Appendix 2:

Processing of multichannel seismic data off the Faroe Islands and South Greenland:

Technical requirements

1. **Acquisition details** – see Appendix 1

2. **Navigation data** will be supplied in the form of UKOOA format tapes.

3. **Basic processing sequence**

   The following sequence is to be considered the required flow. However, GEUS reserves the right to alter the sequence as necessary to provide improvement in data quality.

   1. Demultiplex if needed, merge and reformat of seismic and positioning data
   2. Editing and polarity reversal of bad (portions of) records and traces
   3. Designature and phase matching
   4. Corrections for spherical divergence and inelastic attenuation
   5. Produce geometry QC displays: as Near trace plots
   6. Low cut filter (as required)
   7. Trace decimation with spatial anti-alias filter (if required)
   8. Optional noise attenuation (FK or FX filtering with removable AGC)
   9. Deconvolution, possibly surface consistent
   10. Preliminary velocity analysis: 1 km interval (20 CDPs, 12 velocity functions), velocities to be horizon consistent, iso-velocity plots produced
   11. Preliminary NMO correction with mute
   12. Display of brute stacks
   13. Multiple attenuation (FK or wave equation demultiple in CDP domain) (as required)
   14. Time variant scaling
   15. DMO gathers and QC stack
   16. Final velocity analysis (post-DMO) and QC stack 500 m interval (20 CDPs, 12 velocity functions), velocities to be horizon consistent, iso-velocity plots produced
   17. DMO (t-x domain Kirchhoff or F-K domain log stretch)
   18. Final NMO correction
   19. Pre-stack mute (inner and outer trace muting)
   20. Time variant scaling
   21. Final stack (mean, alpha trimmed mean or median stack)

22. Deconvolution, single or multiple operator.
23. Optional F-X deconvolution (Random Noise Attenuation)
24. Filtering and scaling (as required)
25. Kirchoff migration
26. Optional application of wavelet filter to produce a zero-phase section (wavelet shall either be supplied by GEUS or Contractor)
27. Spectral whitening
28. Time variant filtering and scaling
29. Produce final tapes on IBM 3590 cartridges from raw stack, raw and final filtered migration data in SEG-Y format, stacking and migration velocities in ESSO V2 format

4. Alternative migration algorithms

Contractor shall provide alternative migration algorithms:
a) Extended Stolt
b) Modified Residual
c) Omega-X

5. Variations to basic processing sequence

GEUS may require the following changes, which will affect basic and optional processes:
i) Record length decrease or increase, per second
ii) Pre-stack processing at decreased or increased sampling intervals
iii) Post-stack processing at decreased or increased sampling intervals

6. Optional processing routines

With the tender CONTRACTOR shall provide details of optional processes and support services:

6.1 Pre-Stack Processes
   a) Noise Attenuation
   b) Multiple Attenuation
   c) Wavelet Processing
   d) Additional Velocity Analysis

6.2 Post-Stack Processes
   a) Noise Attenuation
   b) Wavelet Processing
   c) Migration
   d) Inversion
   e) Additional Velocity Analysis

6.3 Support Services

    a) Additional/Copy Tapes

         - IBM 3590 cartridge

         - 8mm exabyte

    b) Displays 1:25,000 @ 10 cm /sec 1:50.000 @ 5 cm /sec

        -Film

        -Sepia

        -Paper

    c) Additional Final Reports

    d) Tape Storage

7. Testing

Contractor shall select and GEUS shall agree to test parameters using segments of at least one seismic line in each area. The testing includes all tests necessary to perform the processing to a standard acceptable to GEUS, both the basic processing sequence and any chosen optional processes, including but not be limited to tests on:

Initial testing, as soon as possible after receipt of data for the first line

1. Select 5 shots for each of the areas, representing the range of signal to noise ratios and specific noise problems
2. Amplitude recovery tests on selected shots
3. Exclusive filter trial on shots (10 Hz bands)
4. Low cut filters trial on shots (2 Hz steps)
5. All necessary testing for deconvolution
6. Preliminary DBS on shots
7. NMO and mute tests
8. Noise suppression tests pre and post stack
9. Testing of stacking method

Pre stack testing, where relevant a control stack shall be included in displays

1. Noise attenuation
2. Deconvolution
3. Scaling
4. Mute
5. Multiple attenuation
6. DMO

Post stack parameter testing

1. Deconvolution

2. Noise suppression
3. Filter testing
4. Spectral whitening
5. Scaling

Migration parameter testing

Trials shall investigate various algorithms and determine the migration velocity fie1d once the optimum algorithm has been selected.

8. Final tapes and plots

The following tapes shall be supplied, formatted and labelled at GEUS's specification:

1. Stacking velocity tapes
2. Raw stack tapes
3. Raw migration tapes
4. Final migration tapes

All final data shall be supplied on IBM 3590 cartridges to GEUS. The data acquired off the Faroe Islands should be provided also for the Faroese Government in the same format.

Displays on film and paper of final migration and final stacks but only for data acquired off the Faroe Islands shall be supplied as 1:25.000 @ 10 cm /sec and/or 1:50.000 @ 5 cm /sec.

9. Final processing report

Within 4 weeks after completion of processing a final report shall be delivered. Details on the content of the report will be given in the draft processing contract.

10. Price quotation

The tenderer shall give a price quotation (in DKK per km) for the seismic processing, based on the scope of services given above. Data from the two areas shall be tested and processed separately.