

DEVELOPMENT OF A LOW-PROFILE RESCUE BREATHING APPARATUS AND A MINE RESCUE TEAM HELMET

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ABSTRACT

The Bureau of Mines has funded the development of two items of mine rescue team equipment in order to make mine rescue missions safer and more efficient. A 2-h breathing apparatus was developed with the goals of low profile, light weight, positive pressure, cooler breathing air, and low breathing resistance. These goals were achieved through the use of efficient design, proper choice of materials, dual spring-loaded breathing bags, and an internal heat exchanger. The apparatus, the LP-120, has a profile of 10 cm, weights 10 kg, and contains 240 L O₂. A rescue team helmet was also developed that combines the functions of full head protection, breathing apparatus facepiece, communications, and lighting. This helmet was designed to be used with the LP-120.

INTRODUCTION

Since mine rescue teams constitute a small market in the view of equipment manufacturers, their needs remain unfulfilled when they are unique. At present, mine rescue teams utilize equipment that largely has been designed for other purposes and are hampered in their duties by being forced to use safety equipment that only marginally serves their needs. Simply stated, the problem is that the more general the need, the more likely it is to be satisfied; whereas the more unique the need, the more likely it is to be unsatisfied.

The Bureau is attempting to solve the problem of how to advance technology in mine rescue team equipment through subsidizing its development costs. At present, the Bureau is involved with two such developments: a low-profile rescue breathing apparatus and a mine rescue team helmet.

DESCRIPTION OF APPARATUS

The low-profile rescue breathing apparatus is being developed by U.S.D. Corp. through contract H0123008. The mine rescue team helmet is being developed by Gentex Corp. through contract H0252050. Both pieces of equipment are being developed to improve the efficiency, safety, and comfort of mine rescue team members involved in mine rescue and recovery missions.

LOW-PROFILE RESCUE BREATHING APPARATUS