

**TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT**

Date: February 9 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.

<p>Transportation Pooled Fund Program Project # (i.e., SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX))</p> <p><u>TPF 5(253)</u></p>	<p>Transportation Pooled Fund Program - Report Period:</p> <p><input type="checkbox"/> Quarter 1 (January 1 – March 31)</p> <p><input type="checkbox"/> Quarter 2 (April 1 – June 30)</p> <p><input type="checkbox"/> Quarter 3 (July 1 – September 30)</p> <p><input checked="" type="checkbox"/> Quarter 4 (October 1 – December 31)</p>	
<p>Project Title: Evaluation of Member Level Redundancy in Built-up Steel Members</p>		
<p>Name of Project Manager(s): Tommy E. Nantung</p>	<p>Phone Number: 765-463-1521</p>	<p>E-Mail: tnantung@indot.in.gov</p>
<p>Lead Agency Project ID: TPF-5(253)</p>	<p>Other Project ID (i.e., contract #):</p>	<p>Project Start Date: 9/1/2011</p>
<p>Original Project End Date: 8/31/2014</p>	<p>Current Project End Date: 8/31/2014</p>	<p>Number of Extensions: None</p>

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
\$600,000	\$17,400	7%

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
\$17,400 (2.9%)	2.9%	8.3%

Project Description:

The objective of this research project is to quantify the redundancy possessed by built-up members. For example, a riveted built-up member will not "fail" if one of the components fractures. However, there is very little experimental data which is available to quantify the remaining fatigue life or strength of a member in which one of the components has failed. Further, if these members are located in bridges classified as fracture critical, if significant member redundancy can be shown, these members may not need to be classified as FC. However, doing so would release these members from the more rigorous arms-length inspection currently required. As a result, should a component fail, it may go undetected for an extended interval. Thus, a portion of the project is devoted to setting rational inspection intervals for these members. Lastly, the advantages of using built-up members fabricated with HPS components fastened using HS bolts in new construction will also be explored.

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

- The project kick-off meeting was held in Indianapolis IN on October 17-19, 2011. Both Pooled fund projects [TPF-5(238) and 5(253) were held at the same time]
- The literature review continues.
- The large-scale experimental program is being refined. The cooling chamber has been designed and has undergone multiple tests. At this time, a full-scale plate girder that is larger than what will be tested, has been successfully cooled to temperature below -60F (Zone III LAST). Some minor refinements will be made but the cooling chamber is essentially complete
- The Research Team has been in discussions with various owners to secure riveted built-up members from existing bridges to be used in the large-scale testing program.
- Preliminary design of built-up members fabricated using HS bolts for new construction is underway.
- Fixtures for loading have been obtained and are in fabrication. The steel for the fixtures was donated and the fabrication is also being donated.

Anticipated work next quarter:

- Continue to refine the testing plan.
- Finalize the design of the cooling chamber
- Take Delivery of the large-scale testing fixtures
- Finalize the design of the first specimens to be fabricated using HS bolts
- Continue to work with DOT's to obtain specific existing riveted built-up members
- Begin initial FE studies to estimate fracture toughness demands on girders and plates with cracks

Significant Results:

During the past quarter, the major steps forward included:

1. Development and design of large cooling chamber to ensure large girders can be tested at temperatures of -60F or less.
2. Final design and detailing of the large-scale fixtures

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).

The issues with the contract delays have been handled and the Research Team is working hard to get back on schedule. Though slightly behind, we do not believe it will have a major impact to the overall schedule at this time.

Potential Implementation:

None at this time. Too early in the research.