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Development Of Research Methods for Determining the Operational Characteristics of Electric Vehicles in The Conditions of a Hot Climate of Uzbekistan

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Annotation: This article analyzes the changes in the indicators of internal combustion engines in the hot climate in the exploitation of vehicles, the distribution of heat flow in the details of the cylinders when the piston bottom and the touch surface of the cylinder Gorlovka are dry, changes in their temperature and cracks in the piston-cherry Junction and operational characteristics of internal combustion engines

Key words: Operational characteristics of internal combustion, exploitation of vehicles

Introduction

Operations research (British English: operational research), often shortened to the initialism OR, is a discipline that deals with the development and application of advanced analytical methods to improve decision-making. It is sometimes considered to be a subfield of mathematical sciences. The term management science is sometimes used as a synonym.

Employing techniques from other mathematical sciences, such as modeling, statistics, and optimization, operations research arrives at optimal or near-optimal solutions to complex decision-making problems. Because of its emphasis on practical applications, operations research has overlap with many other disciplines, notably industrial engineering. Operations research is often concerned with determining the extreme values of some real-world objective: the maximum (of profit, performance, or yield) or minimum (of loss, risk, or cost). Originating in military efforts before World War II, its techniques have grown to concern problems in a variety of industries.

Operational research (OR) encompasses the development and the use of a wide range of problem-solving techniques and methods applied in the pursuit of improved decision-making and efficiency, such as simulation, mathematical optimization, queueing theory and other stochastic-process models, Markov decision processes, econometric methods, data envelopment analysis, neural networks, expert systems, decision analysis, and the analytic hierarchy process. Nearly all of these techniques involve the construction of mathematical models that attempt to describe the system. Because of the computational and statistical nature of most of these fields, OR also has strong ties to computer science and analytics. Operational researchers faced with a new problem must determine which of these techniques are most appropriate given the nature of the system, the goals for improvement, and constraints on time and computing power, or develop a new technique specific to the problem at hand (and, afterwards, to that type of problem).

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The major sub-disciplines in modern operational research, as identified by the journal Operations Research, are:

- Computing and
- information technologies
- Financial engineering
- Manufacturing, service sciences, and supply chain management
- Policy modeling and public sector work
- Revenue management
- Simulation
- Stochastic models
- Transportation

Blackett's team at Coastal Command's Operational Research Section (CC-ORS) included two future Nobel prize winners and many other people who went on to be pre-eminent in their fields. They undertook a number of crucial analyses that aided the war effort. Britain introduced the convoy system to reduce shipping losses, but while the principle of using warships to accompany merchant ships was generally accepted, it was unclear whether it was better for convoys to be small or large. Convoys travel at the speed of the slowest member, so small convoys can travel faster. It was also argued that small convoys would be harder for German U-boats to detect. On the other hand, large convoys could deploy more warships against an attacker. Blackett's staff showed that the losses suffered by convoys depended largely on the number of escort vessels present, rather than the size of the convoy. Their conclusion was that a few large convoys are more defensible than many small ones.

While performing an analysis of the methods used by RAF Coastal Command to hunt and destroy submarines, one of the analysts asked what colour the aircraft were. As most of them were from Bomber Command they were painted black for night-time operations. At the suggestion of CC-ORS a test was run to see if that was the best colour to camouflage the aircraft for daytime operations in the grey North Atlantic skies. Tests showed that aircraft painted white were on average not spotted until they were 20% closer than those painted black. This change indicated that 30% more submarines would be attacked and sunk for the same number of sightings. As a result of these findings Coastal Command changed their aircraft to using white undersurfaces.

Other work by the CC-ORS indicated that on average if the trigger depth of aerial-delivered depth charges (DCs) were changed from 100 to 25 feet, the kill ratios would go up. The reason was that if a U-boat saw an aircraft only shortly before it arrived over the target then at 100 feet the charges would do no damage (because the U-boat wouldn't have had time to descend as far as 100 feet), and if it saw the aircraft a long way from the target it had time to alter course under water so the chances of it being within the 20-foot kill zone of the charges was small. It was more efficient to attack those submarines close to the surface when the targets' locations were better known than to attempt their destruction at greater depths when their positions could only be guessed. Before the change of settings from 100 to 25 feet, 1% of submerged U-boats were sunk and 14% damaged. After the change, 7% were sunk and 11% damaged; if submarines were caught on the surface but had time to submerge just before being attacked, the numbers rose to 11% sunk and 15% damaged. Blackett observed "there can be few cases where such a great operational gain had been obtained by such a small and simple change of tactics".

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