Carbon Monoxide Levels and Risks

CO level	Action
1-4ppm	Normal levels in human tissues produced by the body.
3-7ppm	6% increase in the rate of admission in hospitals of elderly for asthma (Sheppard-1999)
5-6ppm	Significant risk of low birth rate if exposed during last trimester (Ritz & Yu 1999)
5ppm	1st visual display on NSI 3000 low level CO monitor
9ppm	ASHRAE standard for allowable spillage from vented appliances, indoors, for 8 hours exposure daily. EPA standard for outdoors for 8 hours and a maximum 3 times per year. (Clean Air Act)
10ppm	Outdoor level of CO found associated with significant increase in heart disease deaths and hospital admissions for congestive heart failure. (JAMA, Penny) 1st Ambient level occupants should be notified -NCI protocol
15-20ppm	First level World Health Organization lists as causing impaired performance, decrease in exercise time and vigilance. 1st Alarm level for NSI 3000 Low Level CO Monitor - 5 minutes.
25ppm	Maximum allowable in a Parking Garage (International Mechanical Code)
27ppm	21% increase in cardio respiratory complaints (Kurt 1978)
30ppm	Earliest onset of exercise induced angina (World Health Organization) 1st Visual display on UL2034 approved CO Alarm -Must not alarm before 30 days
35ppm	US NIOSH recommended 8 hour maximum workplace exposure EPA Standard for outdoors for 1 hour and a maximum of 1 time per year Level many fire departments wear breathing apparatus before entering 2nd Ambient level occupants should be notified and space ventilated 2nd Alarm level for NSI 3000 low level Monitor for 5 minutes

CO Level	Action
50 ppm	US OSHA recommended 8 hour maximum workplace exposure Maximum NCI level for un-vented appliances
70ppm	1st Alarm level of UL2034 approved CO Alarms 2-4 hours 3rd Alarm level for NSI 3000 – 30 seconds NSI 3000 Low Level Monitor cannot be silenced by reset button
100ppm	Maximum NCI CO level during run cycle in all vented appliances (stable) Maximum NCI CO level for all oil appliances
200ppm	First listed level (established in 1930) healthy adults will have symptoms-headaches, nausea NIOSH & OSHA recommend evacuation of workplace Maximum "AIR FREE" CO for vented water heater and un-vented heaters (ANSI Z21) UL approved alarms must sound between 30-60 minutes (NSI 3000-30 seconds)
400ppm	Healthy adults will have headaches within 1-2 hours. Life threatening after 3 hours Maximum "Air Free" CO in all vented heating appliances (ANSI Z21) Maximum EPA levels for industrial flue exhaust UL alarms must alarm within 15 minutes (NSI 3000-30 seconds) Maximum recommended light off CO for all appliances (NCI - except oil)
800ppm	Healthy adults will have nausea, dizziness, and convulsions within 45 minutes. Unconscious within 2 hours then Death (established in 1930) Maximum "Air Free" CO for un-vented gas ovens (ANSI Z21)
800ppm +	Death in less than one hour
2000ppm	EPA Standard for new vehicle emissions
3000ppm+	Typical emissions from propane lift trucks, gasoline powered tools etc.