

# WELCOME to the 2<sup>nd</sup> Annual Walla Walla and Portland Districts Joint Navigation Meeting June 1, 2016

Port of Morrow  
SAGE Center  
Boardman, OR

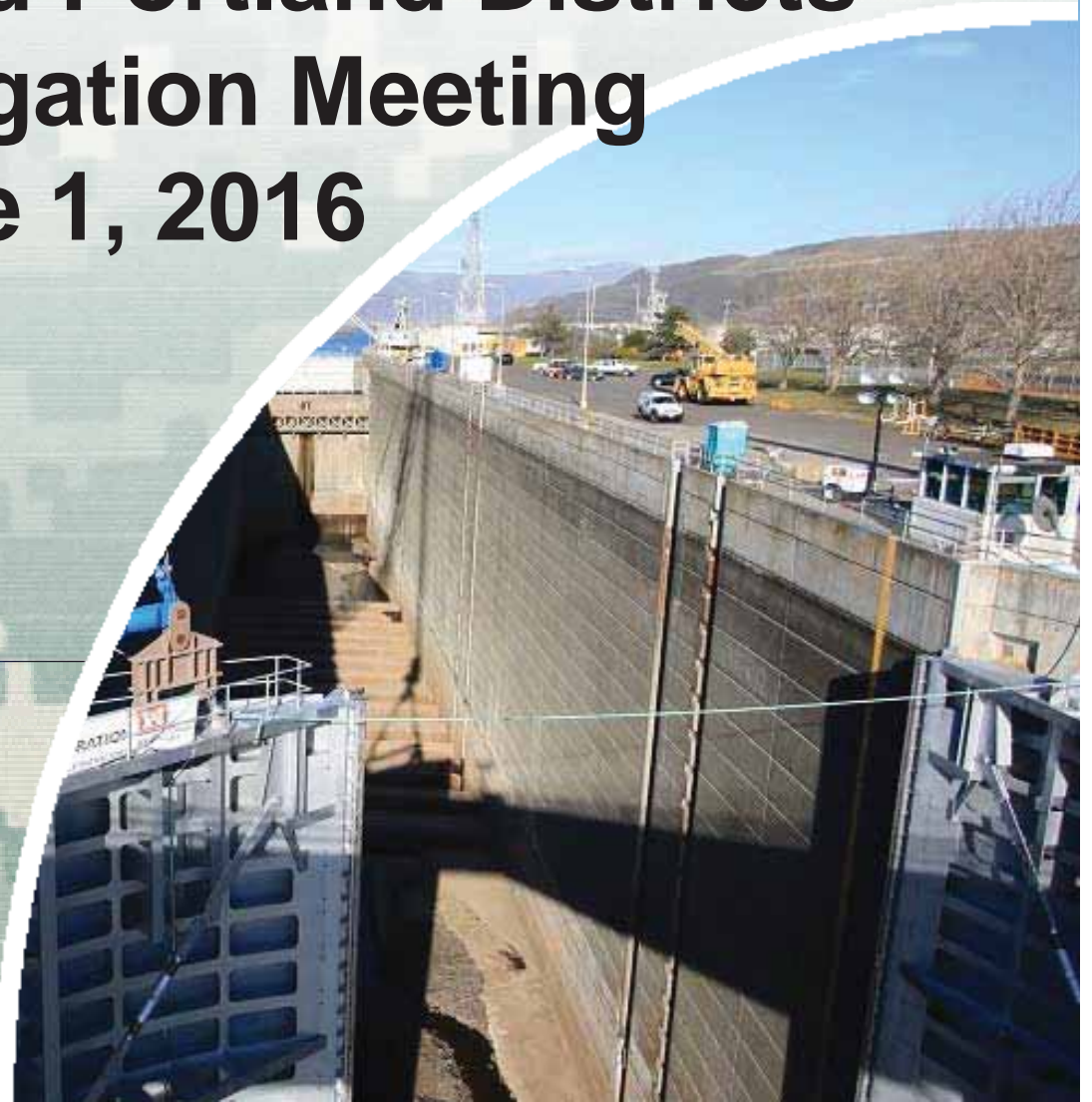


**U.S. ARMY**



®

US Army Corps of Engineers  
**BUILDING STRONG**®



# Morning Agenda

9:30 – 10:00

**Sign-In and Pay for Lunch Orders**

Table at Auditorium Entrance)

10:00 – 10:15

**Welcoming Remarks**

Col Torrey DiCiro  
Deputy Commander  
Northwestern Division

**Spring 2015 Navigation Lock Maintenance Outage Overview**

10:15-10:30

**Portland District Projects**

Dwane Watsek,  
Chief of Operations  
Portland District

10:30-10:45

**Walla Wall District Projects**

Rick Werner  
Chief of Operations  
Walla Wall District

10:45-11:30

**Cost Capital Improvement Strategy for Inland Projects**

Doug Ellsworth  
Senior Asset Management Specialist

11:30-12:00

**The Coast Guard in the Columbia and Snake River System**

John F. Moriarty  
US Coast Guard District 13

12:12-45

**Lunch in Upstairs Lunch Room**



# Afternoon Agenda

12:45-1:15 pm

Stakeholder Messages

Kristin Meira  
Pacific Northwest Waterways Assoc  
  
Rob Rich,  
Columbia River Towboat Association

## Updates on the progress of Projects in the FY 17 Navigation Outage

1:15-1:45

Bonneville and The Dalles

Jeff Ament  
Project Manager, Portland District

1:45-2:00

McNary Gate Repairs

Steve Hartman  
Project Manager, Walla Walla District

2:00-2:15

Lower Monumental

Steve Hartman,  
Project Manager, Walla Walla District

2:15-2:30

Ice Harbor

Steve Thompson  
Project Manager, Walla Walla District

2:30-2:45

Little Goose

Jason Williams  
Project Manager, Walla Walla District

2:45-3:00

FY 17 Extended Outage  
Communications Plan

Gina Baltrusch, Public Affairs,  
Walla Walla District

3:00-3:30

Closing Comments  
Q&A

LTC Timothy Vail, DE, Walla Walla  
Kevin Bruce, DPM, Portland District



# NWP 2016 Lock Maintenance Update

**Dwane Watsek**

Chief, Operations Division  
Portland District

June 1, 2016

Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



**U.S. ARMY**



US Army Corps of Engineers  
**BUILDING STRONG**



# Bonneville Lock and Dam

- Annual Preventative maintenance
  - Tainter Valve Inspections
  - Miter Gates
  - Swing Bridge
  - Oil purifying system
  
- Inspect components and also replace consumable items
  - Oil
  - Oil Filters
  - Motor/pump couplings
  
- Changed broken or plugged grease lines on the Miter Gates



**BUILDING STRONG®**

# Bonneville Lock and Dam

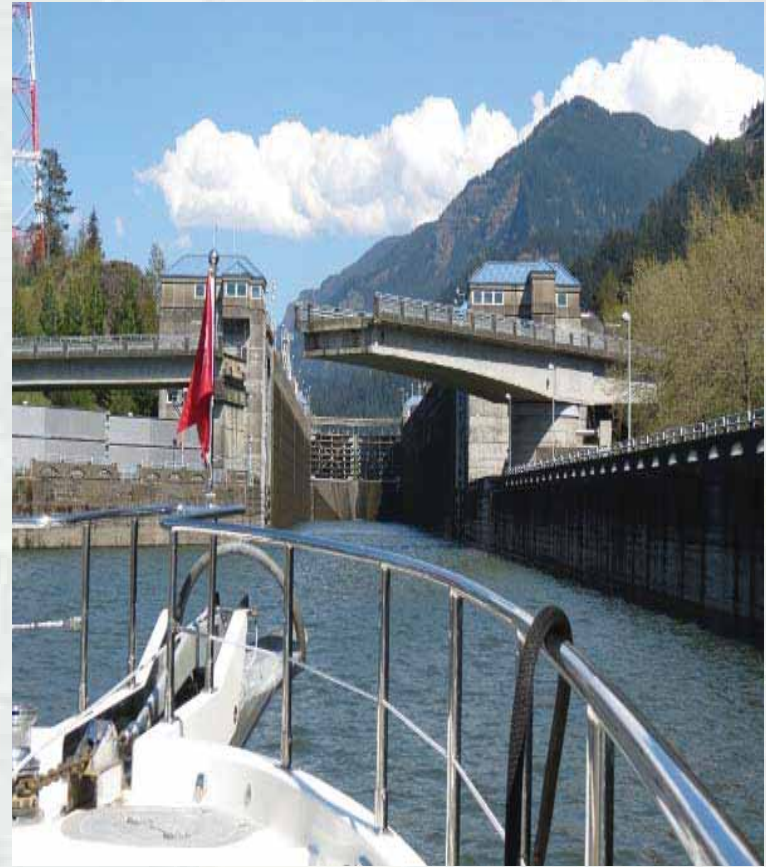
- Performed maintenance on each Farval system as required annually.
- Accomplished testing of fire system including the deluge for the downstream Miter Gates.
- Performed Preventative Maintenance on various other auxiliary systems.
- Tainter Valves (vice miter valves) 1, 2 and 3 for visual inspections



**BUILDING STRONG®**

# Bonneville Lock and Dam

- Findings and Repairs:
  - No issues identified routine work and PM's completed on major components
  - Keeper plate for pin on Tainter Valve 3
- Completion:
  - Work was completed 2 days before scheduled and Lock was return to service
  - All equipment tested prior to RTS.



**BUILDING STRONG®**

# The Dalles Lock and Dam

- Annual Preventative Maintenance
  - Tainter Valves
  - Miter Gates
- Tainter Valves:
  - Valve keepers, pins, bushings and structure inspected
  - Completed Valve HPU mechanical PM`s, Electrical wellness checks
  - Dam Safety office conducted conduit inspections
- Inspect bottom seal and pintle bearings
- Fill Valve #3 OOS (broken keeper)
- Gate Strut arms inspected, strut arm limit switches checked for functionality and lubricated



**BUILDING STRONG®**



# The Dalles Lock and Dam

- Gate #3
  - Inspect and lubricate wire ropes
  - Inspected gate structure
  
- Miter Gates 1&2
  - Gate 1&2 mechanical drive PMs, Electrical system wellness checks and PMs
  - Inspected gudgeon bushing`s, pin`s, anchor plates, turnbuckles and turnbuckle air bags
  - Gate 1 gearbox oil purifier installed
  - Gate 2 gearbox oil purifier supply and return plumbing reconfigured
  
- Provided access to extended outage construction contractor for field measurement verification



**BUILDING STRONG®**

# The Dalles Lock and Dam

- HSS inspection (photo shown) Climbing inspection on the Down Stream Miter shows no issues found during inspection
- Completion:
  - Work was completed on scheduled and Lock was return to service with no issues
  - All equipment tested prior to RTS.



**BUILDING STRONG®**

# John Day Lock and Dam

- Annual Preventative maintenance
  - Tainter Valve Inspection
  - Gate Inspections
  - Mooring Bit Inspection
- Hired SDS Lumber Tug to move floating bulkheads (picture shown)
- Tainter Valve Structural and Mechanical Engineering inspections performed
- Electrical DSQ1 preventative maintenance occurred and was completed along with as-builts for next year's replacement



SDS Lumber contract tug moving the floating bulkhead into place at the start of the annual lock maintenance



**BUILDING STRONG®**

# John Day Lock and Dam

- District Structural Engineers inspected upstream gate
- Dam Safety/Engineering inspect Valves 2 and 4
- Upstream and downstream gate structural inspection
- Complete PM's and inspections of equipment conditions
  
- Findings and Repairs:
  - Tainter Valve 4 seal tear
  - Crack growth in upstream gate
  
- Completion:
  - Work was completed 2 days before scheduled and Lock was return to service
  - All equipment tested prior to RTS.



**BUILDING STRONG®**

# NWW 2016 Lock Maintenance Update

**Rick Werner, P.E.**

Chief, Operations Division  
Walla Walla District

June 1, 2016

Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



**U.S. ARMY**



US Army Corps of Engineers  
**BUILDING STRONG**



# Lower Granite

- Replaced upstream gate South side Kevlar rope.
- Adjustment of tainter gate cable tension, skew, and timing.
- Inspected and repaired miter gate anodes.
- Engineering inspection of miter gate pintle bearing structural area.
- Engineering inspection of drain/fill valve linkage/rods for a future project.



**BUILDING STRONG®**

# Little Goose

- Replaced Top & Bottom Seal sections on Fill Valve #4.
- Drilled out new Trunion Arm Cracks on Fill/Drain Valves.
- Purged/Replaced Grease Lines on all Fill/Drain Valves.
- Checked Tension on Upstream Tainter Gate Cables.
- Pushed in Land Side Trunion Pin on US Tainter Gate, and installed new keeper plates to prevent backing out in the future.



**BUILDING STRONG®**

# Lower Monumental

- LSP2 Transformer:
  - ▶ Purchased temp. transformer
  - ▶ Original transformer refurb completed April 2016
  - ▶ Plan to swap out in FY17 outage
- Replaced both gearboxes on Upstream Gate #2



BUILDING STRONG®



# Lower Monumental

- Lifting eye holes are wallowed through wear which provides play in the valve operation that can cause severe vibration and/or shock loading that could damage other parts/machinery.
- Requires replacing the assembly (lifting plates, pin and bushing)



**BUILDING STRONG®**

# Lower Monumental

- Tainter Valves –  
Fill/Drain Valves
- Tainter Valve 4 Emergency Work:
  - ▶ Replaced cracked lifting ears and repaired guide rods
  - ▶ Replaced grease lines and installed EAL grease at trunnions
- Future work on Tainter Valve 4:
  - ▶ Trunnion bearings, bushings, keeper plates, and hardware
- Replaced seal on Tainter Valve 1



**BUILDING STRONG®**

# Ice Harbor

- Full dewater and 5 year dam safety culvert & tainter valve inspections.
  - ▶ Concrete lateral condition-
- U/S gate machinery repairs.
- Tainter Valve – Drain: Repairs.



BUILDING STRONG®

# McNary

- Grease line repairs on all valves (project)
- TV-3 repairs on lifting eyes. (project)
- Downstream miter gate crack repair (Contract)



**BUILDING STRONG®**

# McNary

- Navlock Bulkheads
  - Procured 8 New Culvert Bulkheads
  - Bulkheads utilized to unwater the tainter valves and the navigation lock chamber.



**BUILDING STRONG®**

# Questions?



**BUILDING STRONG®**

### Corps of Engineers "Capital Investment Strategy for Inland and Intracoastal Waterways"

**Doug Ellsworth**  
Senior Asset Management Specialist  
HQ US Army Corps of Engineers  
[Douglas.E.Ellsworth@usace.army.mil](mailto:Douglas.E.Ellsworth@usace.army.mil)



US Army Corps of Engineers  
**BUILDING STRONG.**



---

---

---

---

---


---

---


---

### Changing the Infrastructure Conversation


#### Aging Infrastructure: Do we have some? (YES)



Green River Lock & Dam 3  
Rochester, Kentucky  
Built 1836  
*Andrew Jackson was U.S. President*



Green River Lock & Dam 4  
Woodbury, Kentucky  
Built 1839  
*Martin Van Buren was U.S. President*



**BUILDING STRONG.**

2

---

---

---

---

---


---

---


---

### Changing the Infrastructure Conversation


#### Aging Infrastructure: But what does 'aging' mean?




Ponte de Vila Formosa  
Portugal  
Built ~ 25 BC  
*Augustus was Roman Emperor*  
Picture taken 2013



Erie Canal  
Built 1817-1825  
*James Monroe was U.S. President*  
Picture taken 2011



Duesenberg J  
LaGrande  
Built 1934  
*Franklin Roosevelt was U.S. President*  
Picture taken 2009



**BUILDING STRONG.**

3

---

---

---

---

---

---

---

---

### Changing the Infrastructure Conversation, "Aging Infrastructure"...What are we really saying??

Source: Transportation Research Board Special Report 315, "Funding and Managing the U.S. Inland Waterways System What Policy Makers Need to Know," Committee on Reinvesting in Inland Waterways: What Policy Makers Need to Know

...lock performance... investment required."

