MEMORANDUM FOR FILE 16 January 2008

SUBJECT: NESP, FIRST INCREMENT ANALYSIS, PRESENTATION TO INDUSTRY

1. A list of attendees is attached as Enclosure 1. Two people called on the phone to listen and participate and their names are also listed.

2. The meeting was started at 1:00 p.m. by Bill Gretten of Rock Island District and he asked everyone to introduce themselves. Jeff Stamper of St. Louis District then began his presentation. His PowerPoint presentation is included as Enclosure 2. The presentation is based on the design and planning progress to date, which continues to change. It was emphasized how meeting like this contributes to the direction of these changes.

3. The Water Resource Development Act (WRDA) is now passed and the districts want to communicate with the internal and external stakeholders and to advertise the Navigation and Ecosystem Sustainability Program (NESP) with all.

4. A slide was shown regarding the generalized schedule for design, construction, partial wintertime closures, and full wintertime closures. The Corps is studying these issues all the time and will continue to do so. The closures and series nature of the lower five locks results in lock closures essentially shutting down the navigation system, but the Corps anticipates that continued work could reduce the impacts. The definition of winter closures is considered to be from December 15 to March 15, but will be refined with additional work and coordination with the industry. A partial closure in the wintertime could allow for perhaps one day of lock availability per week. Ice conditions and the overall harsh winters may not allow this and may not even permit safe transit in the river; therefore, a partial closure could be as severe as full closing the lock in the winter. A full wintertime closure for lock construction will not permit any navigation during the approximately 90-day duration. Scale models will help advance construction studies for the locks. So far only two of the locks are modeled at the Engineering Research and Development Center (ERDC) in Vicksburg, Mississippi. They will now start on modeling LaGrange Lock. As shown on the slide, the design times are distinct for each lock due to the expected flow of funding.

5. A slide was then shown listing each of the seven new locks along with their respective construction costs, design start date, construction start date, and construction completion date. With the funding that the Corps has received thus far, not as much as design work can be accomplished. A question was asked that if the Corps was to receive an amount of appropriation, where would this funding go. Jeff answered that any funding would be distributed to each of the projects which would correspond with each project's comparable progress.

6. Jeff next showed a slide on the NESP Program Cost Distribution and a slide of the Historic and Expected NESP Resources. The latter slide illustrates the number of people required in the next few fiscal years using Corps personnel, private sector contracts, and other agencies. When funding is received the Corps will contract out to get the work done since other staffing-intensive projects are on-going like rebuilding after Hurricane Katrina.

7. Jeff then presented the two slides titled “The Plan” and “First Increment” which outlined the plan of work to be done in the First Increment. A question was asked to define traffic management. Traffic management is explained in a later slide so the question was deferred to that time for a more illustrative answer. The First Increment includes small-scale structural and non-structural measures including mooring facilities, switchboats, and an appointment scheduling system, and also includes the new 1200-foot locks at 20, 21, 22, 24 and 25, LaGrange, and Peoria (please note that Lock and Dam No. 23 does not exist), the systemic environmental mitigation, and the economics interim report.

8. A slide was then presented of a funding and timeline graph titled “Navigation Program Adjusted Baseline Cost Distribution”, which shows a funding peak around the year 2017. The annual Major Rehabilitation of $65 million and annual Operations and Maintenance (O&M) of $125 million were noted as being a necessary part of the system and are vitally needed to make the system work. A question was asked in regard to the apparent bell-shaped curve of expected funding and how this compares with actual funding for the Ohio River work. Jeff answered that the funding for some of the projects on the Ohio River have worked out well but in more recent times projects have been underfunded. The graphs present the funding that the Corps estimates that it will require, but, of course, we don’t know what funding will be received.

9. One of the small-scale structural measures is the Moorings. Jon Fleishmann of the Rock Island District is the team leader. WRDA wording allows flexibility to put them where they are needed most. The moorings at Lock 14 and LaGrange are proposed to have a FY09 construction contract award.

10. A non-structural measure is the Switchboats which is almost like industry self-help but these will be government-contracted boats to be used. There will be some time savings using these switchboats with more savings for downbound tows of about 13 minutes. The switchboats are proposed to have a contract award in FY09 using one or two and then the government will do an evaluation. The Corps will investigate the locations of the boats but for now the locations are undecided. Industry should give their opinions as to which lock is best suited for switchboats. Locks 22 and 25 have the longest delays so the Corps anticipates that these would be the best locations. Dave Gordon in the St. Louis District is the team leader. The decision as to locations depends on the delays if the delays are caused by breaking up tows or working with the drafts.

11. The non-structural measure of Traffic Management would include tow resequencing, vessel-to-lock proximity data tools, real-time lock currents data, tradable permits, lockage fees, and lockage time scheduling. This has also been referred to as appointment scheduling. Tow Resequencing was based on a report by the University of Missouri at St. Louis (UMSL) and is based on vessel type expediency. This basically means that single barges lock through faster so they would probably lock first and there would be no recognition of the value of the barge cargo. The Corps’ and industry’s comments are completed on this report. Industry’s opinion is that the value of the cargo has never been the priority but it has always been safety of the traffic on the river. Usually barge companies are willing to give up their turn for others, but this puts a responsibility on the lockmaster to ensure Industry preferences. The Government and industry definitely need to work together on this issue. In the end, the value of cargo may not be the consideration but possibly if the cargo is considered critical, then it may get priority lockage.

Vessel-to-lock proximity data, also know as the proprietary"Smart Lock", uses DGPS in which the pilot knows how close he is to the lock which can assist him. This could be considered an asset management tool since the barge would be reducing the risk of damage to the lock and vessel. Dave Gordon in the St. Louis District is the team leader. The Corps proposes to have a traffic management concept ready by the end of FY08 and ready for testing. A question was asked as to whom will decide which way to go. The Corps would like the barge industry's opinions and help in the process of the decision-making. Industry's opinion is that the vessel-to-lock proximity doesn't work with all charting systems available and there are many different kinds. Jeff reiterated that he appreciates the communication exchange.

12. In regard to the new 1200-foot locks, WRDA wording says "The Secretary shall construct new locks…", thus five new locks will be constructed at Lock and Dam Nos. 20, 21, 22, 24, and 25 on the Mississippi River and two new locks will be constructed at LaGrange and Peoria on the Illinois River.

13. As shown on the slide, at Lock 22 the average delays have been 4.5 hours and the average annual commercial tonnage is 33.3 million tons. Michael Tarpey from the Rock Island District is team leader.

14. As shown on the slide, at Lock 25 the average delays have been 4.0 hours and the average annual commercial tonnage is 34.7 million tons. The team leader is Steve Hobbs from the St. Louis District. One issue at this lock is that the center wall has a filling and emptying culvert that will be redirected to service the 1200 ft lock leaving the 600ft lock to fill and empty from the culvert in the landward wall. A question was asked concerning the potential for the culvert to service both locks on an as needed basis. This was answered that is not feasible. A larger issue of reliability of only one gate system for the culvert was surfaced and this can be addressed. Steve has had meetings with industry and will continue to do so.

15. As shown on the slide, LaGrange Lock the average delays have been 2.8 hours and the average annual commercial tonnage is 35.1 million tons. Toby Hunemuller of the Rock Island District is team leader. A question regarding the average delay inclusion of the navigation pass was surfaced. The delay is an annual average and therefore does include the navigation pass. Delay for times when only the lock is available were not used in the model since most annual periods would have significant open pass. Impacts at this site are not as great as at the other sites because the new lock will be landside.

