

## Session 3

### Session 3: "Material Requirements"

#### Session Co-Chairmen

**Bill Roggensack**

Engineering Co-ordinator, Centre for Frontier Engineering Research

**Alain Le Bon**

Ingénieur en Chef, Direction Recherche-Développement, SOLLAC

**Session Co-Chairman:** Bill Roggensack is Engineering Coordinator at the Centre for Frontier Engineering Research. A graduate in civil engineering from the University of Alberta (BSc 1970; PhD 1977), Dr. Roggensack has more than 15 years of experience as a frontier consultant, specializing in arctic and geotechnical engineering. Prior to joining C-FER in 1987, he spent 12 years with EBA Engineering Consultants working as project director for a range of frontier resource development projects onshore and offshore in Canada, Alaska and elsewhere in the world. He is currently an executive member of the National Research Council's Associate Committee on Geotechnical Research and chairman of the NRC Marine Geotechnical Subcommittee.

**Session Co-Chairman:** Alain Le Bon spent many years with IRSID as a Research Metallurgist studying hot deformation, hot and cold rolling, weldability and fatigue. Now at SOLLAC (flat production branch) R and D, he is in charge of metallurgical problems in connections with plants.

**Session Abstract:** Materials which behave in a satisfactory manner in moderate environments may not be at all suitable in cold regions. Two reasons exist for this. First, the behaviour of the material may vary with temperature; generally, materials will become stronger but much less ductile with decreases in temperature. Second, the cold environment, or more specifically, large changes in temperature, may include strains into the structure which are beyond the capability of the material to withstand. The papers in this third session examine the behaviour of frozen soils, of steels and of bituminous pavements. In addition, the methodology for determining the effect of thermal changes on soil masses is outlined.

#### "Heat Transfer at Low Temperatures"

**Anne-Marie Cames-Pinteaux**

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**Author:** Anne-Marie Cames-Pinteaux has a doctorate in thermal science.