DSI EXPANDED CONVEYOR TECHNOLOGY
TECO DOCK CONVEYOR WITH TRIPPER

C-6 Dock Conveyor at Transfer Terminal, Southern Louisiana, USA	
Material	Various coals and coke
Design Rate	6187 t/h (6820 STPH)
Peak Rate (Drives)	6845 t/h (7545 STPH)
Max Instant Rate	To 8000 t/h (8800 STPH)
Belt Width	1829 mm (72")
Belt Speed	4.55 m/s (895 FPM)
Lift	8.0 m (26.3')
Length	430 m (1409')
Drive Power	522 kW (700 HP)

Dock Conveyor

The 1829 mm wide C-6 dock conveyor carries various types of coal and coke to the traveling ship loader. The coal feed comes from the storage yard, reclaimed by a bucket wheel type Stacker/Reclaimer (S/R) and from river barges which are unloaded by a bucket ladder type continuous barge unloader (CBU). The material is delivered to the ship loader by a belt tripper. The tripper location may be anywhere along the dock length as the ship loader travels to position its loading boom over each of the ship's holds. When the S/R and CBU are both working peak feed rates can exceed 8000 t/h.

Operating since 1983 the C-6 dock conveyor has experienced a slack belt condition when stopping loaded. Occasionally, under very heavy loading, the carrying belt has doubled over on itself when drifting to a stop.

The data table (above) lists features and parameters of the C-6 dock conveyor.

Project Description

Aware of the latest technologies in modeling, simulation and analysis of belt conveyors (which were not commonly used in the early 1980s) the customer decided to do a complete analysis of the C-6 conveyor and to determine the best solution for the slack belt problem.

DSI *ExConTec*

Dos Santos International was chosen to perform a detailed analysis of the C-6 dock conveyor and to recommend a solution to the slack belt problem.

Dos Santos work at this The Transfer Terminal, in Southern Louisiana, USA, dates back to the mid-1970s and has been steady throughout the late 1990s continuing to present.   DSI's familiarity with the terminal and all of its equipment complimented the Dos Santos reputation in the high-tech conveying field making DSI the logical choice.

Detailed conveyor analysis, using the Expanded Conveyor Technology (*ExConTec*) computer simulation and analysis program, is able to predict the slack belt condition. This is by rigid body dynamics, which determines the distribution of the inertial forces, superimposing these on the travel resistance forces as the conveyor drifts to a stop. The DSI *ExConTec* program is extremely versatile, with no intrinsic limitation on material carrying path or preference for location of drive, braking or tensioning (take-up) stations. "Load" and "Unload' (macro) buttons permit real-time analysis of real loading conditions including loading on, trailing off and any load discontinuities that will most aggravate the belt tension distribution. DSI *ExConTec* also features expanded equations to account for the increased belt line resistance of induced curvature. The DSI *ExConTec* discretionary factors permit calibration of the analysis model to reflect the experience and philosophy of The Terminal Operations including power monitoring of the C-6 dock conveyor.