HEAVY-DUTY UNIT MAINTENANCE PROBLEMS

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In modern manufacture, in many areas of the industry heavy-duty units have found application. Distinctive feature of such equipment is: - the big size; the big weight; - high cost of components; - increased requirements to manufacture, maintenance and repair of the equipment. At a stage of maintenance and repair there is their necessity for disassembly for access to the failed detail or a unit. It is known, that full disassembly of the equipment at repair – one of undesirable operations as even at the most qualified safe disassembly interface of the worn-in details and a normal tightness in slots with motionless landings are disturbed. The part of details at disassembly is damaged (inflow, paws, flanges break, edges of bolts, nuts get off, rivets and etc.). Aggregates and the details which are not demanding repair, at all it is not recommended to remove from the equipment because of possible lowering working capacity of machines as a whole. Therefore before disassembly of the equipment it is important to define objective necessity of execution of operations.

Offered the new approach, which considers consequences of maintenance of the complex equipment. The product, from the point of disassembly technique, view is represented as set of parts joints that going into it. Thus the period of product maintenance is represented as the function that depending from of some factors: – time of maintenance; – conditions of maintenance; – degrees of residual effect on an environment. The factor of time – for long time of parts maintenance even in normal conditions occurs change of an aspect of the connection, linked for example, to wear of pairs abrasion, change of parts physical properties being in contact (drying of rubber seals, contact surface magnetization and etc.). The maintenance conditions factor – effect of an excited environment, a dust content of a working area, effect of a heat, heavy loadings, maintenance in hard radiation conditions (heightened radiation), etc. The factor of a degree of residual effect on an environment – defines a degree of consequences of unfavorable maintenance conditions effect any product as a whole, and details going into it in particular (explosion hazard, residual radiation, biological danger, etc.). All the above-stated factors influence, separately and in the set, not only on transformation of joints aspects, but also on generation of sequence of selective product disassembly up to the costing parts. Besides the choice of industrial conditions on repair shop and means of technological equipment also depends on a combination of their influence.

The considered questions of a machine industry hard loaded responsible products resource saving at a stage of their repair, on an example of the heavy-duty gas-turbine compressors. A technique for safe disassembly of the element base of gas turbine compressors is proposed, taking into account the specific operating conditions and residual effects on the environment.