Fact Sheet

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Los Angeles and Long Beach Harbors Model Study

Background: The ports of Los Angeles (POLA) and Long Beach (POLB), in coordination with the U.S. Army Engineer District, Los Angeles (SPL), have been developing new plans for harbor expansion. These plans will be constructed in phases, leading up to a master plan development targeted for the year 2020. The harbors have a history of surge due to long-period waves which create excessive ship motion in certain areas. Consequently, the ports and the Corps plan to ensure optimization of proposed expansions to minimize ship motions in the new basins, as well as preventing adverse effects in existing harbors areas.

Research Description: The U.S. Army Engineer Research and Development Center constructed a physical model of the Los Angeles-Long Beach Harbors complex during the period from July 1972 to July 1973. The model has a 1:100 vertical scale and a 1:400 horizontal scale and reproduces the entire harbor area, the shoreline from Point Fermin to Huntington Beach and underwater contours out to -300 ft. The total model area is 44,000 sq ft. It is the largest wave action model ever constructed in the United States. Waves are generated by a 210-ft-long electrohydraulic wave generator which can be positioned to reproduce curved wave fronts and is computer controlled to generate waves of varying heights and periods. In addition to the physical model, extensive field data has been acquired and numerical models have been developed to assist in studies of harbor oscillation, ship motion, harbor circulation, and water quality.

Applications of the model: The physical model recently has been used to: a) collect data for the POLA's Pier 400 expansion project. (This is a two-phase project which involves the creation of over 500 acres of new landfill to accommodate sixteen new berths.) b) study proposed improvements to the POLB's Pier J and Navy Basin facilities, and c) investigate effects of proposed main channel deepening and pier expansions within the Los Angeles harbor. Most recently, the model was used to assist the POLB in determining the effects of proposed modifications to several marine terminals within Long Beach Harbor. This latter study has been completed and is currently in the report preparation phase.

The model has shown that it accurately predicts harbor oscillation patterns and has been applied to several projects. It will continue to be operated as a planning and design tool as expansion of the harbors continue.

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