

Miter Gate Pintle Ball Replacement

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Navigation System Operations Manager

Chouteau Lock and Dam 17

12 February 2013

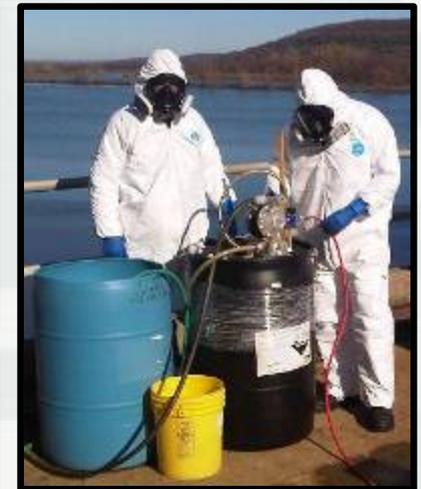


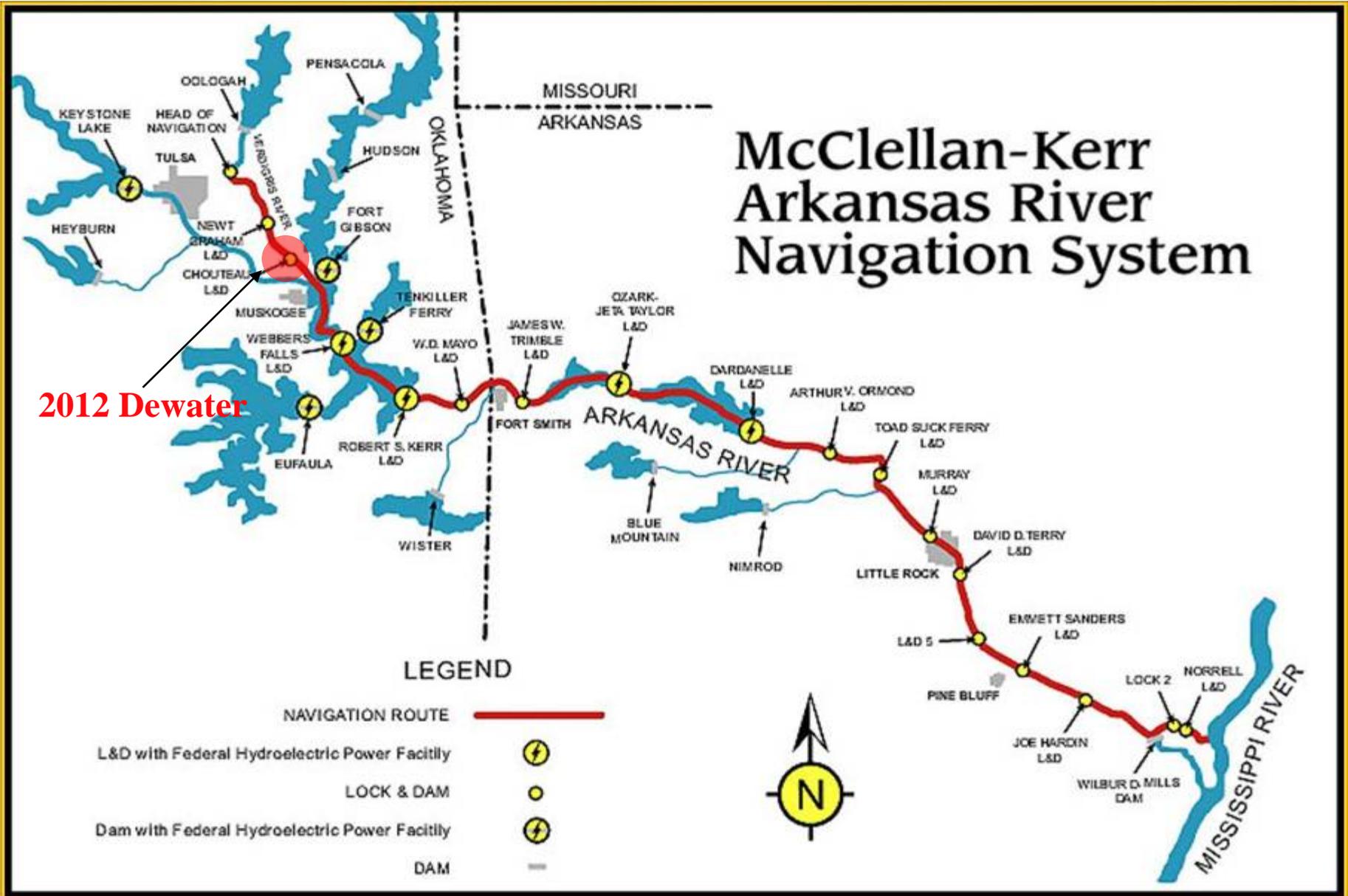
US Army Corps of Engineers
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SWT Navigation Project

