State of West Virginia
Earl Ray Tomblin, Governor
WV Office of Miners' Health, Safety & Training
Eugene White, Director
#7 Players Club Rd., Suite 2 • Charleston, West Virginia • 25311-1626
Telephone 304-558-1425 • Fax 304-558-1282
www.wvminesafety.org

May 8, 2013

Ed Roscioli, CEO
ChemBio Shelter, Inc.
968 Postal Road, Suite 320
Allentown, PA 18109-9399

Subject: Additional Approvals of ChemoBio Shelter™ under WV Legislative Rule Title 56, Series 4 Emergency Rules Governing Protective Clothing and Equipment

Sir,

After review of documents submitted and a site visit to your facility in Sofia, WV your application for modification of the approvals for the ChemBio Shelter™ is hereby amended to incorporate a design change to existing ChemoBio Shelter™ approvals to provide an addition safety margin for brass regulators by placing them in a hermetically sealed box within the "safe area" following the proposals in the attached documents.

All ChemoBio Shelter™ units newly manufactured or refitted will be so equipped.

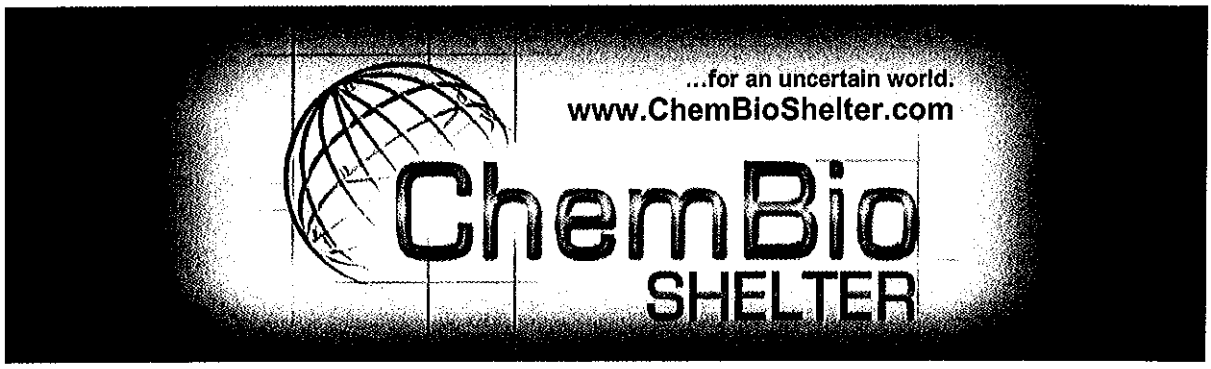
ChemBio Shelter™. Shall, upon request, provide this office with verification of valid orders, delivery dates, and status of delivery as required for this office to enforce §56-4-8.

Any changes required or enhancements to the approved design affecting the ability to meet any provision of §56-4-8 shall require approval of this Office prior to any affected the ChemBio Shelter™ being placed into operation.

Sincerely,

Eugene White

Eugene White, Director
Office of Miners' Health and Safety



Randall Harris
Consultant to the State of West Virginia
WV Office of Miners' Health Safety & Training
#7 Players Club Rd, Suite 2
Charleston, WV 25311-1626

May 7, 2013

Re: Request for Modification

Dear Mr. Harris,

The purpose of this letter is to seek approval from WVOMHST regarding the use of brass bodied air and oxygen regulators in our ChemBio Shelter models for the WV-MSHA refuge alternative refit program.

The proposed design change includes brass regulators placed in a hermetically sealed box within the "safe area". This provides a solution to the concern regarding de-zincification of brass by enclosing the regulators a hermetically sealed box within the sealed area of the shelter box.

You reviewed our shelter model 2428-20 LifeShelter, s/n LS12187, which was placed in service at United Coal's Locust Thicket mine on April 22, 2011. This shelter has also seen service at Wellmore Coal's Hiram Energy mine. This unit was currently in our shop for disassembly in preparation for the refit during your visit to our shop on Friday, May 3, 2013.

