TRANSPORTATION POOLED FUND PROGRAM
QUARTERLY PROGRESS REPORT

Date: _March 31, 2015_

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.e, SPR-2(XXX), SPR-3(XXX) or TPF-5(XXX)* ***TPF 5-238***	**Transportation Pooled Fund Program - Report Period:** X Quarter 1 (January 1 – March 31) ☐ Quarter 2 (April 1 – June 30) ☐ Quarter 3 (July 1 – September 30) ☐ 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:	**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 X 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	**$621,378**	**73%**

Quarterly Project Statistics:

Total Project Expenses and Percentage This Quarter	Total Amount of Funds Expended This Quarter	Total Percentage of Time Used to Date
$30,216	**3.8%**	**100%**

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 fabrication. Advancements in NDT techniques along with technologies not regularly used, such as phased array UT have the potential to further reduce the chance of a defect being missed.

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

- Continued literature review.
- Performed preliminary CVN material testing and identified plate for potential specimens.
- Refined specimen design based on plate identified during initial CVN testing.
- Received revised quotes for large-scale testing specimens.
- Worked with steel mills to arrange plate donations for specimen web and top flanges.
- Received test frame components for axial test frame from fabricator.
- Began in-house fabrication of additional components for axial test frame.
- Installed MTS hydraulic test frame to perform small-scale fracture mechanics testing.
- Received repaired MTS actuator for West test setup.
- Completed draft report on small-scale material testing.
- Began FE modeling of large-scale specimens.

Anticipated work next quarter:

- Continue reviewing relevant literature.
- Complete fabrication and erection of axial test frame.
- Begin fracture mechanics testing of small-scale specimens.
- Order the first round of large-scale specimens.
- Complete final report for small-scale testing portion of project.
- Continue FE modeling of large-scale specimens.
- Begin fabrication of tensile testing frame.

Significant Results:

During the past quarter, the major steps forward included:

1. Completed CVN testing of plate samples.
2. Installed test frame for small-scale fracture mechanics testing.
3. Began fabrication of axial test frame.

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).

Similar to last quarter, a great deal of time this quarter has been spent working with steel producers and fabricators to obtain plate donations for the large-scale test specimens. This process continues to take longer than anticipated; however, the Research Team is hopeful in the next quarter specimen fabrication will commence.

Potential Implementation:
None to date