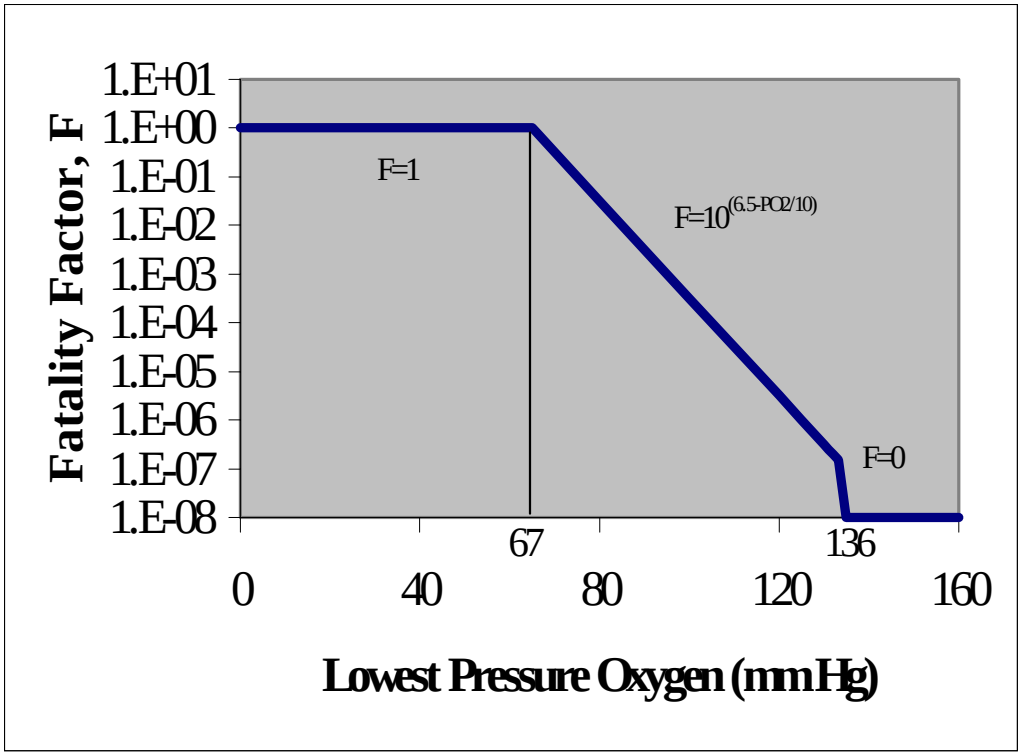
Calculation of the Fatality Factor, F

All exposures above 18% (137 mm Hg) are defined to be "safe" and to not contribute to fatality, therefore the value of F is zero. That is, if the lowest attainable oxygen concentration is 18%, then the value of F is 10^{-7}. This value would result in one fatality in 10 million hours. An expected rate of occurrence of the event of 1 per hour would result in F=1. At decreasing concentrations, the value of F should increase until, at some point, the probability of fatality becomes unity. That point was selected to be 8.8% (67 mm Hg) oxygen, the concentration at which one minute of consciousness is expected.

Figure A-1.



Fatality factor (F_i) versus the lowest attainable oxygen concentration

The value of F depends on the oxygen concentration, the duration of exposure and the difficulty of escape. For convenience of calculation, Figure A-1 defines the relationship between the value of F and the lowest attainable oxygen concentration. This relationship should be used when no better estimate of the probability of fatality from a given event is available. The lowest concentration is used rather than an average.

Oxygen concentrations can be converted to partial pressures by,

$$Po_2 = CPa$$

Where, C = oxygen concentration (volume %)
Po_2 = oxygen partial pressure (mm Hg)
Pa = atmospheric pressure (mm Hg), approximately 760 mm Hg at BNL