The attached Site Visit Photo 1 shows corrosion on the un-protected steel cylinder cap threads and the cadmium plated cylinder retainer bolts exposed to the mine atmosphere. Attached Site Visit Photo 2 is a close-up of a Cavagna CGA-701 oxygen cylinder valve showing obvious de-zincification residue, although there is no visual evidence of stress-corrosion cracking at this point. Attached Site Visit Photo 3 shows the current-style (no cover) high pressure regulator box removed from this unit. It is noted that the brass-bodied high pressure oxygen (left and center) and the high-pressure air regulators (right) are bright & shiny and exhibit no surface patina or evidence of de-zincification. This regulator box was mounted within the sealed "safe area" of the LifeShelter and connected by tubing through the bulkhead plate shown in attached Site Visit Photo 4 and 5.

Since the "safe area" is separated from the cylinder area (and the mine atmosphere) by a continuously welded ¼" steel plate as shown in attached Site Visit Photo 4, the proposed modification of the regulator boxes to provide an additional hermetically sealed area within the sealed "safe area" as presented in the attached pdf drawing is a conservative safety approach.

As discussed all gas connections thru the hermetically sealed regulator box will be stainless steel (air) and Monel (oxygen) bulkhead union fittings as currently used in our shelter bulkhead shown in attached Site Visit Photo 5.

The supply access door to the "safe area" will be sealed with RTV at final assembly and secured to the box weldment with 10-16 3/8"-16UNC hex head bolts (depending on the model) and four 3/8"-16UNC tamper-resistant fasteners to prevent removal of the door while the LifeShelter is underground.

The key to our proposal is the added precaution provided by sealing the regulators within an airtight box within the "safe area" and providing only bulkhead fittings for tubing connection. This provides an added level of protection beyond that demonstrated in the current "safe area".

The air within the high-pressure regulator boxes and the safe area will have the same chemical and humidity composition as the air in our shop until the LifeShelter is either activated or returned to ChemBio for future service. Since corrosion as the result of minor condensation is evident within the "safe area" of the unit inspected, we will place one of our currently used desiccant packs in each sealed panel box. This will minimize the condensation normally associated with lower ambient mine temperatures.

These individual panel boxes will not be opened underground. We will mount the hermetically sealed regulator boxes on the horizontal cross-tubes at the top of the shelter box weldment to protect against accidental contact when loading or transferring supplies in the "safe area".

Our proposed modifications provide the necessary additional level of safety margin to sufficiently protect the brass regulators from the stress-corrosion cracking phenomena previously observed in brass exposed to a mine atmosphere.