16. Jeff next showed a slide with a flow chart of all of the navigation and ecosystem projects going on. The new locks are in the PED (preconstruction engineering design) phase. A question was asked if these presentations would be available to everyone. The presentations will probably be put on the NESP web site and will also be made available other ways, too.

17. Please refer to the slide presentation by Mark Cornish from the Rock Island District. It is noted as Enclosure 3. Mark talked about the two components of the Mitigation Plan; 1) Systemic Mitigation and the basic components which include bank/shoreline erosion, backwater and secondary channels, aquatic plants, fish, mussels, cultural and historic properties, and performance monitoring; and 2) Site Specific Mitigation would include project footprints and

associated areas. The Mitigation Plan will cost about 10% of the whole of Navigation Efficiency of NESP. Of that amount, 80% is systemic mitigation and 20% is site specific mitigation. Mitigation includes not only mitigation but also avoid and minimize. Mark showed slides with an example at L&D 22 during construction of the new lock and the areas affected. He stated that as the projects progress, the Corps will reevaluate the impacts. Mark then showed a slide with a spreadsheet of the habitat replacement costs for different habitat types. The activities for Fiscal Year 2005 through 2007 have included field validation of fish entrainment, field validation of plant model, and the Historic American Engineering Record (HAER) for Illinois Waterway. The Corps has trawled through five hundred miles of river to date to identify the impacts of normal tow operation using scientific methods. This information will be used by the Corps to guide decisions about mitigation and inform river stakeholders. Mark showed a slide of the study areas. The study showed that the entrainment of fish varied widely between pools. It is necessary to get a large sample size to account for the tremendous variability. Mark used an example where paddlefish were entrained near the Grafton early in the study. If the study had stopped after the first few samples, it would have incorrectly found that this species was highly susceptible to entrainment. No other paddlefish were entrained during the remainder of the study, and preliminary findings indicate that this species is not as vulnerable as first thought. Mark showed this anomaly on the slide with a graph of entrainment and propeller damage. The study is not complete and what is presented here are interim findings as shown on the next two slides. The next slide showed a spreadsheet of the different pools and the years of sampling. Other studies done for the Mitigation Plan include a three year study on Submerged Aquatic Vegetation and HAER documentation of the Illinois waterway that will be archived in the Library of Congress. A question was asked for Mark to give the definition of entrainment. Mark answered that it is a combination of physical forces from barges like pressure changes and water that goes through the screws that could damage eggs, larvae, sub-adult and adult fish. Scott Whitney stated that previous hydroacoustic studies have shown that a large amount of fish that get out of the way of the tows and barges.

18. Jeff discussed impacts of reduced funding, alternative funding plans, and issues. What happens if we don't get funding needed? One of the results will be cost growth in all aspects including the cost of using switchboats due to longer contracts, interest during construction, cost inefficiency in mobilization and demobilization, lengthier impacts to navigation during construction with an increased risk of allision (vessel collision with an immobile object like a lockwall under construction), delayed delivery of benefits, and unpredictability of funds that will disrupt design of the construction contracts and workforce planning.

19. Jeff showed a slide with a graph showing funding alternatives and their timelines. The funding alternatives include flat funding of $100 million per year and $150 million per year. The following three slides show a summary table of funding alternatives and relating to funding from the Inland Waterways Trust Fund (IWWTF). A question was asked about the red bar chart of the IWWTF cost estimate which is about 100 million a year and is this trust fund is a separate leg of the three-legged stool? Jeff answered that WRDA authorizes the Corps to do the work but funding is something else and will come annually in amounts that are undeterminable at this point.

20. Jeff then showed the anticipated lock construction using prefabricated elements. The locks would have to be built in the wet. If a perimeter-style cofferdam was used instead, then the existing lock would have to be dewatered, also, which would result in a total closure of the lock for a very lengthy period. The prefabricated units are approximately 30 feet in width by 30 feet in length and would be placed using a crane barge or catamaran.

21. Jeff showed a photo and overlay for information purposes only that illustrates the approaches to the lock with and without a new lock. The construction will be in the way of the existing approaches. A new approach can be accommodated, but the pilots will have to get used to the changing conditions. The Corps does not want the traffic to impact the construction and the Corps is studying this and testing situations. The Corps is thinking about which portion of the new structure should be constructed first so that industry has a target and impacts are predictable and can be communicated. This is one reason switchboats will be added to the lock sites. The switchboats can pull first cuts but can also be used as bow boats. The switchboats will be available throughout construction.

22. Jeff then showed a graph titled "600 ft UMR Lock Performance and Construction Impacts" that shows the annual tonnage and delays. This graph is representative of any of the existing locks from 20 to 25. An increase of annual tonnage dramatically increases the delays since it is an exponential graph. The graph also shows a shaded area of shifts in the curve due to certain occurrences. A left shift would be from closures, transferring I-wall culvert, and new lock feature impediments. A right shift would be from the use of switchboats, channel improvements, and moving the exchange point. In summary, some of the construction could be used to temporarily better the navigation condition and others will make it worse. Differentiating and understanding these is a strong focus of the ongoing work.

23. Jeff ended his discussion by showing a reference guide of take-home type slides and completion dates as of today. He also talked about Quality Control measures which include an Independent Technical Review (ITR), Actively Seeking Lessons Learned, and having a Regional Navigation Design Team (RNDT) (the September 2007 meeting had industry participation). The next team meeting of the RNDT will be sometime in the Spring of 2008 but the date and place have not been decided yet. Generally, this team meets twice a year. A comment was made that the Corps should consider Chickamauga Lock on the Tennessee River for some lessons learned. Jeff said he would look into it and appreciated the comment. Another comment was made that Lock 22 and Lock 25 were chosen to be designed and constructed first because in 1994 the Corps chose a representative rock-founded lock and sand-founded lock. These two locks have a compatibility of design that can be used at the other three Upper Mississippi River (UMR) sites. Locks 22 and 25 have the largest delays, which also supports their leading positions. A lot of conceptual design has been done up front and the Corps is hoping that some of the construction features can be used from one lock to another.

24. Michael Tarpey from Rock Island District then gave a presentation about the new locks at Locks 22 and 25 with a focus on communication events undertaken and future communication needs. His presentation can be found as Enclosure 4. Steve Hobbs, the team leader from St. Louis District, was not able to make it to the meeting. Michael started off by showing photos of the physical hydraulic models at ERDC. Michael stressed that industry input is needed. The

Corps looked at existing conditions with the models and wanted to make sure that accurate conditions were depicted in the models. Then the future planning conditions were tested. Michael showed a summary of dates of meetings, the people involved, and a title of each meeting. The tools used by the Corps will be used for the other locks. The Corps will look at Locks 22 and 25 for construction sequencing and then use this for the other locks when they are being designed. Michael showed the location of the new lock and guidewalls at Lock 25. The physical hydraulic models were used to determine the optimal lengths of the guidewalls. The model also looked at the tow tracks. Michael also showed the location of the new lock at Lock 22. One of the final slides showed a list of points-of-contact with information including phone numbers. Future communication topics are impacts to navigation during construction, lock features, standardized appurtenance locations, safety, and others. Michael stated that the Corps wants to configure the locks to help serve the barge industry and asked if there were other topics that for the Corps consider. Realizing it is difficult to get together at a location, Michael asked how does the Corps make sure that the right people get together. Two possibilities would be to develop a team or a web site. The barge industry is large and a team could only be a few members who would act as the representatives. In today's meeting, the attendees from the barge industry felt that would probably work well even though they all could have different opinions. Industry has to consider that they would have to pay for their employees attending meetings which is costly. The Corps needs to decide on the best way to get information out to all of industry of decisions that have been made. Michael showed a slide of future communication tools which included newsletter, meetings, pilot surveys, websites, visits to ERDC, etc. The NESP web site address is http://www2.mvr.usace.army.mil/UMRS/NESP/. The Tennessee Valley Authority (TVA) is doing something similar with a web site. There is also a river industry web site (RIBB). The Corps' web site should have a link to RIBB. Also, how does the Corps target possible audiences. There are lots of other markets, too, like gravel and other agricultural products. The Corps needs to get our arms around as many people as possible and industry should let us know other people to contact. When we are making decisions we need to be prudent on the number of people on a team. It was suggested that the e-mail communication list could include presidents, vice-presidents, captains, etc.

