Chemical Source Neutron-Density Versus Dual-Burst Pulsed Neutron Decay Log – A Comparison Of Cased Hole Wireline Results

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ABSTRACT
One of the challenges that still faces the petrophysicist is to accurately evaluate a reservoir that has only cased hole wireline logs run on it. Although no cased hole log will give one as complete and accurate answer as would an open hole log suite, there are various alternatives available in cased hole that will give one comparable, or at least acceptable, results in certain borehole environments. This paper describes and compares two different techniques that are available:

1) 1 11/16” AmBe source neutron and Cs source density measurement (MAN-TriDent) and,
2) 1 11/16” pulsed high-energy neutron generator source measuring simultaneous capture (neutron) data and inelastics (density) data (PND).

Emphasis will be placed on the density measurement from each tool. Various case studies are presented with comparisons of both tools run on the same wellbore and also comparing some of the results to open hole logs when they are available. Some of these examples include a horizontal pump down logged through drill pipe, a coal bed methane example, an abandoned well re-entered for possible shallow gas, and a vent flow identification log. From these comparisons, conclusions are drawn as to which tool is most likely to give the best result in different wellbore environments and configurations.