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COMPARATIVE ANALYSIS OF WIRELESS NETWORK SECURITY REQUIREMENTS

The wireless safety legislation in the United States and Ukraine exhibits both similarities and notable differences concerning technical standards, regulatory approaches, and the adaptation to emerging technologies. A comparative analysis of the security requirements and the practical realities in the domain of wireless networks is presented as follows. In the United States, regulations prohibit climbing communication towers during adverse weather conditions, such as storms and lightning, as well as in close proximity to power lines, with a required distance ranging from 10 to 45 feet depending on the voltage. Training in the use of safety systems and anti-locking devices for winches is mandatory [1]. Severe penalties are imposed for violations, including fines of up to $14,502 for serious infractions.

In Ukraine, there are no specific regulations governing telecommunication towers; however, existing regulations [2,3] address the procedures for working at heights during the installation, dismantling of structures and equipment, as well as the repair, reconstruction, and operation of facilities. As of 2019, the fatal injury rate was 13 per 100,000 employees, with 30% of employees working under hazardous conditions due to outdated equipment and insufficient investment.

The primary distinctions between United States and Ukrainian legislation concerning the standardization of wireless networks are as follows. The United States standard §1926.502 offers a distinct advantage due to its detailed clarity regarding the requirements for each type of work, in contrast to the more general nature of Ukrainian regulations.

The enforcement mechanisms in Ukraine exhibit limited effectiveness, and the regulatory framework for state supervision is outdated. It is imperative for Ukraine to integrate technological advancements. In contrast, the United States employs contemporary systems, such as RFID access control for towers, whereas Ukraine predominantly relies on manual control methods.

Table 1

Comparative analysis of US and Ukrainian labor safety requirements for wireless network installation

Criterion	USA	Ukraine
Height threshold	6 feet (1.8 m) for mandatory use of protective systems [1]	The requirements of NPAPP 0.00-1.15-07 do not specify a clear threshold but regulate all work at heights performed from 1.3 m or more from the ground surface, floor, or working floor.
Safety systems	Required: handrails, nets, personal fall arrest devices [1]	Collective and personal protective equipment is required (the main means is a safety belt).
Documentation on work safety	Fall protection plan for unusual situations [1].	Work permit, work execution project (WEP), technological maps [2,3].

In the United States, the primary focus is on mitigating potential injuries within the domain of wireless network operations by implementing technical standards and conducting regular training sessions. Conversely, Ukraine needs to modernize its regulatory framework and enhance funding for safety measures to effectively reduce injuries. A significant issue in both countries is the insufficient regulation of electromagnetic exposure risks associated with working at heights with wireless equipment. Both nations encounter similar technical threats, including unauthorized access and denial-of-service (DoS) attacks. Nevertheless, the United States places greater emphasis on the implementation of contemporary security technologies, such as Wireless Intrusion Detection Systems (WIDS) and Wireless Intrusion Prevention Systems (WIPS). In contrast, Ukraine faces additional cyber threats due to ongoing military conflict and must update its security standards to effectively safeguard its wireless networks.

List of references

1. DIRECTIVE NUMBER:CPL 2-1.36 EFFECTIVE DATE: March 26, 2002: Interim Inspection Procedures During Communication Tower Construction Activities.

2. NPAPP 0.00-1.15-07 Procedure for organizing and performing work at height.

3. The Procedure for Issuing Permits to Perform Hazardous Work and to Operate (Use) Machines, Mechanisms, and Equipment of Increased Risk. Resolution of the Cabinet of Ministers of Ukraine No. 1107 of October 26, 2011