



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET, NW
WASHINGTON, DC 20314-1000

CECW-CE

JUL 10 2017

MEMORANDUM FOR THE RECORD

SUBJECT: Implementation Guidance for Section 1151 of the Water Resources Development Act (WRDA) of 2016, Structural Health Monitoring

1. Section 1151 of the WRDA 2016 directs the Secretary to design and develop a structural health monitoring program to assess and improve the condition of infrastructure constructed and maintained by the Corps of Engineers, including research, design, and development of systems and frameworks. Section 1151 further directs the Secretary to consult with academic and other experts and to consider certain models and research when developing the program. Section 1151 is enclosed.
2. Structural health monitoring (SHM) is the science of making accurate condition assessments about the current and future ability of an asset or system of assets, particularly infrastructure assets, to perform its intended design function(s), based on sensor and inspection data, numerical engineering models, and statistical analyses. The USACE Civil Works Directorate has been actively engaged in structural health monitoring efforts throughout its history, recently incorporating state-of-the-art scientific technical approaches. These efforts have continually evolved in concert with gains in both technology and experience, with specific focus as appropriate for different types of infrastructure assets.
3. To enhance these efforts and implement Section 1151, the USACE Civil Works Directorate will draw on the best practices developed within each Civil Works functional area as well as industry, academia and other stakeholders experts to outline an asset-focused cross-functional Structural Health Monitoring program as per the requirements under Section 1151(a) and (b). This effort will combine human observations and inspections with advances in technology being developed through our Engineering Research & Development Center (ERDC) SHM Research & Development initiative to provide outputs to better inform lifecycle portfolio strategies and corresponding investment decisions. SHM principles and solutions will support and augment USACE Civil Works Asset Management, Operations, Engineering & Construction, and Research & Development (R&D) infrastructure related responsibilities. Funds are currently available through ERDC R&D to develop the necessary science and technology;

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however, no work will be initiated to implement or deploy on an enterprise scale the effort required under Section 1151 unless funds are specifically appropriated for such purposes.

A handwritten signature in black ink, appearing to read 'J. Dalton', with a long horizontal stroke extending to the right.

JAMES C. DALTON, P.E.
Director of Civil Works

Encl

SEC. 1151. STRUCTURAL HEALTH MONITORING.

(a) In general.—The Secretary shall design and develop a structural health monitoring program to assess and improve the condition of infrastructure constructed and maintained by the Corps of Engineers, including research, design, and development of systems and frameworks for—

- (1) response to flood and earthquake events;
- (2) predisaster mitigation measures;
- (3) lengthening the useful life of the infrastructure; and
- (4) identifying risks due to sea level rise.

(b) Consultation and considerations.—In developing the program under subsection (a), the Secretary shall—

- (1) consult with academic and other experts; and
- (2) consider models for maintenance and repair information, the development of degradation models for real-time measurements and environmental inputs, and research on qualitative inspection data as surrogate sensors.