

TRANSPORTATION POOLED FUND PROGRAM QUARTERLY PROGRESS REPORT

Date: December 31, 2012

Lead Agency (FHWA or State DOT): Indiana DOT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a quarterly progress report for each calendar quarter during which the projects are active. Please provide a project schedule status of the research activities tied to each task that is defined in the proposal; a percentage completion of each task; a concise discussion (2 or 3 sentences) of the current status, including accomplishments and problems encountered, if any. List all tasks, even if no work was done during this period.

Transportation Pooled Fund Program Project # <i>(i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</i> <u>TPF 5-238</u>	Transportation Pooled Fund Program - Report Period: <input type="checkbox"/> Quarter 1 (January 1 – March 31) <input type="checkbox"/> Quarter 2 (April 1 – June 30) <input type="checkbox"/> Quarter 3 (July 1 – September 30) <input checked="" type="checkbox"/> Quarter 4 (October 1 – December 31)	
Project Title: Design and Fabrication Standards to Eliminate Fracture Critical Concerns in Steel Members Traditionally Classified as Fracture Critical		
Name of Project Manager(s): Tommy E. Nantung	Phone Number: 765-463-1521 ext. 248	E-Mail: tnantung@indot.in.gov
Lead Agency Project ID: TPF-5(238)	Other Project ID (i.e., contract #):	Project Start Date: 8/1/2011
Original Project End Date: 7/31/2014	Current Project End Date: 7/31/2014	Number of Extensions: None

Project schedule status:

On schedule
 On revised schedule
 Ahead of schedule
 Behind schedule

Overall Project Statistics:

Total Project Budget	Total Cost to Date for Project	Percentage of Work Completed to Date
\$790,000	\$211,106	27%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$49,001	6.2%	50%

Project Description:

The objective of this research project is to take advantage of the major advances that have occurred in the past 30 years in the following areas related to fracture control in steel bridges:

1. The very high toughness of high performance steel (HPS), which was not available 30 years ago, can be used to take brittle fracture off the table so to speak. Crack arrest and very large defect tolerance can be ensured in these steels. Similar strategies have been employed by other industries for several years.
2. Modern fatigue design and detailing can ensure fatigue cracking does not occur.
3. Modern fabrication, shop inspection and the AWS FCP, greatly reduces the likelihood that defects are not introduced during. Advancements in NDT techniques along with technologies not regularly used, such as phased array UT have the potential further reduce the chance of a defect being missed.

Progress this Quarter (includes meetings, work plan status, contract status, significant progress, etc.):

- The literature review continues.
- Load frames have been fabricated and received.
- One set of load frames have been erected (See attached photo).
- New high capacity servo-valve manifolds have been received.
- Installation of the hydraulic system has begun.
- Preliminary large-scale specimen design was completed.
- Small-scale material testing (CVN, CTOD) continues.
- The research team is working with various steel fabricators and DOT's to obtain "drops" of HPS from bridge projects around the US. The small pieces of HPS will be used for samples to be used in the small scale testing
- FE work continues.

Anticipated work next quarter:

- Continue reviewing relevant literature.
- Continue to refine the testing plan.
- Begin planning instrumentation layout for large-scale specimen.
- Finalize design of large-scale specimens.
- Take delivery of actuator connecting plates and install actuators.
- Take delivery of remaining hydraulic components and complete the system installation.
- Assemble remaining set of load frames, as well as applicable bracing, and hydraulic equipment.
- Continue with small-scale material testing.
- Continue to work with DOT's to obtain more "drops".
- Continue FE work.

Significant Results:

During the past quarter, the major steps forward included:

1. Testing fixtures have been received and erection has begun.
2. Hydraulic components have been received and installation has begun.
3. Preliminary design of the large-scale test specimen.
4. FE work continues.

Circumstance affecting project or budget. (Please describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope and fiscal constraints set forth in the agreement, along with recommended solutions to those problems).

None this quarter

Potential Implementation:

None at this time. Too early in the research.

