RESEARCH AND RATIONING ADMISSIBLE NICK ON WORKING BLADES OF THE COMPRESSOR FOR ENGINE NK-12 EXAMPLE

© 2009 A. V. Gritsin¹, E. P. Kocherov², A. P. Rempel¹, V. A. Samoylov¹

¹Samara State Aerospace University ²Samara Machine-Building Design Bureau

Results of this work are the analysis of geometry, experimental and design data for working blades of the compressor of engine NK-12, comparative fatigue tests. The methodology of design-experimental works on forecasting and check of reliability of blades with damages is offered specified concerning requirements of OST.

Reliability, defects, working shovels, durability, endurance limit, method of final elements

Gritsin Alexey Valerievich, postgraduate student of Samara State Aerospace University. Phone: (917) 140-35-40. E-mail: <u>grialeksey@zeos.net</u>. Area of Research: Reliability of aircraft engine.

Kocherov Evgeniy Pavlovich, candidate of technical science, Design manager of Samara Machine-Building Design Bureau. E-mail: <u>osnova@scbm.e4u.ru</u>. Area of research: Strength of elements of aircraft engine.

Rempel Alexandr Petrovich, postgraduate student of Samara State Aerospace University. Phone: (927) 204-26-15. E-mail: <u>alrel@mail.ru</u>. Area of research: Design of aircraft engine.

Samoylov Vitaliy Andreevich, postgraduate student of Samara State Aerospace University. Phone: (960) 815-92-25. E-mail: <u>v.a.samoylov@list.ru</u>. Area of research: Strength of elements of aircraft engine.

References

1. The definition statement of technical state of aircraft engine NK-12MP into exploiting organization militant 90724 Aviation TOF. 12.2006. – 2p.

2. The definition statement of technical state of aircraft engine NK-12MP into exploiting militants 37 VA VGK(SN). - 12. 2006. -5 p.

3. Branch standard OST 1 00304 – 79 «The gas turbine engines blades. Normalization damage of compressor blades from ingress foreign objects».

4. The provision «About establishment and increase of lives time and durability of gas turbine engine militant aviation there units and component parts». - CIAM, 2005. – 80p.

5. The methodology of fatigue test № TH 101-322.

6. The technological certificate № 101-08-06 «About results of relative fatigue tests of compressor rotor blades 1, 5, 9 stages for product MP with nicks and without nicks». - KNIL SCBM, 08. 2006. – 25p.

7. The technological certificate № TC 43-K-2007MP «Validation choice of putting nicks plan on the compressor rotor blades for engine NK-12MP, with special resonancecyclic tests for ascertainment rate of acceptable nicks». - SCBM, 04. 2007. – 40 p.

8. The technological certificate $N_{\rm D}$ 101-11-06 «About results of fatigue tests of compressor rotor blades 1 and 9 stages for product NK-12MP with notch by addition $N_{\rm D}$ 2 to program OP-59-2006NK12-MP». - KNIL SCBM. 11. 2006. – 10 p.

9. The technological certificate \mathbb{N} TC 101-K-2007NK-12ST «The analysis influence of admissible along all blade tip nocks by OST 1 00304-79 with depth 0,2 mm at fatigue resistance for compressor rotor blade 9 stage». – SCBM. 11. 2007. – 75 p.