (5.1.3.5.12)*	*Manifold for Cryogenic Liquid Cylinders with Reserve (5.1.3.5.13)*	*Cryogenic Bulk with Cryogenic Reserve (5.1.3.5.14)*	*Cryogenic Bulk with Cylinder Reserve (5.1.3.5.15)*	*Medical Air Proportioning System (5.1.3.6.3.13)*	*Medical Air Compressors (5.1.3.6)*	*Instrument Air Compressors (5.1.13.3.5)*	*Medical–Surgical Vacuum Pumps (5.1.3.7)*	*WAGD Producers (5.1.3.8)*	*Oxygen Concentrator (5.1.3.9)*
Instrument air main line pressure high							5.1.9.2.4(7)			
Instrument air main line pressure low							5.1.9.2.4(7)			
Instrument air dew point high							5.1.13.3.4.11(A)(2) 5.1.9.2.4(12)			
Instrument air cylinder reserve in use (if provided)							5.1.13.3.4.11(B)(1)			
Instrument air cylinder reserve less than 1 hour supply							5.1.13.3.4.11(B)(2)			
Oxygen concentrator low concentration										5.1.3.5.11.13(2) 5.1.3.9.2(10)(c) 5.1.3.9.4.1(5) 5.1.9.2.4(14)(b)
Oxygen concentrator offline										5.1.3.5.11.12(5) 5.1.3.9.4.1(5) 5.1.9.2.4(14)(b)
Oxygen reserve in use										5.1.3.9.4.3(2) 5.1.9.2.4(3) 5.1.9.2.4(14)(c)
Oxygen reserve supply less than 1 day (low contents)										5.1.3.9.4.3(3) 5.1.9.2.4.(4) 5.1.9.2.4(14)(d)
Oxygen main line low concentration										5.1.3.9.4.2(4) 5.1.9.2.4(14)(g)
Oxygen main line high concentration										5.1.3.9.4.2(5) 5.1.9.2.4(14)(h)
Oxygen main line pressure high										5.1.9.2.4(7)
Oxygen main line pressure low										5.1.9.2.4(7)
Oxygen change of source										5.1.3.9.4.4(1)(a)
Oxygen concentrator internal pressure low										5.1.3.9.4.4(2) 5.1.9.2.4(14)(f)
Oxygen concentrator local alarm										5.1.9.2.4(9)

FAQ Why are two master panels needed in two locations?

The master panel listed in (1) allows the responsible person(s) to see which system alarm is activating and quickly respond to any alarm. This panel is not required to have continuous surveillance. The second master panel listed in (2) needs to be monitored "24/7/365" and is normally located in the security office, telephone switchboard office, or other similar area. When an alarm is activating, the person(s) monitoring the master alarm panel is required to immediately contact the person(s) responsible for maintaining the MGVS. See Exhibit 5.37 for an example of a master alarm panel.

If an alarm were to activate, it would indicate that an MGVS requires immediate attention and correction to operate properly for patient care. The master alarms, and the continuous monitoring of them, are critical to the safety of patients.

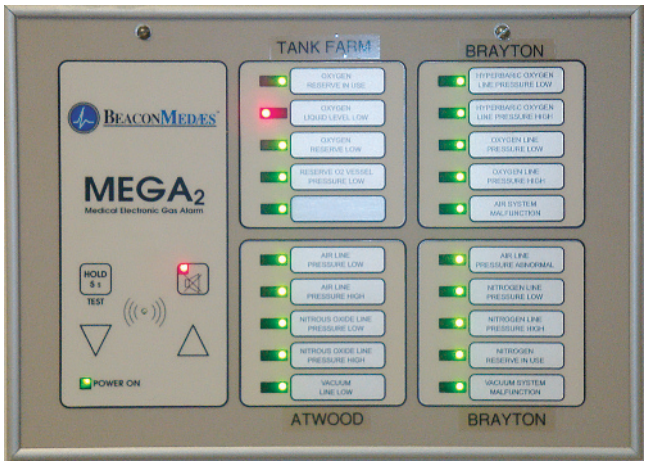

EXHIBIT 5.37

Master Alarm Panel Mounted on Wall in Hospital.