4 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

## Why a Capital Investment Strategy?

### Meet WRRDA 2014 Requirements!!

**Title II, Subtitle A, Section 2002, (d) CAPITAL INVESTMENT PROGRAM.—**

"(1) IN GENERAL.—Not later than 1 year after the date of enactment of this subsection, the Secretary, in coordination with the Users Board, shall develop and submit to Congress a report describing a 20-year program for making capital investments on the inland and intracoastal waterways based on the application of objective, national project selection prioritization criteria.

"(2) CONSIDERATION.—In developing the program under paragraph (1), the Secretary shall take into consideration the 20-year capital investment strategy contained in the Inland Marine Transportation System (IMTS) Capital Projects Business Model, Final Report published on April 13, 2010, as approved by the Users Board.

"(3) CRITERIA.—In developing the plan and prioritization criteria under paragraph (1), the Secretary shall ensure, to the maximum extent practicable, that investments made under the 20-year program described in paragraph (1)—

"(A) are made in all geographical areas of the inland waterways system; and

"(B) ensure efficient funding of inland waterways projects.

...but also because it is an integral part of Life Cycle Asset Management!

5 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

## A Short History of Asset Management and Risk for Inland Navigation

2004: FY04 Budget: Guidance issued on use of O&M "State of the Navigation"

2005: FY05 Budget: Guidance issued on use of O&M "State of the Navigation"

2006: FY06 Budget: Guidance issued on use of O&M "State of the Navigation"

2007: FY07 Budget: Guidance issued on use of O&M "State of the Navigation"

2008: FY08 Budget: Guidance issued on use of O&M "State of the Navigation"

2009: FY09 Budget: Guidance issued on use of O&M "State of the Navigation"

2010: FY10 Budget: Guidance issued on use of O&M "State of the Navigation"

2011: FY11 Budget: Guidance issued on use of O&M "State of the Navigation"

2012: FY12 Budget: Guidance issued on use of O&M "State of the Navigation"

2013: FY13 Budget: Guidance issued on use of O&M "State of the Navigation"

2014: FY14 Budget: Guidance issued on use of O&M "State of the Navigation"

2015: FY15 Budget: Guidance issued on use of O&M "State of the Navigation"

- It was only in 2008 when USACE first used AM principles of condition and consequence in the "5x5" matrix for 2010 Budget
- "Consequence" at that time was based on tonnage, so is the SAME consequence at a specific site regardless of the number, condition, or mission importance, of the components being maintained, repaired or replaced
- In 2010 the Corps conducted Operational Condition Assessments on all Inland Navigation projects
- An Operational Risk Assessment process was developed which estimated economic impacts on shippers and carriers
- The FY13 Budget initiated the transition from "tonnage" to "economic impact on our stakeholders" as consequences
- The process continues to inform the annual O&M budget, focusing on Risk Reduction, and is also being used to inform the long-term Capital Investment Strategy

6 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---





## Why a Capital Investment Strategy?

### Meet WRRDA 2014 Requirements!!

**Title II, Subtitle A, Section 2002, (d) CAPITAL INVESTMENT PROGRAM.—**

**"(1) IN GENERAL.**—Not later than 1 year after the date of enactment of this subsection, the Secretary, in coordination with the Users Board, shall develop and submit to Congress a report describing a 20-year program for making capital investments on the inland and intracoastal waterways based on the application of objective, national project selection prioritization criteria.

**"(2) CONSIDERATION.**—In developing the program under paragraph (1), the Secretary shall take into consideration the 20-year capital investment strategy contained in the Inland Marine Transportation System (IMTS) Capital Projects Business Model, Final Report published on April 13, 2010, as approved by the Users Board.

**"(3) CRITERIA.**—In developing the plan and prioritization criteria under paragraph (1), the Secretary shall ensure, to the maximum extent practicable, that investments made under the 20-year program described in paragraph (1)—

- (A) are made in all geographical areas of the inland waterways system; and
- (B) ensure efficient funding of inland waterways projects.

...but also because it is an integral part of Life Cycle Asset Management!



BUILDING STRONG®

---

---

---

---

---

---

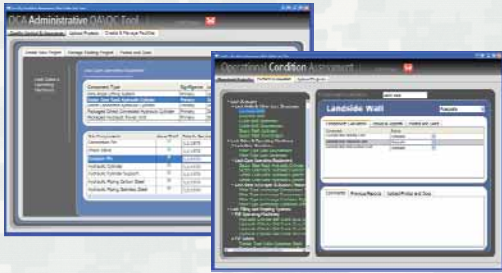
---

---

---

---

## Inland Navigation Inventory



Nationally Standard Component Hierarchy across the Corps Navigation Portfolio



BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

## Operational Risk Assessment Baseline Risk Process

Establishes all risk metrics in relationship to two primary criteria:

- Mission -- the combination of adverse conditions and consequences that would occur from an **Unscheduled Outage** due to **component failure, resulting in an inability to lock traffic and/or maintain the navigation pool** and
- Safety -- the combination of adverse conditions and consequences that would occur from a **component failure, resulting in exposure of the project personnel and end users to life safety impacts**

Probability of Operational Failure X Consequence of Failure



---

---

---

---

---

---

---

---

---

---

### For Each Component in the Inventory

**OCA** (Operational Condition Assessment) is developed by the IMTS team and implemented by the teams.

**P(f)** (Probability of Failure) is assessed by the Management Center with support from MOC/IME's.

**Economic Consequences** are assessed by the IMTS team and implemented by the teams.

**Recovery Durations** are assessed by the IMTS team and implemented by the teams.

13 BUILDING STRONG®

---

---

---

---

---

---

---

---

### The Pieces of the Puzzle

Assigning Condition Ratings

Probability of Operational Failure

14 BUILDING STRONG®

---

---

---

---

---

---

---

---

### Calculating Operational Risk (ORA)

**Probability of Operational Failure** X **Consequence of Failure** (Unsatisfactory Performance)

What is the Condition of Components in your site specific Inventory? and based on the condition of THAT Component what is its Probability of Failure?

What is the average "Impact Recovery Duration" (in DAYS) to restore Mission capability for that component from a failure that caused an Unscheduled Outage?

What Economic Impact on Shippers-Carriers is there based on the Duration of that Unscheduled Outage?

**Notional Example:**

Component "X" in Condition "D" Has P(f) = 0.488996058

Component "X" has an IRD = 20 days

At L&D Site "Y" the Econ Impact on Shippers-Carriers for an Unscheduled Outage of 20 days = \$2,663K

$$P(f) \times \text{Consequence} = \text{Risk}$$

$$0.488996058 \times \$2,663,000 = \$1,302,197$$

15 BUILDING STRONG®

---

---

---

---

---

---

---

---

### Calculating Operational Risk Reduction

Notional Example (Prior Risk, i.e. Current Risk):

**Component "X" in Condition "D"**  
Has P(f) = 0.488996058

$$P(f) \times \text{Consequence} = \text{Risk}$$

$$0.488996058 \times \$2,663,000 = \$1,302,197$$

Example W/PY "Fully Repair" – (resets Condition and thus P(f) to "B")

**Component "X" in Condition "B"**  
Has P(f) = 0.074939894

$$P(f) \times \text{Consequence} = \text{Risk}$$

$$0.074939894 \times \$2,663,000 = \$199,565$$

**Risk Reduction = \$1,302,197 - \$199,565 = \$1,102,632 for that component**




---

---

---

---

---

---

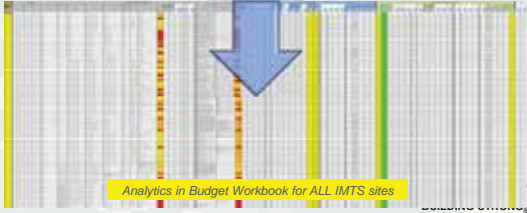
---

---

---

---

### Using The Pieces of the Puzzle



Analytics in Budget Workbook for ALL IMTS sites

---

---

---

---

---

---

---

---

---

---

### Improved 2010 Capital Projects Business Model

2010	2015
<b>Improving Risk and Reliability</b> <ul style="list-style-type: none"> <li>Single Top Level Asset</li> <li>"Condition" VERY Subjective</li> <li>No "Risk of Failure" (probabilities)</li> </ul>	<b>Improving Risk and Reliability</b> <ul style="list-style-type: none"> <li>Condition at Component Level</li> <li>"Condition" determined by rigorous process</li> <li>Baseline Weibull Curves, plus updating</li> </ul>
<b>Improving Economic Impact</b> <ul style="list-style-type: none"> <li>Annual Transportation Rate Savings</li> <li>Doesn't consider outage durations</li> <li>Subjectively addresses Aux Chamber</li> </ul>	<b>Improving Economic Impact</b> <ul style="list-style-type: none"> <li>Monte Carlo simulation of Economic Impacts</li> <li>Multiple Durations from 1 Day to 365 Days</li> <li>Includes Aux Chamber, and much more (such as normal processing times, normal delays, multi-out processing time (for Aux. etc.), in Simulation)</li> </ul>

**PLUS** using a Nationally consistent and repeatable approach across entire IMTS!

Working Draft - Pre-Decisional 18 BUILDING STRONG

---

---

---

---

---

---

---

---

---

---

### Navigation Project Risk Exposure

The Basics ("critical non-routine maintenance"):

- ✓ Need to **repair the most critical assets**/components that...
- ✓ Are in the **worst shape/condition** that...
- ✓ Have the **highest likelihood of failing** and...
- ✓ Causes the **highest impact on our customers**

Example: Part of a single project site

How much risk is at that Project? Can I take care of it with O&M? OR do I need a Capital investment?

19 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

### USACE AM Total Risk Exposure (TRE)

For EACH IMTS Site (to Component level):

Inventory Condition P(f) X Econ Impact on Shippers and Carriers = Risk (@ Component level)

X

Σ = TRE

Assigning Condition Ratings

Total Risk Exposure is composed of:

- "Residual Risk" – Components in "A" & "B" condition that *currently* do NOT show impacts on mission performance (including components that have been Repaired/Replaced)
- "Operational Risk" – Components in "C" thru "F" condition that *currently* show impacts on mission performance

Each IMTS Site will have varying degrees of Operational and Residual Risk which can inform Investment Strategies

20 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

### Spectrum of Investment Strategies

Project Level

**Risk Exposure Levels**

HIGH Residual Risk Exposure / LOW Operational Risk Exposure = Strategic Maintenance Management

SIMILAR Residual Risk Exposure / SIMILAR Operational Risk Exposure = ?

LOW Residual Risk Exposure / HIGH Operational Risk Exposure = Past the "Point of No Return?" – Rehab or Modernization

Investment Strategy

Increase Maintenance

Plan for Capital Investment

...and everything in between...

21 BUILDING STRONG®

---

---

---

---

---

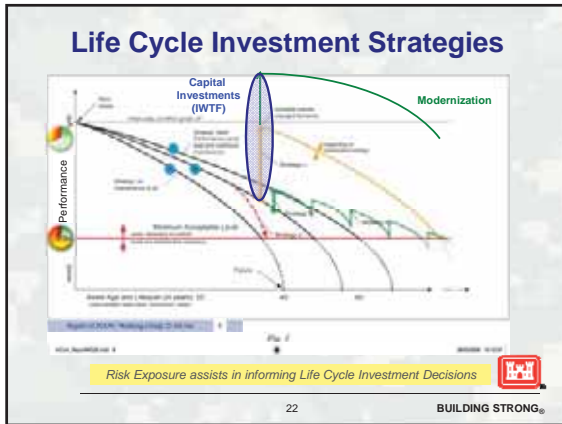
---

---

---

---

---




---

---

---

---

---

---

---

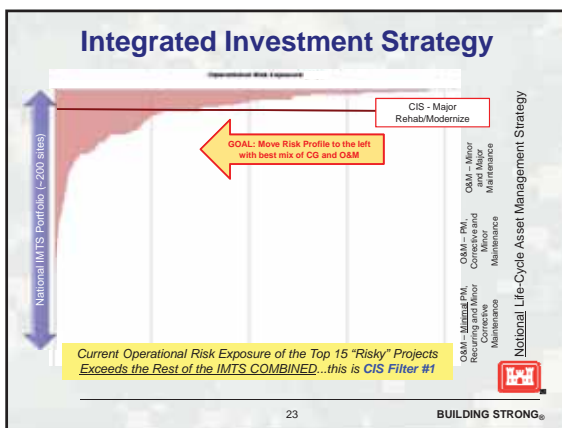
---

---

---

---

---




---

---

---

---

---

---

---

---

---

---

---

---

### Operational Risk Exposure – Feature | System

(Condition/Risk of Critical Components across entire IMTS)

Feature   System	Feature   System   Sub-System   Component
<ul style="list-style-type: none"> <li>1. Fuel System &amp; Operating Machinery</li> <li>2. Fuel System &amp; Operating Machinery</li> <li>3. Fuel System &amp; Operating Machinery</li> <li>4. Fuel System &amp; Operating Machinery</li> <li>5. Fuel System &amp; Operating Machinery</li> <li>6. Fuel System &amp; Operating Machinery</li> <li>7. Fuel System &amp; Operating Machinery</li> <li>8. Fuel System &amp; Operating Machinery</li> <li>9. Fuel System &amp; Operating Machinery</li> <li>10. Fuel System &amp; Operating Machinery</li> </ul>	<ul style="list-style-type: none"> <li>1. Fuel System &amp; Operating Machinery</li> <li>2. Fuel System &amp; Operating Machinery</li> <li>3. Fuel System &amp; Operating Machinery</li> <li>4. Fuel System &amp; Operating Machinery</li> <li>5. Fuel System &amp; Operating Machinery</li> <li>6. Fuel System &amp; Operating Machinery</li> <li>7. Fuel System &amp; Operating Machinery</li> <li>8. Fuel System &amp; Operating Machinery</li> <li>9. Fuel System &amp; Operating Machinery</li> <li>10. Fuel System &amp; Operating Machinery</li> </ul>

Notional Working Draft Pre-decisional Example

Maintain and Repair the Most Critical Components that have the Potential to Cause Highest Mission Impacts

24 BUILDING STRONG

---

---

---

---

---

---

---

---

---

---

---

---

## Ensuring Capital Investment vs O&M

**Definition for Major Rehabilitation of inland waterway projects found in Section 205 of the WRDA 1992** -- "For the purposes of laws relating to navigation on inland and intracoastal waterways of the United States, the term "rehabilitation" means --

- (1) Major project feature restoration --
  - (A) which consists of structural work on an inland navigation facility operated and maintained by the Corps of Engineers;
  - (B) which will significantly extend the physical life of the feature;
  - (C) which is economically justified by a benefit-cost analysis;
  - (D) which will take at least 2 years to complete; and
  - (E) (i) which will require at least \$20 million (as amended by WRRDA 2014) or current threshold (for FY 2017, the threshold will be \$21 million after inflation adjustments of the annual President's Budget) in capital outlays"

The WRDA 1992 definition also includes structural modification of a major project component (not exhibiting reliability problems), but currently, the CIS only focuses on the larger reliability projects. Further, the definition states that Major Rehabilitation does not include routine, deferred, or minor maintenance and that the dollar threshold referred to above shall be adjusted annually according to the economic assumption published each year as guidance in the Annual Program and Budget Request for Civil Works Activities of the Corps of Engineers.

Combined with review of Budget and Annual Work Plans...these are CIS Filters #2 and #3...next Steps MRR or Feasibility Study?



---

---

---

---

---

---

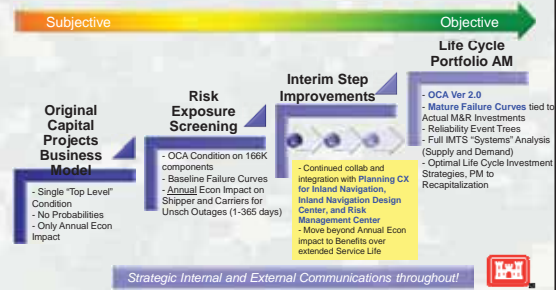
---

---

---

---

## The Journey Continues Beyond WRRDA 2014... Delivering for the Present While Preparing for the Future



---

---

---

---

---

---

---

---

---

---

## Water Resources Reform and Development Act of 2014

**Title II, Subtitle A, Section 2002, (d), (4) CAPITAL INVESTMENT PROGRAM.**

"(1) IN GENERAL.—Not later than 1 year after the date of enactment of this subsection, the Secretary, in coordination with the Users Board, shall develop and submit to Congress a report describing a 20-year program for making capital investments on the inland and intracoastal waterways based on the application of objective, national project selection prioritization criteria.