25. Jeff Stamper mentioned that a tow boat ride-along could be beneficial for designers so that can learn how the piloting is done. This could be key to the lessons learned before design. ERDC has cameras at their physical hydraulic models and others not in attendance are able to view the models and videos.

26. Jeff asked the attendees regarding the level of detail of presentation and if there should be more detail or if there was too much. The opinion stated was that the graphs were of interest especially regarding the tonnage and delays. Involvement in the Navigation Environmental Coordinating Committee (NECC)/Economics Coordinating Committee (ECC) meetings could also be useful. Chuck Spitzack, the Regional Project Manager, located in the Rock Island District noted that those meetings are quarterly. Each Corps district has a river team called the River Resource Action Team (RRAT). Chuck added that planning for the new locks is continuous and ongoing. Scott Whitney, the Rock Island District Project Manager added that better models are being developed now. The economic report is out for comment and is available for review on the NESP web site. A comment was made that the transportation modal conversion has changed a bit for the number of trucks that equate to a barge. It was discussed by

the attendees from industry that they are in support of the NESP program and will assist in several ways possible to them.

27. Jeff reiterated some points made during the meeting and that minutes of this meeting and the PowerPoint presentations will be available. Jeff felt that he heard good things about forming alliances. Other alliances can be created to support facts and the Corps can give information required to support data needs for these alliances. Jeff thanked all for attending because these gatherings are great. Jeff asked if industry would want to see something similar on the ecosystem side. A couple attendees said yes and the others were silent. Industry representatives could meet Corps people like biologists and see what is happening with them and those projects and how it intertwines with navigation. The web site has NESP fact sheets and is very accessible. The web site address is found in paragraph 24 above. The authorization of NESP shows the appreciation of the waterway and that it is a combination of not just navigation but the ecosystem.

28. Jeff adjourned the meeting at 4:35 p.m.

Encls

JANET C. ULIVI, P.E.
Civil Engineer, Engineering and
Construction Division

Enclosure 1

ATTENDEE SIGN-IN SHEET
NESP - Navigation Coordination Meeting with Towing Industry
National Great Rivers Museum, Melvin Price Locks and Dam, Alton, Illinois
14-Jan-08

Name		Organization
Billo	Dave	Bunge North America, Inc.
Cornish	Mark	USACE-MVR-PM-A
Cox	Mike	USACE-MVR-OD-I
Cruse	Lester	Magnolia Marine Transport Co.
Dalrymple	Nicole	USACE-MVS-PA
Davis	Marc	Inland Marine Service
Dell'Orco	Lou	USACE-MVS-OD-N
Dickey	Samuel	American Commercial Lines, Inc.
Esper	Josh	Marquette Transportation Co. LLC
Goin	David	Marquette Transportation Co. LLC
Goodwin	Bob	Maritime Administration (MARAD)
Granados	Rick	USACE-MVR-OD
Gretten	Bill	USACE-MVR-OD-M
Henleben	Ed	Ingram Barge Company
Hettel	Marty	AEP River Operations (Memco)
Howerton	Gale	U.S. Coast Guard
Jaeger	Steve	Heart of Illinois Regional Port District
Kehoe	Art	Consolidated Terminals & Logistics (CGB)
Kincaid	John	USACE-MVR-EC-DM
Kindra	John	Kindra Lake Towing, LP
Knapper	Jerry	Ingram Barge Company
Rector	Mike	USACE-MVS-EC
Roach	Mark	Inland Marine Service
Rohde	Paul	Waterways Council, Inc. (MARC 2000)
Silverthorn	Dan (Chairman)	Heart of Illinois Regional Port District
Spitzack	Chuck	USACE-MVR-PM-M
Stamper	Jeff	USACE-MVS-EC-DA
Starbuck	Max	National Corn Growers Association
Tarpey	Michael	USACE-MVR-EC
Ulivi	Janet	USACE-MVS-EC
Vick	Gerry	Manley Brothers, LLC / UMF
Whitney	Scott	USACE-MVR-OD
Wiltz	Terry	Florida Marine Transporters, Inc.

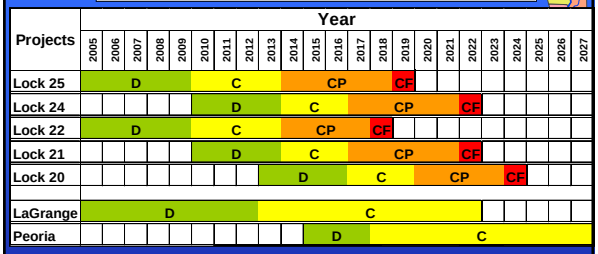
Enclosure 2

Navigation & Ecosystem Sustainability Program (NESP)

First Increment Plan for External Stakeholders

January 14, 2008

Implementation of NESP Locks



D = Design Only

C = Construction, small impacts to navigation

CP = Construction, Partial Wintertime Closure, one day/wk availability

CF = Construction, Full Wintertime Closure

UMR-IWW Lock Plan

NEW 1200' Locks First Phase = $1.95 Billion (Oct 2006 price levels)

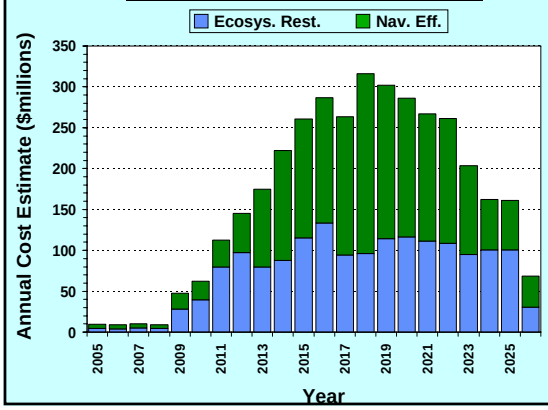
Measures	PED Start	Const. Start	Complete	Cost ($ Millions)
NEW UMR LOCKS				
Lock 22	2005	2010	2018	232.3
Lock 25	2005	2010	2019	324.4
Lock 24	2010	2014	2022	309.9
Lock 21	2010	2014	2022	322.5
Lock 20	2013	2017	2025	221.4
NEW IWW LOCKS				
LaGrange	2005	2012	2022	261.3
Peoria	2015	2018	2027	262.6

External Stakeholder Meeting

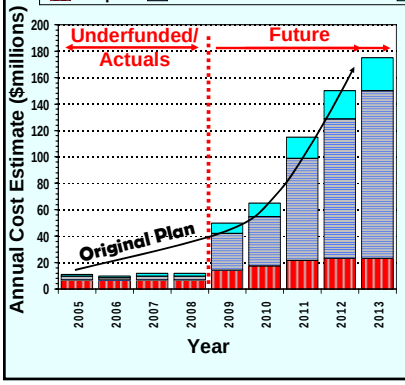
Objectives:

- NESP Program Costs
- Navigation Measures Overview
- Adjusted Navigation Component Baseline Concept
- Funding Alternatives and Consequences
- Discussion

NESP Program Cost Distribution



Historic and Expected NESP Resources



NESP People		
FY	Total Budget ($M)	People
05	10.3	55
06	9.2	49
07	12.3	51
08	8.8	46
09	50?	103
10	65?	132
11	115?	169
12	150?	181
13	175?	181

The Plan

- Phases of Navigation Planning and Implementation - the second phase/increment requires additional/updated feasibility study.

