

ENVIRONMENTAL/ ENGINEERING GEOLOGISTS

Active Faults In The Gulf Coastal Zone

Carl E. Norman

HGS Environmental/Engineering Evening Meeting - February 9, 1994

Social Period 7:00 p.m., Program 7:30 p.m.

H.E.S.S., 3121 Buffalo Speedway

Several hundred active surface faults are known onshore in the Texas-Louisiana Gulf Coastal Zone, and hundreds have been identified offshore. The vast majority are listric normal growth faults with near-surface dips of 70 to 85 degrees. No strike-slip component of motion has yet been identified on any surface fault.

About 80 percent of the surface faults are associated with diapiric intrusion of salt. They tend to be short, ranging in length from 1 to 5 km, and extend over and radiate outward from salt stocks. The remainder are 5 to 20 km-long regional faults that strike more or less parallel to the coastline. The more active ones are paired with strike-parallel antithetic faults about 2 km from the parent fault on its downthrown side. The

antithetics occur in short segments opposite only the more rapidly moving parts of the parent fault.

Rates of dip-slip displacement across the faults vary in both time and space. Currently the highest rates are about 3 cm/yr. In the strike direction, the rates decrease progressively from a maximum near the mid-point of the fault to zero at its *termini*. Unfortunately, the rates of displacement are slow enough to make many of the faults difficult to detect, but fast enough to cause substantial damage to structures built across them. The 16.5 km-long Long Point Fault in west Houston, for example, is in the

process of damaging about 240 buildings.

Ground deformation of significance on the human time scale extends only a few tens of feet from the fault trace along the length of the fault. For engineering purposes it is important that the location and width of the zone of deformation be established precisely. The talk will include a discussion of currently used techniques for reaching those goals.

CARL E. NORMAN Biographical Sketch



Carl Norman is an Associate Professor of Geology at the University of Houston, specializing in structural geology and rock mechanics. He began an intensive study of active faults on the Gulf coastal plain in 1977. Early work centered on identification and mapping of faults. Current work is focused on fault kinematics and dynamics.