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Laurent Gindre[1], Rubino Jean-Loup[1], Fabrice Malartre[2] (1) Totalfinaelf, Pau, France (2) E.N.S.G, Nancy, France

Log responses in the carbonate Mishrif formation (Cenomanian, Middle East)

Cenomanian shallow marine carbonate bodies in the Middle East area provide excellent studies subjets in order to establish a relationship between carbonate cores and subsurface well logs. Shape analysis based on GR and Sonic logs is compared with muddy (mud, wacke and packstone) and coarse (grain to rudstone) carbonate facies sequences of the Mishrif Formation. The great correspondance allows to translate depositional evolutions into electrofacies and electrosequences. Curve shape parameters give geometric and faciologic informations. The GR electrosequence gradient and curve asymetry degree reveal aggrading, prograding and retrograding architecture. The flatness degree is associated with depositional area. Stratigraphic discontinuities correspond to log breaks in trend electrosequences and define chronostratigraphic markers in well correlations. Each depositional system tract results of elementary electrosequences stacking pattern and presents a typical GR log response. This methodologic tool leads to a multi-scale stratigraphic system tracts framework in a strict carbonate context in all depositional areas (shelf, slope, basin). It reveals complex forced regressions with early lowstands on the shelf and carbonate submarine fans in deep offshore.