"(2) CONSIDERATION.—In developing the program under paragraph (1), the Secretary shall take into consideration the 20-year capital investment strategy contained in the Inland Marine Transportation System (IMTS) Capital Projects Business Model, Final Report published on April 13, 2010, as approved by the Users Board.

"(3) CRITERIA.—In developing the plan and prioritization criteria under paragraph (1), the Secretary shall ensure, to the maximum extent practicable, that investments made under the 20-year program described in paragraph (1)—

- "(A) are made in all geographical areas of the inland waterways system; and
- "(B) ensure efficient funding of inland waterways projects.



---

---

---

---

---

---

---


---

---

---

### The *Original Plan* to Meet WRRDA 2014 Requirement

- 6 May 15 – Initial Corps Draft CIS report to ASA, OMB and IWUB for Feedback and Comment
- 14 May 15 - Inland Waterways Users Board meeting #75
- 21 May 15 -- Biweekly Industry Feedback call/webinar
- 28 May 15 – IMTS BoD
- 29 May 15 – Final Draft Corps CIS Report
- Now to June 5<sup>th</sup> – Vetting with ASA and OMB to finalize report
- 10 June 15 – ASA transmit report to Congress
- 10 June 15 – House T&I Committee Hearing on WRRDA 2014



28 BUILDING STRONG®

---

---

---

---

---


---

---

---

### May 2015 CIS

- Determined Risk Informed Priorities
- Draft Scenario Funding Schedule Comparison
  - Budget
  - Annual Allocated
  - *Maximized IWTF Program (Fully supported by Industry)*
- Key Concepts Incorporated from 2010 CPBM
  - Concept of *"Finish What You Start"*
  - *Efficient Funding* as Best We Can
  - Incorporate Life Cycle Asset Management
- Additional Stakeholder considerations incorporated
  - *Advance Preconstruction Engineering and Design (PED) and construction on one or two lock modernization projects on the Upper Mississippi River and Illinois Waterway system (NESP)*



29 BUILDING STRONG®

---

---

---

---

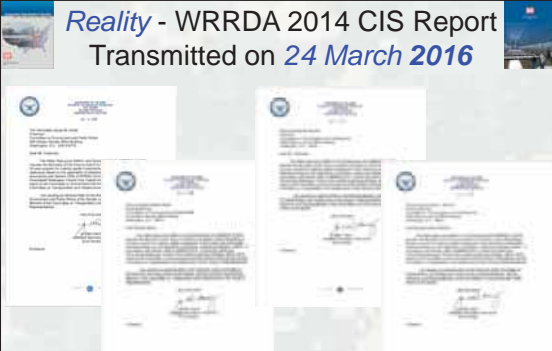
---

---


---

---

### Reality - WRRDA 2014 CIS Report Transmitted on *24 March 2016*



Also transmitted to Inland Waterways Users Board



30 BUILDING STRONG®

---

---

---

---

---

---

---

---



## Users Board Advice and Recommendations to Congress

*March Plans for Users Board Recommendations*

Review of the FY 2017 Work Plan, the FY 2017 President's Budget proposal, and responses to date with the Inland Navigation Trust Fund Committee. The Board has the recommendations to make to our December 2015 207 Annual Report for Fiscal Year 2017 should continue to continue to strong support. (The Board continues to recommend to FY 2017)

- Congress should support for the construction of Inland waterway infrastructure projects the navigation system appropriate to approximately \$200 million based on an estimated total funding to respond FY 2017 (FY 2017 estimate)
- Continuing to use the project priority list contained in the Capital Development Plan dated April 13, 2010<sup>1</sup>, the Administration should fully allocate that \$390

<sup>1</sup> The Board notes that a little more than a week ago, the Administration finalized the Secretary of the Army's 20-year Capital Investment Strategy (CIS) called for in WRIDA 2014. The Secretary's CIS report is substantially different from what the Board and other navigation industry representatives worked on a year ago. Does not represent the position or have any consequence of the Board, and should not be used to change the priorities of the Capital Development Plan.

BUILDING STRONG<sup>®</sup>

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

## Many Changes Since 2010 CPBM Establishing New Baseline(s)

**Original 2010 Schedule Assumed:**

- \$380M/year available (total)
  - IWTF share assumed fuel tax increase
  - Assumed matching funds available
- Dams 100% General Treasury
- Major Rehab (MR) 100% General Treasury up to \$100M
- \$60M+/- per year set aside for (MR)
- Continuing Contract Clause

**Key Considerations Moving Forward:**

- Update economics, schedules and funding
- IWTF share of Olmsted changed to 15%
- Major Rehab threshold changed to \$20M
- Timing/Phasing of Engineering and Economic Updates
- \$0.09 Fuel Tax Increase
- Greater Focus on Risk

BUILDING STRONG<sup>®</sup>

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

Scenario	Description	Summary
Baseline	The Inland Navigation Program (INP) and General Treasury Fund (GTF) is limited to \$100 million per year (Note: Limited to \$100 million General Treasury)	<ul style="list-style-type: none"> <li>• Four ongoing construction projects could be completed</li> <li>• Four new construction projects (including two channel projects) could be completed</li> <li>• Two new construction projects would be in progress</li> <li>• Seven major rehabilitation projects could be completed</li> <li>• IWTF limited funds to \$20 million while Olmsted's role only stays in some construction, that priority limited by approximately 20 million per year</li> <li>• MR must be same in total, but work is completed prior to baseline because by not taking advantage of the reduced material requirements for the Olmsted Locks and Dam</li> </ul>
Annual Milestone	General Treasury funding is limited to \$200 million per year and annual appropriations will continue to be available without congressional funding request for Olmsted's Budget for channel navigational projects	<ul style="list-style-type: none"> <li>• Four ongoing construction projects could be completed</li> <li>• Four new construction projects (including two channel projects) could be completed</li> <li>• Two new construction projects would be in progress</li> <li>• Seven major rehabilitation projects could be completed</li> <li>• IWTF limited funds to \$20 million while Olmsted's role and Dam is under construction. Inter-relationship between \$20 million and \$10 million to the remainder of the 20-year (10 years)</li> <li>• Four major projects for the IWTF (includes the Annual Milestone Scenario) is very similar to the Olmsted INP Scenario</li> </ul>
Maximum IWTF	Funding available in the Inland Navigation Program is only limited by the IWTF funds available	<ul style="list-style-type: none"> <li>• Four ongoing construction projects could be completed</li> <li>• Four new construction projects (including two channel projects) could be completed</li> <li>• Two new construction projects would be in progress</li> <li>• Seven major rehabilitation projects could be completed</li> <li>• IWTF limited funds to \$80 million while Olmsted's role and Dam is under construction. Inter-relationship between \$20 million and \$10 million to the remainder of the 20-year (10 years)</li> <li>• Additional IWTF resources would be available. There would be a one dollar difference between the Annual Milestone Scenario and Maximum IWTF Scenario</li> </ul>

- 'Ongoing' Projects Completed
- # of NEW Construction Projects Completed and # In Progress (completion beyond the 20-year timeframe)
- # of Major Rehabs Completed and In Progress
- Description of what happens to the Trust Fund Balance over the 20 years
- General comparison to other Scenarios

BUILDING STRONG<sup>®</sup>

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

### Final CIS

- The 2010 IMTS Capital Projects Business Model report generally *reflected the views of the Users Board*, but not the Administration.

Issue(s)	Before (May 2015 Draft version)	After (March 2016 Final version)
the CIS will be evaluated by the 2015 CPBM	Included many references and ties to the 2010 plan. <b>Result:</b> The CIS is a new "planning framework" meeting WRRDA 2014 Section 2002 that is owned by and approved by the Administration.	All references to the 2010 CPBM, unless explicitly tied to the Congressional Mandate, were removed.

- In accordance with WRRDA 2014, the Draft report coordinated with inland navigation stakeholders, but *required the Secretary to submit* the report and therefore the report *represents the views of the Administration*.

Issue(s)	Before (May 2015 Draft version)	After (March 2016 Final version)
"Finish What You Start" is a key CIS principle	"Tier" process ensured that once a project reached the top tier, Tier 1, that it pretty much stayed in the overall portfolio and the Tier 2 floor was considered a "hard floor" <b>Result:</b> "Finish What You Start" no longer exists as a key principle	"Tiers" were replaced by a "Filter" process and acknowledgment that "unforeseen circumstances and conditions that a potential project might face, its location, its cost, and other factors, could prevent it from being completed."

34 BUILDING STRONG<sub>®</sub>

---

---

---

---

---

---

---

---

---

---

---

---

### Final CIS (cont.)

- Capital Investment Strategy provides a 20-year strategy for making capital investments on the inland and intracoastal waterways based on the *application of objective, national project selection prioritization criteria*.
- The CIS *implemented new asset management tools* that were not available at the time of the development of the 2010 plan. Because of this, the *underlying analysis is more rigorous and objective*.

**Improved 2010 Capital Projects Business Model**

2010	2015
<b>Improving Risk and Reliability</b> - Single Risk Level - "Cautious" VTRF Subject to the "Top of Floor" Determination <b>Improving Economic Project</b> - Annual Transportation Rate Service - Owner's consider various operations - Supporting operations and Upstream	<b>Improving Risk and Reliability</b> - Condition at Component Level - "Cautious" Assessed by separate process - Separate Risk Levels, just setting <b>Improving Economic Project</b> - Works into evaluation of Economic Projects - Waterway Revenue Plan - Day to Day Cost - INCLUDE All Charges, and Right to Use Cost - Infrastructure Costs, including - Project, O & M, etc.

PLUS some a relatively standard and reasonable amount across the IMTS

Working Smarter - For Results™ BUILDING STRONG<sub>®</sub>

35

---

---

---

---

---

---

---

---

---

---

---

---

### Final CIS (cont.)

- The CIS takes into account the WRRDA 2014 changes to fund Olmsted Locks and Dams 85% from General Treasury and 15% from IWTF, the *increase in the major rehabilitation threshold* to \$20 million, and the ABE Act, which *increased the fuel tax* from \$0.20 per gallon to \$0.29 per gallon effective 1 Apr 15.
- The *top four ongoing construction projects remain the same*: Olmsted, Lower Mon 2, 3, and 4, Kentucky Lock and Dam, and Chickamauga Lock. Future projects may be determined to be higher priority than these projects, which would affect funding decisions.
- Other project rankings are not directly comparable to prior rankings, because some projects were completed, work was performed on some projects to reduce risk, and other projects are considered in the CIS that were not previously ready to be considered in the 2010 CPBM.*

36 BUILDING STRONG<sub>®</sub>

---

---

---

---

---

---

---

---

---

---

---

---

## Final CIS (cont.)

- The CIS is a **planning framework** to help consider potential paths forward for how to manage the inland waterways projects. It is not a budget document and therefore does not make budget recommendations, *nor does it constrain the consideration of projects based on budgeting criteria including the 2.5 Benefit-Cost Ratio.*
- Out-year revenue projections used in the CIS are based on U.S. Treasury Department estimates.

Issue(s)	Before (May 2013 Draft version)	After (March 2014 Final version)
WTFF Revenue	\$118 million for Budget (now referred to as Baseline) and Annual Allocation Scenarios, \$118 million for Max WTFF, based on rough estimate of fuel tax receipts and the Max WTFF reflected a conservative lower range value than industry's estimates.	Based on the Department of Treasury estimates, \$126 million in FY2017 ramping down to \$94 million in 2028 and straight line from 2020 to 2028 for the three scenarios.
	Result = Using current Treasury projections for the WTFF revenues, the Annual Allocation Scenario is very similar to the Maximized WTFF scenario.	

37

BUILDING STRONG®

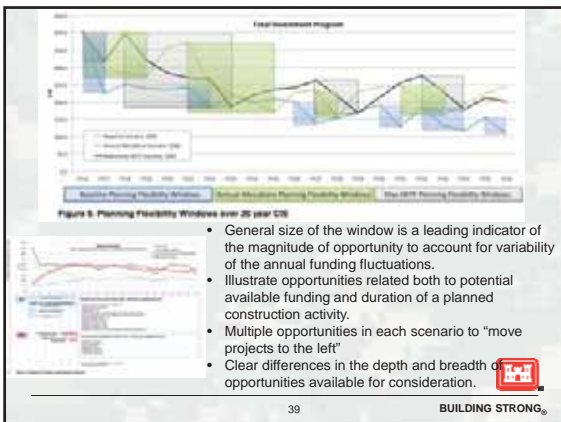
## Final CIS (cont.)

- The CIS proposes to keep a **minimum balance** of \$20 million in the IWTF to help address unforeseen needs in any given year.
- The CIS includes 20-year scenarios, but **only provides project-specific details for the first five years** due to the significant uncertainties about cost, timing, and specific projects further in the future.

Issue(s)	Before (May 2013 Draft version)	After (March 2014 Final version)
Show a 20-year Program	Each scenario illustrated project and detailed project (available) funding for all 20 years of the CIS.	Given the uncertainties of the program variables, which include receipts in the WTFF, the budget authority of the Corps, and the annual appropriations provided to the Corps, only the first five years of resources are provided in detail in the CIS and the remainder are shown in alphabetical order and total is rolled up.
	Result = Lack of visibility and awareness for specific end year requirements, but did add in the concept of Planning "Windows" to illustrate opportunities to schedule projects.	

38

BUILDING STRONG®




39

BUILDING STRONG®

### Final CIS (cont.)

Issue(s)	Before (May 2015 Draft version)	After (March 2016 Final version)
Additional Revenue for the Trust Fund	Not discussed	Future revenues related to the Administration's FY17 Budget proposal that "funds capital investments in the inland waterways within the limits of estimated revenues to the Inland Waterways Trust Fund under current law, and proposes a new user fee to increase revenue to the trust fund to enable a significant increase in funding for investments, while also ensuring that a percentage of those revenues go toward maintenance of inland navigation projects"
"WTS"	Review an overall description (scope and industry) that the inland and intermodal waterways are a system within a system for overall freight movement. The report was over the "National Marine Transportation System."	"System" is not referenced at all, unless mentioned in Public Law in a specific context.



