

## Automatic Editing of Receivers Outside the Depth Specification Window

In the marginal weather conditions that we have been experiencing during the acquisition of the Investigator survey, maintaining the correct cable depths has been problematic.

At present, the cable depths are being checked by eye using the depth readings from the birds. Not all excursions out of the depth window are being clipped, as in practise this would be too time consuming. Instead a range of receivers is marked as bad if one or more of the following is seen :

- the bird depth goes outside the depth tolerance for an extended period
- the bird depth goes significantly outside the depth window
- more than one adjacent bird goes outside the depth window
- the bird depth is intermittently in and out of the window for an extended period

The range of receivers chosen is from the 1<sup>st</sup> channel on the section with the 1<sup>st</sup> out of spec bird to the last channel on the section after the last out of spec bird. The shotpoint range edited is from when the first bird goes out of spec until the last bird goes back into spec. If the depths are intermittently falling outside the spec window then the entire shotpoint range is still edited. An example of the manual edits for a line is given below:

Seq 017	Cable 1	B1-9	Ch 1-128	SOL-EOL
		B10	Ch 129-152	SP 2205-2074
		B10-13	Ch 129-224	SOL-3629 & 1540-930
	Cable 2	B4-12	Ch 41-248 (409-616)	SP 2240-EOL
		B16	Ch 329-344 (697-712)	SP 945-836
	Cable 3	B2-5	Ch 9-80 (745-816)	SP 2497-EOL
	Cable 4	B3-8	Ch 25-152 (1129-1256)	SP 1620-1486 & 1211-1142
	Cable 5	B5-10	Ch 65-200 (1537-1672)	SP 1609-1420
		B5-9	Ch 65-176 (1537-1648)	SP 1248-1060
	Cable 6	B2-6	Ch 9-80 (1849-1920)	SP 2500-EOL
		B7-9	Ch 81-128 (1921-1968)	SP 1584-EOL

It is possible to automatically edit out the individual receivers that fall outside the depth spec window. This can be done using depth value in the receiver depth field in the P1/90. By using automatic editing more good data is kept, as the edit is tailored to the bad channels on a shot-by-shot basis, rather than a whole block of the cable being edited for the entire shotpoint range. Also more bad data is rejected as even the smallest excursions out of the depth window are removed.

The navigation processing software uses the depth data from the birds to derive the P1/90 receiver depths. The raw depth data is filtered (despiked and smoothed) before being used. The depths for receivers lying between birds are linearly interpolated.

Automatic editing can be done using a couple of methods

1. The Reflex binning system is able to import the receiver depths in the P1/90 and apply binning criteria so that only traces with depths within the spec window are binned. The tests performed onboard so far have used this method which provides the correct coverage but no information about which receivers have been rejected on depth. The P1/90 must also be used to generate a separate edits list for further processing. An example edits text file is given below, but the format can be altered fairly easily. The size of the edit file on the line most badly affected by depth edits seen so far is about 100 Kbytes, so it would be possible to include all these edits with the Observer logs on CD-ROM.

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Shot,Bad Channels (from-to),  
3555,93-133,  
3554,93-132,458-478,503-510,  
3553,94-131,455-481,495-511,743-756,  
3552,97-131,453-483,491-512,740-768,  
3551,99-130,452-485,488-513,740-771,  
3550,100-129,451-513,740-774,
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3549, 99-129, 451-514, 740-778,  
3548, 98-128, 452-514, 740-781, 1854-1854,  
3547, 95-128, 453-513, 737-783, 1853-1858,  
3546, 93-128, 455-513, 737-783, 1852-1864,  
3545, 56-66, 91-128, 457-512, 737-783, 1851-1871,  
3544, 48-74, 89-128, 460-511, 737-784, 1486-1486, 1851-1873,  
3543, 45-79, 88-129, 462-511, 737-785, 1486-1486, 1850-1874,  
3542, 43-84, 87-130, 469-511, 737-786, 1486-1486, 1850-1875,  
3541, 41-131, 470-511, 737-788, 1850-1874,  
3540, 40-133, 470-512, 737-790, 1851-1869,

2. A second editing method would be to zero out the Northing and Easting for the bad receiver in the P1/90. These receivers would not contribute to the coverage when the P1/90 is binned, nor would they be usable in 3D processing. By editing the P1/90 a permanent record of the edits would be kept without the need for a further file to be archived. However, this may cause problems while processing.