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PRELIMINARY REPORT
ON THE SEISMIC INVESTIGATIONS
IN THE EYJAFJARDAR REGION, 1986

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OS-86057/JHD-20 B

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The seismic investigations were carried out by the Department of Geophysics of Leningrad Mining Institute and Academy of Sciences of the USSR in the Eyjafjarðar Region from 5 August till 5 October 1986 along the profile of total length 14.150 m.

1. Methods

The investigations were done by means of refraction survey. The systems of following and opposite travel-time curves were used, the largest distance between shot point and geophone being approximately 18.5 km (SP6, see below). The refraction survey was preferred to the reflection one because the results of the experimental work have shown that the reflected waves are either not registered at all or their intensity is very low and the distance of registration very short. In order to register reflected seismic waves clearly enough it was necessary to have large quantity of shot points with small distances between them. It was impossible due to the conditions of the area. That's why it was decided to make explosions at 6 constant shot points, average distance between them was 5 km.

2. Equipment

The registration of seismic waves was done by the 48-channels digital equipment SSC-3M(CCU-3M) and simultaneously operated and connected together 2 analog 24-channel equipment SMOV-0-24 (CMOB-0-24). The time interval of registration was 12 seconds for the digital equipment and 5 seconds for the analog - the last in order to increase the precision of time-measuring on the seismographic records. The geophones SV-10C (CB-10U) with own frequency 10 Hz were used, 6 of them on each channel.

The distance between the channels (groups of geophones) was 25 m.

3. Position of the profile and shot points

The seismographic records were obtained on the 12 positions of geophones, numbered from (-V) to (+VI). The length of each position was 1175 m. The first channel of each position was the northern one. The 48th channel (group of geophones) of each previous position was on the same place with the 1st channel of each following position (fig.1). There were 6 constant shot points along the profile (from 1 to 6) and 8 small shot points (A-H) organized to investigate the velocity in the uppermost part of the crust where it was possible

because of the surface conditions (farms, fields, pits with water etc.). The position of the shot point 3 was changed during the field work