5.1.9.2.2 A centralized computer system shall be permitted to be substituted for one of the master alarms required in 5.1.9.2.1 if the computer system complies with 5.1.9.3.

A centralized computer system is permitted as a substitute for one of the medical gas and vacuum master alarm panels. An example of a centralized computer system is a building management system (BMS). The BMS is a computer-based system for centralizing and optimizing the monitoring, operation, and management of a building. Depending on the size of a facility and the installed hardware and software, the BMS may monitor and/or control the HVAC, security control systems, fire alarm systems, MGVS, elevators, power, and other facility utilities and functions.

5.1.9.2.3 The master alarm panels required in 5.1.9.2.1 shall communicate directly to the alarm-initiating devices that they monitor.

The subsections of 5.1.9.2.3 clarify the difference for requirements between wired communication (5.1.9.2.3.1) and other methods (5.1.9.2.3.2).

5.1.9.2.3.1 If communication is achieved by wires, the following shall apply:

(A) Each of the two mandatory alarms shall be wired independently to the initiating device(s) for each signal.

(B) The wiring between each mandatory alarm(s) and the initiating device(s) shall not utilize common conductors that, if interrupted, would disable more than one signal.

(C) Each set of wires (in whatever number as required by the alarm) shall run to the initiating device(s) without interruption other than in-line splices necessary to complete the necessary length of wire.

(D) Where initiating devices are remote from the building and the wiring is to run underground in compliance with *NFPA 70*, the following exceptions shall be permitted to be used:

(1) Wiring from the initiating device and through the underground section shall be permitted to be run to a junction box located where the wiring first enters the building.
(2) A single set of wires complying with 5.1.9.2.3.1(B) and 5.1.9.2.3.1(C) for each signal shall be permitted to connect the initiating device and the junction box.
(3) Between the junction box and the two mandatory alarm panels, wiring shall comply with 5.1.9.2.3.1(A) through 5.1.9.2.3.1(C), 5.1.9.2.3.4, and 5.1.9.2.3.5 in all respects.

Each master alarm panel requires independent wiring to each initiating device to ensure complete redundancy in the master alarm warning system. If one master panel loses power — if there is a disruption in the control boards of the master panel, if the control wires become separated from the dry connect connections, or if some other interruption occurs with one master panel — it will not affect the other master panel(s). The single initiating device can be wired to multiple panels; it is not necessary to have a single initiating device for each master panel. For example, if the central supply oxygen system has an oxygen reserve, there will be a single "oxygen reserve low" initiating device. This initiating device can be connected to multiple master alarm panels. The initiating device cannot be connected to one master alarm panel and wired in sequence, or "daisy chained," to a second master alarm.

5.1.9.2.3.2

In the 2015 edition the first allowance was made for "communication" between alarms and sensors rather than "wiring," which was previously the only allowed method. Wiring remains the standard against which other methods should be measured, as is reflected in the following language.

It is difficult to meet this standard with any of the other methods of communication available as of this writing. Wireless, the technique most often promoted for this application, suffers from short ranges and interferences of various kinds. Repeaters, which are the usual solution, introduce points of common failure that are proscribed under 5.1.9.2.3.2(B). Connections over networks (e.g., using the facility's IT network or a custom network) are equally powerful but require a variety of hardware to implement the network itself, any of which might pose a single point of failure. Other potential methods, such as fiber optics, are intriguing but not readily available or even well-suited to the application.

Therefore, this allowance is of interest mainly for the future, as techniques are developed that may overcome the drawbacks of the available technologies.

If communication is achieved by means other than wires, the following shall apply:

(A) Each of the mandatory alarms shall communicate independently to the initiating device(s) for each signal.

(B) The means of communication between each mandatory alarm(s) and the initiating device(s) shall not utilize a common communication device that, if interrupted, would disable more than one signal.

5.1.9.2.3.3 A single initiating device shall be permitted to actuate multiple master alarms.

5.1.9.2.3.4 The mandatory master alarm panels shall not be arranged such that failure of either panel would disable any signal on the other panel.

5.1.9.2.3.5 Where a relay is required to ensure correct operation of an initiating device, the control power for the relay shall not be such that disabling any master alarm panel would disable the relay.

