

# Navigation Structures

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# A new R&D Program to address critical infrastructure issues

- Asset Management
- Life cycle management
- Risk analysis
- Electronic information
- System monitoring
- Updates to technical guidance
- Technology advancements focused on reducing O&M costs, unscheduled outages, and extending service life



# **Work Unit Needs Identified From**

**Asset Management – OCA's**

**INDT – Top Field Repair Issues**

**Kidby Report on Repair Cost 99-05**

**RARG SoN's**

**Corps Ops Managers**



# Program Status

- FY12 Start
- Initial Funding from MCNP: Focus on Navigation Lock and Dam Issues
- Full Funding: Focus on Inland Structures, Coastal Structures, Channels and Pools



# Update Existing Technologies

Documenting and making available to field offices technologies relevant to navigation structures that have been updated and become available since the completion of the REMR program. The information will probably be placed on the Navigation Gateway site or linked to this site. Some of the technologies of interest are paints, coatings, mill specifications.



# Sealing Techniques for Quoin Block Backing Materials

Effective methods to seal the quoin block backing material as it is being placed are needed. A survey of the different techniques that have been tried can be performed to help determine the most effective method. Also lab experiments can be conducted to test the more promising methods.



# Position Measuring Device for Directly Connected Hydraulic Cylinders

It has been recommended that new and rehabilitation and repair projects should specify chrome plated stainless steel or nickel and chrome plated carbon steel piston rods in accordance with UFGS 41 24 27.00 10 Hydraulic Power Systems for Civil Works Structures. There is currently no proven method for position indication and speed control of the hydraulic cylinders using these materials. Position indicator and control systems are needed for use with the recommended chrome plated stainless steel or nickel and chrome plated carbon steel piston rods.



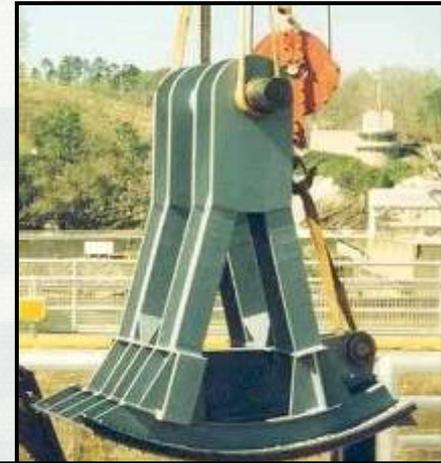
# New Techniques to Reduce Miter Gate Cracking

**Met with SAM Ops and Eng personnel to start planning R&D effort . Discussed several ideas and will initiate a finite element analysis for selected designs.**



# Repair and Replacement Guidance for Lock Valves

Prepared historical background of Corps lock valve types, studies, and performance. Met with NWP, SAM, LRN, and St. Lawrence Seaway to discuss valve issues and help formulate R&D plan. Initiated work to modify existing lock valve facility to accommodate research valve



# Rapid Repair using Composite Materials

## Primary R&D Needs:

- Flow resistance
- Shear resistance
- Field service
- Abrasion
- Development of design guidance
- Cavitation resistance
- Impact affects
- Survivability in water
- Concrete deterioration
- Durability
- Underwater repairs
- Application methodology

