



Lock 25 Roller Gate Repairs

Lock and Dam Maintenance
Workshop 2011



Lock and Dam #25

- Winfield, MO
- UMR 241.4
- Opened May 18, 1939.





Main Chamber

- 600 Foot x 110 Foot.
- Miter Gates on both ends

Dam

- 1,296 Foot
- 14 Tainter Gates
- 3 Roller Gates





Typical Roller Gate

- 18ft Diameter can,
109ft in Length.
- Gate weight is
185,000lbs.
- Built in place gate.
- Apron is the
sealing surface at
the sill.
- Side Shields on
both sides.





Mechanical

- Each gate has a driven end and a non-driven end.
- The gate rests on kogs that are attached to both peirs.
- The gate has teeth which ride in the kogs





Initial Response

- Chain connection ripped out of the gate. 5 Plates.



- Downstream view of gate. NOT horizontal.

What Happened

- Limit Switch failure.
- Upper limit switch gear had moved out its shaft which prevented it from turning.





Stoplogs

- Lock 25
Stoplogs are condemned due to fracture critical welds.
- Borrowed Lock
17 stoplogs





Gate Prep

- Remove Mud.
- Cut slots into apron for sling clearance.
- Weld sling keepers to gate.
- Remove section of chain.



Gate Prep

- Pump out mud, over 6ft.



- Fleet layout for repairs. Service crane and some flats.



Sling Keepers

- 1 inch plate on a radius with 2 gussets.



- Gate slings were 9pt – 1-3/8” Braided Sling.
- Blue sling protector.



Gate Pull – 1st Try

- Offset Slings to obtain proper angle for removal.
- Distance from pier to pier is 100ft with a gate length of 109ft.
- Wasn't enough angle to clear pier house.



Gate Pull – 2nd Try

- Removed short section of sling to acquire proper gate angle.
- Gate angle was approximately 30 degrees.





Gate Repairs

- Gate was placed on the Big Top Tent Barge for repairs.



- This was the first time in Corps of Engineers history that a Roller Gate was Removed.



Gate Repairs

- Both side shields had to be removed.
- Both were damaged during the failure.
- Sealing Surface against both piers.



Gate Repairs

- Approximately 30ft of apron had to be removed.
- This was a key point for the installation of the gate.



- Chain lug plate replacement. This was the main failure point.
- Critical path for reinstallation.
- 5 Plates hucked together.

Gate Repairs

- The gate had to be aligned properly for reinstallation. This keeps the gate in time so the apron will seal against the sill.



- The angle of apron struts were measured to ensure proper alignment.



Gate Installation

- Several parts had to be removed on the piers to accommodate the installation.
- EC used lidar and CAD for determining which parts to be removed.
- Parts included top section of kogs, electrical conduits from next gate.
- Approximately 3inch of clearance.



Gate Installation

- For the gate installation, the gate will remain horizontal.
- The Shreve's green spreader beam was used.



- Wire rope slings had to be replaced due to damage during removal.