40 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---

## Questions?

**Doug Ellsworth**  
 Senior Asset Management Specialist  
 HQ US Army Corps of Engineers  
[Douglas.E.Ellsworth@usace.army.mil](mailto:Douglas.E.Ellsworth@usace.army.mil)



41 BUILDING STRONG®

---

---

---

---

---

---

---

---

---

---



# U.S. COAST GUARD ON COLUMBIA RIVER AND SNAKE RIVER

John Moriarty  
D13(dpw)  
206 220 7274  
[john.f.moriarty@uscg.mil](mailto:john.f.moriarty@uscg.mil)



# USCG DISTRICT 13

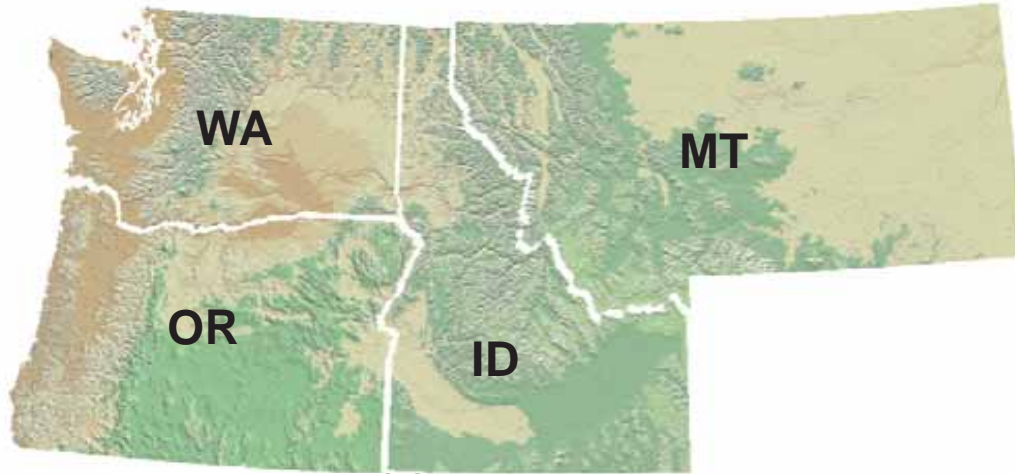


## Personnel

Active Duty: 1689  
Reserve: 445  
Civilian: 143  
Auxiliary: 869

## Sectors

Puget Sound  
Columbia River  
North Bend



## Air Stations (3)

Port Angeles  
Astoria  
North Bend  
+ AIRFAC Newport

## Buoy Tenders (3)

225' Astoria  
175' Everett  
100' Portland

## Patrol Boats (9)

110'  
Port Angeles  
Coos Bay  
87'  
Port Townsend  
Port Angeles (3)  
Bellingham (2)  
Everett

## Vessel Traffic Service (1)

Puget Sound

## Aids to Navigation Teams (4)

## Maritime Force Protection Unit (1) - Bangor

87' Patrol Boats (2)  
64' Special Purpose Craft (6)  
33' Special Purpose Craft (6)

## Stations (15)

### Washington (7)

Bellingham  
Port Angeles  
Neah Bay  
Quillayute River  
Seattle  
Grays Harbor  
Cape Disappointment

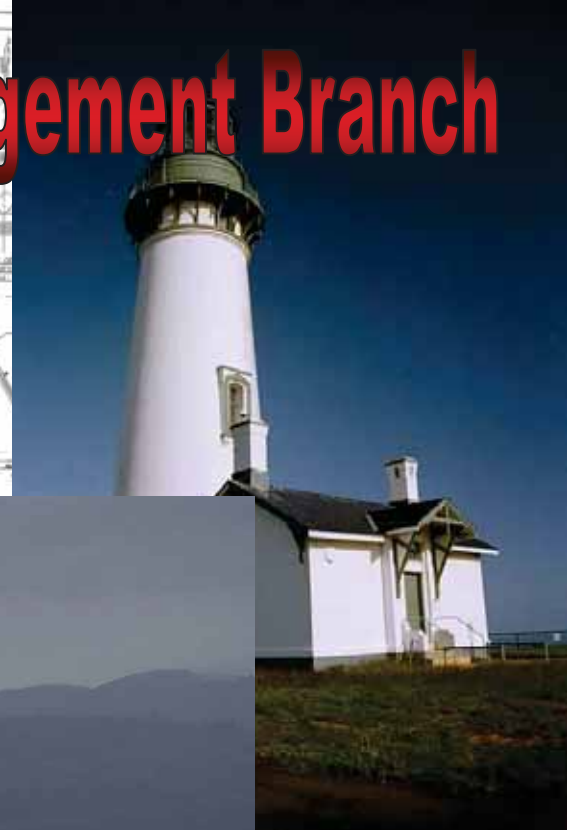
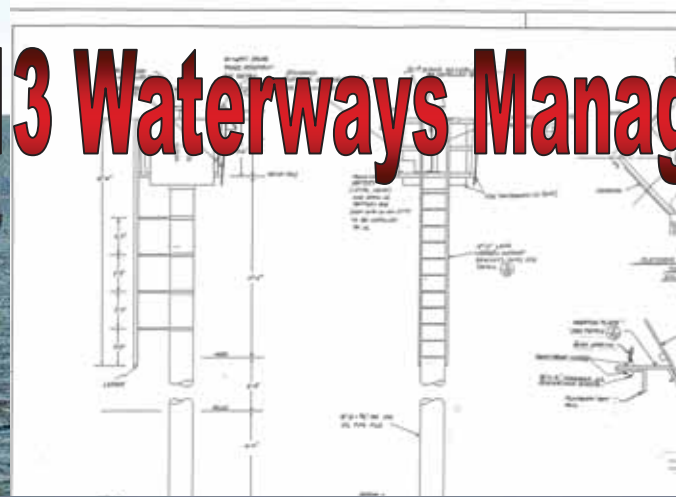
### Oregon (8)

Tillamook Bay  
Portland  
Depoe Bay  
Yaquina Bay  
Siuslaw River  
Umpqua River  
Coos Bay  
Chetco River

### Summer Only (Dets)

Coquille River  
Rogue River

# USCG District 13 Waterways Management Branch





# DPW MISSION



- Manage and oversee waterway system design (systems management) iaw regulatory elements of the Coast Guard's maritime mobility responsibilities to ensure the effective and efficient movement of commerce and access on navigable waterways, including but not limited to:
  - (1) Short Range Aids to Navigation (fixed and floating) iaw 33 CFR 62
  - (2) Limited access areas (e.g. Safety and Security zones, Regulated Navigation Areas)
  - (3) VTS/AIS
  - (4) Safety of Navigation for LNG/LPG, Alternative Energy Projects & EIS
  - (5) Bridge Administration Program
  - (6) COTP Waterways Management program oversight
  - (7) Direct the employment of District AtoN cutters
  - (8) Coordinate and support the Canada/U.S. Joint Coordinating Group for Vessel Traffic Management Service.
  - (9) AS DIRECTED





# World of Work



- Manage 1,891 Federal Aids and approximately 1,000 Private Aids
- Regulate 748 Bridges (654 fixed & 94 draw bridges)
- Directly Supervise CGC FIR (20 ton capacity) and CGC HENRY BLAKE (10 ton capacity)
- Provide Program Direction and Oversight to Sectors regarding AtoN waterways.



# BRIDGES

- RIVERS & HARBORS IMPROVEMENT ACT 1899
- TX from USACE to USCG in 1967 for SECTION 10
- 90 BRIDGES from Astoria to the head of the Columbia River and to Guffy Dam Site (mile 450)



# Force Laydown

- CGC FIR (225' WLB – D13)
- CGC HENRY BLAKE (175' WLM – D13)
- CGC BLUEBELL (100' WLI – SEC Columbia River)
- ANT's:
  - Astoria (1 TANB, 1 20' ABS – SEC Columbia River)
  - Kennewick (1 TANB, 1 20' ABS – SEC Columbia River)
  - Puget Sound (55' ANB, 2 TANB's – SEC Puget Sound)
  - Coos Bay (1 TANB, 1 20' ABS – SEC North Bend)



# ANT KENNEWICK



Homeport: Kennewick, WA  
AOR: Hood River to  
Lewiston, ID, Lake  
Roosevelt & Fort Peck  
Crew: 8 with E-7 Officer in  
Charge



Floating Aids 21

Fixed Aids 245





# CGC BLUEBELL



Homeport: Portland, OR

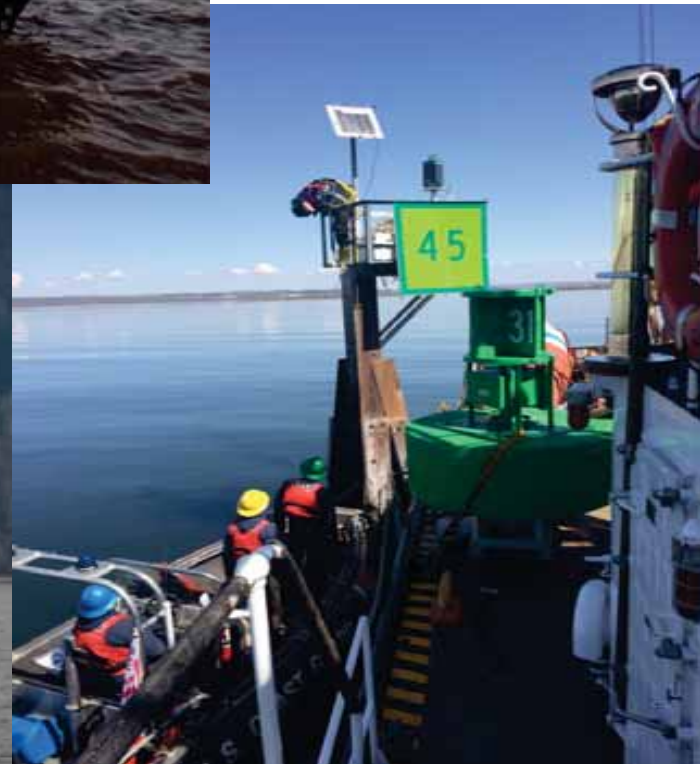
AOR: Astoria to Lewiston, ID

Crew: 15 with CWO  
Commanding Officer



Floating Aids 136

Fixed Aids 229





# CGC HENRY BLAKE



Homeport: Everett, WA

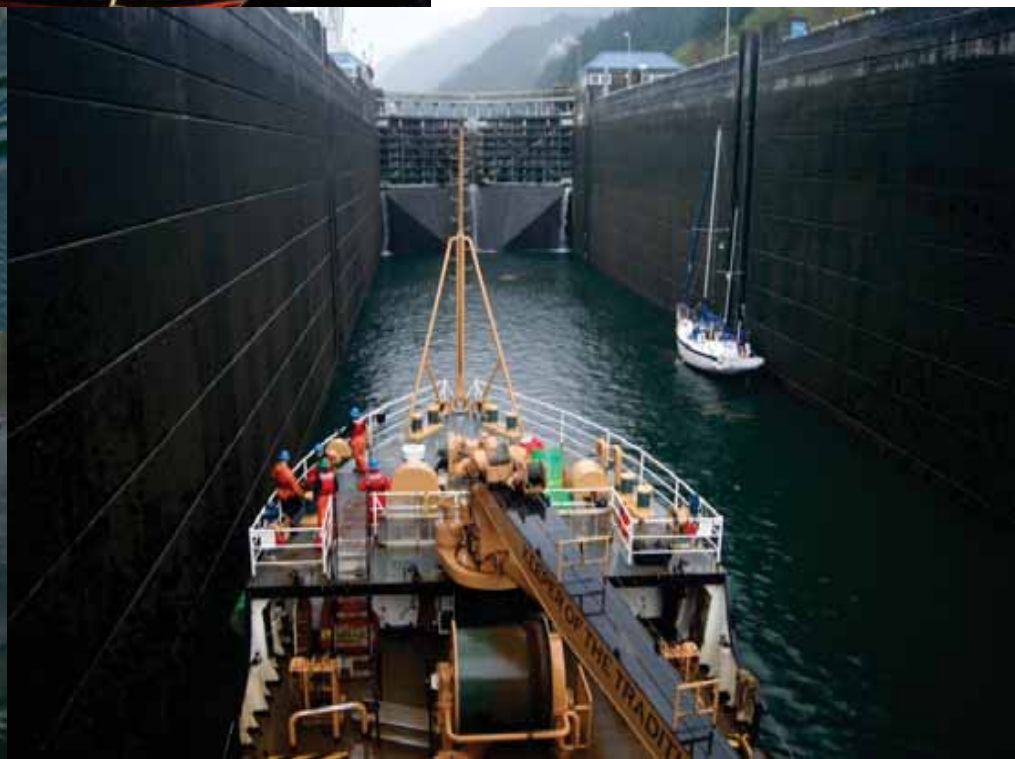
AOR: WA and OR Coast

Crew: 28 with LT (O3)  
Commanding Officer



Floating Aids 156

Fixed Aids 62





# CGC FIR



Homeport: Astoria, OR

AOR: WA and OR

Crew: 46 w/ LCDR (O4)  
Commanding Officer



Floating Aids 115

Fixed Aids 0





# Questions?

Cape Disappointment



ANT Astoria



CGC FIR





# Columbia Snake River System

## Projects and Partnerships



## Long term planning for inland system repairs

- Corps & PNWA – working together
- Continues collaboration that led to success with ARRA funds

### Strategy:

- Identify future major maintenance needs
- Predict and plan for system closures years in advance
- Provide funding vision for Corps HQ and Congress



**Goal: minimize planned and unplanned system closures**

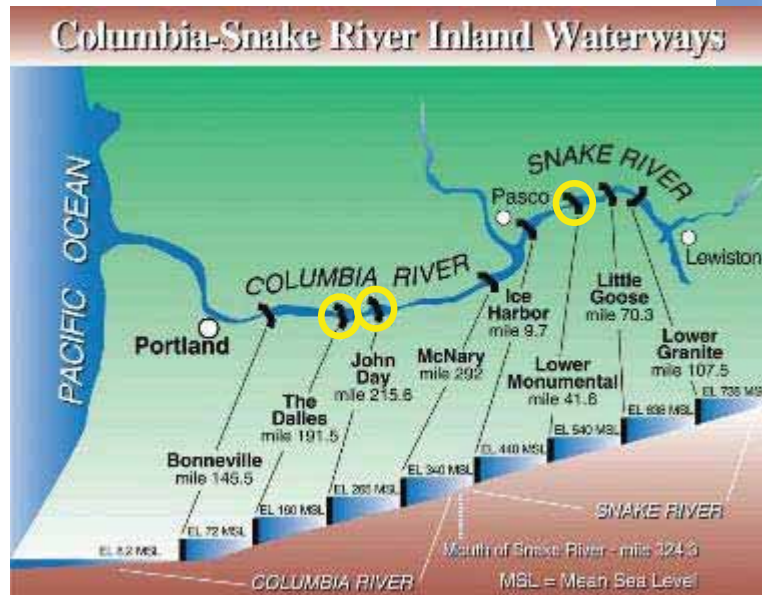
## 2010-2011 major maintenance activities were well planned

- Collaborative planning since 2006:
  - USACE – Portland District
  - USACE – Walla Walla District
  - PNWA
- 2007: Identified Columbia and Snake River maintenance and repair needs; drafted timeline
- 2009: American Recovery & Reinvestment Act (ARRA – “stimulus”) package provided ability to move forward with plans



# Columbia Snake River Locks Major Repairs – 2010/11 COMPLETED

- Significant federal investment
- New gates at 3 locks, major repairs at 3 others in one closure
- Ensures long term viability of the river system



*Lower  
Monumental lock*

# Challenge: Prepare Regional & Overseas Stakeholders

- Growers & manufacturers
- Shippers
- Ports (inland and deep draft)
- Towboaters, steamship operators, pilots
- International grain customers
- Fuel companies
- Municipalities that ship solid waste
- Media
- Government entities (federal/state/local)

# 14-month Communications Effort

- Over 30 speaking engagements with growers, shippers, ports, and government entities
- PNWA *Nor'westers* and fact sheets
- Media outlets – over 24 news stories
- Monthly USACE teleconferences
- Weekly USACE website updates prior/during closure
- USACE tours of projects
- U.S. Wheat Associates/PNWA brochure for overseas buyers



## Economic Impacts - Wheat



Growers had three choices:

- Sell early
- Ship via truck/rail to export facilities during closure
- Increase ground storage; sell after river system reopens



# Economic Impacts - Wheat

- Growers chose the river system
- Wheat volumes before & after the closure increased sharply over historical averages:

## BEFORE CLOSURE

September 2010 – 65% increase  
October 2010 – 20% increase  
November 2010 – 27% increase

## AFTER CLOSURE

April 2011 – 118% increase  
May 2011 – 84% increase  
June 2011 – 88% increase



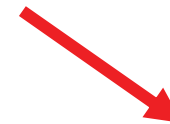
Source: Freight Policy Transportation Institute “Return to the River: Columbia-Snake River Extended Lock Outage”





# Economic Impacts – Solid Waste and Petroleum

Containerized municipal solid waste & petroleum moved upriver by truck and rail at increased cost



Source: Freight Policy Transportation Institute "Return to the River: Columbia-Snake River Extended Lock Outage"

