



**Measurement of Pressures Related to
Vessel Movement within Miraflores
Upper West Lock**

**Mediciones de Presiones
Relacionadas con el Movimiento de
Naves dentro de la Cámara Superior
Oeste de la Esclusa de Miraflores**

USACE

30 de junio de 1999

Contrato No. 97003

**Introducción, Conclusiones y Recomendaciones
(No existe Resumen Ejecutivo)**

SECTION 1. INTRODUCTION

The Canal Capacity Projects Office of the Panama Canal Commission (PCC) is considering various alternatives to augment traffic capacity to meet future demand. The studies will include upgrading current Canal infrastructure, incorporating modern lock technology and water saving methods, alternate systems for raising and lowering vessels, and constructing new locks. In connection with these studies, the Office has determined that a measurement of the actual pressures exerted by vessels and water during the operation of the present locks systems is required. Besides helping define the structural requirements for future locks and shiplifts, an understanding of the effects of vessel movements in the locks is needed to improve existing structures and operating modes.

The Pittsburgh District of the U.S. Army Corps of Engineers, Hydraulics and Hydrology Section, Water Resources Engineering Branch, has considerable experience using pressure transducers to measure water surface fluctuations in lock chambers caused by filling and emptying operations. Since similar techniques could be applied to monitor pressures caused by moving vessels, the Capacity Projects Office contracted the District to perform the testing. The Office selected the northwest Miraflores Lock as the testing site.

The overall study plan was developed by Mr. Juan Wong of the Canal Capacity Projects Office under Director John C. Gribar. Mr. Walter P. Leput, Chief of the Hydraulics and Hydrology Section, traveled to Miraflores in early April 1999 for pre-planning, accompanied by Mr. Jeffrey L. Liggett, Hydrologic Technician. The field tests were conducted from 22-27 April 1999 by Messrs. Raymond A. Povirk, Raymond D. Rush, Hydraulic Engineers, Mr. Dennis D. McCune, Hydrologic Technician, and Mr. Liggett of the Hydraulics and Hydrology Section. Control House operations were recorded by Mr. Wong and Mr. Boris Moreno of the Canal Capacity Projects Office. Messrs. Povirk and Rush performed the data reduction and analysis. In early June 1999 Messrs. Gribar, Wong and Moreno visited the Pittsburgh District for a progress and coordination meeting. This report was prepared by Messrs. Povirk and Rush in June 1999.