Секция «Геология»

Coal Seams Structure of Amaam Coalfield (Bering Coal Basin, Chukotka Autonomous Okrug, Russia)

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Recent years most part of well-known and the richest deposits exhausted. This led to increase interest to smaller and previously non-perspective objects. First they had been ignored due to bad location, small reserves or poor understanding and difficult mining. But now situation has changed, especially in market of coking coal. Non-giant, far from infrastructure objects are in particular interest of international mining companies.

One of such objects is a Amaam coalfield in Chukotka. It has been known since 1947 [1, 2] when first exploration works were performed. They showed very high potential of that coalfield and excellent location with access to Bering sea and Pacific ocean. But then further exploration works were ceased. Nowadays, Amaam coalfield is being considered as a coal deposit with economically reasonable coking coal resources and extremely good location in 25 km from Bering sea. Main problem is a lack of information about structure of coal seams, their correlation and lateral distribution.

Amaam coalfield is a part of a Bering coal basin. It is situated in the Chukotken Autonomous Area, Far East of Russia, in approximately 60 km from Beringovsky. Structurally it belongs to Amaam syncline. Regionally, the syncline is a tectonic basin of the Cenozoic Anadyr – Koryak fold system. The basin is a symmetrical graben structure with folding and both normal and thrust faulting. Basement sediments of the syncline are the Cretaceous marine and non-marine sediments of the Baryskoyskaya and Koryak formations. Tectonic uplift was followed by the deposition of sediments of the Palaeogene Chukchi formation (28 – 65 ma).[3] These are split into 3 members, comprising the upper, middle and lower Chukchi. The two lower members are characterised by marine regression. The lower Chukchi member comprises predominantly lithified marine sandstones, siltstones and conglomerates. The middle Chukchi member hosts terrestrial sands, silts, mudstones and coal seams. The upper Chukchi member is a unit of terrestrial sandstones and includes no coal units.

In general, Amaam coalfield consists of 5 groups of coal seams and coal bands. Their correlation is a problem because of lateral variability in depositional environments and faulting. These result in somewhat variable seam thicknesses and seam correlation characterised with a “low” to “moderate” confidence.

Seam group 1 comprises an upper, main and less frequently lower unit. It is unknown if the lower unit is due to structural or depositional variation. Seam group 1 averages 1.55 m coal thickness. It has mudstone roof and floor.

Seam group 2 is 15-20 m above Seam group 1. The structure is a moderately difficult. Average thickness is 1.5 m. It has dark-gray mudstone roof and floor.

Seam group 3 is 30-35 m above Seam group 2. Seam 3 is the most variable of the coal seams within the Amaam coalfield. It shows poor correlation, and within seam 3 there are considerable interburden thicknesses. Seam 3 Upper, 3 and 3 Lower split into numerous smaller daughter seams (up to 9). Roof is a sandstone, floor is a mudstone. Partings within

the seam are composed with mudstone and siltstone, sometimes partially carbonaceous. The average coal thickness within Seam 3 group is 4.1m.

Seam group 4 comprise two coal units, it is 15-20 m above Seam group 3. Thickness of interburden is variable, indicating lateral changes in a dynamic depositional environment and/or faulting. The total average coal thickness is 2.24 m. Roof and floor is composed with dark grey mudstones.

Seam group 5 is 15-20 m above Seam group 4. Structure is extremely difficult. The Seam can combine 4-11 plies of coal with total thickness from 1.7 to 4.6 m.

Brief description given above has showed that strong exploration works are required in order to get beter understanding of coal seams structures and correlation and then will allow to create a model and start mining operations.

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