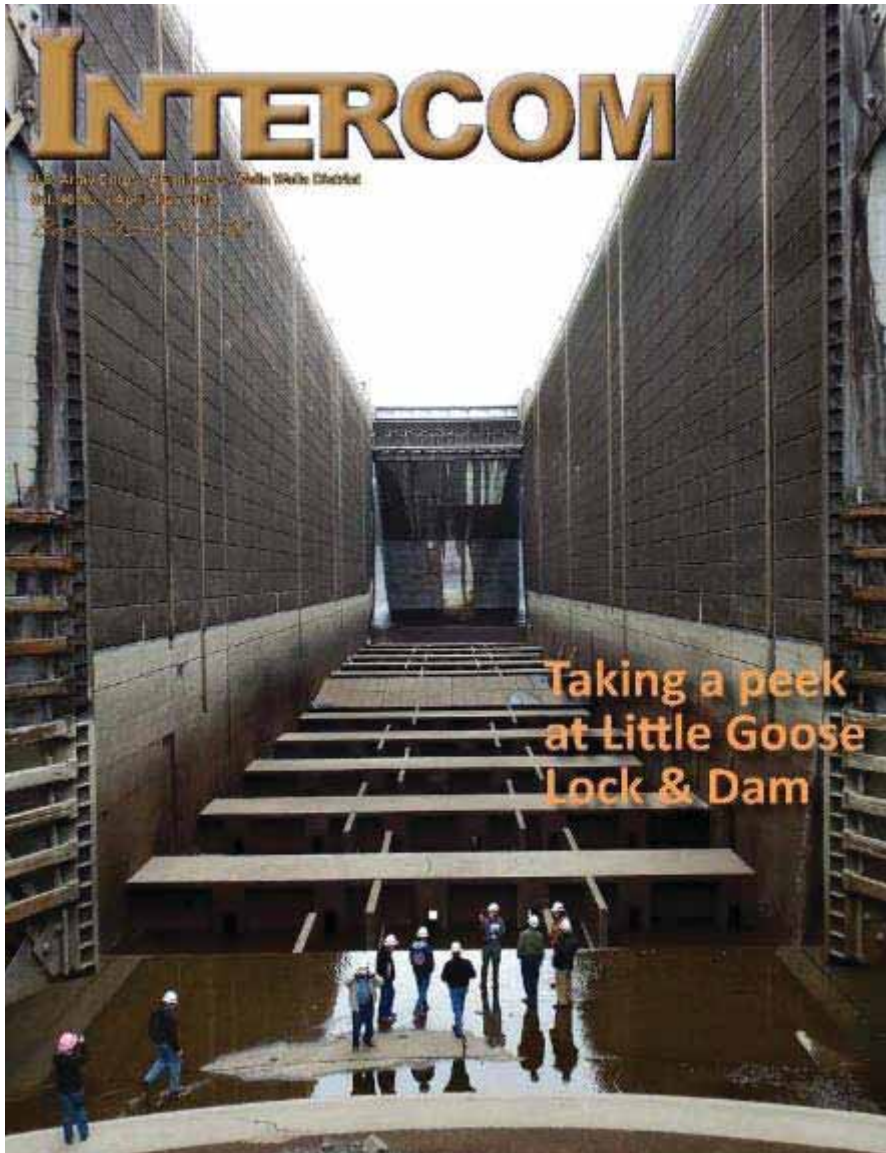
# Economic Impacts – Shipping Rates

- For commodities that moved via truck and/or rail, transportation costs increased 37.4%
- Truck & rail firms increased rates during the lock closure to capitalize on the lack of barge transportation



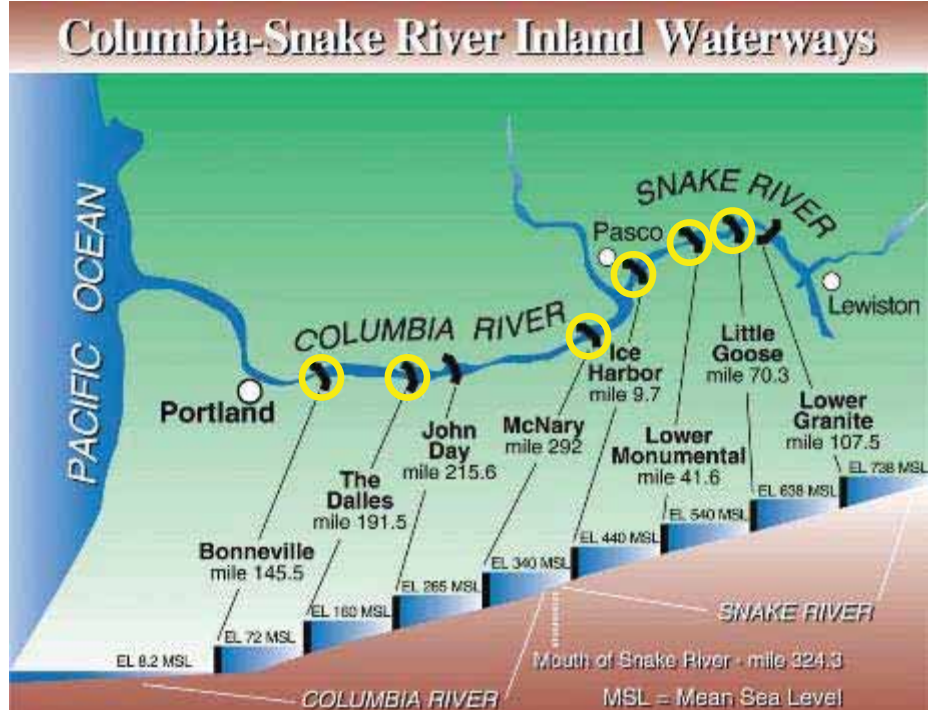
Source: Freight Policy Transportation Institute “Return to the River: Columbia-Snake River Extended Lock Outage”

# More investments coming this winter



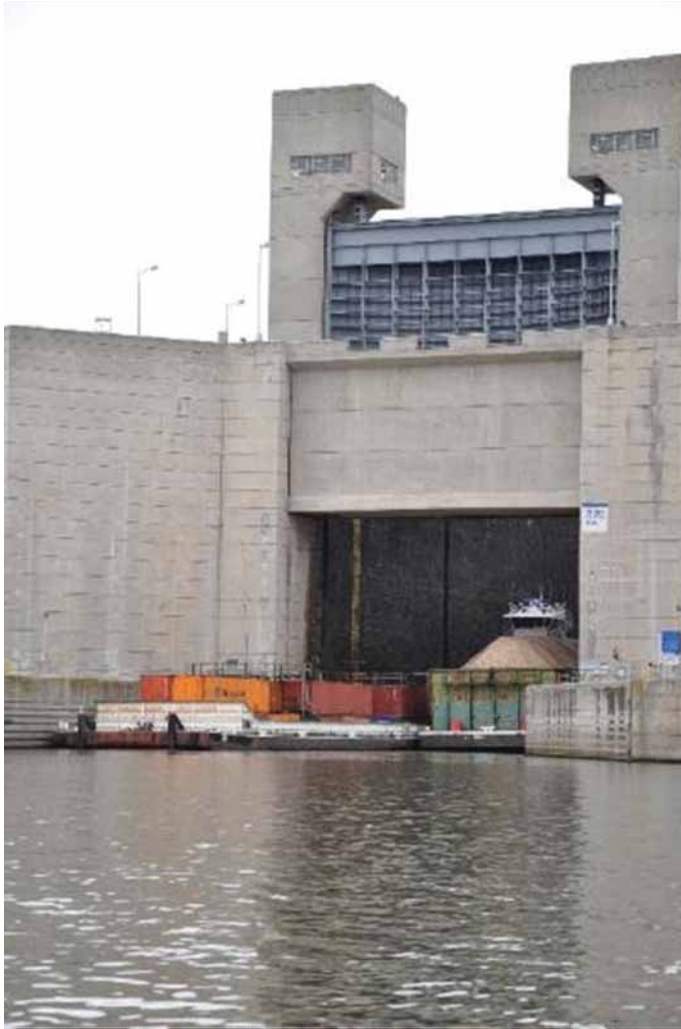
## Next extended closure:

- Approximately 14 weeks
- Mid-December 2016 to mid-March 2017



*Little Goose lock*

**We anticipate  
continued success!**



*First lockage  
at LoMo*



*First  
lockage at  
The Dalles*

25 Mar 2011  
7:44 AM

The background of the slide is a light gray gradient. It is decorated with several realistic water droplets and bubbles of various sizes, some with highlights and shadows, scattered across the surface. The text is centered in the middle of the slide.

# COLUMBIA RIVER TOWBOAT ASSOCIATION




# **CRTA**

- **EIGHT MEMBER COMPANIES REPRESENTING THE MAJOR TOWING LINES PROVIDING SERVICE ON THE COLUMBIA SNAKE RIVER SYSTEM**
- 



# DIVERSIFIED MARINE INC.

- PORTLAND BASED SHIPYARD FOR NEW CONSTRUCTION AND REPAIR.
  - FLOATING CRANE SERVICE, SPUD BARGES, DRY DOCKS.
  - 6 TUGS
- 


# DIVERSIFIED MARINE







# SAUSE BROS OCEAN TOWING


- COOS BAY OREGON BASED SEAGOING COMPANY
  - COLUMBIA RIVER OPERATIONS INCLUDE 6 TUGS AND BARGES TRANSPORTING PETROLEUM.
  - 6 DECK BARGES AND 3 TUGS PROVIDING GENERAL CARGO SERVICE COASTWISE AND TO HAWAII.
- 

SAUSE BROS.





# FOSS MARITIME


- SEATTLE BASED MARINE SERVICES COMPANY .
  - 5 TUGS BASED IN PORTLAND, PROVIDE SPECIAL SERVICE TOWING AND LOWER RIVER SHIP ASSIST.
- 

# FOSS MARITIME





# OLYMPIC TUG AND BARGE


- SEATTLE BASED MARINE SERVICES COMPANY.
  - COLUMBIA RIVER OPERATIONS WITH 3 TUGS INCLUDE HARBOR SERVICES, CONSTRUCTION, AND JFT SUPPORT.
- 

# OLYMPIC TUG AND BARGE





# SDS LUMBER COMPANY

- BINGEN WA BASED TUG COMPANY.
  - OPERATES 6 TUGS WITH BARGE SERVICE FOR WOOD PRODUCTS, AGGREGATES, SPECIAL SERVICES, CONSTRUCTION, AND JFT SUPPORT.
- 

# SDS MARINE







# BERNERT BARGE LINES


- COLUMBIA SNAKE RIVER BASED UPRIVER BARGE LINE.
  - 5 TUGS, 12 BARGES, PROVIDING TRANSPORT OF WOOD PRODUCTS, AGGREGATES, CONTAINERS, SCRAP STEEL, AND SPECIAL SERVICES.
- 

# BERNERT BARGE LINES





# SHAVER TRANSPORTATION COMPANY


- PORTLAND BASED COLUMBIA SNAKE RIVER COMPANY. PROVIDING SERVICE ON UPPER AND LOWER COLUMBIA/SNAKE RIVER SYSTEM.
  - OPERATE 13 TUGS AND 18 BARGES.
  - PROVIDE SHIP ASSIST, GRAIN BARGING AND SPECIAL SERVICE TOWING.
- 

# SHAVER TRANSPORTATION COMPANY





# TIDEWATER TRANSPORTATION AND TERMINALS

- PORTLAND BASED TUG AND BARGE LINE AND TERMINAL OPERATING COMPANY.
  - SERVICE ON LOWER AND UPPER COLUMBIA/SNAKE RIVER SYSTEM.
  - 16 TUGS AND 160 BARGES PROVIDING TRANSPORT OF PETROLEUM, GRAIN, WOOD PRODUCTS, CONTAINERS, SOLID WASTE, AND SPECIAL SERVICE TOWING.
- 



