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BSFOCS:

The Black Sea Fiber Optical Cable System Entered Sea Maps

Measurements of the technical parameters and functional characteristics are to be completed before the commissioning of the system. The submarine route of the optical cable has a total length of 1,250 km. Dimitar Buchvarov* and Valentin Kolev

[The author is a member of the supervisor group in charge of the project. He spent two weeks aboard Maersk Fighter ship as a representative of the Purchasers and observed the process of cable-laying from Varna to the branching complex near Odessa.]

One of the international projects in the Black Sea Economic Zone is the construction of a submarine cable highway between Bulgaria (Varna), Ukraine (Odessa) and Russia (Novorosiisk). This highway is part of the telecommunications network of the region, which is a natural extension of the optical cable rings of BTC Plc. with Greece, Macedonia, Serbia via Ukraine toward the Scandinavian countries, via Russia, where a second route runs toward the Scandinavian countries and via the submarine optical system of Russia - Georgia toward Armenia, Iran and the countries of the Near and Middle East.

The preparation for the construction of the system continued about three years and that could be explained not so much with the existence of technical problems, but with the complex economic and political situation in the countries -investors in the project. During those years a considerable technological progress was attained. The needs of major telecommunications operators for availability of systems with giant information capacities increased.

For this reason one of the events of the middle of April was the practical implementation of the BSFOCS project that had waited for a long time. The left board of an extraordinary ship - the Danish Maersk Fighter was touching the sea port of Varna, waiting for the change of the crew to be completed and preparing itself for the trip to Odessa. The extraordinary fact about this ship was the duration of the trip - two weeks instead of two days. The rigging was also unconventional: transporting equipment for the coils

of cables; one-meter plow for the sea bottom, kilometers of fiber optical cables in enormous rolls loaded in the freight department of the vessel. On the next day - April 18, the cable-laying work on the bottom of the Black Sea began. BTC experts acted as coordinators of the cable-laying work.

The accuracy with which this project was designed and prepared was astonishing. The side deviation was not more than 5 meters, whereas the deviation in terms of length was not more than a dozen of meters. Several different companies effected the separate phases of project's implementation. The feasibility study was done by ICM (an association of companies from France, Italy and Britain), the study with electronic means was accomplished by RACAL (a company of the United Kingdom). In its work RACAL used vessels and attracted specialists from Russia. This phase was completed in the middle of October last year, whereas the final project was presented after a month.

The list of companies continues with the main contractors involved in the project and an international consortium implemented the basic components. Alcatel Submarine Networks (France) supplied the optical fiber cables, the optical joints, the branching complexes and multiplex equipment. TYCO (US) supplied the submarine amplifiers for the terminal equipment. The same company delivered the also the systems for wavelength multiplexing (8 signals can be transmitted on 1 optical fiber at a speed of 2.5 Gbit/s) and equipment for the charging of submarine amplifiers and systems for monitoring and control of the submarine segment. All the components were tested in the manufacturing plants in the presence of specialists from Bulgaria, Greece, Russia and Ukraine at the beginning of February this year.

The activities aboard of Maersk Fighter were impressive with their apparent easiness; the course is monitored by a satellite system for identification of the position and controlled also by the main PC aboard. During the assembling and loading process, a concrete action plan was drawn and stored in the memory of the PC.

The vessel has a powerful moving system allowing close observation of the cable route. The system is not affected by weather conditions (strong sideways winds) or abrupt changes in the direction of the cable laying work. Neither it is affected by the starts and stops of the activities, provoked by the specific features of the relief and the hardness of the sea bottom. The whole management of the cable-laying process is done from the commanding bridge that resembles a command center and by the management center of the low. Simultaneously to the cable-laying process, the specialists of RACAL were working on the maps, which in line with the

international agreements, should be submitted by the state administrations so that the new facilities could find their reflection on the maps. During the realization of the aforementioned activities, other specialists joined the crew of the cable ship. The staff of TeleDenmark International were in charge of the laying of optical cables and amplifiers, the experts of TYCO were responsible for the measurements done in parallel to the laying and the experts of Alcatel were connecting the cable sections and monitored the rest of the activities.

The work from Varna to the branching complex was done in 12 days and on April 29 the cable ship continued to lay the second segment of the cable, the segment to Odessa. In the first half of June the last km of the fiber optical cables in the region of Novorosiisk were laid. Simultaneously to the implementation of the submarine part of the project, experts of the main contractors laid the cables in the terrestrial areas, installed the equipment and began the tests for the multiplex and terminal equipment and insured the auxiliary protection of the cables in the coastal zone.

In accordance with the agreed procedures for the acceptance tests, a number of measurements of the technical parameters and functional characteristics for reliable and accident-free work of the system were done in July and August in view of the system's setting in normal operation.

Upon the setting of BSFOCS in operation one STM 16 will function between Varna, Odessa and Novorosiisk at transmission speed of 2.5 GB/s. This will open the opportunity for simultaneous completion of telephone calls along 30,000 digital circuits, as well as transmission of data, video-exchange, Internet. One hundred percent reliability of the traffic was insured. The submarine part of the system consisting of cables and regenerators allows the transmission of 8 times bigger capacity and this could be realized via additional facilities located in the terrestrial points. The time for the setting of BSFOCS in operation is 2000.

In January 1999 six telecommunications operators - the Bulgarian Telecommunications Company, OTE - Greece, Ukrtelecom - Ukraine, Westelcom - Russia, Cyta - Cyprus and Armentel - Armenia as main initiators and investors signed the contract for construction of the Black Sea Cable System - BSFOCS. The total value of the facility is 51 million USD. BTC's contribution is approx. 12 million USD. Other major operators like Deutsche Telekom, AT&T (US), KDD (Japan), HT - Croatia, etc. joined the project later.