5.1.9.2.3.6 Master alarm signals shall not be relayed from one master alarm panel to another.

5.1.9.2.3.7 Where multi-pole alarm relays are used to isolate the alarm-initiating signals to master alarm panels, the control power source for the relays shall be independent of any of the master alarm panels.

5.1.9.2.3.8 Multiple master alarms shall be permitted to monitor a single initiating device.

Δ **5.1.9.2.4** Master alarm panels for medical gas and vacuum systems shall each include the following signals:

(1) Alarm indication when, or just before, changeover occurs in a medical gas system that is supplied by a manifold or other alternating-type bulk system that has as a part of its normal operation a changeover from one portion of the operating supply to another
(2) Alarm indication for a bulk cryogenic liquid system when the main supply reaches one average day's supply, indicating low contents
(3) Alarm indication when, or just before, the changeover to the reserve supply occurs in a medical gas system that consists of one or more units that continuously supply the piping system while another unit remains as the reserve supply and operates only in the case of an emergency

The alarm condition in item (3) refers to the "reserve in use" signal, not the changeover alarm as listed in item (1). There has been some confusion due to the term *changeover* used to describe this alarm condition. When both the primary gas supply and the secondary gas supply — where a secondary gas supply is present, such as in manifolds for cryogenic containers — become depleted, the reserve source of medical gas will automatically activate and supply the medical gas distribution system. At this time, the "reserve in use" signal will activate and send a signal to the master alarm panels.

(4) Alarm indication for cylinder reserve pressure low when the content of a cylinder reserve header is reduced below one average day's supply
(5) For bulk cryogenic liquid systems, an alarm when or at a predetermined set point before the reserve supply contents fall to one average day's supply, indicating reserve low
(6) Where a cryogenic liquid storage unit is used as a reserve for a bulk supply system, an alarm indication when the gas pressure available in the reserve unit is below that required for the medical gas system to function

The alarm condition in item (6) refers to the "reserve low pressure" signal for a cryogenic liquid storage reserve tank. This alarm condition is similar to the "reserve low" signal listed in item (4) for high-pressure cylinders. As with high-pressure cylinder reserve supplies, the bulk liquid reserve source may supply the main medical gas distribution pipeline periodically, when the primary bulk liquid supply becomes depleted or is being serviced.

Other gas usage or losses of pressure in a bulk liquid reserve supply may be due to tank maintenance, leaks, or equipment failure. Whatever the case, this usage or loss of the liquid reserve over time may lead to a low-pressure point (before being filled by the gas supplier). If the low-pressure signal activation point is reached, a signal will be sent to the master panels indicating low pressure in the bulk liquid reserve supply.

(7) Alarm indication when the pressure in the main line of each separate medical gas system increases 20 percent or decreases 20 percent from the normal operating pressure
(8) Alarm indication when the medical–surgical vacuum pressure in the main line of each vacuum system drops to or below 300 mm (12 in.) gauge HgV

The alarm in item (8) is only required for low vacuum pressure. No alarm is required for high vacuum pressure. Unlike positive gas systems where the line pressure is regulated at the source of supply and failure of a component can cause elevated line pressure that can interrupt patient treatments, the vacuum system is regulated at the patient area usage point. Line pressure for vacuum ranges between 475 mm to 725 mm (19 in. to 29 in.) gauge HgV.

(9) Alarm indication(s) from the local alarm panel(s) as described in 5.1.9.5.2 to indicate when one or more of the conditions being monitored at a site is in alarm
(10) Medical air dew point high alarm from each compressor site to indicate when the line pressure dew point is greater than +2°C (+35°F)
(11) WAGD low alarm when the WAGD vacuum level or flow is below effective operating limits
(12) An instrument air dew point high alarm from each compressor site to indicate when the line pressure dew point is greater than −30°C (−22°F)
(13) Alarm indication if the primary or reserve production stops on a proportioning system
(14) When oxygen is supplied from an oxygen central supply system using concentrators *(see 5.1.3.9)*, the following signals shall be provided:
    (a) For each concentrator unit used in the oxygen central supply system, an alarm indication that oxygen concentration from that oxygen concentrator unit is below 91 percent
    (b) For each oxygen concentrator unit used in the oxygen central supply system, an alarm indication that the isolating valve for that oxygen concentrator unit is closed and the unit is isolated
    (c) For each cylinder header used as a source, an alarm indication that the header is in use
    (d) For each cylinder header used as a source, an alarm indication that the cylinder contents are below one average day's supply
    (e) If the source in use changes because of a failure to appropriately supply the system, an alarm indication indicating an unexpected oxygen supply change has occurred
    (f) An alarm indication that the pressure in the common line on the source side of the line pressure controls is low
    (g) An alarm indication that the oxygen concentration from the supply system is below 91 percent

