



NIR Risk

DAG Narrative

- ❖ There are two main hazards impacting the Non-ionizing radiation risk:
Radiation (non-ionizing only) and **Distance from Earth**
 - Non-ionizing radiation sources include **sunlight and lasers**
 - **Distance from Earth** impacts the **vehicle design** and **Crew Health and Performance system**.
 - **Sunlight exposure** is protected against with the **Protective windows and filters** that are built into the vehicle as well as **Helmet/Protective Visors** that are built into the suit.
 - Ground **lasers** will mainly impact LEO and Lunar DRMs

- ❖ **Eye injury** and **skin injury** are the two main types of health outcomes during a mission.
 - **Eye injuries** include solar retinopathy, cataracts, conjunctivitis, hemorrhagic retinal lesions, and photokeratitis.
 - **Skin injury** is mainly burns due to the sun or lasers.
 - Inflight, the injuries impact **Individual Readiness** that then affects **Crew Capability** and their ability for **Task Performance**.
These could eventually cause **Loss of Mission Objectives** and then **Loss of Mission**.
 - Based on severity, these injuries could lead to long term health effects and inability for **flight recertification** for an astronaut due to structural changes or permanent vision loss.

- ❖ To characterize the long-term health risk, Surveillance is required to Detect Long Term Health Outcomes that may present as visual decrements, although unless an eye injury were to occur during a mission, long term vision effects should not occur.