

## **The Timing of Maturation, Pressure Development and Secondary Migration in the Northern Gulf Basin**

Arthur H. Ross Jr./Exxon Exploration Company; Theresa F. Schwarzer/Exxon Exploration Company; F. W. Schroeder/Exxon Production Research Company

Basin modeling of maturation, fluid flow and abnormal pressure development has allowed significant advances in the understanding of the Tertiary hydrocarbon system of South Louisiana. Identification of source rocks through matching of oils and extracts allowed the migration pathway options to be examined in detail. Fluid flow modeling (using Bethke's BASIN2 and IFP's TEMISPAC) demonstrated the necessity for faults as migration pathways since without the faults sufficient permeability does not exist to allow migration from source to reservoir. Abnormal pressure modeling in conjunction with maturation modeling allowed the development of a timing scenario to explain the relationships between maturation, abnormal pressure development in reservoirs, the formation of traps and effective migration pathways. The synthesis of the results of these techniques allows for a complete understanding of the workings of a hydrocarbon system. These techniques applied here in a normal listric fault, Tertiary clastic setting can be applied to any type of structural stratigraphic setting and obtain similar results.