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Author: Mr. Takeyuki Fukazawa
Japan

STUDY OF TENSION CONTROL COMPONENTS ON EARTH SURFACE PLATFORM FOR SPACE ELEVATOR SYSTEM

Abstract

In IAC 2018 D4.3.9, as one of the indispensable functions on earth-surface platform for Space elevator system, "Cable Handover Function" has been described. The function can make the tether cable be passed from a platform to another for providing efficient arrangement of offshore facilities for dealing with expected various utilization of the tether cable. However, the detailed studies of the function have not been done because of ambiguities of tension control system itself.

Author researches which type of tension control method would be suitable for controlling estimated range of fluctuating cable tension caused by external force, climbers' activities and etc. The consideration takes account of the Cable Handover Function as well. From the studies, it's confirmed that a winch type control will be suitable to handle the cable for the required functions. In addition, author suggests "Alternative cable" to be installed between tension control components and the main tether cable to prevent the main tether cable from having abrasion on winch and other undesirable external affects.

Details of those components and verification of the feasibility/validity are described in this manuscript.