Navigation First Increment
- Switchboats at Locks 20-25
- Moorings
- Traffic Management Testing
- New locks at Locks 20-25, Peoria, LaGrange
- Economic Study
- System Mitigation

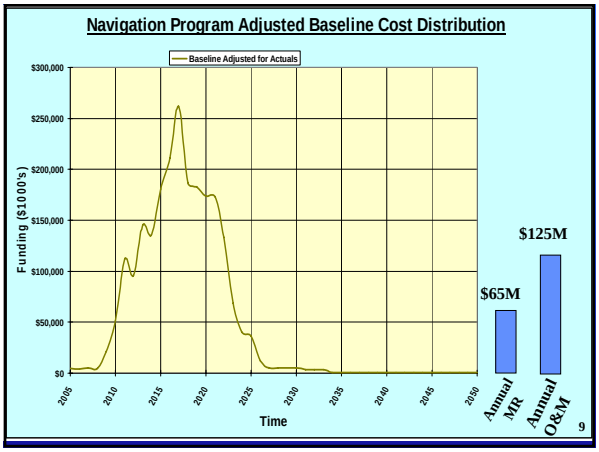
Navigation Second Increment
- Lock Extensions Locks 14-18
- Permanent Switchboats Locks 11-13
- Potential Economic Study

First Increment

Navigation *= $2.21 billion (50/50 Cost Share)*

(Oct 2006 Price Level)

- Small scale struct and non-struct measures ($256M)
  - Mooring facilities - WAS: cells & buoys @ Locks 12, 14, 18, 20, 22, 24 and LaGrange; IS: Cells @ Locks 11, 14, 15, 18-21, 24(2), and LaGrange
  - Switchboats @ Locks 20 through 25
  - Develop and test - appointment scheduling system.
- New 1200' locks at L20-25, LGR, and PEO ($1.95B)
- Systemic Env Mit for Incremental Traffic ($202M)
- Economics – 2008 Interim Rpt, LRR, 2nd Increment Feas

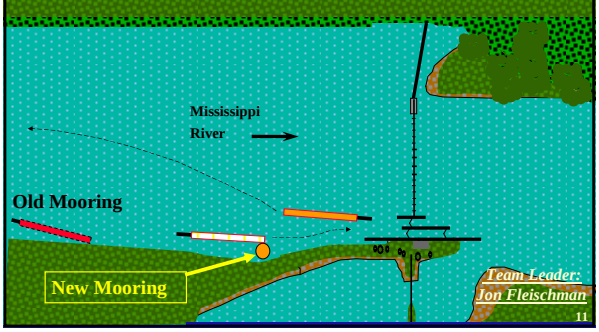


NAVIGATION PROJECTS

Structural Small- Scale Efficiency Measures

NAVIGATION PROJECTS

Moorings Concept



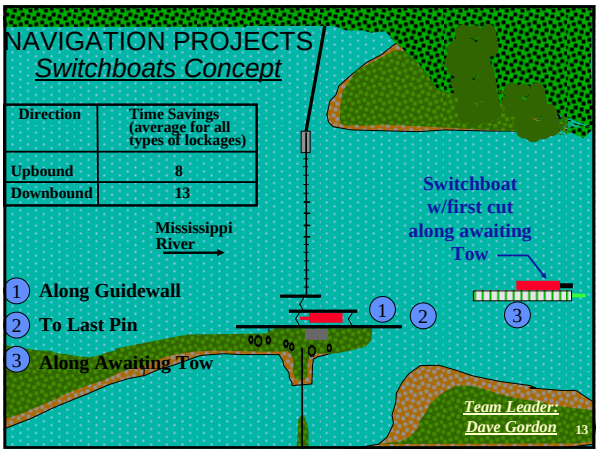
NAVIGATION PROJECTS

Moorings - Status

- **Lock 14 and LaGrange moorings FY09 Contract Award**

NAVIGATION PROJECTS
Switchboats Concept

Direction	Time Savings (average for all types of lockages)
Upbound	8
Downbound	13



Team Leader: Dave Gordon

NAVIGATION PROJECTS
Switchboats - Status

- **FY09 award of One or two boats – Evaluation**

NAVIGATION PROJECTS
Non-Structural Efficiency Measures

Team Leader: Dave Gordon

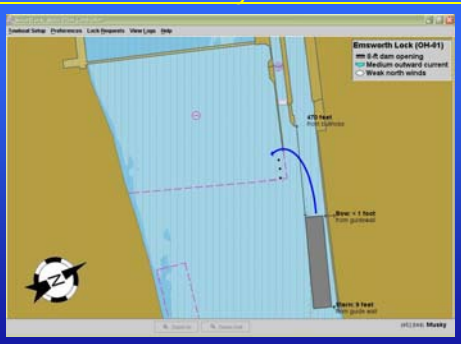
NAVIGATION PROJECTS
Non-Structural Efficiency Measures or Traffic Management

- **Tow Resequencing**
- **Information System**
  - **Vessel-to-Lock Proximity Data**
  - **Real-Time Lock Currents Data**
- **Tradable Permits**
- **Lockage Fees – flat or performance based**
- **Lockage Time Scheduling**

NAVIGATION PROJECTS
Tow Resequencing

- Analysis and Report by UMSL in 2006
- Appointment based on vessel type expediency….
  - Single lockages are shorter and go first.
  - Requires a mix of tows in the queue – no singles, no added efficiency
- COE and Industry Comments Completed
- No recognition of $$ Value or Strategic Value of vessels queued
- Places burden on lockmaster
- Anticipated implementation and acceptability problems

NAVIGATION PROJECTS
Vessel-to-Lock Proximity Data – Smart Lock



NAVIGATION PROJECTS
Smart-Lock

"I would be more confident entering a lock using this system, even in bad weather." – Captain Musky

NAVIGATION PROJECTS
Non-Structural Measures - Status

By the end of FY08, Traffic Management will have:

- **Traffic Management Concept for Testing**

NAVIGATION PROJECTS
Structural Large - Scale Efficiency Measures, New 1200 ft Locks

NAVIGATION PROJECTS
WRDA – Get to It!

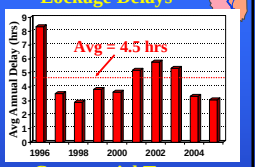
WRDA Language for New Locks-

(1) IN GENERAL- The Secretary **shall construct** new 1,200-foot locks at Locks 20, 21, 22, 24, and 25 on the Upper Mississippi River and at LaGrange Lock and Peoria Lock on the Illinois Waterway.

