ISRP 2000 abstract

Presenter/author	Title	Abstract
Daniel, Bruce Engineering manager, S.E.A. Group, Sydney, Australia	**Effects of ventilation of protective suits in reducing heat strain**	Humans generate heat at all times, and the rate of heat generation increases with activity. To maintain a constant body temperature around 37oC this heat must be dissipated. A chemical protective suit, being impermeable to harmful gases, fluids and particles, is inherently a very good insulator of heat. In addition, to achieve good protection, the suit must be sealed to the wearer's body. It therefore offers a formidable barrier to heat transfer by convection, conduction, radiation and evaporation. A protective suit generally restricts the loss of the metabolic heat with the result that the wearer's body temperature never reaches equilibrium. The temperature of the body therefore rises until, in extreme cases, the wearer either collapses or is forced to stop working and remove the suit. A study has been undertaken to investigate the potential to improve heat dissipation from a chemical protective suit by using a ventilation system which bleeds filtered air from an FPBR (Fan-supplied Positive-pressure Breath-responsive air-purifying Respirator). The FPBR has the inherent ability to provide ventilating air at a rate approximately proportional to the exertion of the wearer because its blower fan speed responds to the breathing pattern of the wearer. This paper describes the initial theoretical study which models the heat flow conditions of a person wearing a chemical suit, and estimates the effect on core body temperature of ventilating the suit at various flow rates. Future research will include tests to determine the practical effects of such ventilation. The ultimate aim of the research project is to develop an integrated ventilation system which would provide heat dissipation close to optimum. This in turn would result in great improvements in both work efficiency and well-being of employees.