

Research Testing of Electric Rocket Engines. Methodology & Process Management

M.O. Ermakova¹, Moscow Aviation Institute (National Research University) (MAI), romashovamo@mai.ru

A.M. Erikova¹, MAI

V.P. Monakhova², MAI, PhD (Tech.)

P.A. Karepin³, MAI, Prof. Dr. (Tech.)

¹ Senior Lecturer, Moscow, Russia

² Associate Professor, Moscow, Russia

³ Professor, Moscow, Russia

Citation: Ermakova M.O., Erikova A.M., Monakhova V.P., Karepin P.A. Research Testing of Electric Rocket Engines. Methodology & Process Management, *Kompetentnost' / Competency (Russia)*, 2024, no. 9–10, pp. 72–81. DOI: 10.24412/1993-8780-2024-9-72-81

key words

testing, process management, model, elements, reliability of testing results

We have discussed the problem of managing the process of research tests of electric rocket engines. Models of the process are built, the developed system of model elements (subprocesses and tasks) of the main stages with the indication of the regulating normative and technical documents and the algorithm for ensuring the reliability of the results of the tests of electric rocket engines are presented.

All these developments will make it possible to more effectively manage the process of research tests of electric rocket engines and further create a base for automating the workflow of the process. They can also become an effective additional analysis tool for solving the problem of process optimization.

References

1. Hall and ion plasma engines for spacecraft, ed. by A.S. Koroteev, Moscow, *Mashinostroenie*, 2008, 280 P.
2. Yakovlev E.A. Testing of space electric rocket propulsion systems: textbook for universities, Moscow, *Mashinostroenie*, 1981, 105 P.
3. Kharlan Ya.Yu., Osovskiy A.V., Kharlan A.A., *Reshetnevske chteniya*, 2017, vol. 1, pp. 385–386.
4. Gordeev S.V., etc, *Inzhenernyy zhurnal: nauka i innovatsii*, 2022, no. 5(125).
5. Kozhevnikov V.V., Mel'nikov A.V., Nazarenko I.P., Khartov S.A., *Izvestiya RAN. Energetika*, 2019, no. 3, pp. 40–51.
6. Mel'nikov A.V., Khartov S.A., *Izvestiya RAN. Energetika*, 2018, no. 3, pp. 4–11.
7. Antropov N.N., Akhmetzhanov R.V., Bogatyry A.V., etc, *Izvestiya RAN. Energetika*, 2016, no. 2, pp. 4–14.
8. Akhmetzhanov R.V., etc, *Vestnik SGAU*, 2015, vol. 16, no. 2, pp. 378–385.
9. Vavilov I.S., etc, *Dinamika sistem, mekhanizmov i mashin*, 2021, vol. 9, no. 2, pp. 248–255.
10. Smirnov P.E., Khartov S.A., Kashulin A.P., *Vestnik MAI*, 2018, vol. 25, no. 2, pp. 117–124.
11. Kozhevnikov V.V., Khartov S.A., *Izvestiya RAN. Energetika*, 2017, no. 3, pp. 13–20.
12. Kozhevnikov V.V., Khartov S.A., *Izvestiya RAN. Energetika*, 2016, no. 2, pp. 26–33.
13. Toropov G.P., Khartov S.A., *Vestnik MAI*, 2011, vol. 18, no. 2, pp. 83–88.
14. Kozhevnikov V.V., etc, *Izvestiya vuzov. Aviationsnaya tekhnika*, 2018, no. 4, pp. 150–153.
15. Dolganova O.I., Vinogradova E.V., Lobanova A.M. Modeling of business processes: textbook and workshop for universities, 2nd ed., ed. by O.I. Dolganova, Moscow, *Yurayt*, 2023, 322 P.
16. Hofer R. R., Peterson P. Y., Gallimore A. D., *IEPC-01-045*.
17. Kozlov O.V. Electric probe in plasma, Moscow, *Atomizdat*, 1969, 293 P.
18. Shastry R., etc. Method for Analyzing ExB Probe Spectra from Hall Thruster Plumes.
19. Plasma diagnostic techniques, ed. by R. Huddlestorne, S. Leonard, Moscow, *Mir*, 1967, 515 P.
20. Mel'nikov A.V. High-frequency ion engine with additional permanent magnetic field, Moscow, *MAI*, 2019, 157 P.
21. Kozhevnikov V.V. Investigation of local plasma parameters in the discharge chamber of a low-power high-frequency ion engine, Moscow, *MAI*, 2017, 139 P.
22. Bogatyy A.V. Electromagnetic ablative pulsed plasma engine for small spacecraft, Moscow, *MAI*, 2021, 159 P.
23. Lyubinskaya N.V. Ablative pulsed plasma engine for promising small-sized spacecraft, Moscow, *MAI*, 2020, 164 P.
24. Frolova Yu.L. Influence of the pressure of the residual atmosphere of the vacuum chamber on the divergence of the jet of a stationary plasma engine, Moscow, *MAI*, 2021, 161 P.