ATA Antonio Feed Mechanical Investigation

General:

This document provides an overview of the mechanical investigation and design work, for the ATA Antonio Feed retrofit program. It defines the three work packages and their desired goals for the project.

1. Link Arm
   1. Analysis and identification of the failure modes that lead to broken connections between the coaxial cable and the log-periodic feed.
   2. Development of an alternative design, which meets mechanical and EM requirements.
   3. Implementation of the new design into an existing feed for verification.
2. Feed Vibration
   1. Analysis of the vibration frequency spectrum generated by the cryo-cooler and vacuum pump.
   2. Modelling the feed structure and analysing the transmission of the vibration from its source into the log-periodic feed.
   3. Development of a new thermal flex plate to reduce vibration transmission.
   4. Development of new standoffs to reduce vibration transmission.
   5. Implementation of both designs into an existing feed for verification.
   6. Analysis which compares the reduction in vibration transmission between the source and the log-periodic feed of the prototype design with the current design.
3. Documentation
   1. Proving complete documentation for the Link Arm design.
      1. Model and simulation files.
      2. Mechanical drawing.
      3. Complete report, describing all work which has been done.
   2. Providing complete documentation for the Vibration analysis.
   3. Providing complete documentation for the new thermal flex plate.
      1. Model and simulation files.
      2. Mechanical drawing.
      3. Complete report, describing all work which has been done, including the measurement of the vibration transmission.
   4. Providing complete documentation for the new standoffs.
      1. Model and simulation files.
      2. Mechanical Drawing.
      3. Complete report, describing all work which has been done, including the measurement of the vibration transmission.

The goal of this project is to have a feed prototype which incorporates all three new designs, the arm link, the thermal flex plate, and the vibration dampening standoffs. In addition to that we also want a final analysis, which quantifies the reduction and effectiveness of these designs when comparing them to the exiting feed design.