



**US Army Corps
of Engineers**
Rock Island District

LOCK & DAM 20 (CANTON, MISSOURI) MISSISSIPPI RIVER

General Contractors:

Lock: Maxon Construction, Dayton, Ohio

Dam: S.A. Healy Company, Detroit, Michigan, and Davenport, Iowa

Construction: 1932-1935

Congressional Districts: MO-9; IL-17

DESCRIPTION

Lock and Dam 20 is 343.2 miles above the confluence of the Mississippi and Ohio rivers. The complex stretches across the river at a point where the valley is quite wide, about five-miles wide at the level of the lock and dam. A levee and the Gregory Diversion Ditch separate the complex from the town of Canton.

The movable dam has three non-submersible roller gates (20-feet high and 60-foot long), 34 non-submersible Tainter gates (20-feet high and 40-foot long), and six submersible Tainter gates (20-foot high and 40-foot long). The submersible Tainter gates submerge three feet.

The lock dimensions are 110-feet wide by 600-feet long with additional provisions for an auxiliary lock. Normal upper pool elevation is 480.0; this is about 15 feet above the tail waters of the dam at low water. When both pools are at their normal depths, the difference is reduced to 10 feet or less.

The maximum lift is 10.5 feet with an average lift of 5.3 feet. It takes approximately 7 minutes to fill or empty the lock chamber. It takes 6 hours for water to travel from Lock and Dam 19, in Keokuk, Iowa, to Lock and Dam 20.

HISTORY/SIGNIFICANCE

The lock opened in 1935. Dam 20 was the first dam in the Rock Island District to include Tainter gates. The plans originally called for all of the Tainter gates to be operated by hoist cars traveling on the dam's service bridge. However, the District modified two Tainter gates so they were individually operated by line shafts and motors housed in installations above each gate. This operating machinery worked so well that all subsequent Tainter gates in the 9-foot channel project, regardless of which district they were in, used line shafts and motors. Lock and Dam 20 was the first complex in the District on the Mississippi River to undergo major rehabilitation. The lock and dam elements of the complex were completed at a cost of \$3,363,500.

ANNUAL TONNAGE (10-YEAR HISTORICAL)

<u>Year</u>	<u>Tons</u>	<u>Year</u>	<u>Tons</u>
1998	31,745,410	2003	30,811,633
1999	36,530,515	2004	25,228,357
2000	35,015,410	2005	25,564,051
2001	31,113,406	2006	27,584,821
2002	35,902,022	2007	26,423,478

(MORE INFORMATION ON THE REVERSE SIDE)

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COMMODITY TONNAGE & LOCKAGES (2007)

Coal	3,926,590	<u>Subtotals:</u>	
Petroleum	390,482		
Chemicals	2,928,533	Grain	15,096,740
Crude Materials	1,866,566	Steel	296,843
Manufactured Goods	739,733		
Farm Products	16,530,030	<u>Lockages:</u>	
Manufactured Machinery	27,410		
Waste Material	1,800	Boats:	3,168
Containers & Pallets	1,624	Cuts:	4,464
Unknown	10,710		

CURRENT MAINTENANCE ISSUES – LOCK & DAM 20

Item (Critical Rank Order)

Miter Gate Replacement
 Systemic Bulkhead Slots
 Lock Strut Arm Replacements and Traveling Kevel Rail
 Mule Replacements
 Systemic Miter Gate Replacement
 Raise Gate/Valve Machinery
 Systemic - Crane Rail Adjustments - Dam
 Structural Repairs - Tainter and Roller Gates - Interior
 Initiate Rehabilitation Evaluation Report for Ice/Debris Gate
 Systemic Structural Repairs Service Bridge Dam
 Systemic Structural Repairs - Tainter and Roller Gates - Exterior
 Miter Gate Machinery/Gearbox Repair
 Systemic Tainter Valve Replacement
 Lock Checkpost Replacement

Dam Rehabilitation Evaluation Report
 Repair Lock Ladder Recesses
 Repair Lock Armor Plates
 Replacing 70-Year-Old Lock Pontoon Barge (Work Flats)
 Lock Concrete Condition Survey and Repairs
 Repairs to Guide Cells and Erosion Repairs at Lower Ends
 Bridge Crane Repairs To Lattice Boom & Crane Undercarriage
 Repair Upstream Landwall Bullnose
 Replace Dam Decking
 Repair Downstream Dam Bullnose
 Control Station Repairs
 Rehabilitation of Lock Roadway
 Repair Canton Creek Bridge
 Systemic - Standby Generator and Compressor Enclosures

TOTAL ESTIMATED COST: \$40,900,000

The Water Resources Development Act of 2007 (WRDA 07) Title VIII authorized the dual-purpose navigation and ecosystem restoration plan for the Upper Mississippi River and Illinois Waterway. The new 1,200-foot lock, which will be located in the auxiliary lock chamber, will cost approximately \$221,000,000. The design and construction of the new lock is dependent upon annual appropriations.

The 9-foot Navigation Project was largely constructed in the 1930's and includes 37 Locks and 1,200 miles of waterway in Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The system's 600-foot locks require tows to split and lock through in two operations. This requires uncoupling barges which triples lockage times and exposes deckhands to safety risks.

More than 580 manufacturing facilities, terminals, and docks ship and receive tonnage on the system. In 2005, more than 160 million tons of cargo worth roughly \$28.5 billion moved on the system. Annually, the project generates an estimated \$1 billion of transportation cost savings compared to the operation and maintenance costs of approximately \$115 million.

In constant dollar terms, operations and maintenance funding for the system has been largely flat or declining for decades, while maintenance needs increase. Long-established programs for preventative maintenance have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the lock malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

POINT OF CONTACT

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