Lock & Dam 24

(Clarksville, Missouri)
Mississippi River

U.S. ARMY CORPS OF ENGINEERS **BUILDING STRONG®**

Construction: 1936-1940
General Contractor:
Lock and Dam: Central Engineering Company, Davenport, Iowa

Congressional District: MO-9; IL-17

Description

Lock and Dam 24 is located at Mississippi River mile 273.4, 93.5 miles upstream of St. Louis. Its 13,000-acre pool is 27.8 miles long.

Lock dimensions are the standard 110 by 600 feet, with the upper gate bay section of an auxiliary lock. Average lift is 15 feet. Unlike Locks 25 and Old Locks 26, which are pile-founded structures built atop sand and gravel, Lock 24 is founded on durable shale. Because of the presence of a firm foundation material, the lock chamber is not floored and no lateral struts were provided to stabilize the intermediate and river walls.

The 1,340-foot long movable dam has 15 fully submersible Tainter gates, 25 feet high by 80 feet long, which pivot vertically to control water flow. The gates are raised and lowered by individual electric motors, connected by line shafting to link-chain hoists, located beneath the dam service bridge. The piers provide support for the Tainter gates and the steel deck girder service bridge that extends the length of the dam. The dam includes a 2,720-foot submersible dike.

A major rehab of Lock and Dam 24 was completed in 2005. This work consisted of replacing a large portion of the concrete in the lock chamber walls, walkways and work areas. Also, new gate and valve machinery was installed elevating the electrical components above the 1993 flood levels.

History/Significance

The lock was put into operation on May 12, 1940. This was the first dam on the 9-Foot Channel Project constructed without roller gates. The submersible, elliptical Tainter gates of Dam 24 represent the apex of gate design achieved during the project. At the time of their construction, the Corps believed these gates to be the largest Tainter gates ever constructed. Because of the large size of the Tainter gates, and the relatively ice-free conditions of this stretch of river, roller gates were eliminated entirely from the dam design. These Tainter gates were innovative that they rendered roller gate technology, the principle engineering feature in dam construction at the time, obsolete.

Annual Tonnage (20-Year Historical)

Year	Tons	Year	Tons	Year	Tons	Year	Tons
1992	39,423,782	1997	33,614,330	2002	38,864,614	2007	30,145,700
1993	26,581,272	1998	34,747,480	2003	33,761,938	2008	23,133,551
1994	30,735,288	1999	39,296,994	2004	27,883,604	2009	26,682,701
1995	37,540,528	2000	38,697,993	2005	28,932,976	2010	24,127,530
1996	36,181,599	2001	34,785,352	2006	31,061,559	2011	22,927,332

Commodity Tonnage & Lockages (2011)

Coal	1,528,178
Petroleum	237,430
Chemicals	3,552,869
Crude Materials	2,554,426
Manufactured Goods	1,314,367
Farm Products	13,666,551
Manufactured Machinery	55,980
Waste Material	0
Containers & Pallets	1,600
Unknown	15,931

Subtotals:	Grain	12,224,669
	Steel	94,200
Lockages:	Commercial Boats:	1,789
	Recreation Boats:	495
	Light Boats:	102
	Other Boats:	47
	Total Boats:	2,433
	Total Cuts:	3,583

The 9-Foot Channel Project

Lock and Dam 24 is one of 29 locks and dams on the Upper Mississippi River that provide a water stairway of travel for commercial and recreational traffic from Minneapolis to the Gulf of Mexico.

The existing 9-foot Channel Navigation Project was largely constructed in the 1930s and extends down the Upper Mississippi River from Minneapolis-St. Paul to its confluence with the Ohio River and up the Illinois Waterway to the Thomas J. O'Brien Lock in Chicago. It includes 37 Locks and approximately 1,200 miles of navigable waterway in Illinois, Iowa, Minnesota, Missouri and Wisconsin.

The maintenance needs of the aging infrastructure are increasing at a rate much greater than the operations and maintenance funding provided for the system which adversely affects reliability of the system. Long-established programs for preventive maintenance of major lock components have essentially given way to a fix-as-fail strategy, with repairs sometimes requiring weeks or months to complete. Depending on the malfunction, extended repairs can have major consequences for shippers, manufacturers, consumers, and commodities investors.

Additionally, the system's 600-foot locks do not accommodate today's modern tows without splitting and passing through the lock in two operations. This procedure requires uncoupling barges at midpoint which triples lockage times and exposes deckhands to increased accident rates.

There are more than 580 manufacturing facilities, terminals, grain elevators, and docks that ship and receive tonnage in the Upper Mississippi River basin. Grains (corn and soybeans) dominate traffic on the system. Other commodities, mainly cement and concrete products, comprise the second largest group. A modern 15-barge tow transports the equivalent of 1,050 large semi-trucks (26,250 cargo tons, 875,000 bushels, or 17,325,000 gallons). Annually, the 9-foot project generates an estimated $1 billion of transportation cost savings compared with the operation and maintenance costs of approximately $115 million.