# 2016/2017 Columbia/Snake River System Extended Navlock Outage Portland District

**Jeff Ament, P.E.**

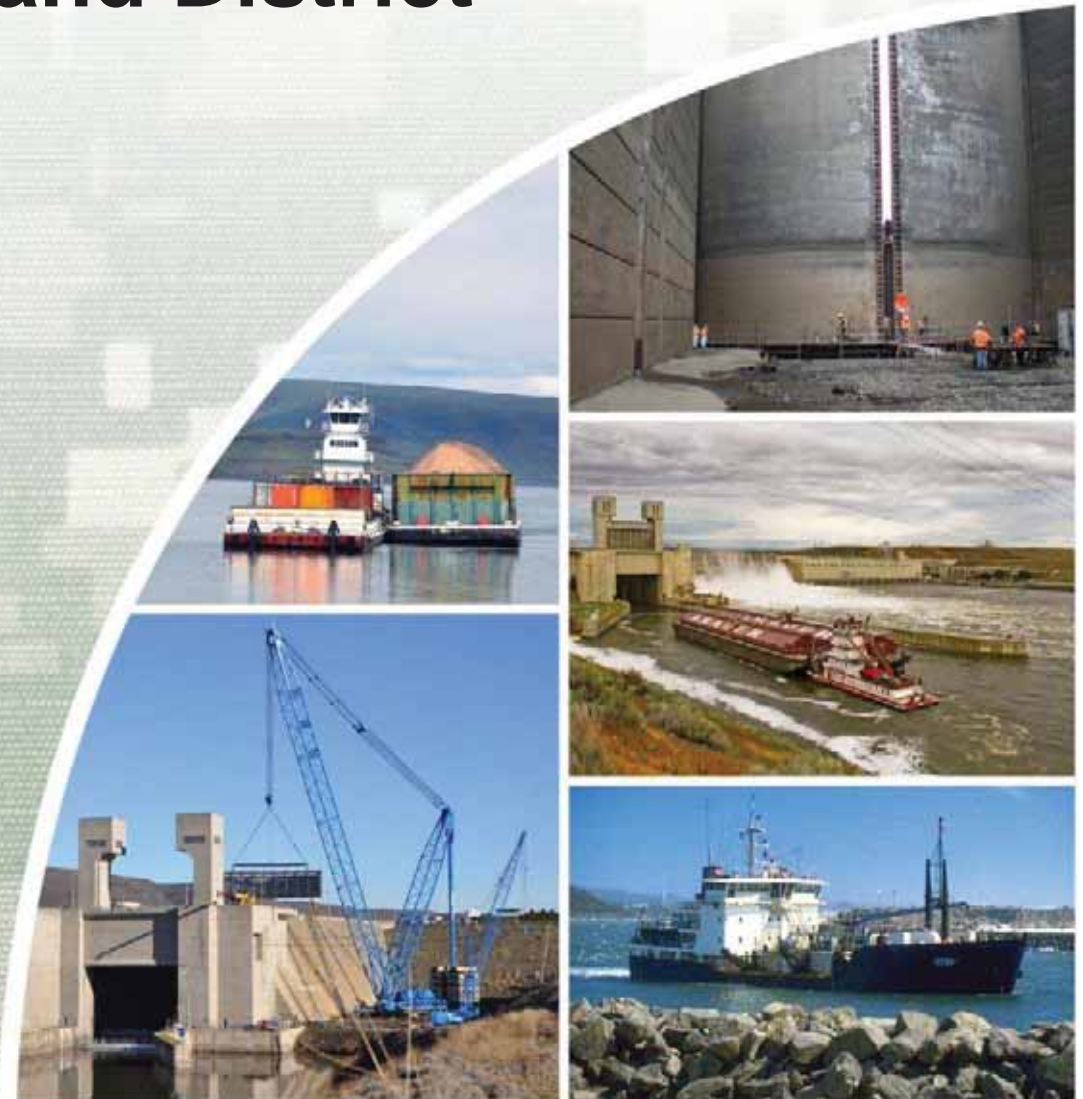
Project Manager

Portland District

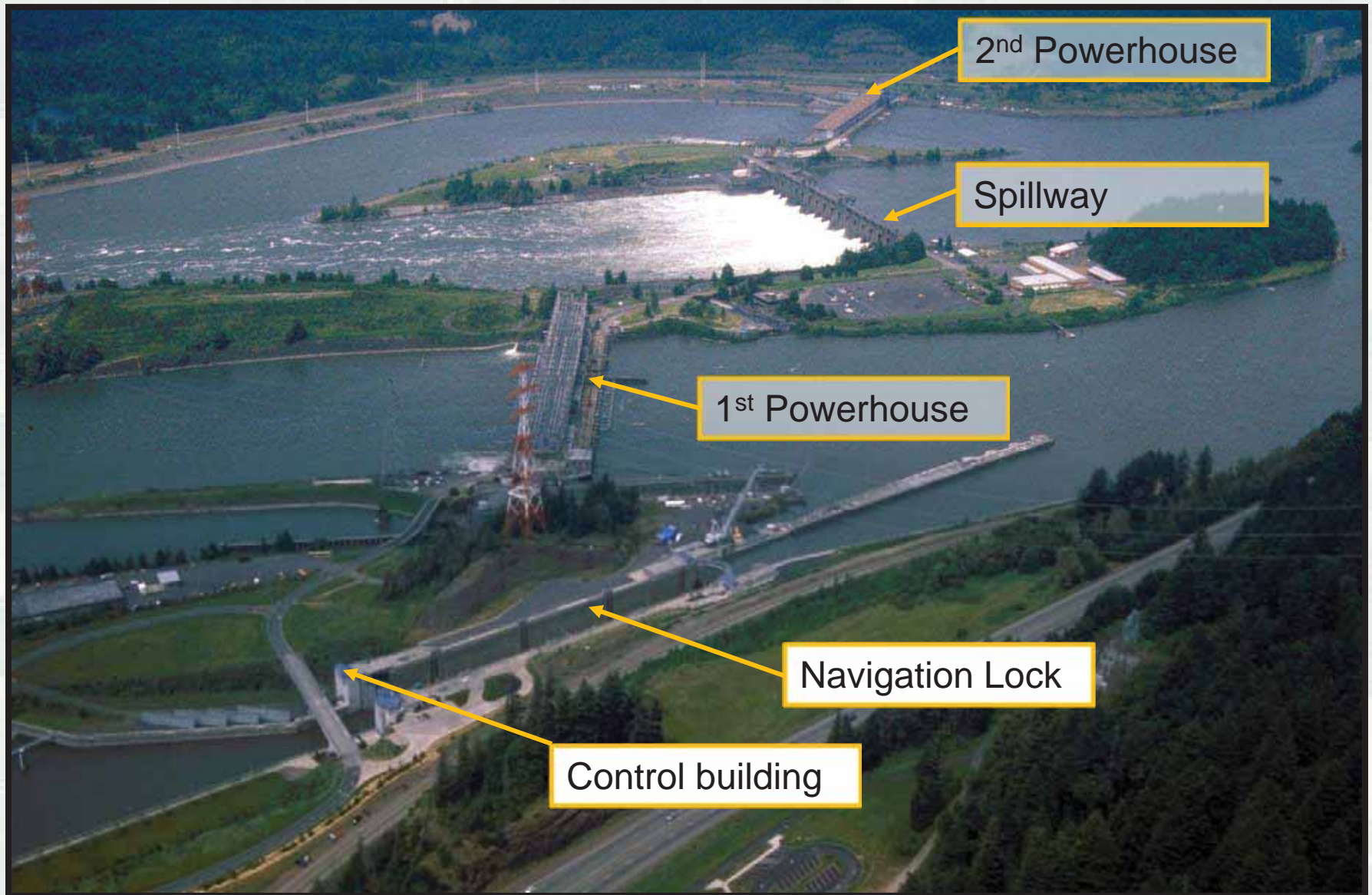
June 1, 2016



US Army Corps of Engineers  
**BUILDING STRONG**



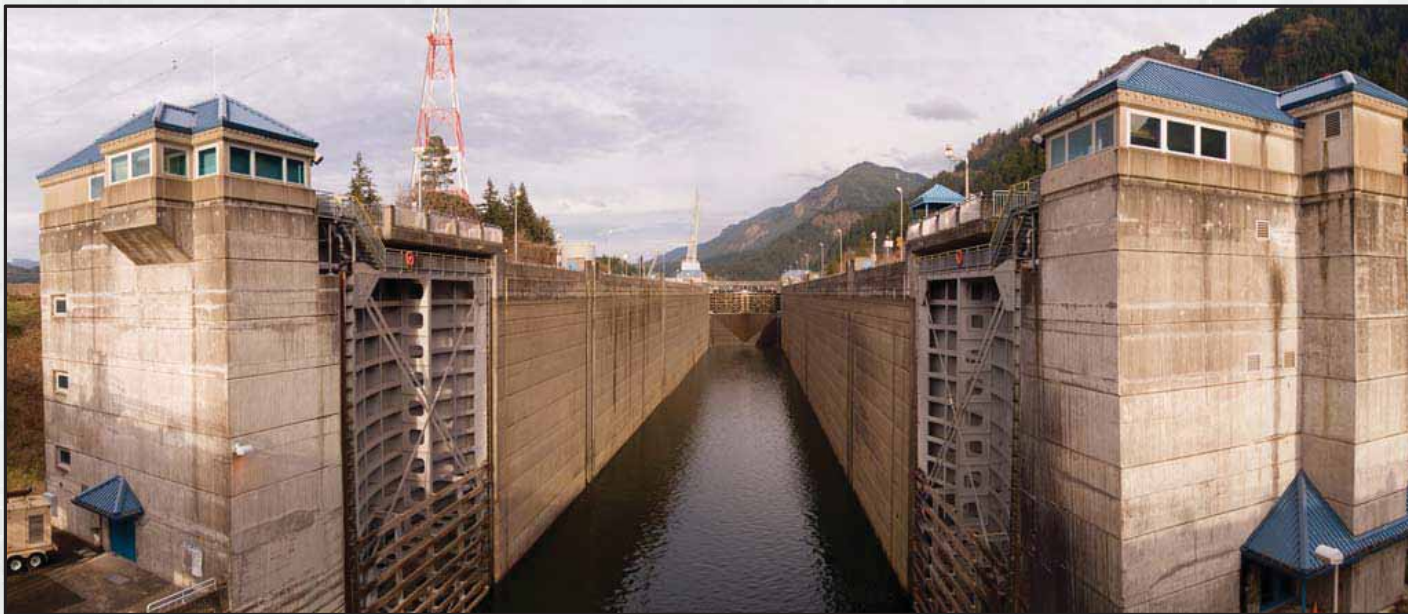
# Bonneville Dam





# Bonneville Extended Lock Outage Plan

- Upgrade controls (both hardware and software)
- Perform inspections and PMs
- Outage to be first 8 weeks starting Dec. 12, 2016
- Outage Milestones
  - ▶ Installation Complete
  - ▶ Commissioning Complete



# Bonneville FY17 Extended Lock Outage Current Status



Security-Sensitive  
Not Publicly  
Releasable

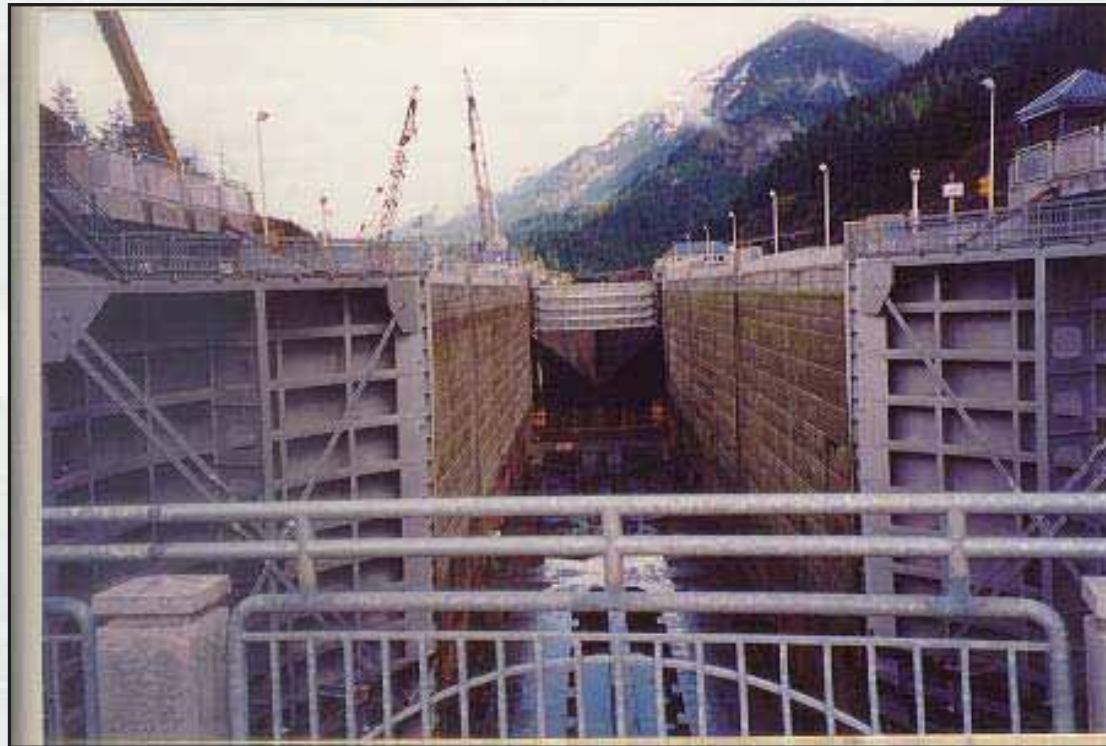
- All work being completed by in-house staff
- Purchased PLCs and Components FY15
- Performing prework – routing cables, installing electrical panels
- Starting software programming

Security-Sensitive  
Not Publicly  
Releasable



# Bonneville FY17 Extended Lock Outage

- Outage is Dec. 12, 2016 through Feb. 9, 2017
- Questions?



# The Dalles

1956

Present



60 Years



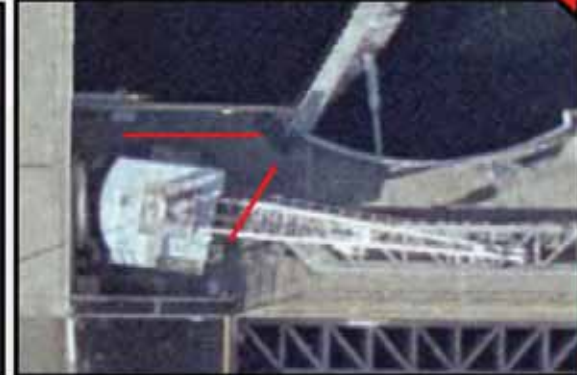
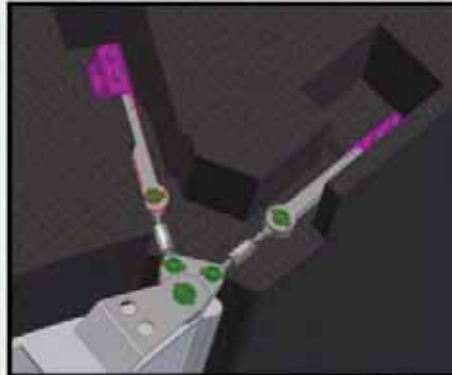
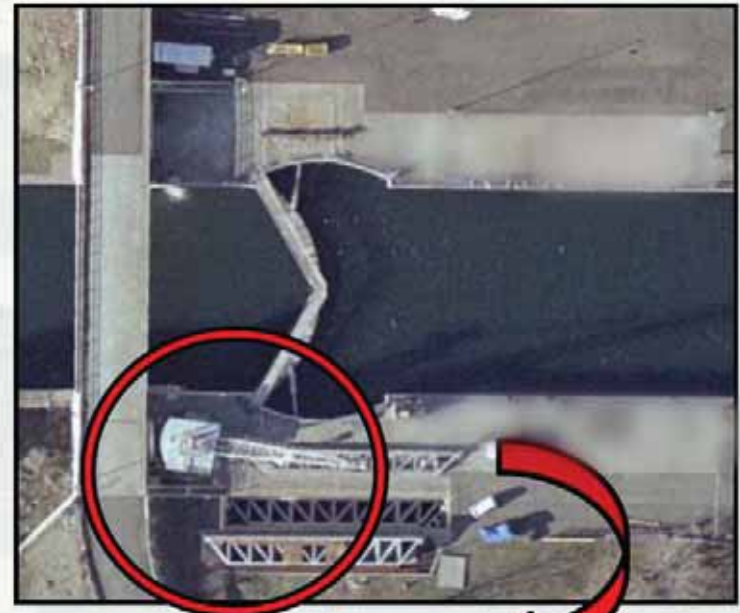
PORTLAND DISTRICT  
BUILDING STRONG®

# The Dalles (looking upstream)



# Current Issues/Plans – Downstream Gate

- Gate and Pintle (bottom hinge point) replaced in 2011
- Gudgeons (top hinge point)
  - ▶ Cracks noted in 2010/11
  - ▶ Repairs made in 2011
  - ▶ Analysis – near end of service life
  - ▶ Replace in FY17 outage
- Additional work (FY17 optional)
  - ▶ Cathodic protection
  - ▶ Vibration issues



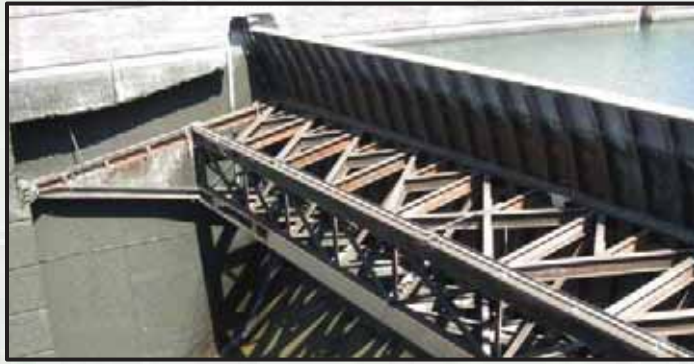
U.S. ARMY

Design by Tetra Tech

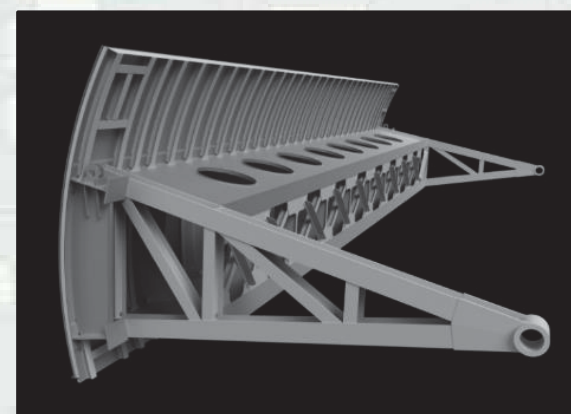
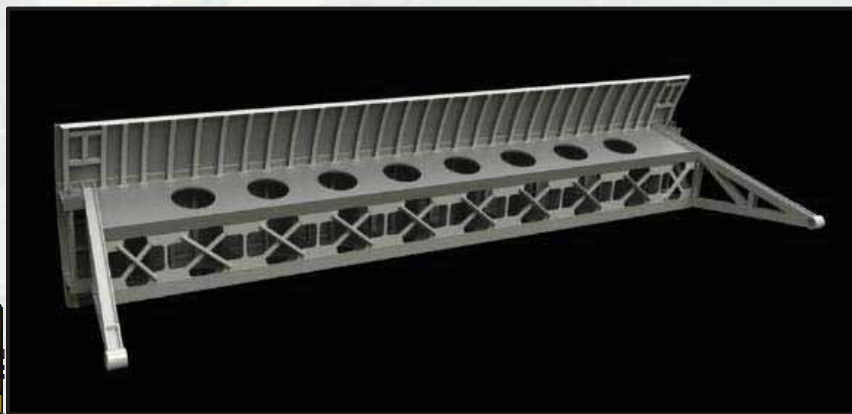
8

PORTLAND DISTRICT  
BUILDING STRONG®

# Current Issues/Plans - Upstream Gate



- Cracked welds and deformed members
- Gate is twisted, causing uneven lifting
- Replace gate in FY17 outage
  - ▶ Includes mechanical & electrical equipment



# Current Issues/Plan - Controls

Security-Sensitive  
Not Publicly  
Releasable



- 60-year old hardware difficult to maintain
- Insulation breakdown
- Included in 2016/17 Outage
  - ▶ Operator Interface Controls upgrade
  - ▶ Electrical Power Distribution System upgrade





# The Dalles FY17 Extended Lock Outage Contracts

- Supply contract for power distribution system awarded to Schneider Electric, September 2015 (\$700k)

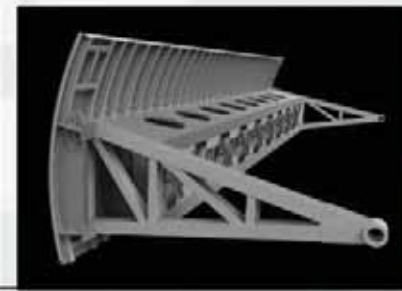
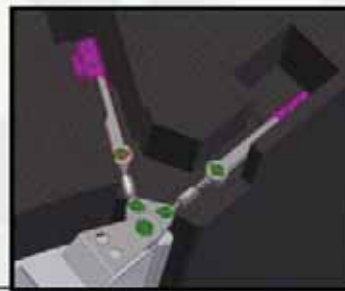
- ▶ Funding from FY15 workplan



