Activity Summary

Reliability assessment of a MEMS-based isolation valve for propulsion systems

NANOSPACE

Company presentation

NanoSpace AB is a subsidiary to the Swedish Space Corporation (SSC) with the overall objective to develop and provide commercial products for the space industry based on MEMS technology.
NanoSpace is mainly an R&D company with a number of products under development. Our main product lines are:

- A miniaturized cold gas propulsion system for satellites
- A miniaturized xenon feed system for Ion engines
- A miniaturized propellant gauging system for spacecraft

In addition to these major products, a number of discrete components such as valves, sensors and filters for space applications are developed to stand-alone products. Overall, NanoSpace vision is to become a component and subsystem supplier with a number of commercial products – based on own development and secured by own IPR.

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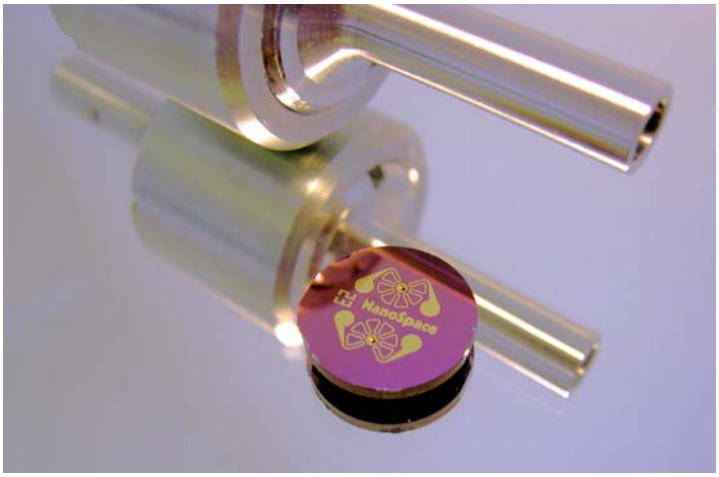
Overview/Scope of Activity

A MEMS-based Micro Isolation Valve (MIV) was developed by NanoSpace as a component in a complete micro propulsion system. The target was to manufacture a small, robust, and reliable isolation between the tank and the propulsion system.

From manufacturing and evaluation the first generation MIV some major redesigns were discovered. The second generation (shown in the figure below) includes many of the identified changes, for instance the inlet redundancy.

However, MEMS technology is still considered to be fairly immature. This project serves two main purposes. First to establish a MIV design that would attract a larger group of potential customers. If a single MIV design is not sufficient, a family of MIV designs will be considered. The second objective for this project is to increase the level of confidence for this technology.



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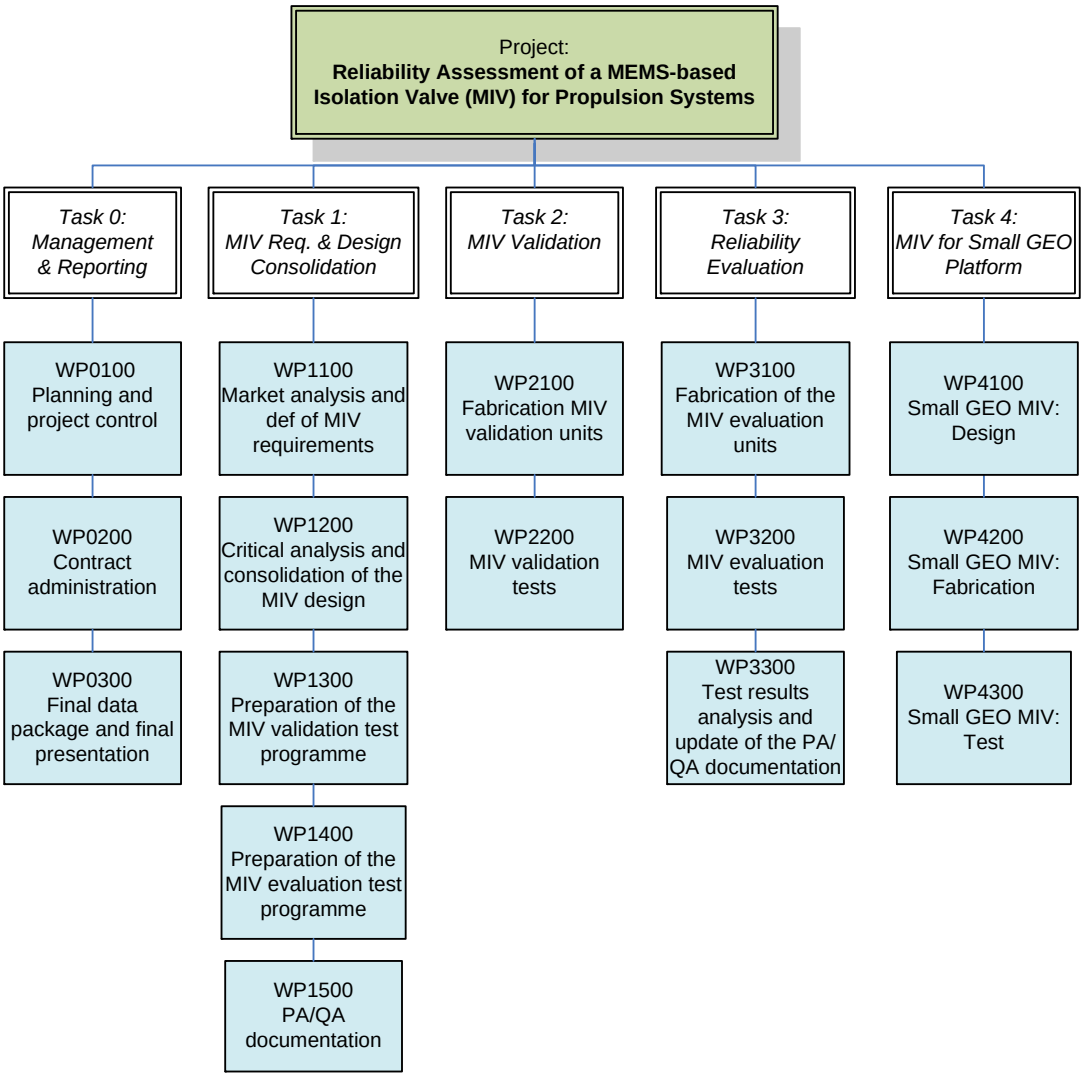
Activity approach and work structure



The project timeframe is June 2011 to November 2012