- Maintain 9' depth for @ 150 miles of navigation channel
- Maintain serviceability of existing infrastructure
 - ▶ 5 Lock and Dams in Oklahoma
 - All Locks are 110' X 600' single chamber
 - Lifts range from 20' to 48'
 - Average age of Locks is 42 years
 - 3 to 18 Tainter Gates per Spillway
 - ▶ Navigation Office and Marine Terminal
- Project Personal
 - ▶ Project Office Staff
 - 1 Project Manager – BLM
 - 3 CE Tech - Hydrographic Survey Team
 - 2 Support Specialists and 1 Student Aide
 - ▶ Major Maintenance Unit
 - 1 Fleet Maintenance Manager
 - 1 Floating Plant with 8 crew members
 - 7 Major Maintenance employees
 - ▶ Lock and Dam Staff
 - 2 Operations Manager's
 - 5 Maintenance Hub Mechanic's
 - 25 Lock and Dam Operators
 - ▶ 1 Field Engineer assigned to Navigation





Chouteau Lock and Dam 17



Chouteau Lock 17





Background

- 2009 Dewater Findings
 - ▶ Ruptured Pintle Grease line
 - ▶ Wear gap over 3/16" (normal under 1/20")
 - ▶ Lubrication attempts unsuccessful
 - ▶ Conclusion grease grooves worn smooth

- 2010 Planning
 - ▶ Gather data/ parts list
 - ▶ Started procuring parts
 - ▶ Perused FY12 funding
 - ▶ LRL site visit
 - ▶ Jacking system plans

- 2011 Top Anchorage
 - ▶ Concrete breaking around embedded metal
 - ▶ Measured 1/32" movement during operation
 - ▶ Minimal movement on other Gates



21 Day Scheduled Closure

▪ Purpose

- ▶ Repair worn Miter Gate pintle to prevent future damage to embedded castings, eventual failure and unscheduled outage to navigation

▪ Scheduled work activities

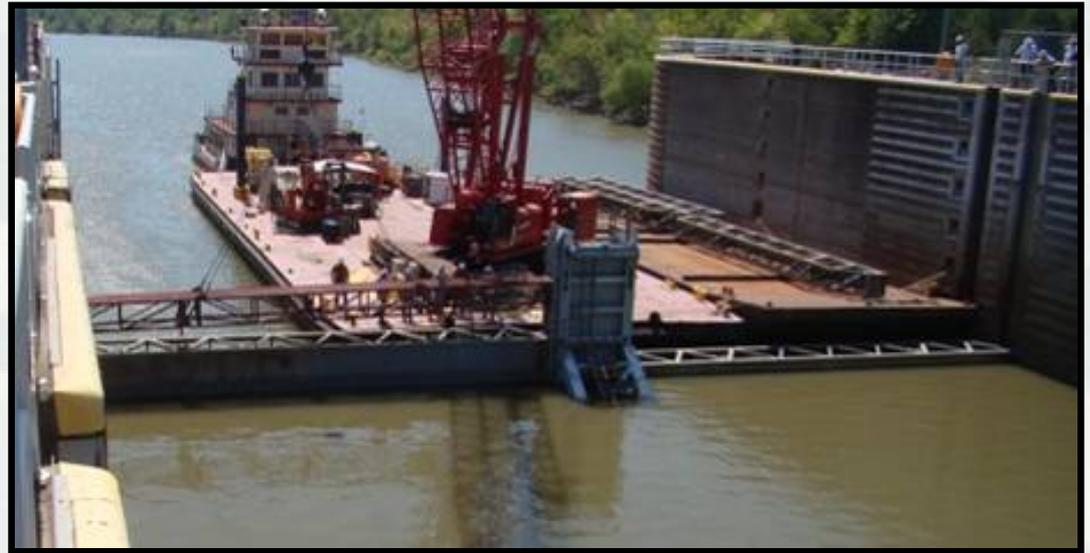
- ▶ Set/ pull Dewater Closure
- ▶ Remove silt/ debris load
- ▶ Erect/ disassemble Scaffolding
- ▶ Install/ remove jacking guide assemblies
- ▶ Disassemble/ reassemble top anchorage
- ▶ Raise/ Lower Miter Gate
- ▶ Replace Pintleball and Bushings
- ▶ Replace Pintle grease lines
- ▶ Replace Bottom Seals
- ▶ Tension Diagonals and survey Miter Gate
- ▶ ~~Re-surface Contact Blocks~~
- ▶ Fill-in/ weld guide mounting holes
- ▶ Spot paint