Item (14) and its subparts add requirements for the alarms that are needed to support the oxygen concentrator supply systems now permitted.

Δ **5.1.9.2.5** The alarm indications required in 5.1.9.2.4(7) and 5.1.9.2.4(8) shall originate from sensors installed in the main lines immediately downstream (on the patient or use side) of the source valves. Where it is necessary to install a main line valve in addition to a source valve *(see 5.1.4.3)*, the sensors shall be located downstream (on the patient or use side) of the main valve.

The main line shutoff valve can usually be eliminated if the source of equipment is within the facility. If the main line valve is eliminated, the actuating switch for these signals must be installed immediately

downstream (on the piping distribution side) of the source shutoff valve. Supply systems remote from the facility (such as oxygen bulk supplies) would still require both a source valve and a main valve just inside the facility. The pressure switch in this instance would be just downstream of the main valve where it first enters the facility or building. The requirements are constructed so no switch should ever need to be placed outdoors.

5.1.9.3 Master Alarms by Computer Systems. Computer systems used as substitute master alarms as required by 5.1.9.2.1(2) shall have the mechanical and electrical characteristics described in 5.1.9.3.1 and the programming characteristics described in 5.1.9.3.2.

The intent of this section is to make sure that a computer system functions both mechanically and electrically and includes programming that allows it to act as a stand-alone panel, with the addition of features such as pagers, autodialers, and so forth. The requirements are divided into physical requirements (5.1.9.3.1) and programming requirements (5.1.9.3.2). These computer functions must be verified under 5.1.12.4.5.1(G), which might require the assistance of a programmer.

Δ **5.1.9.3.1** Computer systems used to substitute for alarms shall have the following mechanical and electrical characteristics:

(1) The computer system shall be in continuous uninterrupted operation and provided with power supplies as needed to ensure such reliability.
(2) The computer system shall be continuously attended by responsible individuals or shall provide remote signaling of responsible parties (e.g., through pagers, telephone autodialers, or other such means).
(3) Where computer systems rely on signal interface devices (e.g., electronic interfaces, other alarm panels, 4 mA to 20 mA cards), such interfaces shall be supervised such that failure of the device(s) shall initiate an alarm(s).
(4) If the computer system does not power the signaling switches/sensors from the same power supply required in 5.1.9.3.1(1), the power supply for the signaling switches/sensors shall be powered from the life safety branch of the essential electrical system as described in Chapter 6.
(5) Computer systems shall be permitted to communicate directly to the sensors/switches in 5.1.9.2.3 in the same manner as an alarm panel if operation of another alarm panel(s) is not impaired.
(6) Communication from the computer system to the signaling switches or sensors shall be supervised such that failure of communication shall initiate an alarm.
(7) Computer systems shall be provided with an audio alert per 5.1.9.1(3), except the audio alert shall be permitted to be only as loud as needed to alert the system operator.
(8) The facility shall ensure compliance with 5.1.9.1(13).

Δ **5.1.9.3.2** The operating program for computer systems used to substitute for alarms shall include the following:

(1) The medical gas alarm shall be allocated the priority of a life safety signal.
(2) A medical gas alarm signal shall interrupt any other activity of a lesser priority to run the alarm algorithm(s).
(3) The alarm algorithm shall include activation of an audible alert, activation of any remote signaling protocol, and display of the specific condition in alarm.
(4) The alarm algorithm shall provide for compliance with 5.1.9.1(1) through 5.1.9.1(5), and 5.1.9.1(8).

