Auxiliary Miter Gates Replacements

Lock and Dam Maintenance
Workshop 2016

USACE MVR
Mississippi River Project Office
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MISSISSIPPI VALLEY DIVISION
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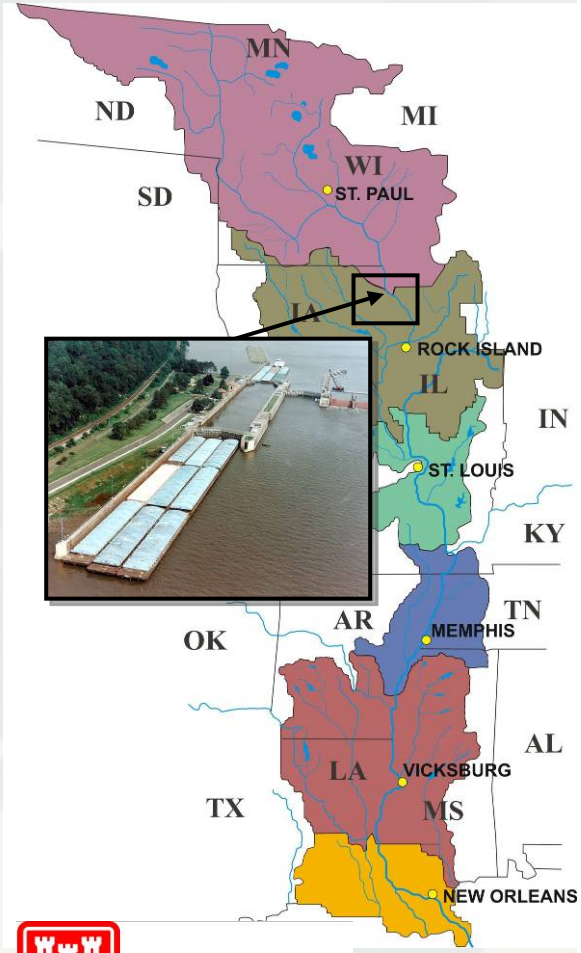
Execution Issues

- Delaying Replacement of these auxiliary (emergency) gates at Locks 11, 12 and 13 increases the risk unscheduled closure and increases the cost of completion.
- Economic cost – if facility has a significant unscheduled closure, the estimated daily cost is $515,500, as expressed in lost transportation savings (2004 data).

Notes

Lock & Dam No. 11, 12, 13 Auxiliary Gates

Rock Island District



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Project Description

- Lock and Dam 11 is located on the Upper Mississippi River, at river mile 583.0, in the town of Dubuque, Iowa.
- Lock and Dam 12 is located on the Upper Mississippi River, at river mile 556.7, in the town of Bellevue, IA.
- Lock and Dam 13 is located on the Upper Mississippi River, at river mile 522.5, in the town of Fulton, IL.
- Annual Tonnage: During the five year period 2001-2005, an annual average of 17.8 million tons of commodities traversed Lock and Dam No. 11; 19.4 million tons of commodities traversed Lock and Dam 12; 19.7 million tons traversed Lock and Dam 13.
- Annual transportation benefits for traffic utilizing Lock and Dam 11 were approximately $139,200,000 in 2004 with similar benefits at Lock and Dam 12 and 13.
- Recreational Utilization: During the five year period 2001-2005, an annual average of over 5,700 recreational vessels transited Lock and Dam 11.
- These auxiliary (emergency) gates are not part of an operational lock chamber however they do maintain the navigation pool. Severe corrosion has destroyed the main skin plates of these 70-year old gates (50-year design life).
- Failure of emergency gates would cause loss of the navigation pool and resulting closure to navigation. Closure of pool 11 would shut down the water plant for Dubuque, IA (population 90,000) and John Deere Harvester as well.

Current Issues / Status

- Package priority ranks 17th in MVD Backlog of Maintenance.
- Cost estimate is $7,765 million per site. This work includes installation of bulkhead slots and construction of new auxiliary (emergency) gates.
- Delays in performing work increases the total project cost and increases potential for downtime at Lock and Dam No. 11.
- No Auxiliary (emergency) gates have yet been replaced in Rock Island District. Lock and Dam 24 and 25 in St. Louis District had auxiliary gate replacement in the 2003 timeframe.
- The Auxiliary chamber was originally constructed as a means of passing traffic during national emergencies and also if failure occurred at the main lock chamber. Both the upper and lower sill elevation allows passage when gates are operated with assistance from a motor vessel.

Typical location of Emergency / Auxiliary gates.

Photographs

Date of Construction: 1934-1939
L/D11, L/D12, L/D13

Package priority ranks 17th in MVD Backlog of Maintenance. Auxiliary miter gates hold pool for pools 11, 12 and 13. Failure of gate would close navigation for an extended period.

