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Group**

**Z1010-18**  
National Standard of Canada



# Management of work in extreme conditions

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## **Z1010-18** **Management of work in extreme conditions**

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# Technical Committee on Work in Extreme Conditions

<b>L. Polley</b>	C & R Engineered Solutions Inc., Georgetown, Ontario <i>Category: General Interest</i>	<i>Chair</i>
<b>J. Thiessen</b>	Proactive Safety Solutions and Consulting, Winkler, Manitoba <i>Category: User Management</i>	<i>Vice-Chair</i>
<b>D.A. Aleven</b>	Aleve'n Inc., Owen Sound, Ontario	<i>Associate</i>
<b>S. Almosnino</b>	Resource Environmental Associates Limited, Markham, Ontario	<i>Associate</i>
<b>S. Bollito</b>	RUETGERS Canada Inc., Hamilton, Ontario <i>Category: User Labour</i>	
<b>R.E. Burley</b>	Mosaic Potash, Esterhazy, Saskatchewan	<i>Associate</i>
<b>M. Bussoli</b>	Apparel Innovation Centre, Calgary, Alberta	<i>Associate</i>
<b>K.L. Caldwell</b>	National Defence Headquarters, Ottawa, Ontario	<i>Associate</i>
<b>R. Chernish</b>	Department of National Defence, Winnipeg, Manitoba <i>Category: Government and/or Regulatory Authority</i>	
<b>C. De Roché</b>	Hatch Ltd., Mississauga, Ontario	<i>Associate</i>
<b>C. Dente</b>	Dentec Safety Specialists, Inc., Newmarket, Ontario <i>Category: Producer Interest</i>	

<b>J. Downey</b>	Bell, Mississauga, Ontario <i>Category: User Management</i>	
<b>C. Duval</b>	AECOM, Sherwood Park, Alberta	<i>Associate</i>
<b>A. Forrest</b>	International Association of Firefighters, Winnipeg, Manitoba	<i>Associate</i>
<b>J. Gagné</b>	WorkSafe NB, Grand Falls, New Brunswick <i>Category: Government and/or Regulatory Authority</i>	
<b>M. Gilston</b>	Canada Building Materials Company a Division of St. Marys Cement Inc., Toronto, Ontario	<i>Associate</i>
<b>R. Grikinis</b>	Liberty International Underwriters, Toronto, Ontario <i>Category: General Interest</i>	
<b>M.L. Hall</b>	IBEW Local Union 636, Woodlawn, Ontario <i>Category: User Labour</i>	
<b>A. Heinrichs</b>	WorkSafe BC, Vancouver, British Columbia <i>Category: Government and/or Regulatory Authority</i>	
<b>J. Hoffman</b>	Hydro One, Burlington, Ontario <i>Category: User Management</i>	
<b>G. Hunter</b>	LaCrosse Footwear, Inc., Portland, Oregon, USA	<i>Associate</i>
<b>L.C. Hyllengren</b>	Red Wing Shoe Company, Red Wing, Minnesota, USA <i>Category: Producer Interest</i>	
<b>V. Quierdo</b>	CTT Group, St-Hyacinthe, Québec <i>Category: General Interest</i>	

<b>R. Jarvis</b>	Ford Motor Company of Canada, Limited, Oakville, Ontario <i>Category: User Management</i>	
<b>T. Kamm</b>	Alberta Labour, Edmonton, Alberta <i>Category: Government and/or Regulatory Authority</i>	
<b>N. Koehncke</b>	University of Saskatchewan, Saskatoon, Saskatchewan <i>Category: General Interest</i>	
<b>G.F. Lamy</b>	Conseil du patronat du Québec, Montréal, Québec	<i>Associate</i>
<b>R.H. LeChien</b>	BDL Consulting, Toronto, Ontario	<i>Associate</i>
<b>D. Levesque</b>	Royal Canadian Mounted Police, Ottawa, Ontario	<i>Associate</i>
<b>C.L. Lockhart</b>	Horizon Health, Moncton, New Brunswick	<i>Associate</i>
<b>J. Mavrinac</b>	International Association of Fire Fighters (IAFF), Porcupine, Ontario <i>Category: User Labour</i>	
<b>D. Mazier</b>	Canadian Federation of Agriculture, Justice, Manitoba <i>Category: User Labour</i>	
<b>K. Messenger</b>	Enger Safety Group, Truro, Nova Scotia	<i>Associate</i>
<b>T. Mulholland</b>	Rack-Net-Works, Mississauga, Ontario	<i>Associate</i>
<b>J. Ogilvie</b>	Public Services Health and Safety Association (PSHSA), Brampton, Ontario <i>Category: General Interest</i>	
<b>E. Padua</b>	Red River College and EP Safety and Health Consulting and Associates, Winnipeg, Manitoba	<i>Associate</i>