The intent of the operating requirements in the 4 items listed in 5.1.9.3.2 is to make sure that the use of a computer system for a master alarm does not minimize the critical response that one of these alarms should initiate. One concern over the allowance for computer systems is that the computer will be monitoring too many functions, and an MGVS alarm will not take precedence. Requiring that these be programmed to have the priority of life safety signals is intended to alleviate the concerns that medical gas alarms interrupt lesser priority activities and that they still provide an audible alert.

5.1.9.4* Area Alarms. Area alarm panels shall be provided to monitor all medical gas, medical–surgical vacuum, and piped WAGD systems supplying the following:

(1) Anesthetizing locations where moderate sedation, deep sedation, or general anesthesia is administered
(2)* Category 1 space

A.5.1.9.4 See Table A.5.1.9.4.

TABLE A.5.1.9.4 *Requirements for Category 1 Area Alarms*

Alarm Condition	*Requirement Location*
High line pressure (for each gas piped to the area)	5.1.9.3 5.1.9.3.1 5.1.9.3.2 5.1.9.3.4
Low line pressure (for each gas piped to the area)	5.1.9.3 5.1.9.3.1 5.1.9.3.2 5.1.9.3.4
Low medical–surgical vacuum (if piped to the area)	5.1.9.3 5.1.9.3.1 5.1.9.3.3 5.1.9.3.4
Low WAGD vacuum (if piped to the area)	5.1.9.3 5.1.9.3.1 5.1.9.3.3 5.1.9.3.4

A.5.1.9.4(2) Examples of Category 1 Space include post-anesthesia recovery, intensive care units, and emergency departments.

Area alarm panels are installed in patient care areas such as, but not limited to, post-anesthesia care units (PACUs), NICUs, ICUs, emergency rooms, delivery rooms, and operating rooms. The decision of whether to alarm an area piped with medical gas or vacuum should not be based on the name of that area but, rather, be based on the risk to the patient if the medical gas and vacuum were disrupted. An area alarm panel is not required at all patient care areas where medical gas and vacuum are located. Any patient care area where the disruption of the supply of gas or vacuum will not adversely affect patient care treatment will not require an area alarm. Exhibit 5.38 shows an area alarm panel for an operating room.

EXHIBIT 5.38

Area Alarm Panel. (Courtesy of Tri-Tech Medical, Inc.)

5.1.9.4.1* Area alarms shall be located at a nurse's station or other similar location that will provide for surveillance.

The proper location for an area alarm is inside the room or area being monitored by the alarm panel, near the nurses' station, or in another location that is most likely to be staffed whenever patients are present. The area alarm could be mounted in the hall near the zone valve box assembly, such as across from the nurses' station, if it can be continuously monitored.

FAQ Where should the area alarm be mounted if there is no nurses' station?

In occupancies that do not have a classic nurses' station area, alarms might be on a common wall visible to several nurses at all times. It is also permitted to install more than one alarm panel or relay signal. This might be necessary in occupancies that have only one large zone for an entire area or floor plans that are divided into several "pods." This would ensure that staff are warned about gas delivery problems even if no one is near a particular alarm panel.

Alarms are sometimes placed in each anesthetizing location. This arrangement exceeds the requirements of NFPA 99 and is thus permitted. A common case involves an anesthetizing location, where NFPA 99 allows an alarm for a "suite" of rooms but does not require an alarm for each room. Paradoxically, this is due to the fact that the OR is typically able to deal with loss of gas better than any other location in the facility, and the desirability of an alarm in the OR itself is questionable.

Nevertheless, when a facility does put an alarm in each OR, does it also need the "suite" alarm? There are two schools of thought. The first contends that the facility is at liberty to exceed the requirements of NFPA 99 but must still meet the minimum standard; consequently, yes, a "suite" alarm is still required. The second school of thought contends that an alarm in each OR exceeds NFPA 99 and therefore no "suite" alarm is necessary. The code itself only purports to be a minimum safe standard and offers no guidance whatsoever in cases where the facility elects to exceed the minimum.

In such cases, the only guidance must derive from intent, and owners must make decisions based on their own procedures and their own emergency plan. Clearly, the intent of alarms in the OR is to inform the staff so that they can act to preserve patients' lives and perhaps resolve the problem. An alarm in the OR clearly best achieves the first goal but, in fact, might do little to address the second. In a typical OR, it