Security-Sensitive  
Not Publicly  
Releasable

- Construction contract awarded to Northbank Civil and Marine, February 2016 (\$12M total w/opts)

- ▶ Mandatory items awarded (US gate, DS gudgeon)
- ▶ Awarded Optional Controls (April 2016)
- ▶ Funding available for all remaining optional DS gate follow-on items (award in-process)

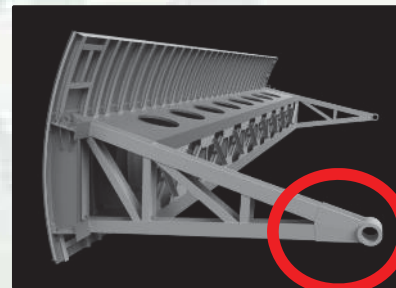


PORTLAND DISTRICT  
BUILDING STRONG®

# The Dalles FY17 Extended Lock Outage

## Current Status

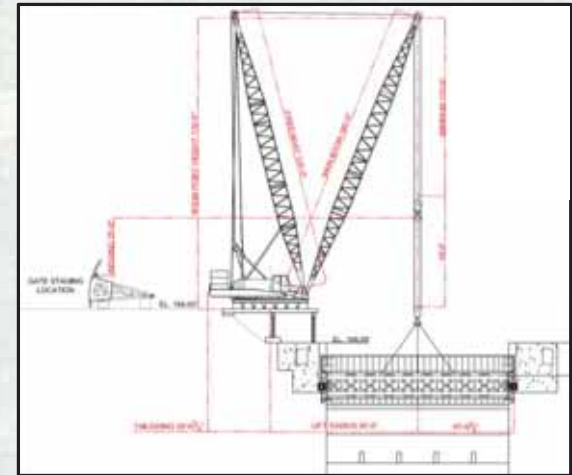
- Contractor performed site survey during 2016 lock outage
- Contractor preparing/submitting submittals
- Contractor verifying fabrication processes
  - ▶ US gate trunnion assembly mock-up
  - ▶ Weld procedures
- Plan to start installing power distribution equipment August 2016
  - ▶ Will be used in-place of temporary power during extended outage
  - ▶ Minimizes work/risk during extended outage



# Construction Schedule Highlights

- Steel fabrication (US gate & DS gudgeon)

- ▶ Start – by June 27, 2016
- ▶ Complete – by Dec. 2, 2016
- ▶ Shipment – on-site by Dec. 8, 2016
  - Prior to start of lock outage



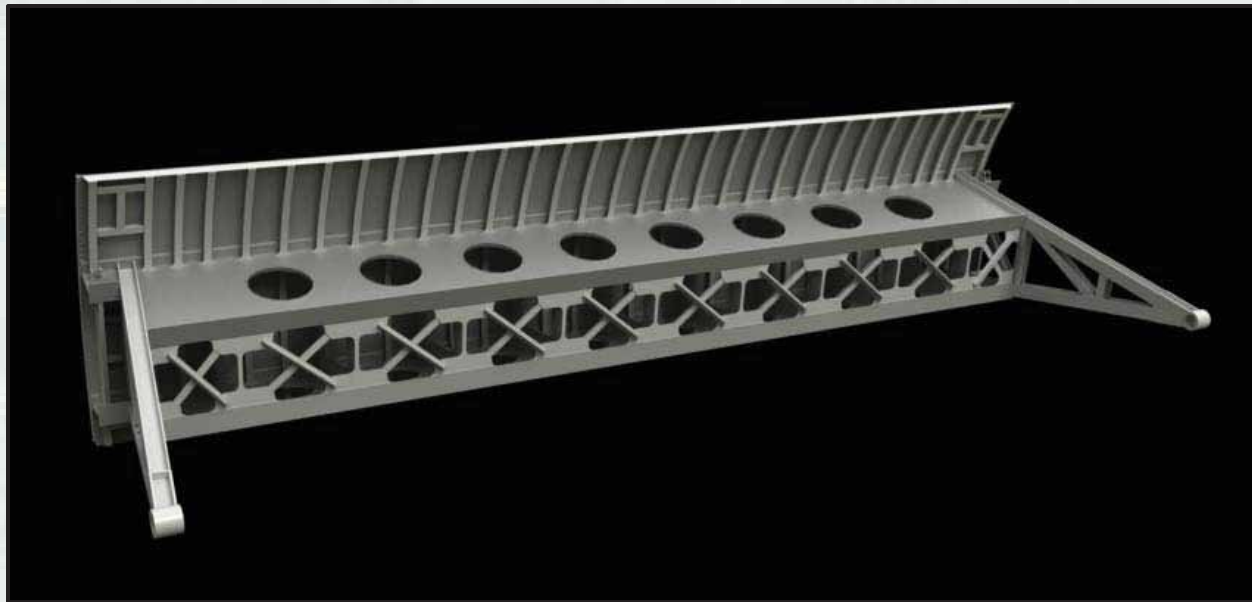
- On-site work begins

- ▶ Start electrical on-site installation – Aug. 1, 2016
- ▶ Start crane set-up – Oct. 28, 2016
- ▶ Tentative US gate removal – Dec. 27-29, 2016
- ▶ Tentative US gate placement – Jan. 17, 2017



# The Dalles FY17 Extended Lock Outage

- Outage scheduled Dec. 12, 2016 6 a.m. through March 20, 2017 11:59 p.m.
- Model
- Questions?



# McNary Downstream Miter Gate Interim Repairs

**Steve Hartman**  
Project Manager  
Walla Walla District

June 1, 2016  
Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



US Army Corps of Engineers  
**BUILDING STRONG**



# Background - McNary Downstream Miter Gate Interim Repairs



- Two-Leaf arched miter gate
- Gate put in service in 1954
- 106 feet tall x 86 feet wide
- Cracks monitored for past several years
- Crack repairs completed each year since March 2014
- Semi-annual follow-up inspections performed each year to confirm structural issues that require repair during annual Nav-Lock Outages



BUILDING STRONG®

# McNary Downstream Miter Gate Interim Repairs

March 2016 Completed Work:

- Continuation of Crack Repairs
- Completion of Quoin Seal Resurfacing
- Completion of Miter Seal Resurfacing



**BUILDING STRONG®**

# McNary Downstream Miter Gate Interim Repairs



March 2016  
16 Locations at Miter & Quoin Blocks  
Repaired With Welded Stiffening Plates





# McNary Downstream Miter Gate Interim Repairs



March 2016  
Bolted Plate  
Crack Repairs



**BUILDING STRONG®**

# McNary Downstream Miter Gate Interim Repairs



Miter Seal

March 2016 - Resurfaced Up to 60 Ft Elevation



**BUILDING STRONG**<sup>®</sup>

# McNary Downstream Miter Gate Interim Repairs

Quoin Seal



March 2016 - Resurfaced Up to 60 Ft Elevation



**BUILDING STRONG**®

# McNary Downstream Miter Gate Interim Repairs

## 2017 Scope of Work

- Full Height Structural Inspection of Each Miter Gate Leaf
- Repair of Cracks Identified By Inspections
- Gudgeon Eye-Bar and Pin Repairs
- Replacement of Miter Gate Bottom Seal
- Timber Fender Replacement



BUILDING STRONG®

# McNary Downstream Miter Gate 2017 Interim Repairs

## Gudgeon Pin Replacement

- North side Gudgeon Pin Bore elongation of 0.106”
- South side unequal loading and Gudgeon Pin Bore elongation of 0.032”
- Pin replacement requires jacking and shoring of gate leaves
  - ▶ Each Gate Leaf weighs 400 tons



# McNary Downstream Miter Gate Interim Repairs



Gudgeon Pin to be replaced

New Pins from March 2015 Contract



**BUILDING STRONG®**

# McNary Downstream Miter Gate Interim Repairs



Bottom Seal To Be Replaced



**BUILDING STRONG**®

# McNary Downstream Miter Gate Interim Repairs



Replace Deteriorated  
Timber Fenders:

- Each Miter Gate Leaf
- On Nav-Lock Walls  
At Gate Recess Areas



**BUILDING STRONG®**



# McNary Downstream Miter Gate Interim Repairs

## 2017 Interim Repairs Schedule

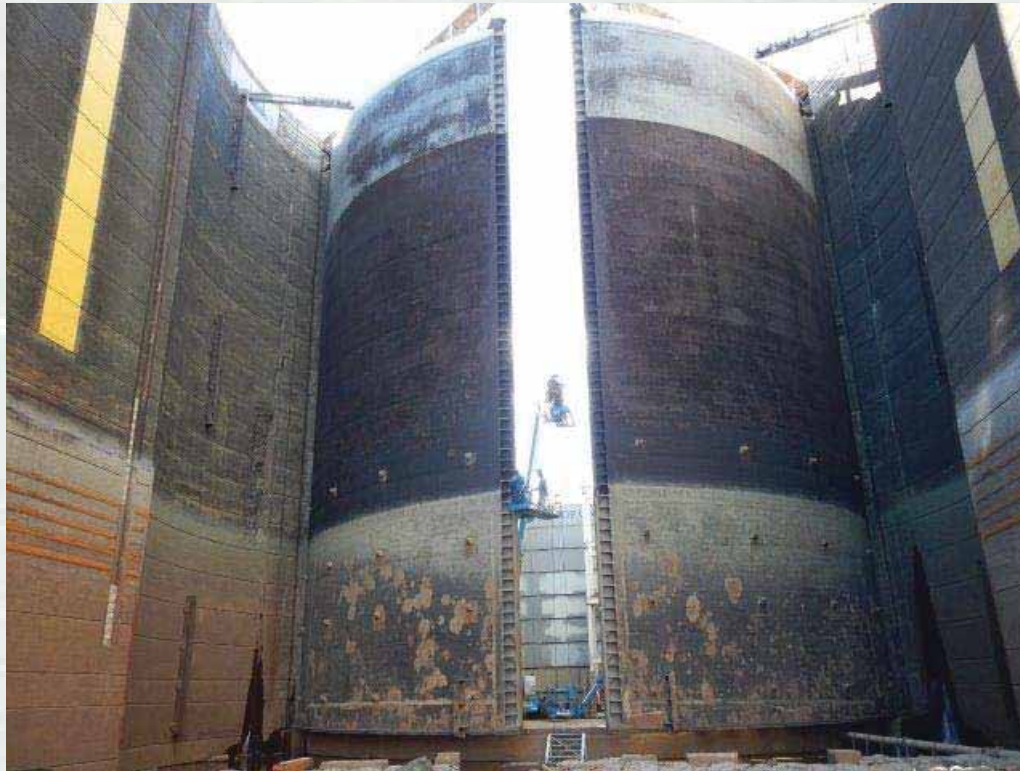
- Design Completion: August 2016
- Contract Award: October 2016
- On-site Work Window: December 12, 2016 – March 20, 2017
- Sequence of Work and Concurrent Activities are keys to contractor success
- Main drivers of risk to schedule are wind and other weather conditions



BUILDING STRONG®

# McNary Downstream Miter Gate Interim Repairs

Questions?



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades

**Steve Hartman**  
Project Manager  
Walla Walla District

June 1, 2016  
Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



US Army Corps of Engineers  
**BUILDING STRONG**



# Background - Lower Monumental D/S Gate Hoist Machinery Upgrades

- Vertical Lift Gate
- Gate Replaced in 2011
- 84 feet tall x 88 feet wide
- 690 Tons
- Most of hoist machinery and electrical components are original equipment put into service in 1969
- Refurbished gearboxes installed in 2011
- Antiquated controls difficult to maintain and obtain replacement parts



**BUILDING STRONG®**

## Executive Summary -

## Lower Monumental D/S Gate Hoist Machinery Upgrades

### SCOPE:

- Replacement/upgrade of the downstream gate hoist mechanical machinery
- Replacement/upgrade of associated electrical and control equipment
- Rehabilitation of the gate hoist friction sheaves and misc. structural components
- **Contract Award:** January 26, 2016
- **Contractor:** Knight Construction
- **Award Amount:** \$3,371,100



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades



Hoist Machinery Rooms



BUILDING STRONG®

# Lower Monumental D/S Gate Hoist Machinery Upgrades



Hoist Friction Sheave – 18 ft diameter,  
112,000 lbs



(12) 2-1/4" Diameter  
Hoist Cables Each Side



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades

## Structural Upgrades & Repairs:

- Weld Repairs on Friction Sheaves
- New Machinery Supports
- New Machinery Room Work Platforms & Ladders
- New Tower Roof Guardrail
- Structural Upgrades for Overhead Service Crane Corbels



**BUILDING STRONG®**



# Lower Monumental D/S Gate Hoist Machinery Upgrades



Similar New Equipment Bases – John Day



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades

## Mechanical Upgrades:

- Replace Hydraulic Power Units and Motors with Motor-Driven Gearboxes
- Install New Hoist Drive Pinion Gears, Bearings, and Brakes
- Install New Friction Sheave Bearings
- Replace Overhead Service Cranes



Existing Hydraulic Power Unit and Motor



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades



New Mechanical Drive Equipment at  
John Day – Model Design for LOMO

New Pinion Gear & Bearings



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades

## Electrical & Controls Upgrades:

- Remove Hydraulic Control Panels and Motor Control Centers
- New Motor Control Panels
- New Variable Frequency Drives (VFD's) and Hoist Motors
- New Programmable Logic Controllers (PLC's)
- New D/S Lock-stand Operator Control Console



Existing Hydraulic Control Panel and  
Motor Control Center



BUILDING STRONG®

# Lower Monumental D/S Gate Hoist Machinery Upgrades

Security-Sensitive  
Not Publicly  
Releasable

Existing D/S Gate Operator Controls



BUILDING STRONG®

# Lower Monumental D/S Gate Hoist Machinery Upgrades

Legacy Controls

Legacy Controls

Security-Sensitive  
Not Publicly  
Releasable

LOCK STAND

New Lock-Stand Operator Controls



**BUILDING STRONG®**

# Lower Monumental D/S Gate Hoist Machinery Upgrades

## Controls Upgrades

- Stand Alone Controls Network Ensures Cyber Security Compliance
- PLC Monitors Status of Equipment and Operates Equipment Based on Human Operator Commands
- Variable Frequency Drives (VFDs) Improve Reliability by Providing Gentle Starts and Stops of Gate Hoist Machinery
- VFDs Provide Additional Method of Holding the Gate With the Motor and Improve Safety of the Hoist Brake System
- Data Logger to Capture System Event Data, Status, and Equipment Trends – Improves Ease of Troubleshooting and Predictive Maintenance



BUILDING STRONG®

# Lower Monumental D/S Gate Hoist Machinery Upgrades

## Contract Schedule:

- Procure/Fabricate Long Lead Time Equipment: April – October 2016
- Pre-Outage Installation of New Overhead Service Cranes, Electrical & Control Panels, Conduit, and Wiring: September - November 2016
- Navigation Lock Outage Work Window: December 12, 2016 – March 20, 2017



**BUILDING STRONG®**



# Questions?



**BUILDING STRONG®**

# Ice Harbor Downstream Gate Hoist Machinery Replacement

**Steve Thompson**  
Project Manager, PMP  
Walla Walla District

June 01, 2016  
Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



US Army Corps of Engineers  
**BUILDING STRONG**



# Ice Harbor Downstream Gate Hoist Machinery Replacement

## Background:

- 1962 Navlock in-service
  - Apprx. 96,000 cycles
- Lift Gate replaced in 1995
  - 90' Tall
  - 720 Tons
- Wire Ropes replaced in 2012



BUILDING STRONG®

## Executive Summary -

# Ice Harbor D/S Gate Hoist Machinery Replacement

### SCOPE:

- Replace worn-out equipment
- Increase reliability
- Modernize controls
  
- **Contract Award:** January 08, 2016
- **Contractor:** Knight Construction
- **Award Amount:** \$4,698,500



