

Abstract

Method for determining the fatigue of a pump rotor of a gas turbopump

A method for determining the fatigue of the pump rotor of a gas turbopump comprises the following method steps:

- continuous determination of the rotational speed (n) of the pump rotor,
- determination of the local rotational speed maxima and minima of a temporal rotational speed profile under consideration,
- association of the rotational speed maxima and minima with each other to form pairs,
- determination of a pair fatigue value (L) for each of the rotational speed pairs, and
- accumulation of all pair fatigue values (L) to form a total fatigue value (L_{tot}).

In this manner it is possible to determine the cyclic stress for the pump rotor of a vacuum pump and to include it in the calculation of a total fatigue value.

(Fig. 3)