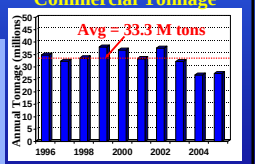
NAVIGATION PROJECTS

Lock and Dam No. 22

Lockage Delays



Commercial Tonnage



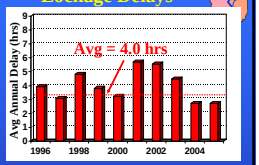
Historical Info	
River mile:	301.2
Opened:	1936
Last Rehab:	1990
Size:	600' x 110'
Lift:	10 ft

NEW 1200' Lock Info	
Est. Cost:	$232.3M
Start PED:	2005
Start Const:	2010
Complete:	2018

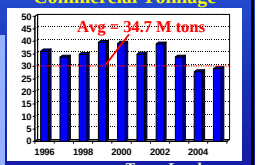
Team Leader: Michael Tarpey

Lock and Dam No. 25

Lockage Delays



Commercial Tonnage



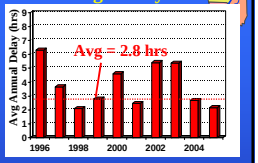
Historical Info	
River mile:	241.4
Opened:	1939
Last Rehab:	2001
Size:	600' x 110'
Lift:	15 ft

NEW 1200' Lock Info	
Est. Cost:	$324.4M
Start PED:	2005
Start Const:	2010
Complete:	2019

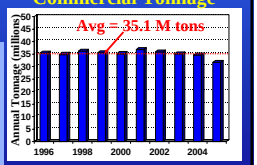
Team Leader:
Steve Hobbs

LaGrange Lock and Dam

Lockage Delays



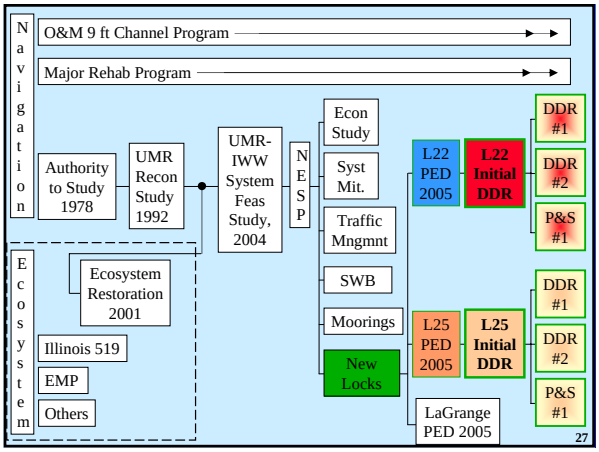
Commercial Tonnage



Historical Info	
River mile:	80.2
Opened:	1939
Last Rehab:	1991
Size:	600' x 110'
Lift:	10 ft

NEW 1200' Lock Info	
Est. Cost:	$261.3M
Start PED:	2005
Start Const:	2013
Complete:	2022

Team Leader: Toby Hunemuller



NAVIGATION PROJECTS

Systemic Mitigation

NAVIGATION PROJECTS

Systemic Mitigation

- Fisheries
- Mussels
- Aquatic Plants
- Backwater and Side Channels
- Shoreline Erosion
- Cultural and Historic
- $202M aligned with project construction

Team Leader:
Mark Cornish

NAVIGATION PROJECTS

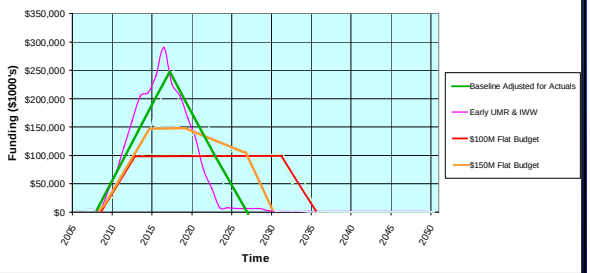
Alternative Funding Plans and Issues

NAVIGATION PROJECTS

Impacts of Reduced and Uncertain Funding

- SWBs alone cost $10M/year for 5 boats
- Interest during construction increase
- Cost inefficiency in mob and demob of construction contractor and equipment standby costs
- Lengthier impacts to navigation during construction, increase risk of allision
- Delayed delivery of benefits
- Also, unpredictable funds disrupt designing construction contracts and workforce planning.

NESP Navigation Component Funding Alternatives



NAVIGATION PROJECTS

Increasing Funding

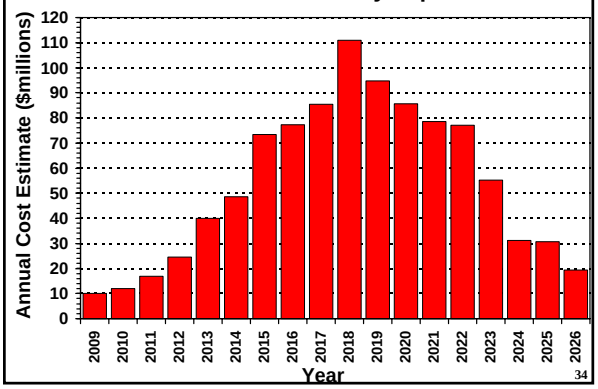
Summary Table - $100M/yr Flat Funding		
Mississippi River Lock Construction	2010 - 2031	*System Benefits start 2032*
Lock Closures - Mississippi River	2012 - 2030	
Illinois Waterway Construction	2013 - 2034	*System Benefits start 2035*
Lock Closures - IWW	likely minimal	*cofferdam overtopping*
Total Cost ($1000's)	$2,329,374	

Summary Table - $150M/yr Flat Budget		
Mississippi River Lock Construction	2010 - 2027	*System Benefits start 2028*
Lock Closures - Mississippi River	2012 - 2026	
Illinois Waterway Construction	2013 - 2029	*System Benefits start 2030*
Lock Closures - IWW	likely minimal	*cofferdam overtopping*
Total Cost ($1000's)	$2,291,520	

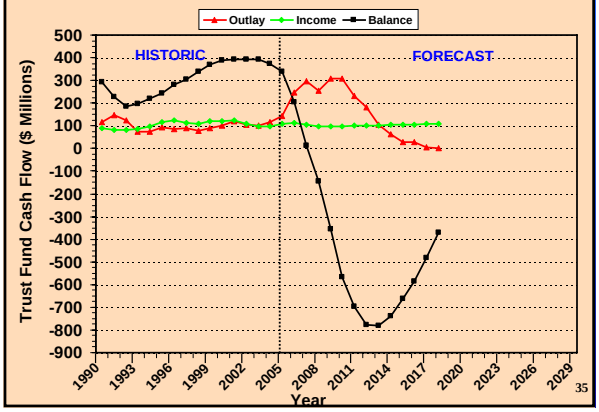
Summary Table - Adjusted Baseline ('05-'08 actuals/budgets)		
Mississippi River Lock Construction	2010 - 2024	*System Benefits start 2025*
Lock Closures - Mississippi River	2012 - 2022	
Illinois Waterway Construction	2013 - 2026	*System Benefits start 2027*
Lock Closures - IWW	likely minimal	
Total Cost ($1000's)	$2,280,560	

Summary Table - Early UMR & IWW		
Mississippi River Lock Construction	2010 - 2022	*System Benefits start 2023*
Lock Closures - Mississippi River	2011 - 2021	
Illinois Waterway Construction	2012 - 2022	*System Benefits start 2023*
Lock Closures - IWW	likely minimal	
Total Cost ($1000's)	$2,260,552	

