

Project Capsule

26-1ST



March 2026

Skew Detection System Replacement on Vertical Lift Bridges (Phase III)

PROBLEM

Phase III of this study will resolve issues identified during Phase II, the implementation phase, and integrate one or more of the recommended new technologies into the existing Ellenders Ferry Bridge control system. The work will include the resolution of Phase II communication and data transmission issues and investigate the shortcomings of the installed SMART relays and associated equipment applicable to the inclinometer and encoder systems only. No further work is to be done on the laser skew detection system. Phase III will include upgrades to the system to achieve the desired level of skew monitoring accuracy. Revisions will also include a provision for DOTD to have remote access to the skew system. All upgrades will be installed, and changes will be made to integrate the new systems into the existing control and operating system. Note that due to limitations in the existing Ellenders Ferry Bridge operating system, this integration will provide only an indication of skew and system alarm and trip in the event of a skew condition, not control of skew.

OBJECTIVE

The objective of this study is to further improve and refine the recommended preferred alternative skew monitoring and detection technologies (inclinometer and encoder systems only), integrating them into the existing control system and proving their operability and long-term reliability at the Ellenders Ferry Vertical Lift Bridge.

METHODOLOGY

The project will include the following tasks:

1. Analyze the shortcomings of the communications network installed in Phase II. The tasks will consist of troubleshooting the network, including an in-depth analysis of the Phase II-collected data and test results.
2. Develop modifications, replacements, and reconfigurations of the communication transmission system to resolve all system network shortcomings. This task will include working closely with the Phase II systems vendor (Panatrol) and SMART relay manufacturers to develop a SMART relay specifically designed for our application.
3. Investigate and resolve issues related to the installed SMART relays and associated equipment.
4. Design and integrate upgrades to the Phase II Ellenders Ferry Bridge control system. The proposed upgrades will not actively control skew of the bridge but will provide skew indication, monitoring, alarm, and system trip functionality in the event of severe skew conditions.



Figure 1. Ellender Ferry Bridge, SR 27, Calcasieu Parish, Louisiana

Start Date

March 1, 2026

Duration

15 months

Funding

SPR: TT-Fed/TT-Reg - 6

Principal Investigator

Gareth Rees, P.E.
Wiss, Janney, Elstner Associates, Inc.
215-340-5830

Administrative Contact

Julius Codjoe, Ph.D., P.E.
Special Studies Research Administrator
225-767-9761

Technical Contact

Walid Alaywan, Ph.D., P.E.
Senior Structures Research Engineer
225-767-9106

**4101 GOURRIER AVE.
BATON ROUGE, LA 70808**



Read capsule online:

www.ltrc.lsu.edu/publications.html

DELIVERABLES

1. Provide a system that enables DOTD to remotely access the installed skew system to analyze the performance of the monitoring system. This feature will be available for read-only access, with the option to download captured data. Remote access will be provided to DOTD within two weeks of the award of the Phase III contract
2. Provide final testing and commissioning for the upgraded new skew technology system to prove its operating accuracy and reliability.
3. Prepare a Final Report documenting Phase III work. This report will include the results of the troubleshooting, the design upgrades, and the results and analysis of the skew-monitoring testing. Additionally, recommendations for the application of the system at other bridges will be included in the report.

IMPLEMENTATION POTENTIAL

The work provided in Project 26-1ST may be used in the implementation of the new skew technology to prove its effectiveness as a viable option for future rehabilitations at other tower drive vertical lift bridges in Louisiana.