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ENGINEERING AND CONSTRUCTION BULLETIN

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Subject: Welding and Metallurgy Technical Center of Expertise

Applicability: Information

1. This ECB announces the recertification of a Welding and Metallurgy Technical Center of Expertise (TCX).

2. The previous Welding and Metallurgy TCX resided in Jacksonville District (SAJ), which provided excellent support and a high level of expertise. Recently, there has been a shift in the concentration of expertise from SAJ to Portland District (NWP). With an inventory of over 1,300 hydraulic steel structures (HSS), the largest in USACE, NWP has developed specialized expertise in HSS inspection, design, detailing, and fabrication and the AWS D1.5 welding code. The Welding and Metallurgy TCX recertification was approved on 13 December 2012 and assigned the responsibilities of this TCX to Portland District. Some examples of current NWP expertise are enclosed.

3. All districts are encouraged to utilize the Welding and Metallurgy TCX on a reimbursable basis for: welding design, welding inspection, fatigue and fracture evaluation, finite element evaluation of weldments, metallurgical issues related to welding of mild steel, cast steel and high-strength steels, fit for service analysis of welded structures, welding procedure specifications, on-site quality assurance verification requirements, use and modification of UFGS 055913 “Fabrication of Hydraulic Steel Structures”, material selection, specification and verification, vibration analysis of materials, or similar tasks where the local staff may not have a high level of specialize expertise. Review Management Organizations should also utilize the TCX for review of projects having major metal and welded components. Requests for support should be directed to the TCX technical point of contact, Mr. Travis Adams, 503-808-4954, Travis.M.Adams@usace.army.mil. Additional information regarding this TCX can be found in TEN at https://ten.usace.army.mil/TechExNet.aspx?p=s&a=CX;33

4. The point of contact for this ECB is Mr. Chris Westbrook, Civil Works Branch, E&C, HQUSACE, 202-761-7584, email: Christopher.H.Westbrook@USACE.army.mil.

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Examples of recent NWP activities and expertise related to welding and metallurgy:

- The design and detailing of the tallest and heaviest vertical lift gate in the Corps at 2,000,000 pounds. This gate was designed and detailed to meet current fracture and fatigue guidance.

- The design and detailing of new 900,000 lb miter gates which incorporated the latest design details and fabrication in accordance with AWS D1.5 incorporating design changes which included the adoption of adjustable quoin and miter block systems and self lubricating materials.

- The inspection, analysis, and design for the ongoing tainter gate rehabilitation program. Multiple gates have been retrofitted to meet the design requirements of ER 1110-2-2702.

- The design and detailing of filling and emptying reverse tainter valves which operate at maximum water velocities of up to 135 ft/sec and were designed to operate under 115 feet of head. The design incorporated AWS D1.5 weld requirements as well as fatigue and fracture resistant detailing.

- The design and detailing of numerous upstream and downstream fish facilities. The district has extensive experience with the design of stainless steel and aluminum structures for the transport of fish. These structures include flumes, hoppers, and dewatering screen systems that are subjected to dynamic loads.

- Portland District was involved in performing fatigue evaluation, interim repair, and permanent repair of large diameter rotating support sheaves. The work included instrumentation for stress range, carbon equivalency determination for welding, bolted retrofit design and fatigue crack repair for a highly constrained cyclically loaded structure.

- Portland District maintains a staff of Certified Welding Inspectors (CWI's) to assist with fabrication quality assurance. The Districts CWI staff has worked for Districts across USACE performing welding quality assurance services.