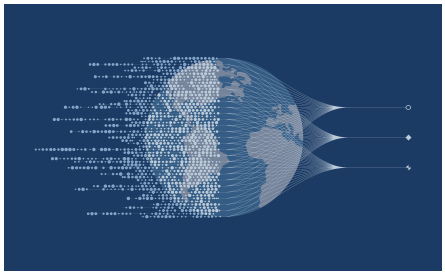

ID: **P4.3-718** Type: **E-poster**

# of building a cost-effective, resilient and secure network in Today's world - Use case: The GCI IV

The Global Communications Infrastructure (GCI) network is how the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization fulfills its responsibilities related to receiving and distributing data and reporting products to the verification of the Treaty [Article IV. Verification, Section A, Paragraph 14 (a)]. Since it started in 1998, this network has evolved and is currently operating its 3rd generation and is preparing to transition to the 4th generation by 2028. This network of 600+ links, deployed in 100+ countries including the polar and Antarctic regions, requires tremendous effort and resources to be operated and maintained. Additionally, the growing demand in network throughput, the variety of connectivity requested, environmental and climate challenges, the surge of emerging technologies such as Low Earth Orbit satellites, artificial intelligence, blockchains, quantum computing and algorithms, and many more, poses serious challenges to the development of a coherent and modern network architecture for the 4th generation GCI, considering all these changes. Based on all the above, a mapping of the various challenges identified to the risk and threats they pose to the future GCI network, and to the opportunities that can be leveraged from several emerging technologies is proposed.

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Session Classification: P4.3 Use of enabling Information Technologies

Track Classification: Theme 4. Sustainment of Networks, Performance Evaluation, and Optimization: T4.3 Use of enabling Information Technologies