SYNRFIT AND POSTRIFT SEQUENCES IN THE NORTHERN NORTH SEA

INTRODUCTION

This contribution describes briefly some structural and stratigraphic elements of the northern North Sea (58° to 62°N), to illustrate the evolution, four seismic segments (all taken from different Nopec surveys) located in slightly different geological provinces will be shown (Figure 1).

The evolution of the northern North Sea took place during two pronounced rift phases followed by postrift subsidence. The early rift phase is of probable late Paleozoic age and can be demonstrated on seismic lines both on the Horda Platform and farther south in the Stord basin (see Nopec regional lines). The late rift phase of predominantly Late Jurassic age, easily can be demonstrated on seismic lines all over the northern North Sea, including the Viking graben and the Tampen spur. The associated postrift unconformity, generally known as the Base Cretaceous Unconformity, is a pronounced seismic marker.

The rift phase, according to one model and elaborated upon by several others, is characterized by crustal thinning in response to extension, and consequent subsidence through large-scale, listric, normal faulting. The postrift phase involves thermal subsidence decreasing with time and thinning of the lithosphere due to cooling. The late rift phase from basal Cretaceous time, marine clays progressively onlapped the tilted fault block. For the present study, the marine, highly radioactive, anoxic Kimmeridge Clay shales (Draupne Formation) and top of the marine Heather Formation. The Draupne Formation is by far the most important source rock of the northern North Sea.

The Tampen spur is bounded to the east by the West Viking graben and includes the East Shetland basin. The Viking graben proper, however, continues with a north-northeast strike. The seismic line analyzed is located on the Tampen spur in the northeast prolongation of the East Shetland basin. The Tampen spur is bounded to the east by the West Viking graben and includes the East Shetland basin. The Viking graben proper, however, continues with a north-northeast strike. The seismic line analyzed is located on the Tampen spur in the northeast prolongation of the East Shetland basin. The Tampen spur is bounded to the east by the West Viking graben and includes the East Shetland basin. The Viking graben proper, however, continues with a north-northeast strike. The seismic line analyzed is located on the Tampen spur in the northeast prolongation of the East Shetland basin.