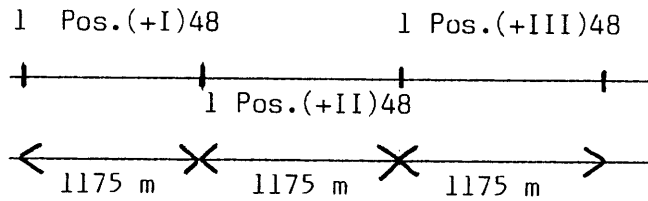


Fig.1

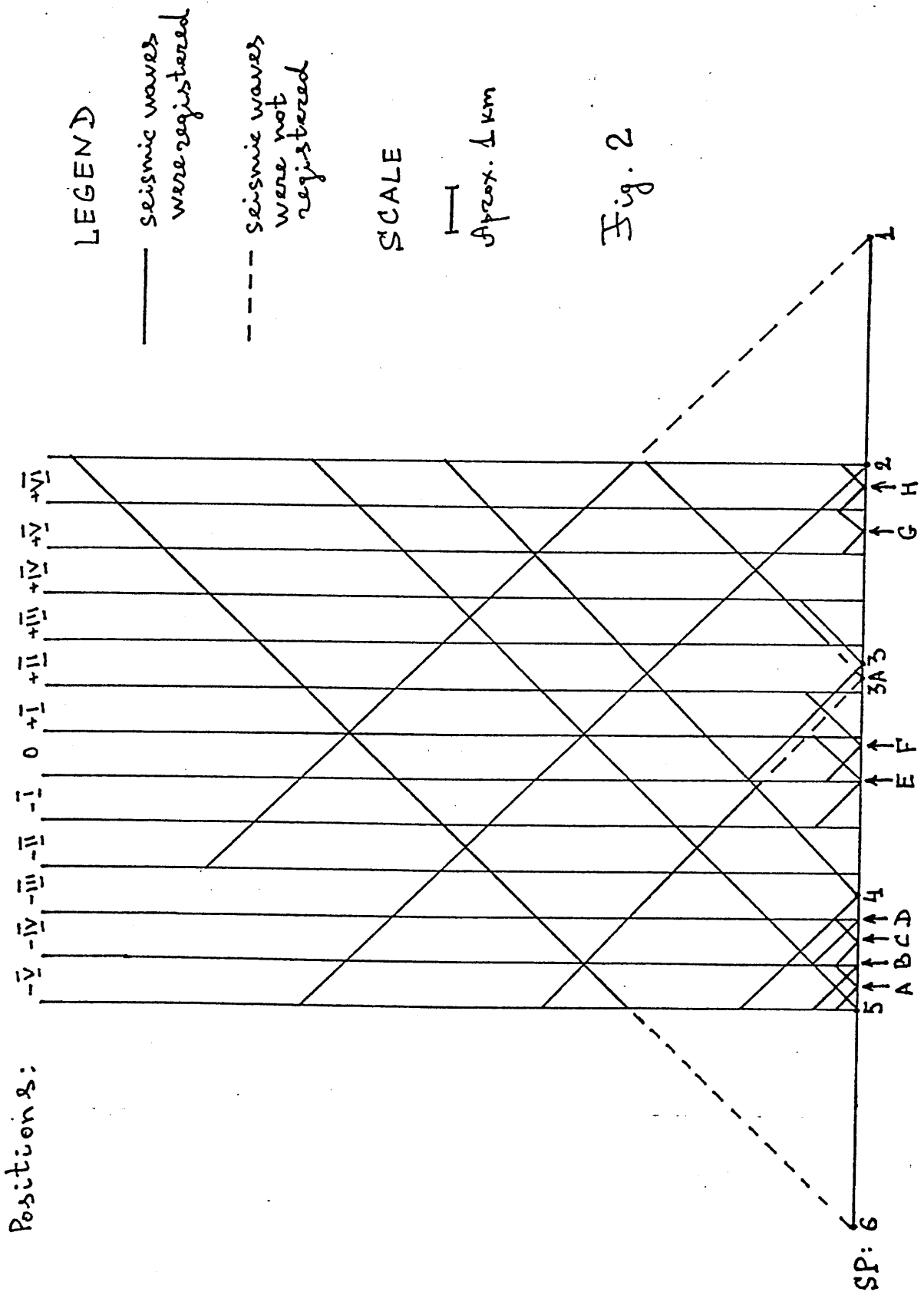
because the owner of the land has prohibited the continuation of explosions near his farm. Thus appeared the shot point 3-A. The location of the positions of geophones and shot points is shown on the airpicture, the scale 1:35000 (1 cm = 350 m).

4. System of investigations
is shown on fig.2.

5. Seismographic records

Only the analog seismographic records are discussed now, because it is possible to obtain the copy of digital data and to proceed them only in the future.

The seismographic records are attached one with another for each shot point along the profile. There are 12 lists of seismographic records for shot points from 1 to 6 and 8 lists for shot points from A to H.



The time marks on those lists are made by the blue colour and the time is written near each blue mark in seconds. The time scale is 1 sm = 50 ms. By the red arrows are shown the boundaries of each position. The numbers of channels within each position are written only for the channels No.1 and No.48. The seismic traces 1 and 48 of previous and following positions cover one another everywhere except the lists of records obtained for positive positions of shot points 4, 5, 6 and shot point E. On these 4 lists the traces 1 and 48 are attached one below other.

During the registration on the magnetic tape no filters were used. When rewriting from the tape to the paper was usually used the filter from 14 to 40 H_z . The exceptions are in the table:

SP	Positions	Channels from-to	Band, H_z
4	+IV,+V,+VI	all	14-28
5,6	+III	25-48	14-28
	+IV,+V,+VI	all	14-28
1	-I,-II	all	14-28
2	-III,-IV,-V	all	14-28
H	+VI	all	no filter
G	+V	all	no filter
F	0	all	20-28
D,C	-IV	all	14-56
A	-V	all	14-56
E	0	1-24	no filter
		25-48	14-20

6. Special notes

- a) The seismic profile was located not far from the farms and electrical lines. Due to this the noise level was rather high and it was practically impossible to decrease this noise. Substantial level of the noise was also produced by the hot water pipe (the frequency band of the noise 20-25 H_z).
- b) The distance between the 1st channel of the Position 0 and the 48th channel of the Position (-I) is 50 m.

7. Future processing

The processing of the obtained data will be carried out in Leningrad Mining Institute in wintertime 1986-87.

8. Brief look at the obtained data

The obtained data in general seem to be satisfactory. The intensity of seismic waves from shot points 4 and 5 sometimes is slightly more than the noise level, but the increase of the explosions there was impossible. The first impression of the cross-section of the crust in the Eyjafjarðar Region is that it is slightly differentiated by the values of seismic velocity, but several refraction boundaries are present. The distinct registration of S-waves from the most of the shot points seems to be very interesting. The comparison of the P- and S-wave velocities gives the opportunity to obtain extra information on the physical properties of the rocks, porosity and water contents.

9. Acknowledgements

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