

TYPICAL TOXIC GAS SYSTEM INSPECTION VIOLATIONS

The following is a list of typical violations often found by inspectors and a generic solution. You can use this list to improve the safety of your facility, to prepare for an upcoming inspection, or to develop your own self-inspection program. Note that specific code requirements may vary somewhat from jurisdiction to jurisdiction, so if you have questions or would like to know the specific code sections, please contact your local agency. (The reference number is used to make it easier to identify specific items; it does not refer to a code or ordinance.)

I. TYPICAL PERMIT VIOLATIONS

| No. | General Type | Description |
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| 100 | Permit | <ul style="list-style-type: none"> • Storage, use, or handling of regulated gases without a permit. © Submit required documentation to obtain a permit. |
| 101 | Release Notice | <ul style="list-style-type: none"> • Failure to notify the Fire Department of a regulated gas release. © Submit report of incident and change procedures to require immediate notification of unauthorized releases. |
| 102 | Interior Storage | <ul style="list-style-type: none"> • Failure to provide gas cabinets, laboratory fume hoods, exhausted enclosures, or separate gas storage rooms. © All regulated gases in quantities above the minimum threshold shall be stored within gas cabinets, laboratory fume hoods, exhausted enclosures, or separate gas storage rooms. |
| 103 | Ventilation | <ul style="list-style-type: none"> • Failure to provide required ventilation for gas cabinets, laboratory fume hoods, exhausted enclosures, or separate gas storage rooms, or • Failure to provide average velocity of 200 fpm at the face of access ports or windows and 150 fpm minimum at any point of the access port or window, or • Failure to provide independent exhaust or ventilation from gas cabinets in room. © Submit plans to provide required ventilation. |
| 104 | Cabinets | <ul style="list-style-type: none"> • Gas cabinets are not constructed of 12 gauge steel, or • Gas cabinets are not connected to a treatment system, or • Gas cabinets do not have self closing doors, self closing limited access ports or fire rated windows, or • Gas cabinets do not have negative pressure in relation to surrounding area. • Gas cabinets are not internally sprinklered © Submit plans to upgrade cabinet. © Repair or replace self closing mechanism. |
| 105 | Number of Cylinders | <ul style="list-style-type: none"> • Too many gas cylinders stored in a single gas cabinet. © The number of cylinders contained in a single gas cabinet shall not exceed three, one of which must be an inert purge gas. |
| 106 | Treatment Systems | <ul style="list-style-type: none"> • Failure to service, provide, or operate a treatment system so it is capable of reducing the maximum allowable discharge concentration of the gas to one-half the IDLH at the point of discharge. © Submit plans to provide or upgrade treatment system |

