Fact Sheet

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Solutions to Icing and Ice Congestion at Navigation Locks

Purpose: To develop and demonstrate low cost ice control methods on a large scale at ice-affected locks.

Background: Ice interferes with winter operations many Corps locks. Common problems include congestion of lock approaches and lock chambers with broken ice pieces (brash ice) and icing of lock walls and miter gates. As a result, full lock dimensions are often unavailable, forcing tow size restrictions that can reduce waterway capacity by as much as 50%. While ice lockages and high flow bubblers help clear brash ice from the lock chamber, effective low cost solutions to lock wall icing do not exist. A number of innovative icing solutions have been evaluated at small scale (e.g., heat panels, low-adhesion materials, and electro-expulsive shedding), but no method has yet proved effective or economical for large areas. Because new lock construction and major rehabs are planned at ice-affected locations, this technology gap must be filled.

Facts: Existing ice control methods and recent gains have been evaluated, and most promising methods identified. The ice adhesion strength of paints, coatings and materials for use at navigation structures has been measured, and an electro-expulsion deicing panel has been successfully tested at Starved Rock Lock on the Illinois Waterway. With Bridgestone USA, CRREL has developed a prototype inflatable lock wall deicer, to be field-tested at a Corps project next winter. CRREL also assisted Pittsburgh District in the deicing design for floating guardwall at the new Charleroi Lock. For the Detroit District, CRREL is developing ice control measures for the planned 1200 ft lock at the Soo.

Inflatable lock wall deicer prototype

Electro-expulsion deicer on lock wall

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