**BUILDING STRONG®**

# Ice Harbor Downstream Gate Hoist Machinery Replacement



- Damage to pinion gear teeth



- Damage to ring gear teeth

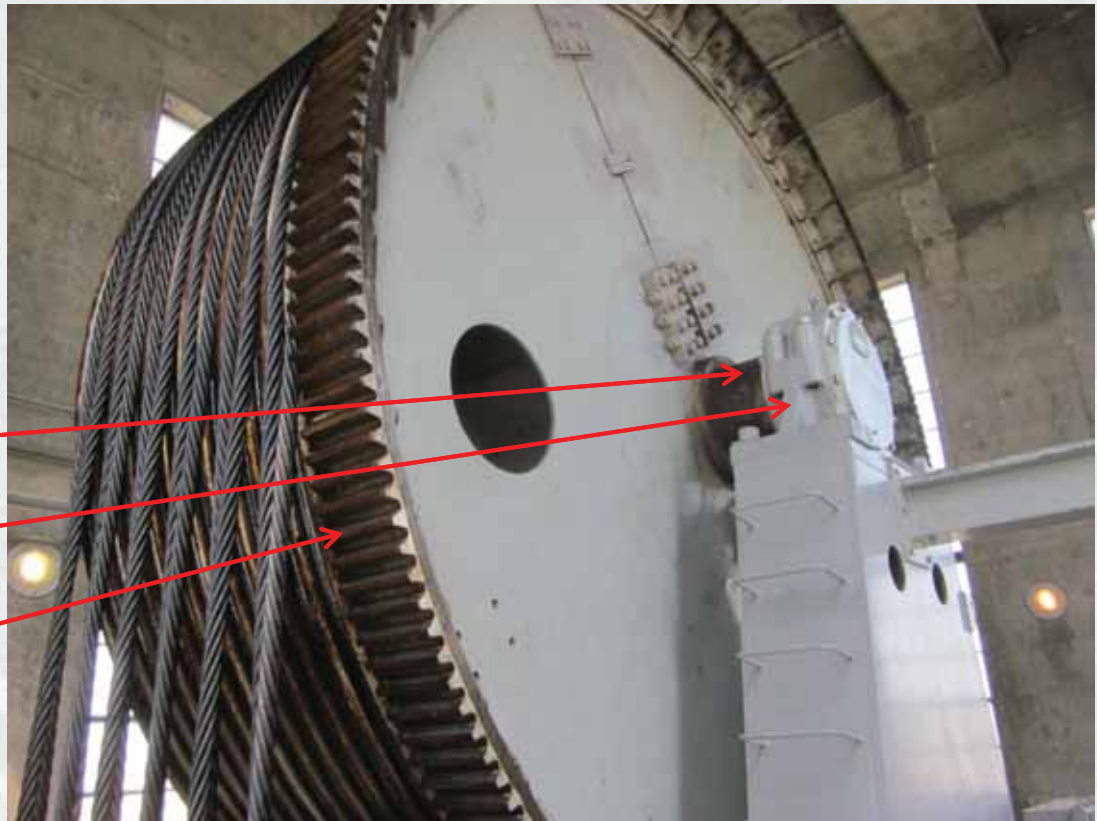


BUILDING STRONG®

# Ice Harbor Downstream Gate Hoist Machinery Replacement

- **Replace:**

- ▶ Friction sheave shaft
- ▶ Friction sheave bearings
- ▶ Ring gear

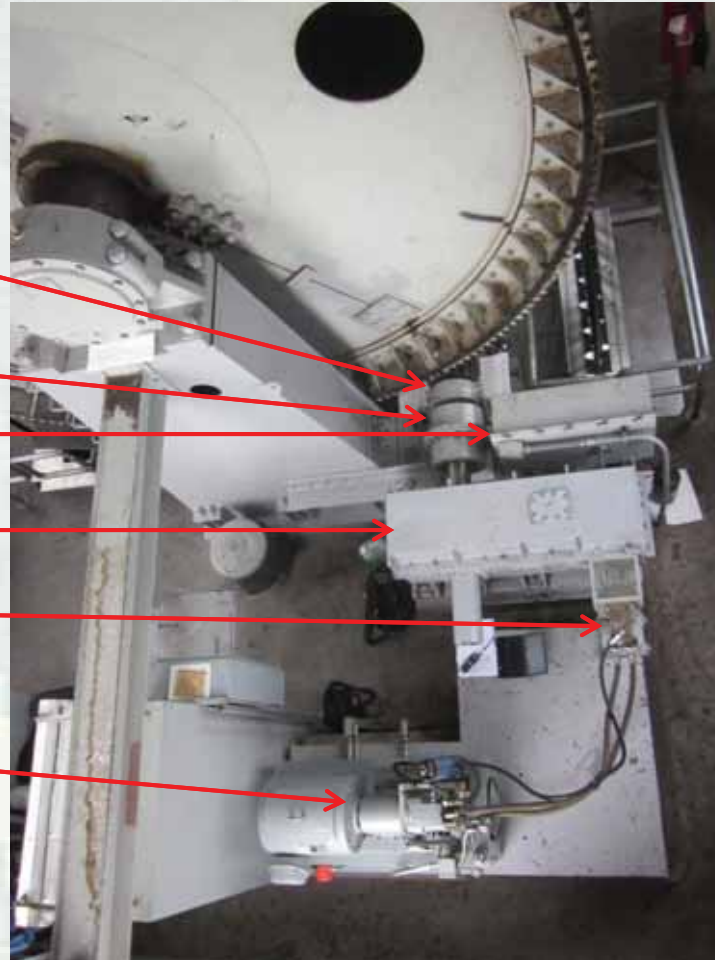


**BUILDING STRONG®**

# Ice Harbor Downstream Gate Hoist Machinery Replacement

## ■ Replace :

- ▶ Pinion gear & bearings
- ▶ Couplings
- ▶ Primary brake
- ▶ Gearbox
- ▶ Hydraulic motor
- ▶ Electric motor, pump, and hydraulic equipment



BUILDING STRONG®

# Ice Harbor Downstream Gate Hoist Machinery Replacement

## ■ Upgrades

- ▶ Electrical and Controls
- ▶ Tower Overhead Crane
- ▶ Roofs



BUILDING STRONG®



# Ice Harbor Downstream Gate Hoist Machinery Replacement

## Contract Schedule:

- Feb 2016 A&E Task Order Award (McMillen)
- Mar – Dec 2016 Fabricate long lead time equipment
- Sep - Dec 2016 PRE-Outage Work Window:  
New overhead service cranes, electrical & control panels, conduit, and wiring
- 12 Dec 2016 – 20 Mar 2017 Navigation Lock OUTAGE Work Window
- April 2017 POST-Outage Work Window:  
Training, roofing & safety rails



**BUILDING STRONG®**

# Questions?



**BUILDING STRONG®**

# LITTLE GOOSE LOCK & DAM FY17 DOWNSTREAM MITER GATE REPAIR

**Jason Williams**  
Project Manager, PMP  
Walla Walla District

June 1, 2016  
Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



US Army Corps of Engineers  
**BUILDING STRONG**



# BACKGROUND

Little Goose lock & dam is located on the Lower Snake river near Starbuck, Wa. The navigation lock provides critical river transportation and shipping capability along the snake river

- Little Goose Downstream Gate is a two-leaf Miter Gate
- Placed in Service 1970
- Each leaf is approximately 118 Feet tall by 43 Feet wide and over 700,000 lbs



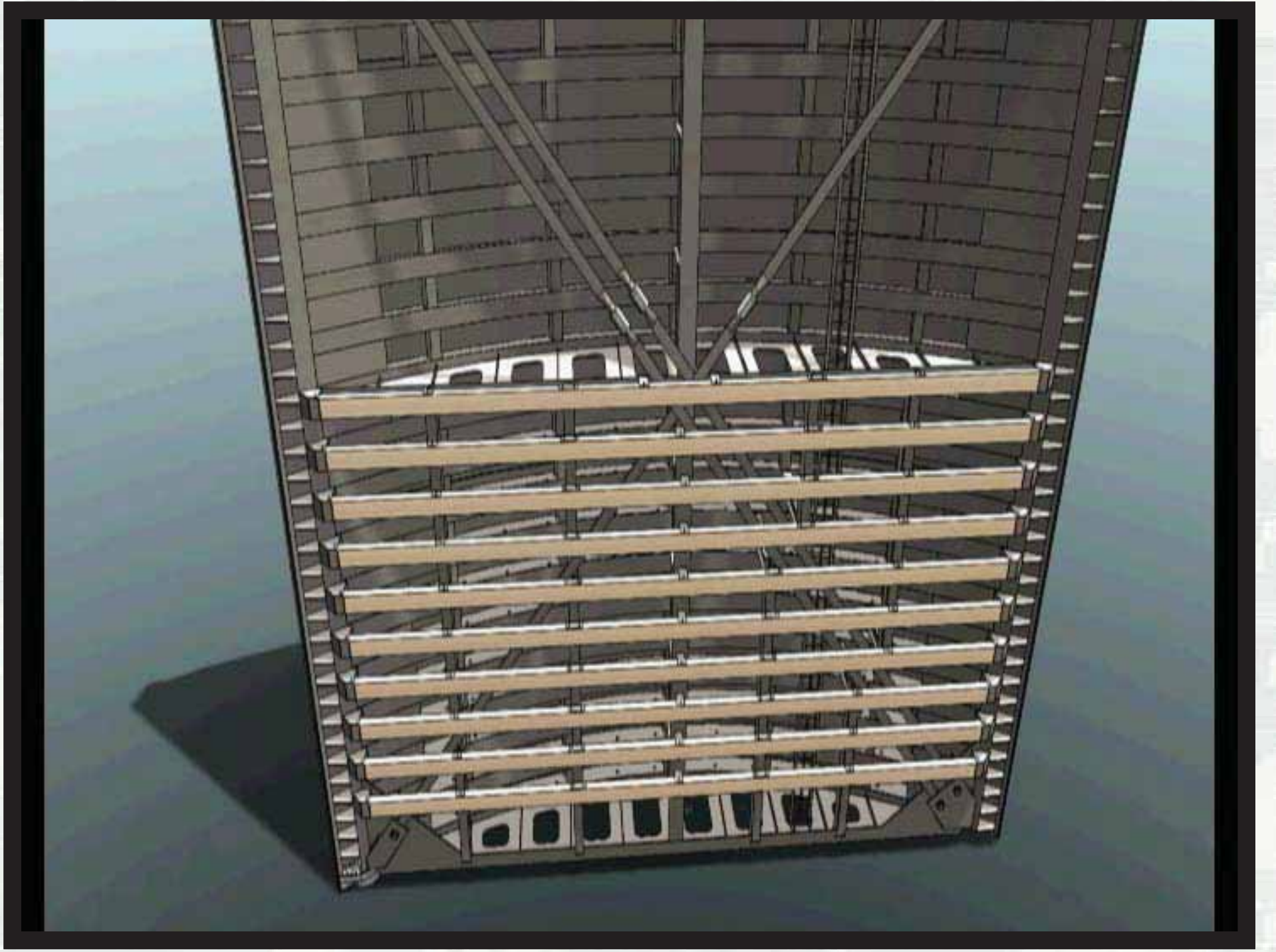
**BUILDING STRONG®**

# EXECUTIVE SUMMARY

- SCOPE: Repairs to the downstream miter gates to include replacement of gudgeon arm, pintle heel assemblies, timber fenders, repairs of the quoin and miter blocks, and painting below tail water elevation .
- CONTRACT AWARD DATE: 9 May 2016
- CONTRACTOR: Dix Corporation
- AWARD AMOUNT: \$2,186,395

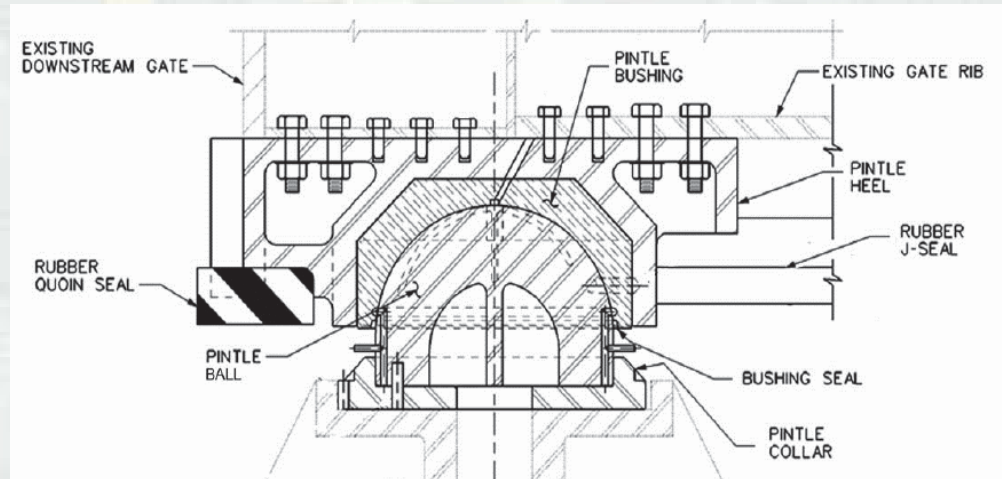


**BUILDING STRONG®**



# PINTLE REPAIRS

- Replacing the cast steel pintle heels and new pintle balls.
- Demolition of existing cracked structural steel members that support the pintle heel and gate.



**BUILDING STRONG®**

# REPLACE GUDGEON LINKAGE AND PINS

- Replacing the gudgeon linkage assemblies that connect each gate leaf to their respective gudgeon anchor frames.



BUILDING STRONG®



# STRUCTURAL REPAIRS TO QUOIN AND MITER BLOCKS

- Replacement of the quoin and miter bearing blocks for the bottom 22 feet (approx.) of the gate.



**BUILDING STRONG®**

# INSTALL NEW FENDERS AND SAFETY RAILS

- New safety railing around the top perimeter of each gate leaf
- Removal of existing and replacement of the timber fender systems on each gate leaf



**BUILDING STRONG®**

# QUESTIONS



**BUILDING STRONG<sup>®</sup>**

# Stakeholder Communications

**Gina Baltrusch**

Public Affairs Specialist  
Walla Walla District

June 1, 2016  
Columbia-Snake River Navigation System  
Spring Stakeholder Meeting



**U.S. ARMY**



US Army Corps of Engineers  
**BUILDING STRONG**



# Keeping Stakeholders Informed

- Webpage
- eMail
- Teleconferences
- Special Events
- Stakeholder Updates
- News Releases
- Fact Sheets



BUILDING STRONG®

**Webpage**  
**General Information**  
**News Releases**  
**Updates**  
**Contacts**



<http://www.nww.usace.army.mil/Missions/Navigation/FY17LockOutage.aspx>

**eMail**

**Stakeholder Updates**  
**Special Event**  
**Announcements**

[FY17LockOutage@usace.army.mil](mailto:FY17LockOutage@usace.army.mil)

**Sign Me Up!**  
for FY17 Extended Navigation Lock Outage Updates  
Fill out and leave card in Corps-labeled box OR email via smart phone

Name \_\_\_\_\_  
Organization \_\_\_\_\_  
Email Address \_\_\_\_\_



**BUILDING STRONG®**



# Social Media



District Internet Pages :

Portland: <http://www.nwp.usace.army.mil/>

Portland Facebook: <https://facebook.com/PortlandCorps>

Portland Twitter: <https://twitter.com/PortlandCorps>

Walla Walla: <http://www.nww.usace.army.mil/>

Walla Walla Facebook: <https://facebook.com/WallaWallaUSACE>

Walla Walla Twitter: <https://twitter.com/WallaWallaUSACE>

YOUTUBE As Resources Allow



BUILDING STRONG®

# Stakeholder Update Schedule

- eMail Update – June 2, 2016
- Teleconference Updates:
  - Monthly** – Sept. 8, Oct. 6, Nov. 3
  - Weekly** – Dec. 1, 8, 15, 22, 29
  - Jan. 5, 12, 19, 26
  - Feb. 2, 9, 16, 23
  - Mar. 2, 9, 16

★ Written update information presented during teleconference will be distributed via eMail and Web-posted the following day

★ Call-in instructions for the next meeting will be included



**BUILDING STRONG®**



# Questions?

[FY17LockOutage@usace.army.mil](mailto:FY17LockOutage@usace.army.mil)



**BUILDING STRONG®**

# THANK YOU

## Walla Walla and Portland Districts Joint Navigation Meeting June 1, 2016

Questions ?  
Comments?



**U.S. ARMY**



®

US Army Corps of Engineers  
**BUILDING STRONG**®