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| | | <p>© Service or operate system treatment system so it is capable of reducing the maximum allowable discharge concentration of the gas to one-half the IDLH at the point of discharge.</p> |
| 107 | Maintenance | <ul style="list-style-type: none"> • Failure to perform annual maintenance of all safety control systems. Ex: Monitoring system, scrubbers, seismic detectors, etc., or • Failure to maintain records of maintenance activities. <p>© Begin performing and documenting any maintenance performed on safety control devices.</p> |
| 108 | Seismic Bracing | <ul style="list-style-type: none"> • Gas cabinets, tanks, and/or piping observed to lack seismic bracing. <p>© Submit plans to provide seismic bracing.</p> |
| 109 | Sprinkler | <ul style="list-style-type: none"> • Failure to provide an automatic sprinkler system in all interior and exterior storage areas, and gas cabinets (see Cabinets above) <p>© Submit plans to provide an automatic sprinkler system.</p> |
| 110 | Incompatible Materials | <ul style="list-style-type: none"> • Incompatible materials stored together. <p>© Provide separate gas cabinets for incompatible materials or separate by 1 hour construction.</p> |
| 111 | Initial Leak Testing | <ul style="list-style-type: none"> • Initial leak testing procedures absent or inadequate. <p>© All containers of regulated gases shall be tested immediately upon delivery and immediately before shipping.</p> |
| 112 | Protective Caps | <ul style="list-style-type: none"> • Cylinders observed to be lacking protective caps and or plugs. <p>© All cylinders of regulated gases shall have protective caps and plugs when not in use.</p> |
| 113 | Emergency Response Plans | <ul style="list-style-type: none"> • Failure to provide an emergency response plan., or • Failure to conduct quarterly emergency drills. <p>© Submit or update the emergency response plan component of the HMBP,</p> <p>© Begin quarterly emergency drills and maintain records of same for three years.</p> |
| 114 | Distance Limitation | <ul style="list-style-type: none"> • Exterior storage too close to a building, property line, street, public way, or exit to a public way. <p>© No exterior storage area above exempt amounts shall be within 75 feet of a building, property line, street, public way, or exit to a public way unless there is an approved shielding structure.</p> |
| 115 | Air Intake | <ul style="list-style-type: none"> • Exterior storage too close to air intake. <p>© No exterior storage area shall be within 75 feet of an air intake.</p> |
| 116 | Local Exhaust | <ul style="list-style-type: none"> • Exterior stationary tank does not have a means of local exhaust or excess flow control, or • Pressure relief valve is not vented to a treatment system. <p>© Submit plans to provide local exhaust flow and or excess flow control.</p> <p>© Connect pressure relief valves to treatment system.</p> |
| 117 | Portable and Stationary Tanks | <ul style="list-style-type: none"> • Portable and/or stationary tanks not in ventilated room without other occupancy or use |

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| | | © Storage of portable and/or stationary tanks shall be in ventilated room without other occupancy or use, or must be stored outside in an approved manner. |
| 118 | Portable and Stationary Tanks | <ul style="list-style-type: none"> • Stationary tank is not labeled with maximum release rate. © Each valve or fitting shall be labeled with the maximum release rate. |
| 119 | Canopies | <ul style="list-style-type: none"> • Failure to store portable tanks and cylinders under a canopy constructed of non-combustible materials. © Submit plans to install a canopy. |
| 120 | Leaker Cabinet | <ul style="list-style-type: none"> • Failure to provide a gas cabinet or exhausted enclosure for leaking cylinders. © Provide either an approved gas cabinet or an exhausted enclosure for leaking gas cylinders. |
| 121 | Cylinder Restraints | <ul style="list-style-type: none"> • Gas cylinders observed without proper restraints. © All compressed gas cylinders must be secured to prevent falling with non combustible restraints. |
| 122 | Seismic Bracing | <ul style="list-style-type: none"> • Gas cabinets, tanks, and/or piping observed to lack seismic bracing. © Submit plans to provide seismic bracing. |
| 123 | Closure | <ul style="list-style-type: none"> • Failure to submit a closure plan. © Submit closure plan describing closure activities. |
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**II. TYPICAL TOXIC GAS SYSTEM VIOLATIONS FOR CLASS III GASES
(All of Section A plus the following:)**

| No. | General Type | Description |
|------------|---------------------|---|
| 150 | Gas Purge | <ul style="list-style-type: none"> • Failure to provide individually dedicated inert gas purge systems. © Provide an individually dedicated inert gas purge for each gas. |
| 151 | Compatible Piping | <ul style="list-style-type: none"> • Piping is incompatible with regulated material. © Submit plans to install new piping that is compatible with the regulated material. |
| 152 | Expansion Chambers | <ul style="list-style-type: none"> • No expansion chambers observed for gas systems requiring same. © Provide expansion chambers in accordance with nationally recognized standards. |
| 153 | No Smoking Signs | <ul style="list-style-type: none"> • No smoking signs were not observed within 25 feet of outdoor storage, use, and handling areas. © Provide No Smoking signs as required. |