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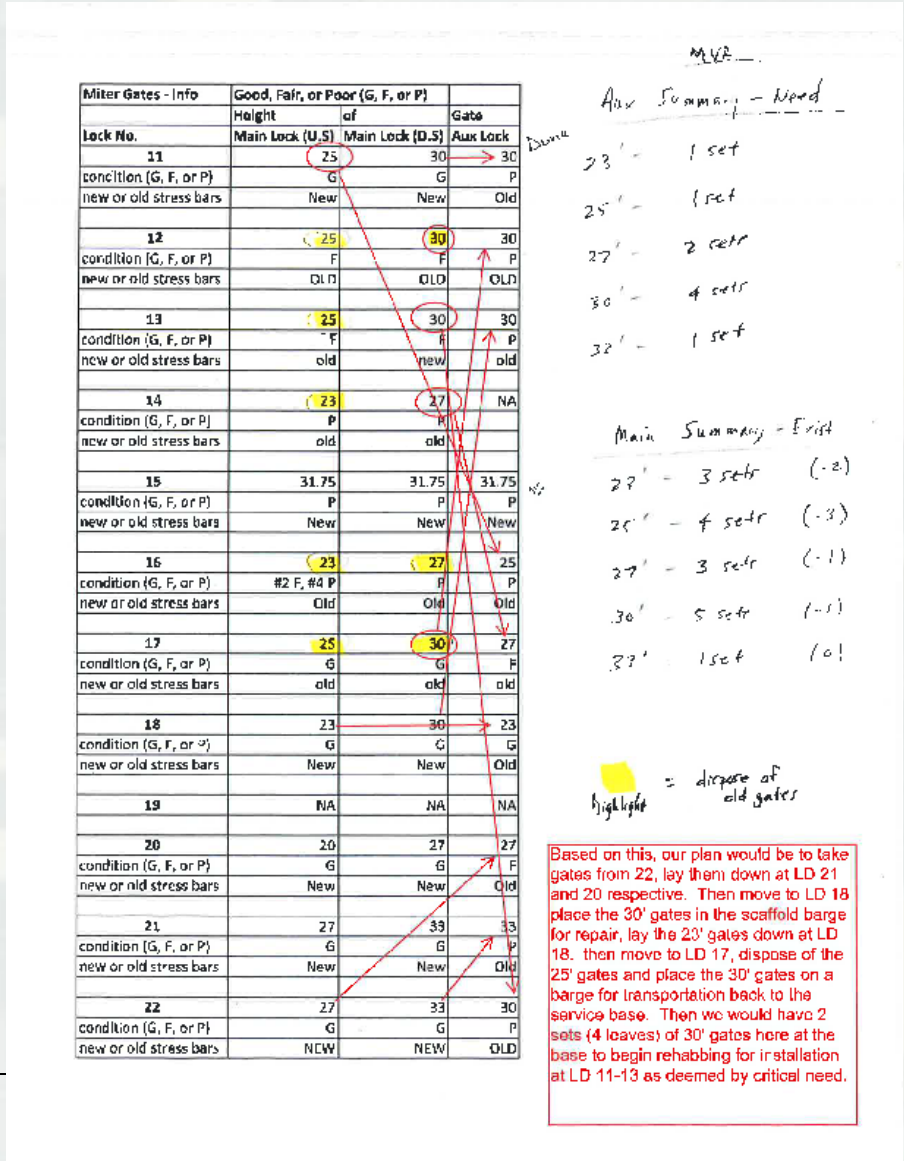
Scope of Work

- The old Lower Lock 18 M/G were used for the auxiliary at Lock 11.
- The old Lower Lock 17 M/G were used for the auxiliary at Lock 12.
- Typical problem from Lock 25 up the Mississippi.



Miter Gates - Info	Good, Fair, or Poor (G, F, or P)		
	Height	of	Gate
Lock No.	Main Lock (U.S)	Main Lock (D.S)	Aux Lock
11	25	30	30
condition (G, F, or P)	G	G	P
new or old stress bars	New	New	Old
12	25	30	30
condition (G, F, or P)	F	F	P
new or old stress bars	OLD	OLD	OLD
13	25	30	30
condition (G, F, or P)	F	F	P
new or old stress bars	old	new	old
14	23	27	NA
condition (G, F, or P)	P	P	
new or old stress bars	old	old	
15	31.75	31.75	31.75
condition (G, F, or P)	P	P	P
new or old stress bars	New	New	New
16	23	27	25
condition (G, F, or P)	#2 F, #4 P	P	P
new or old stress bars	Old	Old	Old
17	25	30	27
condition (G, F, or P)	G	G	F
new or old stress bars	old	old	old
18	23	30	23
condition (G, F, or P)	G	G	G
new or old stress bars	New	New	Old
19	NA	NA	NA
20	20	27	27
condition (G, F, or P)	G	G	F
new or old stress bars	New	New	Old
21	27	33	33
condition (G, F, or P)	G	G	P
new or old stress bars	New	New	Old
22	27	33	30
condition (G, F, or P)	G	G	P
new or old stress bars	NEW	NEW	OLD

Aux Summary - Need

23' - 1 set

25' - 1 set

27' - 2 sets

30' - 4 sets

32' - 1 set

Main Summary - Exist

27' - 3 sets (-2)

25' - 4 sets (-3)

27' - 3 sets (-1)

30' - 5 sets (-1)

32' - 1 set (0)

highlight = dispose of old gates

Based on this, our plan would be to take gates from 22, lay them down at LD 21 and 20 respective. Then move to LD 18 place the 30' gates in the scaffold barge for repair, lay the 25' gates down at LD 18. then move to LD 17, dispose of the 25' gates and place the 30' gates on a barge for transportation back to the service base. Then we would have 2 sets (4 leaves) of 30' gates here at the base to begin rehabbing for installation at LD 11-13 as deemed by critical need.

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Gate Change

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Gate Change

Auxiliary gates do not move and have no machinery.

Large amount of mud.

Gate Change

Quad Cities Heavy Lift Crane

Refurbished Gates excessed from New Miter Gate Program

Disposal

- Auxiliary Miter Gates from Lock 11 & 12
- Alter metal Recycling in Buffalo, IA

Pad Eye's

ANY QUESTIONS