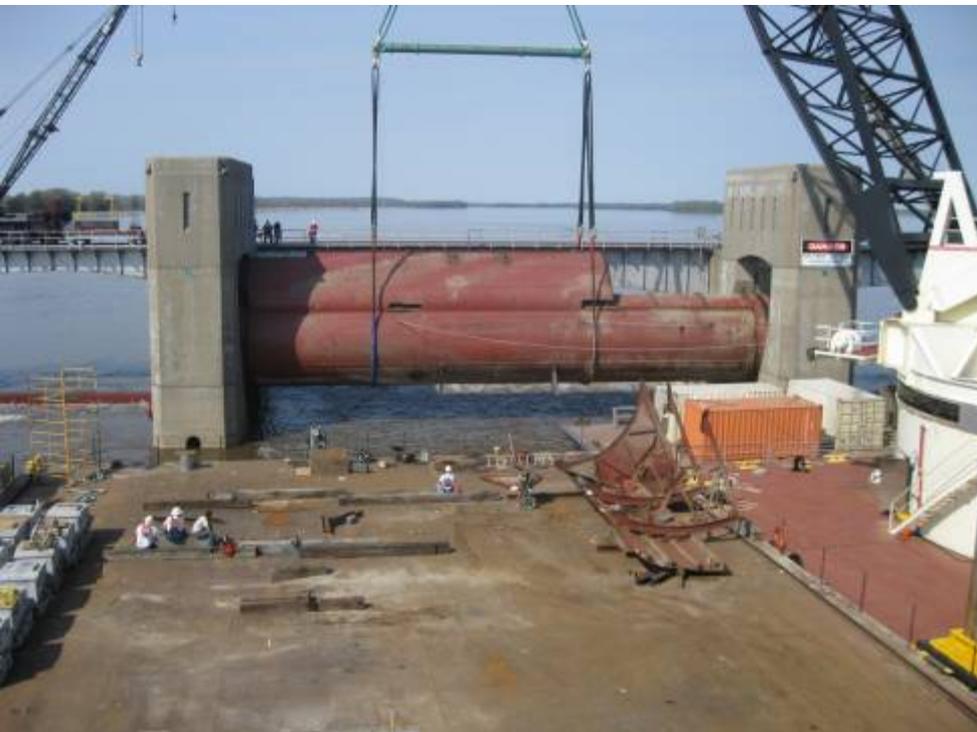
Gate Installation



- Pictures during gate installation.

Gate Installation

- Painting the teeth.

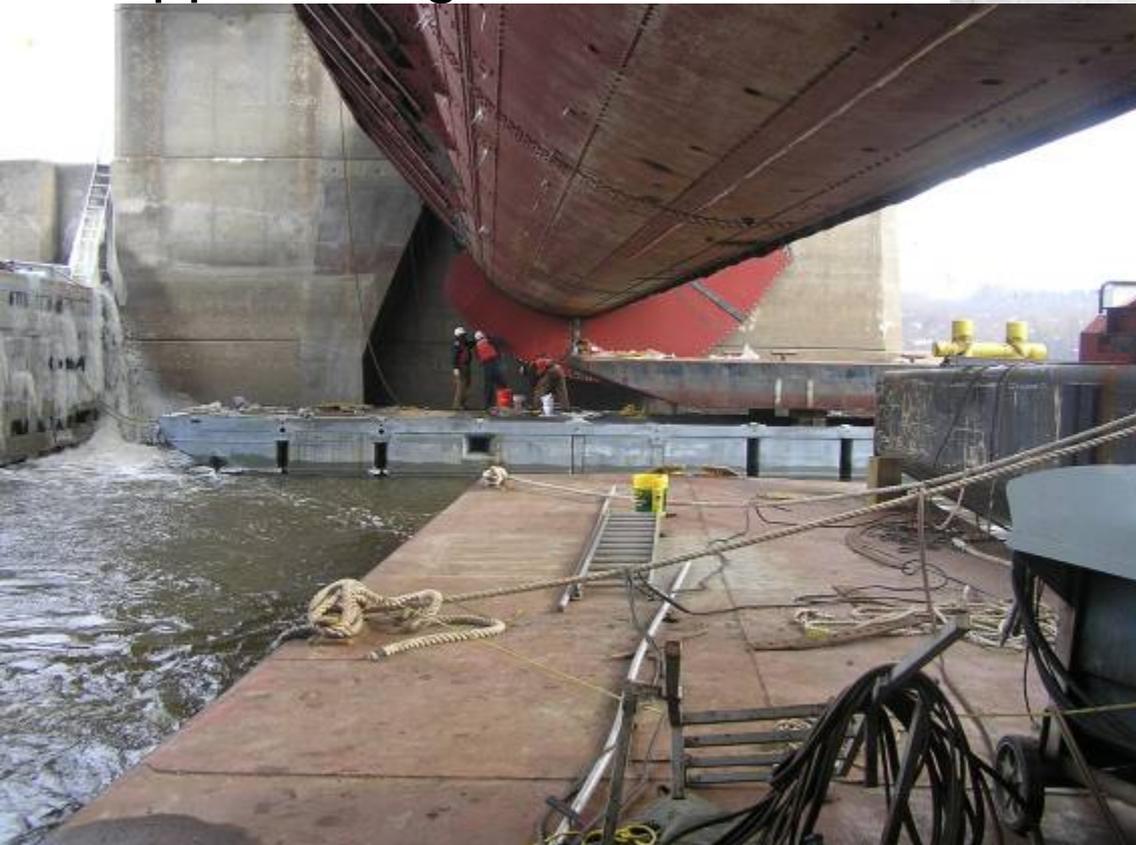


- The heavy lift resources were not required after this point.



Gate Installation

- The chain helps support the gate.



- Flats to assist in replacing misc parts.



QUESTIONS?