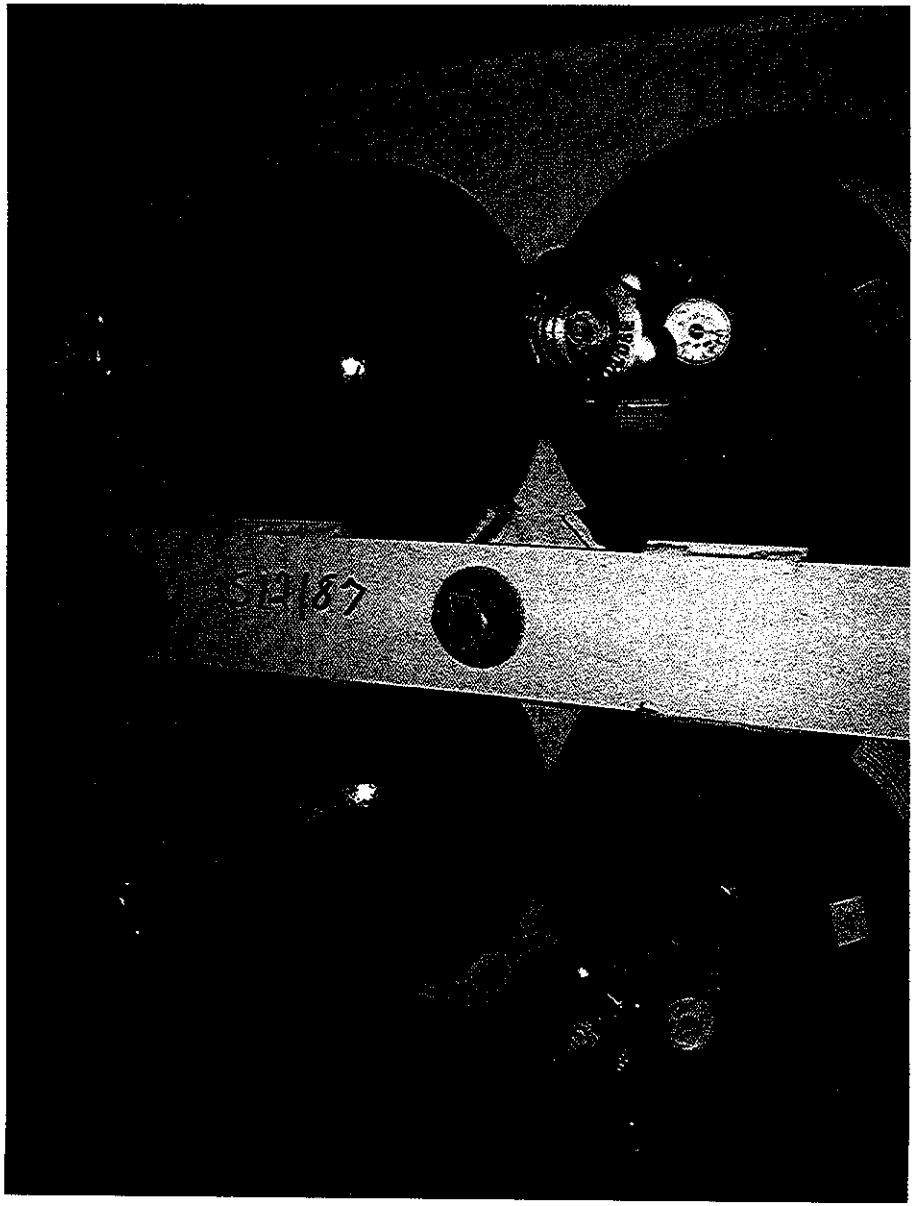
Thank you for your considerate attention to this matter. If you have any questions or need additional information, please feel free to contact me.

Have a great day!

Sincerely,

Edward V. Roscioli, CEO

Site Visit Photo 1



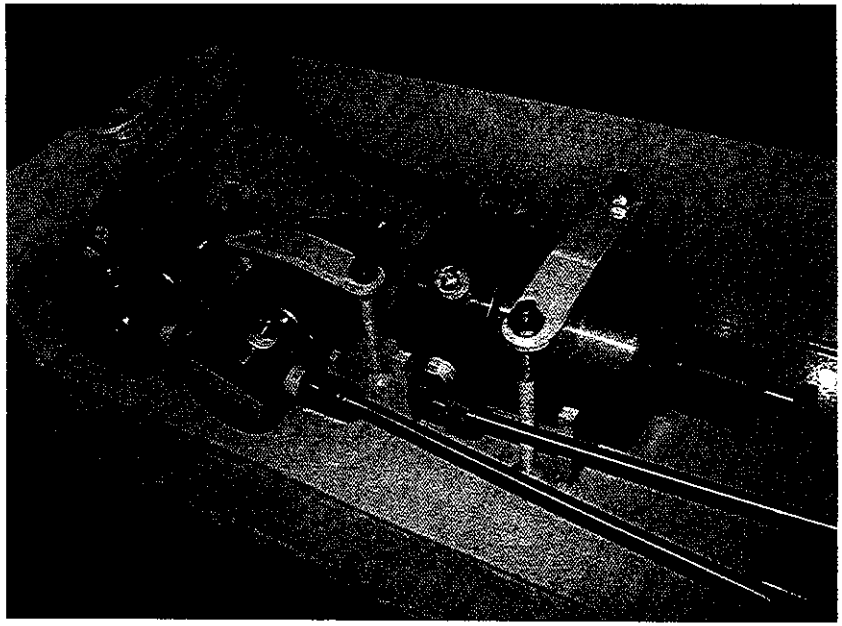
View of cylinder rack with green being oxygen and yellow air

