Fact Sheet

RIVER CONFLUENCE ICE PROGRAM

PROBLEM

Ice accumulations and jams at river confluences slow down or altogether suspend shipping of critical supplies (coal, oil, and grain) in navigable rivers, and often result in damage at fleeting and mooring areas, including the loss of towboats and barges. These ice events can lead to significant damage to Corps of Engineers projects such as river training structures or bank-stabilizing riprap. Annual costs to the Corps are estimated to average $50 million, including structure damage and ice jam flood-fighting efforts. Private sector costs are also significant.

SOLUTION

Complete elimination of ice accumulation problems at river confluences is neither possible nor economically justifiable. Beginning in 1994 and running through 1998, the River Confluence Ice Program is addressing river confluence ice problems by developing practical methods of immediate use by Corps personnel to reduce the ice-event severity and frequency at the junctions of tributaries and their mainstems. Reductions in problem frequency alone will yield reductions in problem costs and average annual damages to Corps projects. Reduced losses by shoreline properties and commercial shipping are also expected.

The objectives of the River Confluence Ice Program are being accomplished in several ways. A prediction system is being developed for confluence ice accumulations, to include an early-warning capability. New and effective means to reduce or prevent the untimely entrance of ice into mainstem rivers from their tributaries are under development. Guidance is being created for including ice-jam/flow interaction in the operating plans of Corps hydraulic projects. The impacts of channel modifications on ice accumulation characteristics are under study. A strong technology transfer emphasis will yield information and guidance for Corps personnel to minimize the effects of river confluence ice accumulations.

RESULTS

The program began in FY 1994 with five active work units; for all work units, confluences with known ice jam potential were reviewed and selections made for initial studies. Historical site-specific data were gathered and analyzed for ice-event likelihoods. Existing structural ice control techniques were reviewed and operating experience updated. A nonstructural technique of darkening river ice just prior to spring breakup was evaluated in field trials. Existing guidance on project operations was assembled from District sources, and their coverage of operational procedures during periods of ice was assessed.

A sixth work unit became active during FY 1995. Additional confluences were reviewed and categorized for their characteristics and ice histories, and several more sites were selected for further study. Initial breakup prediction models were evaluated. Reports on the dusting of river ice covers with mulched leaves were prepared, and other ice weakening methods were being evaluated. A review of structural ice control methods was completed, and an ice-boom design manual has been prepared. Initial guidance on operational effects on upstream ice is being tested, and a contract on ice transport through generic confluences is underway.

Direct benefits to the Corps of Engineers are expected to become evident before the program concludes in FY 1998.

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