

## MEMORANDUM FOR RECORD

SUBJECT: USACE Sign Standards Program - Waterway Signs,  
Evaluation of Overlays to Reduce Glare

## 1. PURPOSE

This memorandum documents an evaluation of overlays being used by Little Rock District to reduce glare from waterway signs. The memo includes historical background information, a summary of the site evaluation and a recommendation on the use of overlays.

## 2. BACKGROUND:

Glare from waterway signs was being reported by the tow industry since the mid 2000s. Initially, 3M recommended that signs be tilted down slightly and glare would be reflected down. A few Corps (MVS, SWL and others) sites implemented the recommendation and found glare was still a problem. A field test aboard a down bound tow approaching LD 2 was conducted in April 2007. Glare produced by tow boat light was independent of observation angle (opposite of auto or recreational boat lights) and increased as the viewing distance decreased. Glare only occurred when tow lights were pointed in direction of signs. A memo from HQ was distributed in 2008 to all commands formally identifying the glare issue with guidance on how to reduce glare from waterway signs. In February 2010, SWL reported glare problems mostly on bull nose signs that had been recently installed at some locks. The problem signs were tilted per previous 3M recommendations without any reduction in glare. SWL installed a non-glare acrylic overlay to problem signs that reduced the glare.

## 3. SITE EVALUATION

On August 24 2011, a site inspection was conducted at Murray Lock and Dam in Little Rock District (see Figure 1). The weather was overcast and it had been raining prior to the inspection. The upstream river wall had two blue/white lock area signs. One was on the bank and the other was on river wall bull nose. I met with Tarik Holmes, from area lock staff, to inspect the sign on the river wall. The sign had the 1/8" acrylic overlay installed (see Picture 1) and was set off the panel by washers/spacers. It had a matte type finish which caused the sign legend to be slightly blurred (see Picture 2). Mr. Holmes stated tow industry reported that overlay had reduce glare but there was loss of legibility especially in low light. Reduced legibility was evident when looking at the sign across waterway approximately 350 ft away.



Figure 1 Murray Lock and Dam, Little Rock, AR



Picture 1 Back of Sign with Overlay



Picture 2 - Sign with Overlay

### 3. RECOMMENDATION

Overlays are reducing glare but at the same time reducing legibility. This reduced legibility has the potential to increase liability. Adding these overlays will cost more and cannot be recommended.

The guidance in the June 2008 HQ memo states for signs in target areas, lower grade reflective sheeting should be considered. This reduces glare without legibility issues at a lower cost than any overlay. It also states when feasible, waterway sign plans should avoid the use of highly reflective signs in industry target areas. Therefore, recommend no changes to current guidance regarding glare.

Timothy Grundhoffer, PE

National Sign Program, MCX  
Technical POC



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS  
WASHINGTON, D.C. 20314-1000

CECW-CO-D

JUN 17 2008

MEMORANDUM FOR COMMANDERS, MAJOR SUBORDINATE COMMANDS AND  
DISTRICT COMMANDS; CHIEFS, CONSTRUCTION - OPERATIONS DIVISIONS

SUBJECT: Glare from Waterways Signs

1. Towing industry representatives have stated safety concerns over encountering excessive glare from certain (high-intensity retro-reflective) signs at approaches to U.S. Army Corps of Engineers locks. The resulting night blindness is one of several issues that we are discussing with the towing industry as part of MG Riley's Inland Navigation Safety Initiative.

2. We need to develop a list of glare problem signs at locks by working with Corps navigation staff, district sign managers, and towing industry stakeholder organizations at the regional and district levels. The National Sign Program staff is developing alternatives and will seek demonstration opportunities to test revised signs. Your participation in these demonstrations is encouraged. Once alternatives are approved, actions to move or replace these problem signs can be taken as outlined in the enclosed National Sign Program memorandum.

3. My POCs for this issue are Mr. Rick Magee, National Sign Program Manager, St. Paul District, (651) 290-5578; Mr. Timothy Grundhoffer, National Technical Adviser, St. Paul District, (651) 290-5574; or Mr. Michael Kidby, National Sign Program Proponent for Waterways Signs, HQUSACE, (202) 761- 0250.

FOR THE COMMANDER:

Encl  
as

*Lawrence A. Lang*  
for  
MICHAEL G. ENSCH  
Chief, Operations  
Directorate of Civil Works

MEMORANDUM FOR CHIEF OF OPERATIONS AND REGULATORY  
COMMUNITY OF PRACTICE (CECW-CO)

SUBJECT: Glare from Waterway Signs

1. The National Sign Program Mandatory Center for Expertise (MCX) recommends managers of Corps navigation facilities determine if there is a glare problem from high-intensity retroreflective signs and take recommended corrective actions.
2. Towing industry representatives have complained about the glare from USACE waterway signs at some lock approaches. Glare is a problem during night time operation at some lock approaches where highly reflective waterway signs are installed at landing or target areas used by towboat pilots. These locations are spotted with tow boat spot lights to assist during lockage. Excessive glare from spot lights can reflect back off signs, and white reflective signs tend to wash-out the area around the sign. The magnitude of the problem will depend on the direction of the spot light beam, proximity to the sign, size of the sign, color and type or grade of reflective sheeting. Field tests by the Sign Program MCX have confirmed these problems.
3. Problematic glare at any USACE lock projects should be addressed using the following corrective actions:
  - a. Identify the landing or target areas used by the towing industry at lock approaches. Coordinate with them to identify if problematic glare is occurring
  - b. Review project sign plans to eliminate/minimize the use of high grade retro-reflective (Diamond Grade™ by 3M or Omni-View™ by Avery) signage in industry target areas. As an alternative, lower grade sheeting may be considered when signs are necessary in target areas. Should any lower grade sheeting be deemed necessary, its use must be approved by the district sign program manager and documented in the project sign plan.
  - c. Plan waterway sign layouts to avoid highly reflective signs in the vicinity of structural features or areas that are used as approach targets.

4. Please direct any questions or requests for technical support regarding problematic glare at lock sites to the National Sign Program MCX, St Paul District. Points of Contact for the MCX are listed below:

Rick Magee  
National Sign Program Manager 651-290-5578

Timothy Grundhoffer, PE  
National Technical POC 651-290-5574

A handwritten signature in black ink that reads "Rick Magee". The signature is written in a cursive style with a long horizontal flourish at the end.

RICK MAGEE  
National Sign Program Manager

cf: Tim Grundhoffer, CEMVP-EC-D  
Mike Kidby, CECW-CO  
Debra Stokes, CECW-CO