

NICS (NASA Instrument Capabilities Study) Instrument Schedule and Cost Study

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Abstract

This paper summarizes work performed on the Flight Projects Directorate Planetary Science Projects Division (PSPD, Code 430) NICS (NASA Instrument Capabilities study) instrument schedule and cost study. Included are a short summary of the original NICS (NASA, 2008), and the design and approach, data collection, analysis, preliminary findings and recommendations from select areas of the current study. The NICS (2008) was chartered by then NASA Chief Engineer Michael Ryschkewitsch and chaired by Goddard Space Flight Center (GSFC) engineer, John Leon. The focus was to identify problem areas in instrument development and, if possible, to offer solutions. In the area of instrument developments, the NICS (2008) identified a lack of resources and authority to successfully manage to instrument cost and schedule requirements; and a lack of critical skills, expertise, and leadership to successfully implement unique (one-of-a-kind) high technology developments (NASA, 2008, pp. 51, 52). Additionally, the NICS (2008) found problems in requirements formulation, reviews and management; unrealistic caps and overly optimistic estimates; and externally directed changes which increased the likelihood of overrunning cost and schedule (NASA, 2008, pp.53, 54). It is noteworthy that NICS findings are consistent with previous studies at the mission level (Robbins, Schmidt & White, 2020). Five years later in 2013, the Instrument Projects Division (IPD) was established to implement and manage instrument projects greater than \$20M. The IPD was known as Code 490. Its structure incorporated several of the NICS (2008) recommendations. To see if these incorporated recommendations made a difference, and to identify other potential challenges in instrument developments, two parallel studies were initiated. Originally led by the IPD, now led by the PSPD, and the Instrument and Payload Systems Engineering Branch (IPSE, Code 592), respectively, the instrument schedule and cost study and the instrument technical complexity study began in 2017. Data collection was initiated in 2020 and is on-going. This paper is limited to the IPD/PSPD study. Among other findings, preliminary data indicate IPD/PSPD project management support positively influenced instrument development as related to providing a dedicated level of support staff, including a deputy Instrument Project Manager (dIPM), reducing

IPM leadership changes, and providing other project support. Next steps include continued data collection and analysis, and mapping to technical complexity data.

References

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