15. DRIVERS' EMOTIONAL REACTIONS IN CONFLICT SITUATIONS ON ROADS

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The reliability of the driver who is the principal element of the "Driver/Automobile/Traffic Environment" system, is to a considerable degree dependent on his emotional state. Functional changes which are of primary importance in ensuring car driving safety, turn out to be more or less widespread in various emotional states.

As it was demonstrated before, the value of the driver's emotional tension depends on the amount and character of information he receives, his responsibility for the life and health of traffic participants and material values preservation, and his individual peculiarities.

The present paper describes drivers' emotional reactions in various conflict situations.

Taking into consideration the fact that the notion "Conflict Situations" has a host of definitions in modern literature, we preferred while stating the results of our research, to describe situations under study in a more specific manner. In particular, as far back as 1972, we put forward the term "situations similar to emergency ones", hard braking, abrupt steering wheel rotation or a combination of hard braking and abrupt steering wheel rotation being their characteristic features.

Subsequently, there was introduced the term "Complex Situations" which was interpreted as:

1) leaving the traffic flow
2) entering the traffic flow
3) passing controlled crossroads
4) non-complicated passing of non-controlled crossroads
5) complicated passing of non-controlled crossroads
6) overtaking

To evaluate drivers' state in the above mentioned situations, a continuous electrocardiogram and galvanic skin reaction (alteration of galvanic skin resistance) registration was conductet. The research results are given in the table.

The electrocardiogram results in situations similar to emergency ones, are of special interest. In these cases, the frequency of heart contractions mounted to 140 beatings per minute, the electrocardiogram voltage decreased, the T-marker flattened and the ST segment fell below the isoline. It shoulb be noted that virtually all drivers experienced an increase of heart contraction frequency after mounting the automobile. In the course of the entire period of driving in the conditions of a large city, it was higher than before driving.

In a number of cases, in situations similar to emergency ones we observed the slowing of heart contractions in the beginning of a situation with their subsequent abrupt quickening. The slowing was accompanied by the "sinking heart" behavioral reaction and a subsequent series of

energetic actions to liquidate the menace of accident. The emotional state of some drivers led to an abrupt deterioration of the ability to handle the situation which is a very complex activity; the drivers` behavior got disorganized, the acquied habits - inhibited, the drivers got fussy and the reaction to irritants was inadequate, etc.

Thus, the excessive significance and density of received information predetermine the development of strongly pronounced emotional reactions leading to a high probability of traffic accidents.

At the same time, evaluating drivers` emotional reactions one cannot but note a positive aspect of this phenomenon. A moderate emotional tension is important to adapt the driver to the traffic environment. It ensures integration of various systems of his organism for safe car driving.

When moving in the traffic flow along highways, particularly in the night, the driver is frequently registered to suffer "information famine" which gives birth to undesirable consequences. The monotonous receipt of insignificant irritants appears to be a weak subliminal stimulus to actuate a stereotype of more complex situations. This paves way to a specific state of monotony with further possible passing into somnolence and sleep. The considerable weakening of functional capacities to receive and decipher information as well as the ability to drive a car on the basis of sensormotoric reactions when the driver keeps awake, is a specific feature of monotony. Typical drivers` reports on such state are:

- "I suddenly realized I didn`t remember to have passed several kilometers", or
- " was driving a car as usual and all of a sudden I saw an obstacle before the car (another transportation means, a passenger, etc.)".

A number of authors share the view that such states deliver 9-30 % of all traffic accidents and up to 50 % of all Traffic Code violations.

In this connection, the importance to optimize information loads on the driver and particularly traffic information, turns obvious. C.Tetard (1985) has grouped traffic information into very important (one that conditions a possible traffic accident), secondary (relevant to the driver but not connected with accident rate) and useless. We believe that to group this or that information as useless is often difficult because the seemingly insignificant information referred to at first sight, may prove to be indispensable in a monotonous situation. At the same time, we think it necessary to develop the classification into the fourth type of traffic information - harmful. At the present showing, what is meant is not only erroneous information (a traffic sign which has not been removed or noticed in time in connection with the situation changed, etc.), but excessive information over certain portions of road as well without considering the time relevant to the driver to receive and decipher information and to work out a decision at the speed set up over a certain portion of road.

The problem of developing and realizing a set of measures to optimize functional states of the driver in terms of traffic safety is far beyond the limits of this paper. It is worth mentioning that optimization of information loads is one of the numerous ways of its achievement. Particularly with that aim, the authors of this paper have developed theoretical and practical grounds of psychophysiological rehabilitation, rational labour and rest, methods and facilities to fight monotony, etc.

Table 1 Frequency of heart contractions (numerator) and GSR (galvanic skin reaction) (denominator) in typical road situations

Type of transportation and number of measurements (n)		Preoperating state	In driver's cab before trip	Road Situations 1	2	3	4	5	6
City Bus Transportation		73.1±0.7 / 21.6±0.3	77.9±1.5 / 22.3±0.2	78.7±0.4 / 22.5±0.1	79.3±0.4 / 22.4±0.1	78.3±0.77 / 22.4±0.2	79.1±1.1 / 22.4±0.2	85.7±1.4 / 24.1±0.3	86.3±1.2 / 24.2±0.3
n		15	15	532	517	177	105	73	93
City Taxi	Speed 35-40 km/h	74.3±0.9 / 21.7±0.4	79.1±1.7 / 22.8±0.4			78.3±1.1 / 21.9±0.2	78.6±1.1 / 22.1±0.4	83.3±1.59 / 23.8±0.3	84.7±1.2 / 23.8±0.3
	n	23	23			98	52	42	93
	Speed 55-60 km/h					79.9±1.3 / 22.4±0.4	81.1±0.1 / 23.7±0.4	92.6±1.8 / 25.9±0.5	90.8±1.3 / 25.8±0.3
	n					69	64	54	121