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Strategic Risk Management for Successful Space & Defence Programmes (4)

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ETHICAL AND ASSURANCE IMPLICATIONS OF SPACE-BASED QUANTUM COMPUTERS AND  
DEVICES

**Abstract**

Technologies relying on quantum mechanical effects to exhibit advanced characteristics are approaching practical implementation. These quantum computers and devices are often developed with a space-based component or application unlike most other new technology domains over the past two decades including cloud computing, virtual reality, micro-electromechanical systems (MEMS), gene editing, and artificial intelligence. This paper explores ethical and compliance challenges arising from space-based quantum computer and device applications and outlines potential risk mitigations. Quantum devices are intended to have a wide array of capabilities including qubit processing, inertial navigation, secure communication, and sensitive radio frequency receiving. Ethical and compliance practices, analogous to artificial intelligence ethics frameworks, can be incorporated into the development and use of quantum devices. These practices are especially important to organizations operating in the extraterrestrial environment.