Work Crews

- Major Maintenance Unit (Fleet)
- Maintenance Hub (Mechanics)
- Lock Operators
- Electrical Section (Electricians)
- Safety Office Representatives
- Navigation Field Engineer
- Structural Engineer
- MVK Dive Crew (Pre-dive Inspection)
- SWL Dive Crew (Set Closure)

Set Dewater Closure



Center Post Receiver



AUG 2009



AUG 2012



Scaffolding – Safety Office Lead





Safety Measures



Unexpected Hazard

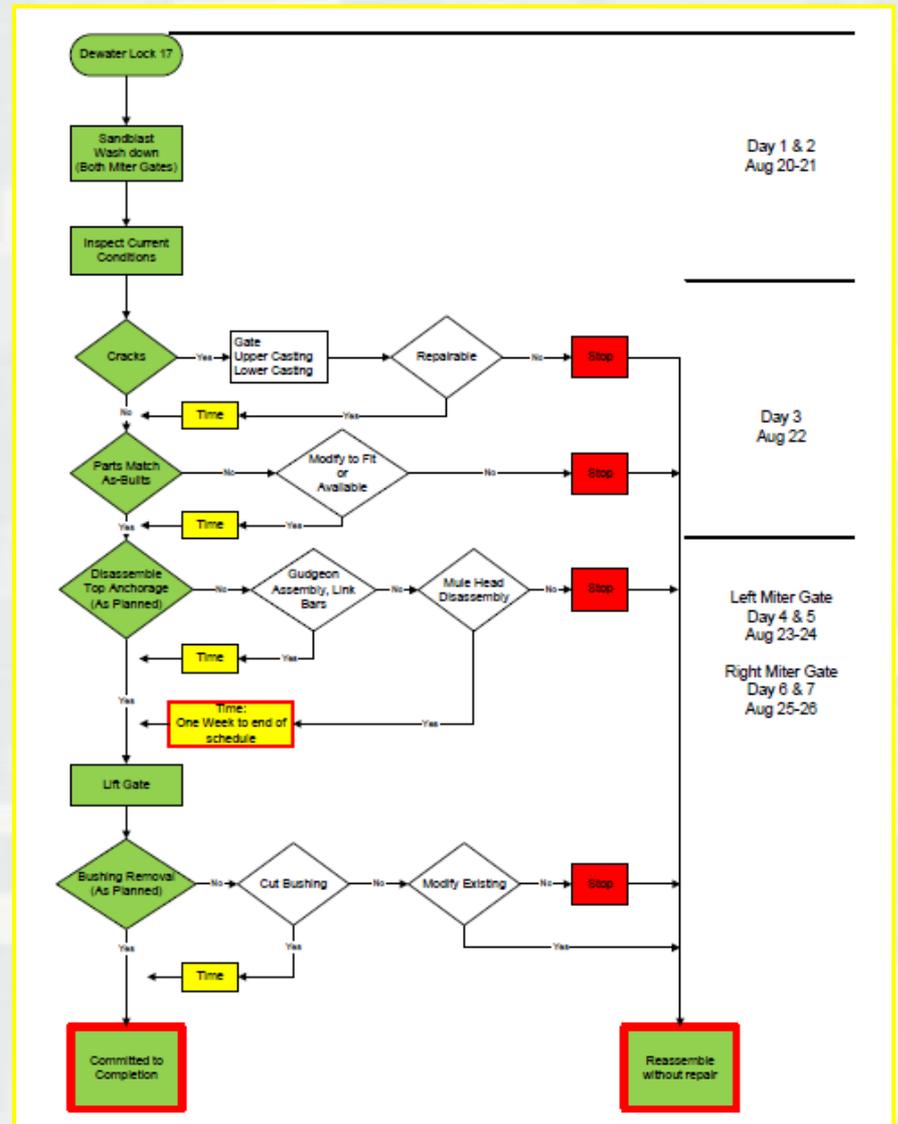


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Pintle Repair Decision Tree

Unknowns

- ▶ Condition of Castings
 - Upper damaged – extended closure
 - Lower damaged – show stopper
- ▶ Parts match As-Built Drawings
 - Incorrect size bushing
- ▶ Top Anchorage Disassembly
 - Mule Head Disassembly