Annual IWWTF Cost Estimates for NESP 1st Increment of Nav Efficiency Improvements



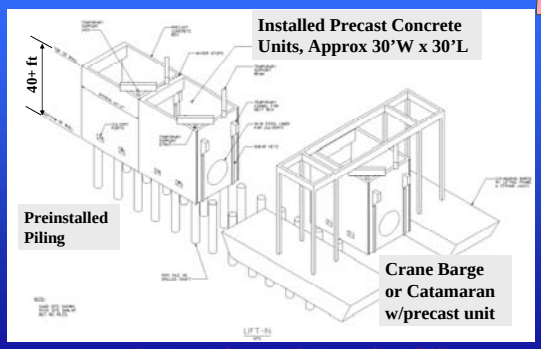
IWWTF - All Projects in the 10-yr Capability '05 Program

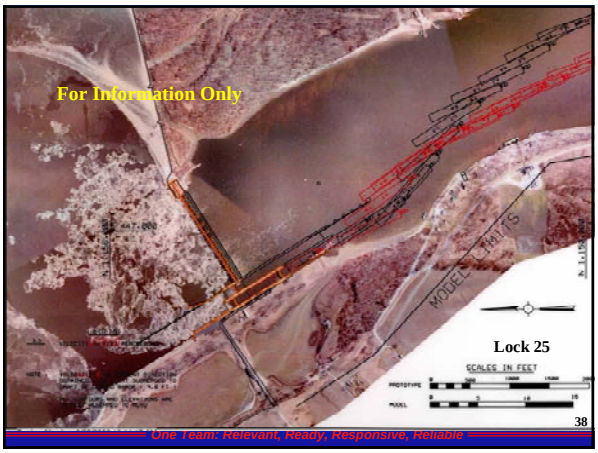


Navigation Projects

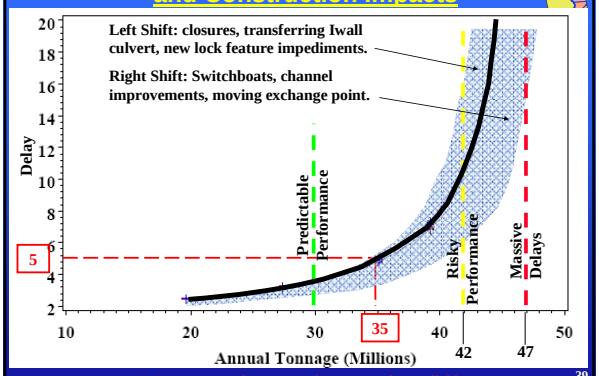
Impacts to Navigation During Construction

Lock Construction Using Prefabricated Elements





600ft UMR Lock Performance and Construction Impacts



NAVIGATION PROJECTS

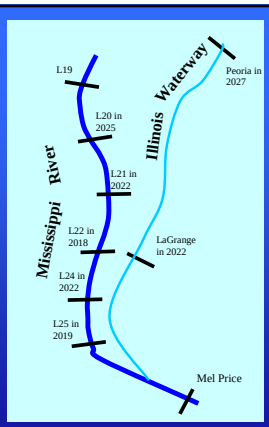
Reference Guides

NESP Navigation Efficiency Projects Reference Guide

- Navigation Efficiency Projects
  - Small-Scale Improvements
    - Moorings
    - Switchboats
  - Large-Scale Improvements
    - New 1200' Locks
  - Traffic Management
    - Tradable Permits
    - SMART Locks
    - GPS Tracking
    - Simul. Modeling
  - Systemic Env. Mitigation
    - Fisheries
    - Mussels
    - Aquatic Plants
    - BW and SC
    - Shoreline Erosion
    - Cultural/Historic

NESP System Lock Construction Reference Guide

(Jan 14, 2008)



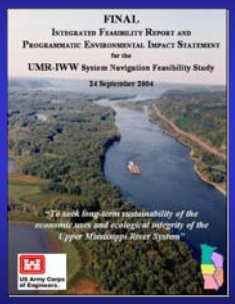
NAVIGATION PROJECTS

NESP QC Measures Reference Guide:

- Independent Technical Review
- Proactively Seek Lessons Learned – McAlpine, Olmsted, Marmet, Braddock, Charleroi, IHNC
- Regional Navigation Design Team – Sept 2007 mtg had industry participation

Enclosure 3

US Army Corps of Engineers



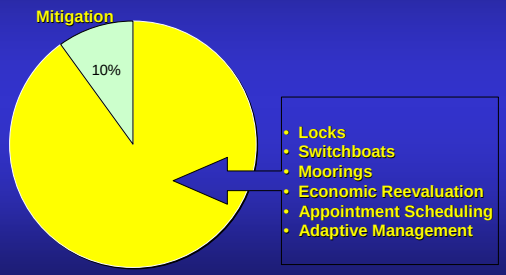
Systemic Mitigation
- Bank Erosion
- Backwater & Secondary Channel
- Aquatic Plants
- Fish
- Historic Properties
- Performance Monitoring

Site Specific Mitigation
- Project footprint & associated areas

One Team: Relevant, Ready, Responsive and Reliable

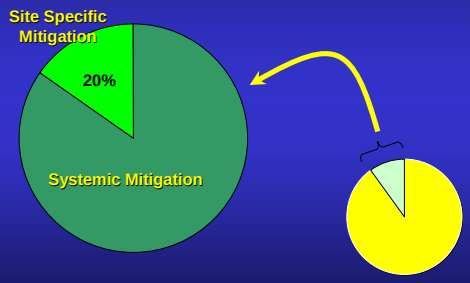
NESP

Navigation Efficiency Budget



NESP

Mitigation Budget



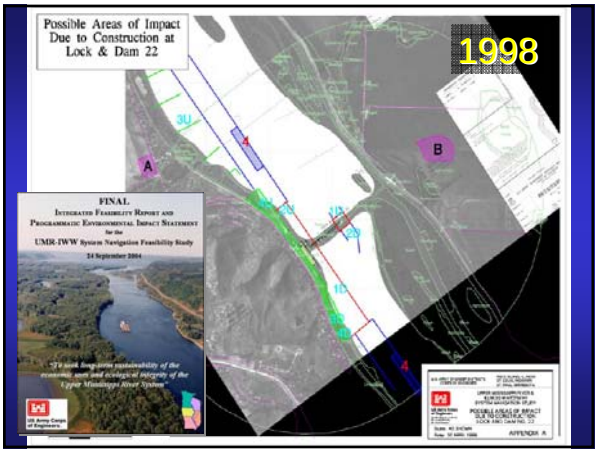
US Army Corps of Engineers

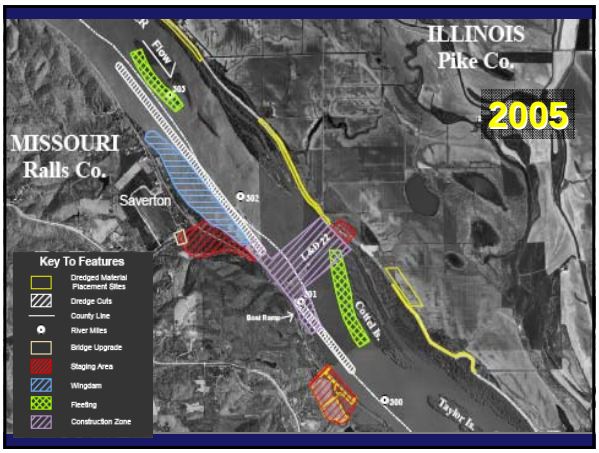
Site Specific Mitigation

- ♦ Lock 25
- ♦ Lock 22
- ♦ LaGrange

Avoid, minimize, or mitigate

One Team: Relevant, Ready, Responsive and Reliable





Habitat Replacement Costs

US Army Corps of Engineers

Lock and Dam 22 Habitat Replacement Costs

Habitat Type	Location 2	Location 3 (Selected Plan - Alternative 6)	Location 4
Bottomland Forest	$2,486,100–4,859,000	$2,486,100–4,859,000	$2,486,100–4,859,000
Main Channel Border	$2,680,000	$2,680,000	$2,822,900
Mussels	Bed upstream in proposed wing dam field	Bed upstream in proposed wing dam field	Bed upstream in proposed wing dam field
Endangered Species	Indiana bat, Bald eagle, mussels	Indiana bat, Bald eagle, mussels	Indiana bat, Bald eagle, mussels