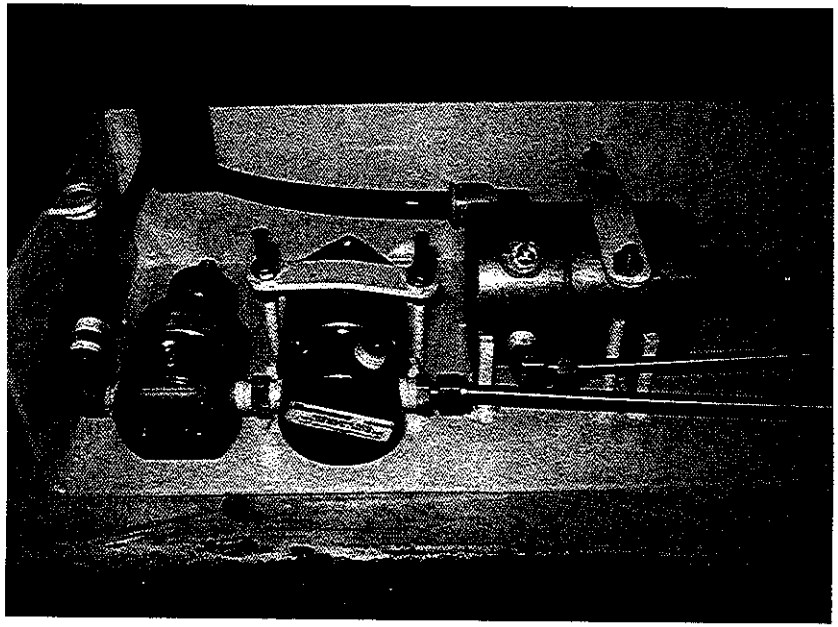
Site Visit Photo 2

Close up of one of the oxygen cylinders with the white residue typical of dezincification.

No visible signs of stress corrosion cracking were yet evident.

