Dear Division Administrators: My staff has compiled some additional details intended to provide clarity to the Technical Advisory (TA) 5140.32 Inspection of Fracture Critical Bridges with T-1 Steel, signed by our Associate Administrator, King Gee, and distributed to you on Monday, September 12, 2011. The details are provided for each recommendation of the TA which are reproduced below.

RECOMMENDATIONS

1. This Technical Advisory strongly recommends that State Departments of Transportation and other bridge owners review the inspection records of their inventory of fracture critical bridges to ensure any components fabricated with T-1 steel have been regularly and appropriately inspected and that any critical findings identified have been properly addressed. As defined in the National Bridge Inspection Standards, a fracture critical member inspection involves a hands-on inspection that may include visual and other nondestructive evaluation.

Discussion: It is recognized that most owners will reference their bridge design plans and/or contract specifications to identify which structures incorporate T-1 steel. The designation T-1, which more accurately describes the U.S. Steel Corporation product that met the requirements of ASTM A514 specification and its predecessors, has become synonymous with many of the corporate twins of that grade of steel. The intent of this TA is to address all of these grades of steel, not just those formally produced by U.S. Steel Corporation. Also, it is very unlikely that the product name of the steel will appear on the design drawings. The following descriptors are a partial list of how this grade of steel was called out on design plans and/or contract documents:

a. ASTM A514

b. Grade 100 Steel

c. Quenched & Tempered (Q&T) Steel

d. High-Strength Steel

e. Heat-Treated Steel

f. Combinations of the above

The adjective “alloy” may also appear in the description with any of the above.

2. If deficiencies are found, follow up with those structures placing priority on inspection or remediation of components primarily in tension such as arch ties, hangers or truss members that contain butt welds.

Discussion: As used in this provision of the TA, deficiencies include those found during previous inspections and any gaps in the inspection process. Also, while the emphasis is on this grade of steel with butt welds, it is intended that findings related to all type of welding on this steel be reviewed for appropriate follow-up actions.

3. It is also recommended that on fracture critical bridges fabricated using T-1 steel prior to the adoption of the modern Fracture Control Plan of the AASHTO/AWS D1.5-88 Bridge Welding Code, where cracks due to a lack of hydrogen control during welding have previously been found, that the soundness of all butt welds in those tension components be verified through visual and non-destructive testing unless this verification has been previously conducted.

Discussion: While it is likely that most bridge owners adopted the AASHTO Guide Specifications for Fracture Critical Non-Redundant Steel Bridge Members when it was originally published in 1978, the Fracture Control Plan that it contained was not a Standard Specification until the 1988 edition of the AASHTO/AWS D1.5-88 Bridge Welding Code. The intent of this TA is to recognize any version of the Fracture Control Plan. If the design plans call out the AASHTO Guide Specifications, the AASHTO/AWS D1.5 or an equivalent contract specification, that bridge would not be subject to the review recommended in this TA.