One Team: Relevant, Ready, Responsive and Reliable

Systemic Mitigation

US Army Corps of Engineers

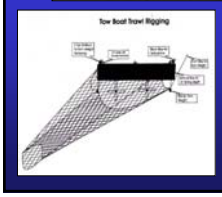
2005-2007 Activities

- Fish entrainment – field validation
- Plant Model - field validation
- Historic American Engineering Record (HAER) – Illinois Waterway

Avoid, minimize, or mitigate

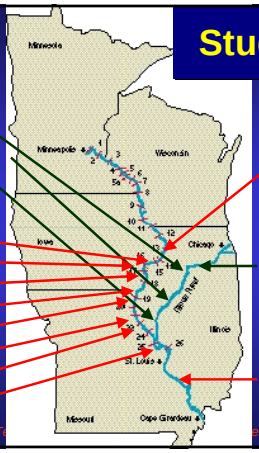
One Team: Relevant, Ready, Responsive and Reliable

Main Channel Trawling



Study Area

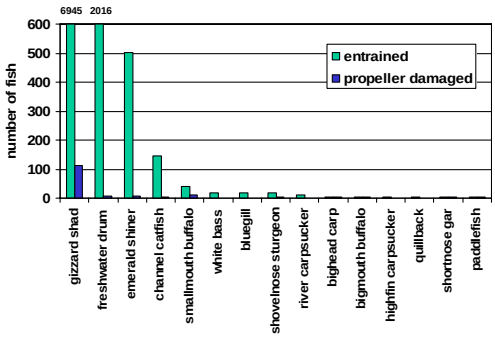
US Army Corps of Engineers



Peoria Pool
LaGrange Pool
Alton Reach
Pool 16
Pool 17
Pool 18
Pool 19
Pool 20
Pool 22
Pool 24
Pool 26

Pool 14
Marseilles Pool
Open River

One Team: Relevant, Ready, Responsive and Reliable



Interim Findings

- Entrainment varies at both reach and pool scales
- More fish are entrained than are damaged by the prop
- Entrainment varies by species abundance
- Entrainment mortality varies by size
- Some reaches of the river are impossible to sample during high flows

	Spring 2006/ 07 (Apr/May)	Summer 2006/07 (Aug/Sept)	Fall 2006 (Oct/Nov)	Winter 200708 (Dec/Jan)	Summer 2007 (Jun)
Middle Miss (Open River)	R	R	R	R	R
Pool 26	R	R	R	R	R
Pool 25	O	O	O	O	O
Pool 24	O	O	O	O	O
Pool 22	O	O	O	O	O
Pool 21	O	O	O	O	O
Pool 20	O	O	O	O	O
Pool 19	O	O	O	O	O
Pool 18	O	O	O		O
Pool 17	O	O	O		O
Pool 16	O	O	O		O
Pool 14	R	R	R		R
Pool 13	O	O	O		O
Alton Reach	R	R	R	R	R
LaGrange Pool	O	O	O	O	O
Peoria Pool	O	O	O	O	O
Marseilles Pool	R	R	R	R	R

Shading indicates sampling completed as of June 2007

R – Required sampling[1], O – Optional sampling[2]

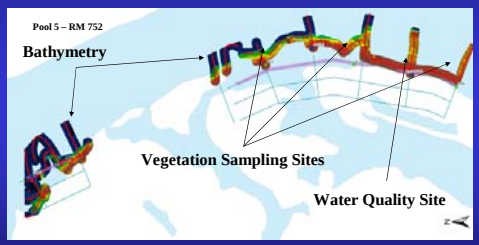
[1]Required only under safe navigation conditions as determined by the Captain
[2]Optional sampling as determined by the Principal Investigator and the Captain

Submersed Aquatic Vegetation

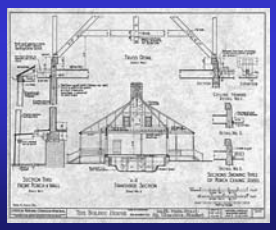
Evaluation of model-predicted plant beds

- Presence
- Community composition
- Spatial extent of beds

Submersed Aquatic Vegetation



Historic American Engineering Record (HAER)



Enclosure 4

Navigation & Ecosystem Sustainability Program (NESP)

Navigation Coordination Meeting with the Towing Industry

Communication and Coordination

January 14, 2008

NESP Navigation Efficiency Communication with Industry

- Previous Examples
  - 2005 Traffic Management Report by UMSL, Review by Industry
  - 2005 Moorings Location and Design Meeting
  - 2006 FedBizOps solicitation on Switch Boats
  - 2006-2007 Physical Hydraulic Navigation Models – Locks 22 and 25
  - 2007 Moorings Pilot Survey

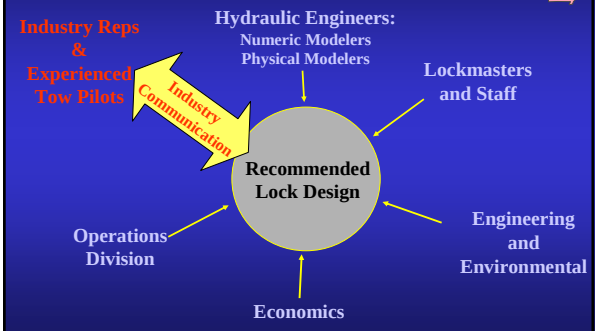
NESP Locks 22 & 25 Communication with Industry

Physical Hydraulic Navigation Models – Locks 22 and 25

I1. LOCK 22

I2. LOCK 25

Physical Hydraulic Navigation Model Studies-INPUTS

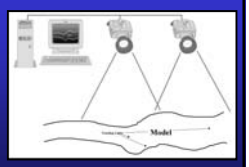


Physical Hydraulic Navigation Model Studies

- Navigation Model – Locks 22 and 25
- 1:120 Scale Model at ERDC in Vicksburg, MS
- 2005 - Update Existing Models used in System Feasibility
- Model riverbed, lock and dam, banklines, etc.
- Remote controlled model towboat and barge flotilla
- Valuable tool used to:
  - Evaluate Navigation Approaches
    - Replicate Existing Navigation Conditions
    - Predict/Evaluate Future Plan Conditions
  - Barge Impact Testing
  - Investigate Construction Sequencing

