FAULT PATTERNS IN MALAY PENINSULA: IMPLICATIONS FOR OFFSHORE BASINS AND REGIONAL TECTONICS

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Malay Peninsula is cut by numerous faults that seem to have formed or reactivated during the Cenozoic. Three prominent trends are evident : NW-SE, N-S and NE-SW. A very subordinate E-W trend is also discernible. NW-trending faults are mainly sinistral strike-slip with significant dip-slip components in places. N-S and NE-SW trending groups comprise both sinistral and dextral strike-slip faults as well as normal faults. E-W striking faults are mainly normal. Thrust faults of diverse orientations also occur.

Different genetic models are considered to interpret the observed fault patterns. It is possible to explain the origin and geometric relationships of the various types of faults in terms of the following :

a) NW-SE trending sinistral 'simple shear' with probably an earlier episode of sinistral N-S 'simple shear'.
b) 'Termination effects' and 'overlap effects' of large strike-slip faults.
c) Thermally induced rifts (responsible mainly for N-S and NE-SW normal faults).
d) Controls exerted by pre-existing structures (e.g. earlier tensional structures as evidenced by the dykes of Mesozoic age).

Overlaps between NW-trending strike-slip faults seem to be an important structural feature and their effects can account for a number of apparently anomalous characteristics such as significant vertical displacements in strike-slip faults (e.g. Bt. Tinggi). On a larger scale, Malay Peninsula itself appears to be an 'overlap' that has been uplifted by transpressive forces.

Similar fault patterns have been recorded in offshore areas suggesting that simple shear and thermally induced rifting processes may be responsible for the formation of offshore basins. Many observed offshore extensional features are likely to be the results of interplay between strike-slip faults.

N-W trending 'simple shear' seems to have played a fundamental role in controlling the Cenozoic structures of Malay Peninsula in particular, and of Southeast Asia in general. Geodynamic factors that may be responsible for such motions remain uncertain and begs more detailed study. Published geodynamical scenarios not only conflict with each other, but also suffer from a serious weakness in that they ignored the role thermal events that undoubtedly created a tensional environment, caused extensional thinning of the crust, and affected the rheology.

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