Site Visit Photo 3



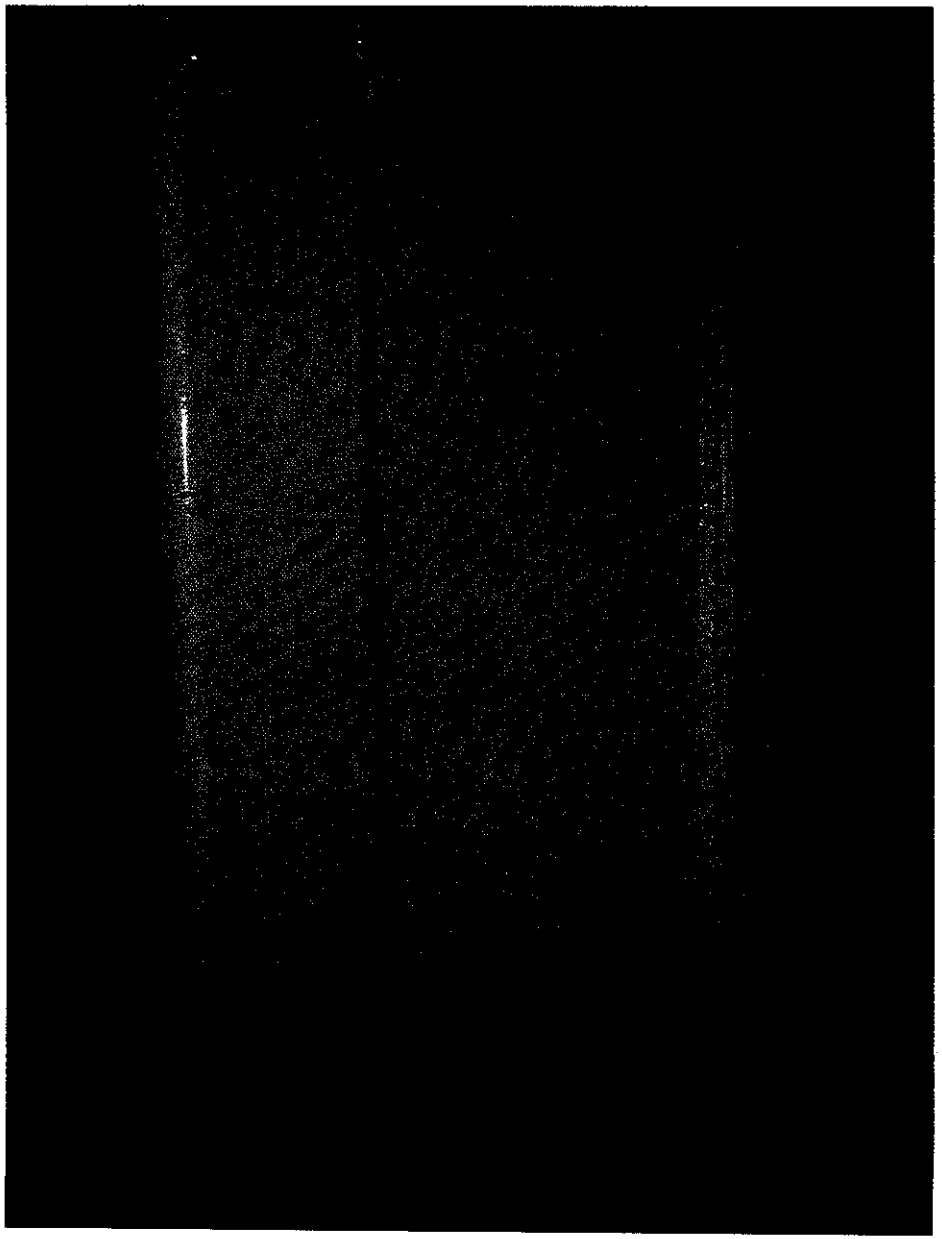


Two views of the current high pressure regulator box from the unit in for refit.

Although dezinicification was observed on the brass calendar valves in the tank section there was no evidence found in this box which was located in the :safe area" during the deployment period.

There was evidence of corrosion on the metal floor of the safe area but not on the walls of ceiling that is assumed to be the result of condensation from the humidity during assembly.

Site Visit Photo 4



Bulkhead between "safe area" and cylinder section.

Note bulkhead fitting holes for all gas lines.

Site Visit Photo 5

Bulkhead between "safe area" and cylinder section from the cylinder side.

Note bulkhead fitting holes for all gas lines.