Physical Hydraulic Navigation Model Studies

- Navigation Approaches – Existing Conditions & Future Plan Conditions
  - Testing with multiple Flow Rates / Stages
  - Approaches & Exits to Existing and New Locks (Maintain Access to the 600-foot Lock in all conditions)
  - Evaluate Approach Wall Location & Lengths, US porting
  - Video Tracking System (VTS) used to collect currents and tow tracks
- Hydraulic Engineer Leads
  - Lock 22 = Tom Gambucci, CEMVR
  - Lock 25 = Dave Gordon, CEMVS
  - Model = Randy McCollum, ERDC



Past Communication Summary
Physical Hydraulic Navigation Model

- Existing Conditions Model Calibration
  - Model District Review – Existing Conditions
  - Model Towing Industry Review – Existing Conditions
    - *Does the model represent navigation conditions to a reasonable degree of accuracy?*
    - *Are model tow operations representative of actual operations?*
    - *Are improvements to the model needed?*
- Future Plan Condition Testing
  - Model District Review – Future Conditions
  - Model Towing Industry Review – Future Conditions
    - *Does the presented design provide adequate navigation under demonstrated flow conditions?*
    - *Are model tow operations representative of what would be anticipated for the presented plans?*
    - *Are improvements to the model needed?*

One Team: Relevant, Ready, Responsive and Reliable

Physical Hydraulic Navigation Model Industry Visits

Navigation Approaches – Existing Conditions & Plan Conditions

Lock 22				Lock 25			
Existing Conditions		Plan		Existing Conditions		Plan	
Tail water	Pool	Tail water	Pool	Tail water	Pool	Tail water	Pool
6-Mar-06	6-Mar-06	1-Sep-06	23-May-07	6-Mar-06	23-May-07	1-Sep-06	9-Oct-07

2006 March 6-7
Lock 25 - Demonstration of Tail Existing Conditions
Lock 22 - Demonstration of Pool & Tail Existing Conditions

2006 Sept 1
Lock 25 - Demonstration of Tail Plan Conditions
Lock 22 - Demonstration of Tail Plan Conditions

2007 May 23
Lock 25 - Demonstration of Pool Existing Conditions
Lock 22 - Demonstration of Pool Plan Conditions

2007 Oct 9
Lock 25 - Demonstration of Pool Plan Conditions
Lock 22 - Follow-up Demonstration of Pool Plan Conditions

One Team: Relevant, Ready, Responsive and Reliable

Physical Hydraulic Navigation Model Industry Visits

Industry representatives providing input and "deciding" on future model direction

2006 March 6-7

Samuel S. Dickey	RIAC / ACBL
Randy McWilliams	IBCO
Don Riley	ARTCO

2006 Sept 1

Raymond Hopkins	RIAC / ARTCO
Dan Keegan	ARTCO
Robert (Dan) Irvin	Ingram Barge
Randy Kirschbam	Alter Barge Line
Robert Mann	Alter Barge Line
Jay McDaniel	Kirby Inland Marine
Dan Davis	Magnolia Marine
Ed Lum	Magnolia Marine
Lester Tarbor	Magnolia Marine
Lester Cruse	Magnolia Marine

One Team: Relevant, Ready, Responsive and Reliable

Physical Hydraulic Navigation Model Industry Visits

2007 May 23

Raymond Hopkins	RIAC / ARTCO
Luke Moore	ARTCO
Gary Cochran	Magnolia Marine
Ed Oglesby	Magnolia Marine
Lester Cruse	Magnolia Marine

2007 Oct 9

Raymond Hopkins	RIAC / ARTCO
Don Riley	ARTCO
Lester Cruse	Magnolia Marine
Reggie Tobbs	Marquette
Jay McDaniel	Kirby Inland Marine

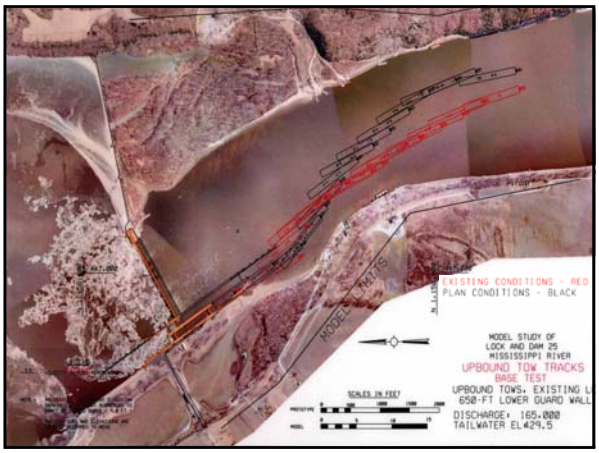
One Team: Relevant, Ready, Responsive and Reliable

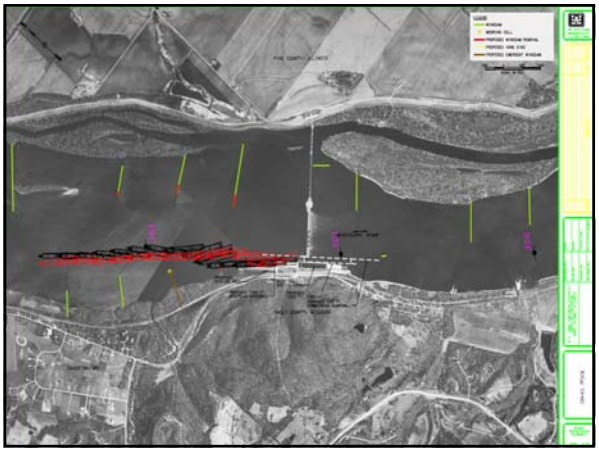
Model Status & Summary
Physical Hydraulic Navigation Model

L22	L25	
✓	✓	• Evaluate Navigation Approaches ♦ Replicate Existing Navigation Conditions ♦ Predict/Evaluate Future Plan Conditions
✓	✓	• Barge Impact Testing
✓		• Investigate Construction Sequencing

One Team: Relevant, Ready, Responsive and Reliable

Recommended Plan
New 1200' Lock





NESP Contacts

- **Chuck Spitzack, CEMVR** — Regional Project Manager
  Charles.P.Spitzack@usace.army.mil
  309-794-5340
- **Jeff Stamper, CEMVS** — Navigation Efficiency Technical Manager
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  314-331-8226
- **Bill Gretten, CEMVR** — Operations Technical Manager
  William.T.Gretten@usace.army.mil
  309-794-4512
- **Michael Tarpey, CEMVR** — Lock 22 Project Manager
  Michael.J.Tarpey@usace.army.mil
  309-794-5179
- **Steve Hobbs, CEMVS** — Lock 25 Project Manager
  Steven.M.Hobbs@usace.army.mil
  314-331-8789

One Team: Relevant, Ready, Responsive and Reliable

NESP Navigation Efficiency Future Communication

- TOPICS for Future Communications
  - Impacts to Navigation during Construction
  - Lock Features
  - Standardized Appurtenance Locations
  - Safety
  - Others - Industry Perspectives?

One Team: Relevant, Ready, Responsive and Reliable

NESP Navigation Efficiency Future Communication

- TOOLS for Future Communications
  - Industry RIBB website
  - NESP Website
    http://www2.mvr.usace.army.mil/UMRS/NESP/
  - NESP Newsletter
  - Industry ITCS fax system
  - Meetings
  - Pilot surveys
  - Future physical model visits to ERDC
    - Navigation Models
    - Filling & Emptying Model
  - Cameras/Video from ERDC models
  - Tow Boat Ride Along
  - Others - Industry Perspectives?

One Team: Relevant, Ready, Responsive and Reliable