<b>W. Pardy</b>	RothLochston, Paradise, Newfoundland and Labrador	<i>Associate</i>
<b>B. Parmar</b>	Greater Toronto Airports Authority (GTAA), Toronto AMF, Ontario	<i>Associate</i>
<b>K. Regular</b>	Vale Manitoba Operations, Thompson, Manitoba <i>Category: User Management</i>	
<b>J. Sheppard</b>	Powell Contracting, Gormley, Ontario	<i>Associate</i>
<b>C. Smelt</b>	General Motors of Canada Ltd., Oshawa, Ontario	<i>Associate</i>
<b>L. Smith</b>	Toro Aluminum, Concord, Ontario <i>Category: User Management</i>	
<b>B. Spiller</b>	The Timberland Company, Stratham, New Hampshire, USA	<i>Associate</i>
<b>F. Switzer</b>	Outdoor Outfits, Toronto, Ontario <i>Category: Producer Interest</i>	
<b>C. Throssell</b>	Vale Canada Ltd., Copper Cliff, Ontario	<i>Associate</i>
<b>R. Volkman</b>	JEDROC Consulting Services Ltd., Ladysmith, British Columbia	<i>Associate</i>
<b>R. Williams</b>	Doubletex, Montréal, Québec <i>Category: Producer Interest</i>	
<b>D. Shanahan</b>	CSA Group, Toronto, Ontario	<i>Project Manager</i>

# Preface

This is the first edition of CSA Z1010, *Management of work in extreme conditions*. It is based on an Express Document, CSA EXP1010, published in 2016.

The purpose of this Standard is to address the application of occupational health and safety management systems to plans for work performed under heightened-risk conditions presented by extreme environmental temperatures, severe weather, low or high atmospheric pressure, and poor air quality (causing impairment of breathing or visibility). CSA Z1010 is the latest addition to the Z1000 series of OHS management systems standards. It is designed to be used within an OHS management system in conjunction with the other standards in the Z1000 series.

This document has been developed by the Technical Committee on Work in Extreme Conditions, under the jurisdiction of the Strategic Steering Committee on Occupational Health and Safety, and will be submitted for formal approval by the Technical Committee.

This Standard has been developed in compliance with Standards Council of Canada requirements for National Standards of Canada. It has been published as a National Standard of Canada by CSA Group.

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  - c) *wording of the proposed change; and*
  - d) *rationale for the change.*

# Z1010-18

## ***Management of work in extreme conditions***

### **0 Introduction**

#### **0.1 General**

Environmental conditions whether outside or inside buildings encountered by workers can have a significant adverse effect on their health and safety. Completion of work tasks could be slowed or quality diminished as a result of exposure to extreme environmental/weather conditions.

The effects of extreme conditions can be both physiological and/or psychological. For example: physiological effects are determined by the ability of muscle cells to transform chemically bound energy from food intake into mechanical energy for muscular work. This process can be impaired by factors that reduce oxygen and fuel availability to muscle tissue. Psychological factors, including motivation and focus can also be influenced by the environmental conditions that the workers experience\*. The ultimate result can be injuries, occupational illness, reduced work output or decreased quality of work performed.

In many instances, environmental conditions cannot be controlled (or even accurately predicted). Changing conditions can heighten risk and create new hazards.

\* Rodahl, K. (2003) "Occupational Health Conditions in Extreme Environments", *The Annals of Occupational Hygiene*, Vol. 47, Issue 3, UK.

#### **0.2 Content of this Standard**

This Standard specifies the requirements for a management system for managing work performed both indoors and outdoors under conditions of:

- a) extreme heat (elevated temperatures);
- b) elevated humidity levels;
- c) extreme cold;
- d) high wind;
- e) extreme levels of precipitation;
- f) severe weather;
- g) high altitude;
- h) high and low atmospheric pressure conditions; and
- i) diminished visibility (e.g., absence of light, fog, smoke, smog, etc.).