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**III. TYPICAL TOXIC GAS SYSTEM VIOLATIONS FOR CLASS II GASES
(All of Section A and Section B plus the following:)**

| No. | General Type | Description |
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| 200 | Piping Connections | <ul style="list-style-type: none"> • Failure to provide piping with welded connections or exhausted enclosure. © Provide welded connections or exhausted enclosures for all Class I & II gases. |
| 201 | Piping for Corrosives | <ul style="list-style-type: none"> • Failure to provide piping of inert materials or secondary containment. © Primary piping shall be constructed of inert materials, or secondary containment shall be provided. |
| 202 | Manual Controls | <ul style="list-style-type: none"> • Failure to provide manual activation controls of "fail-safe to close" design at the point of use and near the source. © Provide an approved manual activation control for all Class I & II gases. |
| 203 | Emergency Power | <ul style="list-style-type: none"> • Failure to provide emergency power for the following: <ol style="list-style-type: none"> 1. Exhaust ventilation and treatment system 2. Gas detection system 3. Emergency alarm system 4. Temperature control systems © Provide an emergency power supply for the above listed items. |
| 204 | Excess Flow | <ul style="list-style-type: none"> • Failure to provide an excess flow control device for portable tanks and cylinders, or • Failure to permanently mark the excess flow control device with the maximum design rate. © Provide excess flow devices with permanent markings to indicate the maximum design flow rate for all cylinders. |
| 205 | Gas Detection & Monitoring | <ul style="list-style-type: none"> • Failure to provide a continuous gas-detection system, or • Failure to monitor the room or area where the gas is stored at or below the PEL, • Failure to monitor the discharge from a treatment system at or below IDLH, or • Failure to provide audible and visual alarms inside and outside the storage, use or handling area. © Provide a continuous gas detection system for all toxic gases |
| 206 | Seismic Shut-Off | <ul style="list-style-type: none"> • Failure to provide a seismically activated valve set to activate at 0.3g. © Provide a seismic control valve or device for all Class I & II toxic gases. |
| 207 | Emergency Alarms | <ul style="list-style-type: none"> • Failure to provide a local emergency alarm, or • Failure to transmit an alarm signal to a constantly attended control station for two or more cylinder storage. |

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| | | <ul style="list-style-type: none"> • Failure to provide local manual emergency alarm, emergency telephone, or signaling device where Class I & II gases are transported through exit corridors or exit enclosures. <p>© Submit plans to upgrade, service, or provide emergency alarm system</p> |
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IV. TYPICAL TOXIC GAS SYSTEM VIOLATIONS FOR CLASS I GASES
(All of Section A, Section B, and Section C, plus the following:)

| No. | General Type | Description |
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| 250 | Secondary Containment | <ul style="list-style-type: none"> • Failure to provide secondary containment for Class I gases capable of directing a release to treatment system, or • Failure to provide continuous monitoring of secondary containment. <p>© Submit plans to provide secondary containment. © Submit plans to provide continuous monitoring of secondary containment.</p> |
| 251 | Auto Shutdown | <ul style="list-style-type: none"> • Failure to provide an automatic "fail-safe to close" shut-off valve for the following: <ol style="list-style-type: none"> 1. Gas detection 2. Remote location alarm 3. Failure of emergency power 4. Seismic activity 5. Failure of primary containment 6. Activation of manual fire alarm <p>© Submit plans to provide the above listed items for all Class I gases.</p> |
| 252 | Reduced Flow Orifices | <ul style="list-style-type: none"> • RFO's observed to be missing or cylinders are not marked with RFO size. <p>© Provide RFO for all cylinders containing a previously designated DOT Poison A, regardless of quantity. All cylinders shall be marked with RFO size.</p> |
| 253 | Emergency. Control Station | <ul style="list-style-type: none"> • Failure to provide a continually staffed emergency control station. <p>© Provide a continually staffed emergency control station for all Class I gases.</p> |
| 254 | Breathing Apparatus | <ul style="list-style-type: none"> • Failure to provide breathing apparatus for class I or corrosive gases. <p>© Provide a minimum of two breathing apparatus and other appropriate protective equipment.</p> |
| 255 | Breathing Apparatus Location | <ul style="list-style-type: none"> • Failure to store breathing apparatus in a suitable location. <p>© Breathing apparatus shall be near the gases but in a safe place to put them on.</p> |