ABSTRACT

Hydrocarbon exploration in a Cenozoic sedimentary succession in the southeastern Gulf of Mexico highlights the importance of high resolution biostratigraphy to understand the geological setting of this complicated area. Calcareous nannofossil, planktonic foraminifera and palynomorph data from six wells in the Macuspana Basin, define chronostratigraphic intervals. Graphic correlation method and sequence stratigraphy allow the construction of a detailed chronostratigraphic framework.

Subsurface sections in this basin represent deep to shallow marine environments which reveal basinward and landward facies shifts related mainly to sea level changes. Graphic correlation helps delineate stratigraphic sequences, while sequence stratigraphic key surfaces cause predictable patterns in the graphic correlation of biostratigraphic data. Integration of graphic correlation and sequence stratigraphy from the six wells reveals an erosional unconformity separating the Pliocene and Miocene strata.

INTRODUCTION

The Macuspana Basin, which is located in the State of Tabasco, México, is a mature hydrocarbon-producing basin (Fig. 1). Studies were conducted on the geological settings of this basin in an effort to better understand hydrocarbon plays by PEMEX (Petroleos Mexicanos). These studies have aided in the intensive exploration going on in the region.

This paper seeks to document the utility of integrating graphic correlation with sequence stratigraphy to produce a chronostratigraphic depositional framework in the Macuspana Basin (Fig. 2). The integration of graphic correlation and sequence stratigraphy enhances the utility of both stratigraphic tools and provides a powerful basin analysis technique.

METHODOLOGY

The main database consists of biostratigraphic information on calcareous nannofossils, planktonic foraminifera and palynomorphs from six exploration wells operated by PEMEX in the Macuspana Basin. The database

615