



# Navigation Structures Inventory Management System (NAVSIMS)

## Description

Information on current and future infrastructure conditions is essential for maintenance and rehabilitation actions. Data on actual conditions are obtained from periodic and detail inspections. These data will be used to develop deterioration models, which will provide the capability to predict future conditions of our navigation infrastructures. The proposed effort includes multiple directions: Development of deterioration states for hydraulic steel structures (HSS) will begin the process of standardization and help in providing standard software and hardware, procedures, and formats. The Navigation Structures Inventory Management System (NAVSIMS), a standardized collection of information of all the hydraulic structural components, will include CAD drawings of such features as as-built structures; any repairs, maintenance, or modifications made to the components after construction; and periodic and detailed inspection reports. The inventory system will be used to perform deterioration modeling and project prioritization. Information stored in the collection will be used as input to the modeling. The models shall be used to predict conditions for each element and to perform a what-if analysis under different budget constraints to determine the impact of different projects.

## Issue

Normally the risks of a navigation structural failure would be the economic consequences from loss of the navigation pool, instead of the risks to human life in downstream communities associated with the loss of a flood control reservoir. As our navigation infrastructure reaches its design life and funding for new facilities continue to fall, the emphasis has shifted from the design and construction of new facilities to the maintenance and rehabilitation of existing navigation infrastructure.



Inspection reports do not have a way to quantify the severity of the deficiencies, nor are they in a standardized format and or consolidated in one central location. Standardization will allow the information pertaining to inspections, repairs, evaluations, and solutions to be shared throughout the Corps where all the District Engineers may use them. Standardization, quantification of the severity of the deficiencies, and a centralized location for the information can then be used to develop deterioration models to predict the condition of the navigation structure at any given point in the future.

## Users

Corps Districts.

## Products

The main product will be the NAVSIMS. The investigation will generate a series of technical notes and refereed journal articles. Technical reports will also be generated and

distributed to the District offices. A workshop to instruct District Engineers in the use of the system will also be conducted.

**Benefits**

NAVSIMS will provide a centralized location where all the information (CAD drawings, inspection reports, repairs, maintenance, etc.) regarding a particular project will be stored and accessible to those who may need it. The condition of each component will be reported according to a deterioration state, which is a quantitative measure of the protective system, corrosion, fatigue, fracture, and overloads/impact deficiencies. Then the deterioration, cost, and optimization models will allow the engineers to analyze the entire inventory and to determine impacts of implementing or deferring repairs in the future. These models will allow the prediction of possible problems and funding for repairs. The ultimate goal of the NAVSIMS is to maintain a safe hydraulic structures inventory. This inventory is created by conducting inspections and evaluations in compliance with governing criteria, acceptable standards, and good practices. This information will be based on thorough documentation of processes, findings, results, and recommendations. NAVSIMS will serve as the means of documentation by recording all the information collected while maximizing efficiency and effectiveness. It will also provide a consistent format and approach in conducting business throughout the organization by providing the proper format for annual reports, a central collection point, and permanent documentation for all records including historical data, evaluations, and review comments and approvals.

**Corps Program**

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