**Comments to "Wide-azimuth acquisition: True 3D at last!" by Cambois et al., and to "Narrow- versus wide-azimuth land 3D seismic surveys" by Cordsen and Galbraith, TLE, August 2002**

The first thing one has to decide upon when designing a 3D seismic survey is the type of geometry to be used. This is an important choice, because the properties of different geometries are different. There are three main geometries available to choose from: parallel geometry, orthogonal geometry and areal geometry. From a geophysical point of view, orthogonal geometry and areal geometry should preferably be as wide as long, i.e., have aspect ratio equal to one, for the simple reason that the properties of these geometries are essentially the same in the x- (inline) and in the y- (crossline) direction. (For orthogonal geometry, C-wave acquisition constitutes an exception. Due to the asymmetric nature of the raypaths, the maximum crossline offset should preferably be larger than the maximum inline offset.) Often, practical, non-geophysical reasons force the designer to select an actual geometry with aspect ratio different than 1.

On the other hand, again from a geophysical point of view, parallel geometry should be selected as narrow as possible. Wide parallel acquisition geometries used in streamer acquisition tend to produce illumination gaps when shooting downdip. The wider the configuration the larger the gaps. Apart from reducing the width of the configuration, the problem can be mitigated by antiparallel acquisition (shooting adjacent boat passes in opposite directions). These and other ideas I have published in a variety of papers in the course of time, all ideas together can be found in the recent book "3-D seismic survey design" published by the SEG.

Cordsen and Galbraith quote from one of those earlier papers: "some areas of a dipping reflector are never sampled by the large offsets, whereas other areas are sampled more than once. These variations are largest for the large offsets. ...". Unfortunately, the quote is pretty much out of context, because my statement was made in a discussion of wide parallel geometries. The statement does not refer to narrow orthogonal geometries as being discussed by Cordsen and Galbraith. Although a narrow orthogonal geometry may have similar width as a wide parallel geometry, their properties would still be different, and a statement made for one does not necessarily apply to the other. In this particular case it does not apply to narrow orthogonal geometries.

In the introduction to the Special Section on wide-azimuth acquisition, Cambois et al. suggest that all wide is better regardless of acquisition geometry, when they note that there appears to be processing advantages to wide-patch geometries, as demonstrated by improved multiple elimination in Hadidi et al.'s paper. In actual fact, the Hadidi paper shows (compare Figure 10 with Figure 17) that the wider the towed-streamer geometry, the more difficult it is to apply the surface related multiple elimination technique (SRME). This is for good reasons, because SRME requires the presence of a source and a receiver at each surface reflection point (point A in Figure 1 of Hadidi et al.). The wider the geometry the sparser sources and receivers and the heavier the assumptions to be made in the multiple prediction scheme.