Gate Guides



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Jacking System



Qty	Description	Size	Unit	Price
5	Cylinder RR20024	200 ton	\$14,152.00	\$70,760.00
3	Pump ZU4440PI-FG	10 Gal Tank	\$3,621.00	\$10,863.00
10	Hose: Manifold to Cyl	30 ft	\$368.00	\$3,680.00
5	Hose: Cyl to Manifold	10 ft	\$182.00	\$910.00
12	Coupler M-F 12ea		\$49.99	\$599.88
6	Gauge and Adapter 6ea		\$118.76	\$712.56
6	Auto-damper Valve		\$87.69	\$526.14
6	Safety Holding Valve		\$431.50	\$2,589.00
5	Manifold A-65	14 inch	\$130.70	\$653.50
6	Needle Valve		\$98.46	\$590.76
7	Oil HF-102	5 gal	\$156.25	\$1,093.75
1	Freight		\$2,500.00	\$2,500.00
Total:			\$95,478.59	





Top Anchorage Disassembly





Raise Miter Gate





Additional Hazards





Pintleball and Bushing Removal



Bushing Removal





Pintleball and Bushing Installation



Lower Miter Gate





Top Anchorage Assembly





Success



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Additional Activities



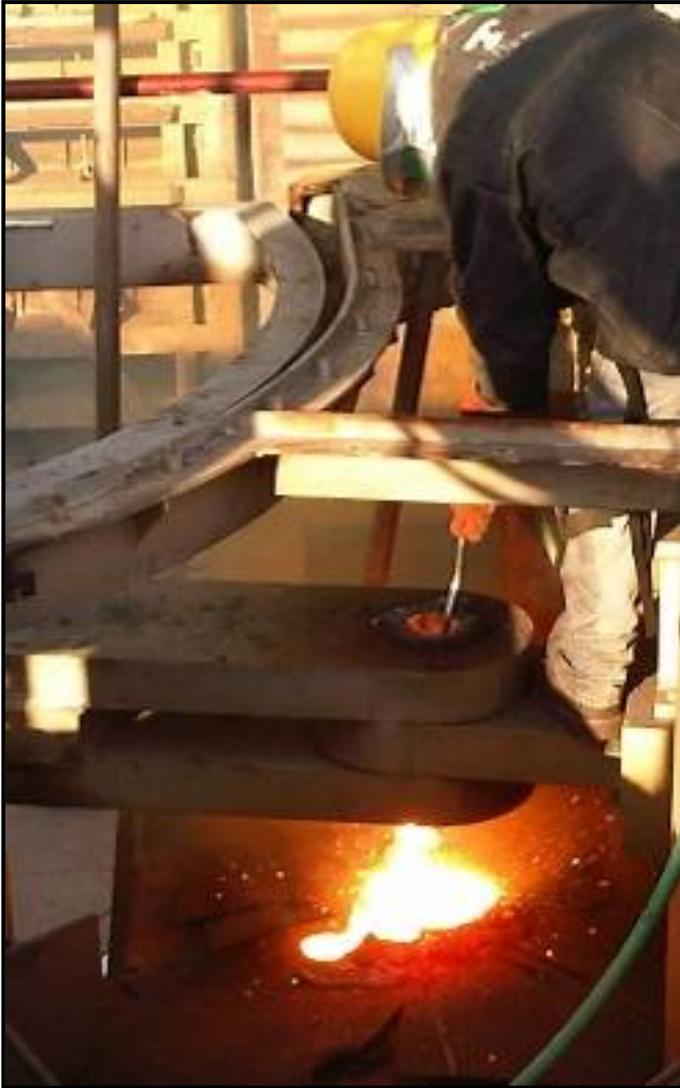


16th Day Pulling Closure



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Specialized Tools



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Specialized Tools (cont)



Questions ?



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