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P1Tools

P1Tools is a Windows based program used to perform Quality Control of navigation data for seismic surveys recorded in the industry standard UKOOA / OGP P1 format, and which also provides an extensive set of utilities relating to P1 and Shell Processing Support (SPS) datasets. Multiple file and zipfile input is supported.

Quality Control Modules

QC Offsets and Integrity

- Computes ranges between pairs of nodes as configured by the user. The following components are computed for each pair configured:
  - Radial, cross line and along line distance
  - Azimuth
- Azimuth for along and across line components is selectable from course made good and line heading (first to last shot)
- Output to csv file summary results: mean, minimum and maximum values
- Interactive time series plots of the computed components
- Record integrity checking:
  - Number of vessels, streamers, receiver groups
  - Source firing sequence
  - Shotpoint interval
- Comprehensive format checking

QC Nodes

- Computes shot to shot movement and depth of nodes configured by the user. The following components are computed for each node configured:
  - Radial, cross line and along line distance
  - Delta cross line and delta along line distance
  - Depth
- The waypoints for line azimuth for computing the along and cross line components are selectable from:
  - First and last shotpoints
  - SeisPos generated P1 header – the waypoints defined in the P2 header – allowing analysis of vessel steering and offset
  - User defined
- Output to csv file summary results: mean, minimum and maximum values
- Interactive time series plots of the computed components

Compare

- Performs shot by shot comparison of positions and depths between two P1 files for nodes configured by the user. The following components are computed for each node:
  - Radial, cross line and along line distance
  - Depth

- Output to csv file summary results: mean, minimum and maximum values
- Interactive time series plots of the computed components

Streamer Depth QC

- Comparison with nominal Streamer Depth Profile (.sdp file)
- Plots and statistics for each streamer
- Plots and statistics for each receiver
- Tests against acceptance criteria

Trend Analysis

- Line-by-line time series plots of:
    - Node offsets
    - Node movement
    - P1 Comparison
    - Streamer Depth

Statistical Testing

- Application of user defined acceptance criteria to:
    - Node offsets
    - Node movement
    - P1 Comparison
    - Streamer Depth
- Statistics available:
    - Average
    - Standard deviation
    - Percentile
- Tests:
    - Equality
    - Inequality
    - Greater than
    - Less than
    - Inclusion

Replay

- Interactive graphical replay of P1, one file or two files overlaid.
- Displays:
    - Vessel, sources, receiver groups, tailbuoys, near CMPs
    - Streamer depths by colour
    - Survey line
    - Waypoints (from SeisPos generated header)
- DXF and ESRI Shape file overlay
- Coastline display
- Zooming and scaling functions
- Supports onscreen measurements
- The waypoints for line azimuth are selectable from:
    - First and last shotpoints

  - SeisPos generated P1 header – the waypoints defined in the P1 header, allowing analysis of vessel steering and offset
  - P1/11 preplot records
  - User defined

Streamer Shape Plot

- Plot user specifiable selection of Vessels, Source, Streamers and Tailbuoys
- Specifiable receiver group interval
- Specifiable shot range
- Supports application of streamer rotation to improve clarity of display
- Plot to screen and printer/plotter

Receiver Interval Analysis

- For each consecutive receiver pair, Mean, minimum and maximum interval
- Overall Minimum and maximum interval

Utilities

Extract

- Extracts data from P1 file in field delimited or P1 format
- User specifiable record and attribute configuration
- Supports P1 decimation
- Specifiable inclusive or exclusive shot range and interval

Coordinate Conversions

- Use P1 header parameters or manually specified parameters
- EPSG ellipsoid definitions
- Projections currently supported are:
  - UTM
  - Transverse Mercator
  - Lambert Conic Conformal 1 and 2 Parallel
  - Oblique Mercator
  - New Zealand Map Grid

Preplot

- Survey types: 2D, 3D, 3D Curve, Spiral, Circle, Coil, OBN
- Grid and ellipsoidal distance computations
- Interactive graphical editing
- Output options:
  - Sail lines
  - CMP lines
  - Binning grid
  - Individual shotpoint locations
- Output formats:
  - P1, P6, SPS, DXF, ESRI Shape, PDF, TXT

Postplot

- DXF output
- Flexible record attribute specification

Concatenation

- Concatenate all input files with header from first file

Intersection

- SPS supported
- Compute reverse intersections option
- Output format options:
    - Native
    - Omega

Tide

- Tidal reductions from flexible format text file
- Datum and propagation velocity corrections

Geographic Overlay

- Overlay P1 and SPS data on geo-referenced image file
- Supported image formats:
    - GeoTiff with embedded geo tags
    - All common image formats with associated real world (ESRI) file

Shape File

- Convert P1 to ESRI Shape format
- Supports Polyline and Point feature classes

Streamer Steering Simulator

- Apply streamer bird steering simulation to existing P1 data
- Specify maximum steering angle

Split File

- Splits P1 and P2 lines based on shot by shot geographical location
- Typical application to separate whole survey dataset by block boundary