Shelter Chambers - Refuge Alternatives

BCMSA Section 106.2 Shelters and Chambers	**30 CFR. Parts 7 and 75**	**Stringent**
(1) - The shelter/chamber shall have at least 48 hours of life support, including air, water food and medical supplies, for maximum number of persons expected to be on the working section.	§ 7.506(b)(1) - The refuge shall have 96 hours of breathable air for each person. § 75.1506(b)(2&3) – A Refuge for: (1) Working sections shall accommodate the maximum number of persons that can be expected on or near the section at any time; and (2) Outby areas shall accommodate persons reasonably expected to use it.	The CFR is more stringent.
(2) - The shelter/chamber must be capable of surviving an initial event with a peak over pressure of 15 PSI for 3 seconds and a flash fire of 300 degrees Fahrenheit for 3 seconds.	§ 7.505(a)(4 and 5) – The refuge alternative must be capable of surviving an initial event with an overpressure of 15 PSI for 2 seconds and a flash fire of 300 degrees for 3 seconds.	The BCMSA is slightly more stringent.
(3) - The shelter/chamber shall be constructed in a manner that the shelter/chamber will be protected under normal handling and pre-event conditions.	§ 7.505(a)(7 and 8) – The refuge shall be made from reinforced material that has sufficient durability to withstand routine handling and resist puncture and tearing during deployment and use. Be guarded or reinforced to prevent damage to the structure that would hinder deployment, entry, or use.	Equivalent
(4) - The Shelter/chamber's atmosphere must have an oxygen concentration above 19.5% and a concentration of carbon dioxide below .5%	§ 7.506 (b)(2 and 3) – The refuges atmosphere shall contain an oxygen concentration between 18.5% and 23%. The average carbon dioxide concentration shall be 1% or less and excursions shall not exceed 2.5%.	The BCSMA is more stringent.

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(5) - The shelter/chamber's atmosphere shall contain less than 50 ppm carbon monoxide.	§ 7.508(a)(1) - The carbon monoxide level shall be less than 25 ppm.	The CFR is more stringent.
(6) - The shelter/chamber's apparent- temperature shall be 95 degrees Fahrenheit.	§ 7.504(b)(1) – The refuge's apparent-temperature shall be 95 degrees Fahrenheit.	Equivalent
(7) - the shelter/chamber shall be provided with the ability to monitor carbon dioxide and oxygen inside and outside the shelter/chamber.	§ 7.505 – at a minimum the refuge alternative shall have the ability to monitor the concentrations of carbon dioxide, carbon monoxide, oxygen and methane. In addition, the monitors shall measure the concentrations of any other harmful gases that the mine has a history of liberating. The air quality inside the chamber, in the air lock and outside the refuge alternative shall be monitored.	The CFR is more stringent.
(8) - There must be a means of exit and entry that maintains the integrity of the internal atmosphere.	§ 7.505(3) - The refuge must either have an isolating air lock or be capable of maintaining adequate positive pressure.	Equivalent
(9) - Power in the shelter/chamber shall be certified by MSHA as being intrinsically safe.	§ 7.7504(a)(1) - Electrical components that are exposed to the mine atmosphere shall be approved as intrinsically safe for use. Electrical components located inside the refuge alternative shall be either approved as intrinsically safe or approved as permissible.	Equivalent
(10&11) - Provide a minimum of 8 quarts of water and 4000 calories of food per person.	§ 75.1508(d)(1) – A minimum of 2,000 calories of food and 2.25 quarts of potable water per person per day.	The CFR is more stringent.
(12) - Provide a method for the disposal of human waste outside the shelter/chamber.	§ 7.504(3)(c) - The refuge must have a means for containing human waste and minimizing objectionable odors.	The BCSMA is more stringent.

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(13) –The shelter/chamber must have a first aide kit.	§ 75.1507(d)(4) – The refuge shall be provided with first aide supplies.	Equivalent
(14) – There must be provisions for inspecting the shelter/chamber and its contents.	§ 7.505(d)(1) – The refuge must provide a means to conduct a preshift examination, without entering the structure, of components critical for deployment.	The BCSMA is more stringent.
(15) - The shelter/chamber must contain the manufacturer - recommended repair tools.	§ 7.504(c) and § 75.1507(d)(5) – requires the refuge to contain repair materials, parts and tools.	The BCMSA is more stringent.
(16) - The shelter/chamber must be equipped with a battery powered strobe light indicating chamber is occupied.	No counterpart standard	The BCMSA is more stringent.
(17) - The shelter/chamber must have a method of communications with the surface.	§ 7.504(c)(1) - The refuge must contain a two-way communication facility that is a part of the mine communication system, which can be used from inside the refuge alternative; and accommodations for an additional communication system and other requirements as defined in the communications portion of the operator's approved Emergency Response Plan.	Equivalent
(18) - There must be proof of current approval for all items and materials.	§ 7.509 - (a) Each approved refuge or component shall be identified by a legible, permanent approval marking that is securely and conspicuously attached to the component or its container.	Equivalent