In addition, this Standard addresses risk escalation factors such as those presented by complex terrain and remoteness of the work site.

This Standard is intended to be consistent with CAN/CSA-Z1000 in that a program to manage work in extreme environmental conditions can be integrated into an organization's existing occupational health and safety management system.

This Standard specifically addresses hazards and risk assessment (Clauses 5, 6, and 7), program planning and implementation (Clauses 8 and 9), and emergency preparedness (Clause 11). Examples of safe work programs, other resources, and cross references to other related standards are included in the Annexes.

This Standard also provides advice for dealing with unforeseen hazards and deteriorating conditions – when to stop work, and when to evacuate.

## 1 Scope

### 1.1

This Standard, following the principles set out in CAN/CSA-Z1000, specifies requirements for

- a) establishing and maintaining an extreme conditions management system in accordance with occupational health and safety management system (OHSMS) principles;
- b) the roles and responsibilities of the management representative, the monitoring team, and the worker;
- c) management of external service providers;
- d) establishing the parameters of extreme conditions;
- e) hazard identification and risk assessment relating to work in extreme conditions, including
  - i) high winds, tornados, hurricanes;
  - ii) extreme temperatures, hot and cold, humidity and wind-chill;
  - iii) heavy rain, lightning, flash flooding;
  - iv) icy conditions — ice buildup, slippery conditions, sleet and hail;
  - v) poor visibility (e.g., absence of light, fog, smoke, smog, etc.);
  - vi) terrain — rough, rocky, uneven, sloped;
  - vii) high altitude — low atmospheric pressure, hyperbaric – pressurized atmosphere; and
  - viii) ice roads — thickness, travel safetyboth individually and in combination, as well as considering risk escalation factors; and
- f) management and control of hazards and risk relating to work in extreme conditions, including
  - i) development of general safety procedures for extreme conditions;
  - ii) personal protective equipment (PPE) and apparel used for work in extreme conditions;
  - iii) health and safety monitoring systems for work in cold, damp, and high winds, as well as work in extreme heat and high humidity (both indoors and outdoors);
  - iv) health and safety monitoring systems for inclement weather and storms involving high winds, heavy rains, tornados, sleet and hail, lightning, and other severe weather conditions;
  - v) health and safety monitoring systems for work at high altitude, low atmospheric conditions and pressurized atmosphere, hyperbaric conditions (individually or in combination);
  - vi) emergency rescue plan development and implementation;
  - vii) travel/transportation to and from workplace;
  - viii) training for work in extreme conditions; and
  - ix) determining fitness for work in extreme conditions.

### 1.2

This Standard does not specifically address safety management of

- a) exposure to ionizing radiation;
- b) toxic or caustic atmospheres;
- c) high-noise and high-vibration environments;
- d) work in underwater environments;
- e) exposure to dangerous animals, insects, or plants; and

f) man-made conditions resulting from socio-political situations.

### 1.3

This Standard is designed to be used with related health and safety management standards, as well as related procedural standards. It is intended to be referenced by other standards as the primary set of requirements for health and safety management of work in extreme conditions. Although this Standard takes into consideration provincial, territorial, and federal legislation, it is not constrained by these regulations. It is intended to be used in conjunction with all provincial, territorial, or federal jurisdictions, and is designed for use in workplaces in all regions of Canada.

### 1.4

This Standard is designed for voluntary application in Canadian workplaces. However, the principles established in this Standard are based on best practices recognized internationally. As such, they may be applied to any workplace involving extreme conditions.

### 1.5

In this Standard, “shall” is used to express a requirement, i.e., a provision that the user is obliged to satisfy in order to comply with the standard; “should” is used to express a recommendation or that which is advised but not required; and “may” is used to express an option or that which is permissible within the limits of the Standard.

Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material.

Notes to tables and figures are considered part of the table or figure and may be written as requirements.

Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

### 1.6

The values given in SI units are the units of record for the purpose of this Standard. The values given in parentheses are for information and comparison only.

## 2 Reference publications

This Standard refers to the following publications, and where such reference is made, it shall be to the edition listed below, including all amendments published thereto:

#### **CSA Group**

Z275.1-16

*Hyperbaric facilities*

Z341 Series-14

*Storage of hydrocarbons in underground formations*

Z432-16

*Safeguarding of machinery*