

XII. Mission Assurance

The SAFIR Project will follow standard mission assurance standards. Consistent with ISO 9001 standards, SAFIR safety and mission assurance (SMA) will be a design integrity program that includes rigorous design review; careful control of parts, materials, and processes; and a thorough program of inspections and tests. The SAFIR SMA also will include assurance management, system safety, reliability, environmental requirements, electronic parts requirements, hardware and software quality assurance, contamination control, and alert monitoring. The SAFIR SMA integrates Operations Assurance into the design phase to ensure flight system and mission operations compatibility. All software documentation and code implementation will be compliant with NASA Software Independent Verification and Validation (IV&V) requirements.

A System Assurance Manager (SAM) will be assigned to provide management oversight of the integrated SMA. Overall safety and mission assurance plans, developed in collaboration with team members, will ensure cost-effective, compliant, and consistent program implementation. The SMA requirements flow down to team members and their subcontractors and suppliers. All team members' applicable processes and procedures will be reviewed and assessed for compliance and consistency by the SMA.

Flight system reliability assessments shall be conducted, including worst-case analyses; fault tree analysis; FMEA; probabilistic risk assessment; and parts stress analyses. Drawing on the experience from the JWST, appropriate levels of redundancy and reliability will be instilled in the design to ensure mission success. Parts control boards, with a SAFIR Parts Engineer member, will assess all EEE parts and radiation effects. Flight system reliability will be achieved through prudent selection and control of electronic parts. The design will include robust, cost-conscious margins, and the I&T program that ensures design compliance with the General Environment Verification Specifications (GEVS).