Site Visit Photo 6

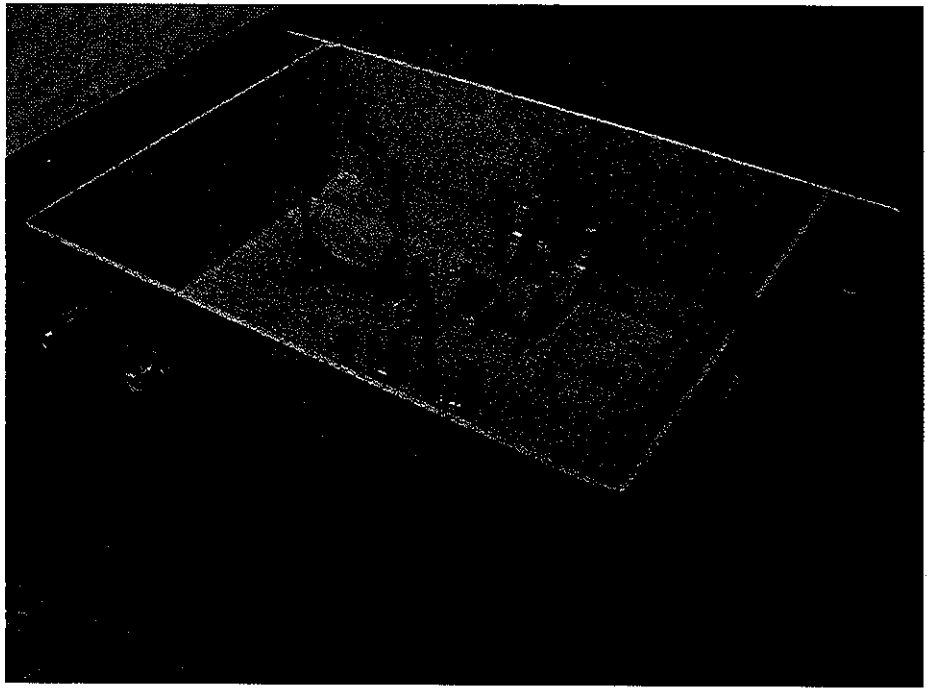
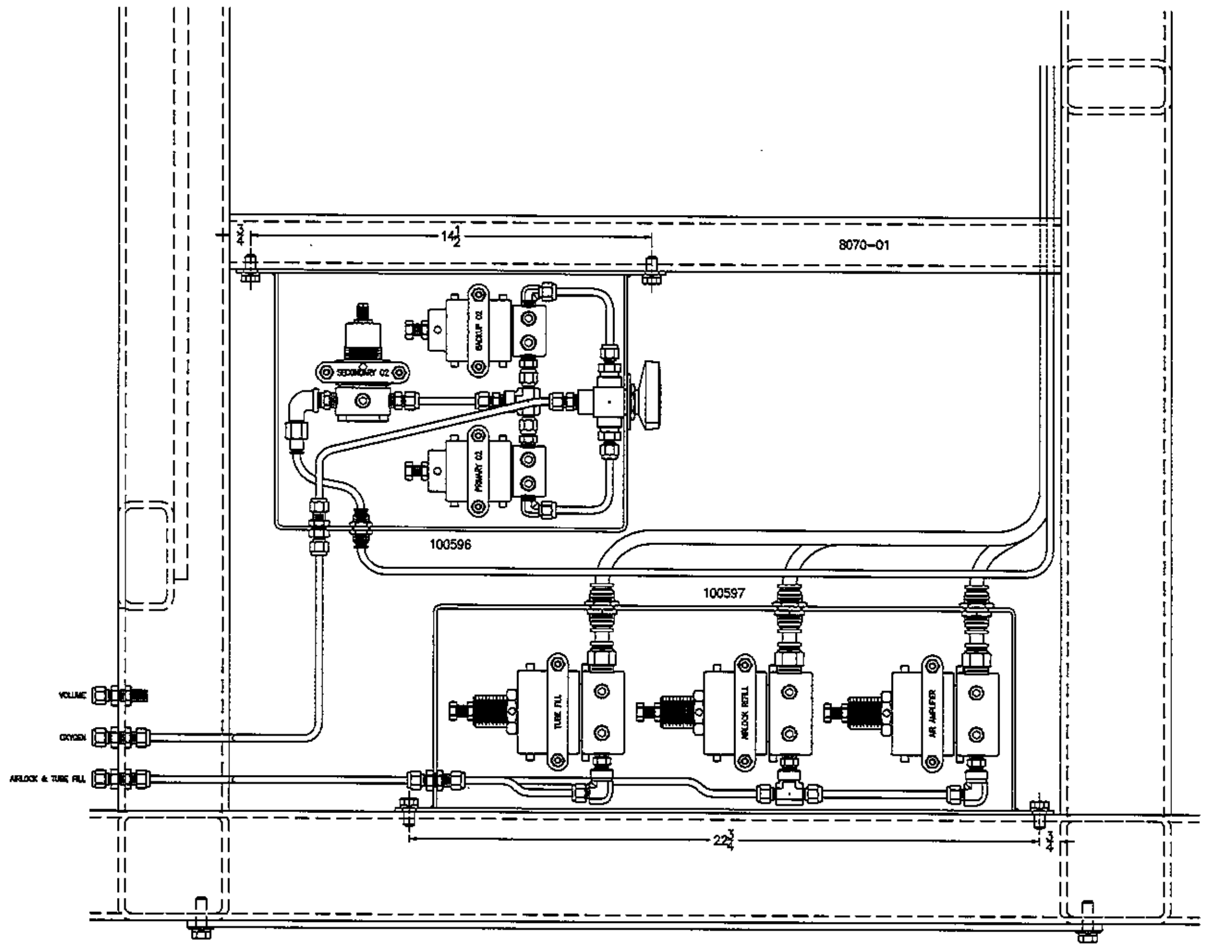


Photo of a new high pressure valve housing.

The proposal discussed was to seal the current opening used to pass tubing through and replace with bulkhead fittings.

After assembly and testing an desiccant pack would be inserted and a lid affixed with an appropriate gasket.



FRACTIONS	1/16"
.X	.1"
.XX	.02"
.XXX	.005"
ANGULAR	.5°
FINISH	125√

NEXT LEVEL ASSEMBLY

REGULATOR PANELS LAYOUT
HIGH PRESSURE AIR & OXYGEN

SCM 12-20-12

2013 REFIT

SCALE 1=2 SHEET 1 OF 1 REV D