
The perspective of the multi-client surveys

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- **The Multi-Client Case**
 - **Time Share and Multi-client**
 - **Conclusions and Recommendations**

The Case for Multi-Client data



- Economics
 - Lower unit costs. Multiclient model makes surveys economical that would otherwise not be acquired. This data increases the knowledge about the subsurface and therefore benefits the (prospective) license holders and the state.
- MC Model acceptance
 - In countries where the MC model is discouraged, exploration activity is generally a lot lower.
- Entry costs lowered
 - It lowers the entry costs for new companies, which increases the competitiveness. This is of importance to maintain healthy exploration activity in Norway.
- Carried Risk
 - MC Companies 'carry' the risk forwards, sometime for a number of years. Delays, time share and being pushed into poor weather windows will add to that 'carry' and hence the cost for the Licensing Companies.

Multi-Client - Technical

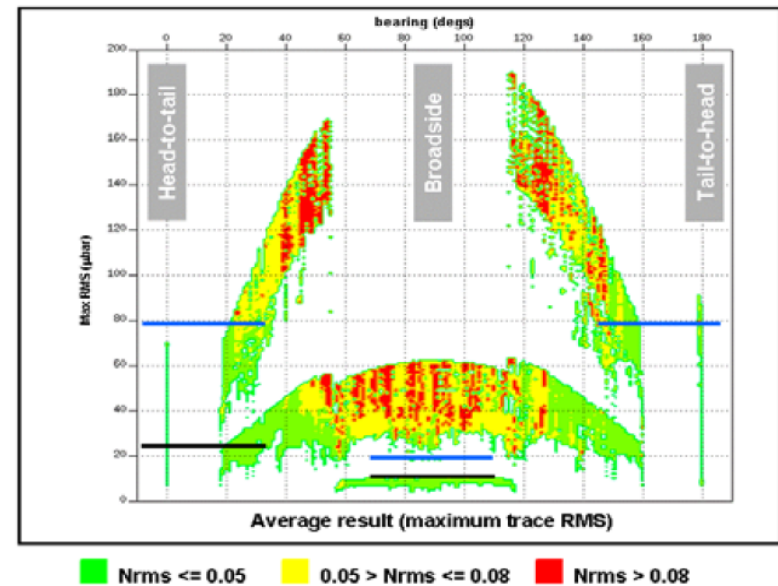
- Pipeline of New Opportunities
 - MC Companies have G&G staff and R&D staff who review areas and come up with new opportunities, play types, risk analysis of basins or trap types etc.
 - This is of tremendous value for Oil Companies who can ride on the IP (Intellectual Property) of the MC Companies.
- Data quality
 - MC data standards are at least as high as contract work.
 - Data with high levels of interference which cannot be removed is of course a major disadvantage to Customers and reduces sales values for MC Companies
 - It is clear that from the recent discussions, that interference can be largely removed.
- Extensive coverage over unlicensed acreage

Multi-Client - Timing

- MC performs data ahead of license rounds
 - It is important to perform surveys ahead of time as many of the Operators are focussed on Operated acreage but their New Ventures teams ultimately need access to data ahead of license rounds in order to make informed decisions about block applications.
 - Delays in performance of surveys will have a knock-on effect for data availability in license rounds or farm-in opportunities.
- Advanced Warning is often short
 - For competitive reasons, it is sometimes necessary to disclose location of surveys late. Location of area of interest is core business for companies involved in MC [just like it is for exploration companies when applying for blocks!]

Interference

In Figure 6, the original SI thresholds for the streamer survey are shown as black bars. After SI simulation and attenuation, an NRMS below a threshold of 0.05 was chosen as an acceptable fidelity to the data without SI. The results determined by peer review as acceptable agreed well with this value. This was used to revise the SI acquisition thresholds for the streamer data, as shown by the blue bars. The thresholds for both head-to-tail and broadside noise were raised, while the higher tolerance for the tail-to-head noise remained unchanged.



- Everyone is hopefully aware of the above paper by now
- Clearly more interference can be accepted from certain directions

REDUCTION OF ACQUISITION TIME-SHARING IN THE NORTH SEA BY SEISMIC-INTERFERENCE ATTENUATION

Ted Manning, Jan H. Kommedal, Richard Wombell, Tony Noss and Tamara Pokrovskaja
EAGE 2006

Comments

- Current IAGC guidelines probably out of date
- Over open acreage priority of MC is equal to any other survey
- MC companies are subject to permits over licensed acreage
- Often MC surveys have flexibility to phase acquisition to limit SI
- 2D probably suffers most from interference due to less azimuth distribution. But as lower cost is seen as the 'give-way' survey
- OBC surveys have multi-azimuth data at high fold probably suffers least from interference
- No reference to onboard processing is made in current guidelines.
- Some interference would still need large scale onshore compute power before being effectively removed (reorder into different domains etc).

Conclusions & Recommendations

- MC plays an important role in facilitating exploration activity, like any other type of survey. Late publication of AOI is a key competitive element.
- New Guidelines should dictate
 - Levels of interference (strength, azimuth, event duration) that justify entering into timeshare
 - A minimum expected SI attenuation method onboard
 - A mandatory joint planning effort to avoid SI from worst azimuths as part of setting up time share agreement.
(this on top of season planning to avoid proximity altogether)
 - Post plot SP location and timing information could be exchanged. The post survey SP time and location will allow very targeted suppression of ‘foreign energy’ in processing. This ‘foreign noise’ will be linear in the ‘foreign shot domain’