Ensuring the Guaranteed Level of Flights Safety-the View of the Future

Oleh Alexeiev

1 National Aviation University

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Abstract
Considering statistics for the last decade on accident/incident of a question of providing guaranteed flight safety level is the most relevant as shortcomings and problems of functioning aviation activity are explained by lack of general-theoretical basis and the standard scientifically based approaches to safety management system which development has to be guided upon the demand of ICAO which defines that any region should not have accident/incident frequency level more than twice exceeds universal. These are the following main areas: introduction of an acceptable level of flight safety in the state; mandatory procedures for the development and implementation of safety management system; obligatory procedures for ensuring direct management of the level of the flight safety within acceptable or established level of the enterprise (continuous monitoring and regular assessment of the flight safety, corrective actions required to maintain the agreed flight safety indicators and monitoring, flight information analysis, risk management, etc.) [1,2] Purpose of methodology consists in association in the only complex of tasks of assessment, providing and verification of safety aviation activities as complex hierarchical structure with independent critical elements and also hardware, program, network and ergatic komponen which are both means, and subject to safety. The realization of ensuring the guaranteed result consists in realization of management processes so that not to allow transition of infrastructure or its systems to potentially dangerous state and to provide blocking (exception) of the corresponding technical object in case of threat of transition or upon transition to a dangerous state and minimization of consequences of such transition.

Index terms—flight safety, guaranteed flight safety level, safety management system, risk analysis.

Introduction he safety management system is the main managerial function which has to be considered at the level, at least adequate behind importance degree to other business functions of any airline which realization has to rely on the balanced allocation of resources on production targets and means of protection which will promote establishment of safety limit.

The similarity of the nature of the appearance of risks and the increasing relevance of their reduction to an acceptable level for various critical applications determines the relevance of the establishment of a methodology to ensure and maintain a guaranteed level of safety of future flights.

By consideration of aspects of flight safety the accepted postulate that absolute safety does not exist after acceptance of protective measures the residual risk always remains. It should be noted that this term is used only in that case when there is a possibility of approach of negative consequences. The risk as a measure of probability of infliction of harm to safe functioning of system and the environment and also weight of this harm is considered by us. "Loss" is defined as physical damage or harming, the state of health connected with deterioration or vital signs of the person who reduces his abilities to normal full functioning from the point of view of its physiology.
The loss can be caused as directly, and is mediately and qualitatively classified behind levels as catastrophic, critical, limit, insignificant. In separate works assessment of a loss is offered to be stated in monetary units (if it is loss of property) and or the number of the human victims. Generally safety functioning of aviation activity is reached due to reduction to risk to admissible level. Thus there is a need to have the system of indicators of efficiency of providing flight safety which would consider a ratio of results and process for assessment of a possibility of management of risk factors at the aviation activities.

Measurement of efficiency of providing flight safety has to provide a role of regulator and its influence on efficiency of processes of safety management system in suppliers of production/service, and their influence on results at the aviation activities. In assessing the effectiveness of the provision of flight safety, account must be taken of the characteristics of the process, which leads to the expected results, and indicators should be developed accordingly. The proposed method of estimating the flight safety, based on three levels of system behavior: the results of high level in the provision of flight safety, the behavior of service providers and the activities of regulatory bodies, is one of the guarantees flight safety level [3,4,5].

1 II. Theoretical Part

2 Theoretical Part

The Integrated Management System allows for the application of static and dynamic information management principles, which makes it possible to identify restrictions and limitations. This concept of the Integrated Management System operation is based upon the separation of static and dynamic information as well as its graded use in the context of implementation of retroactive, proactive and predictive approaches to the management during the services provision.

Retroactive approach is based on the application of corrective measures on the ground of static information received after the fact of a nonconformance or an occurrence has already happened. Distinctive items of static component for this approach are the results of relevant audits (inspections) and investigations of occurrences in the course of which the facts of incompliance with the established requirements are recorded. [3,4] Proactive approach combines application of the static component’s information particularly analytic efforts and project evaluation in order to manage or take appropriate corrective measures before the fact of nonconformance or an occurrence has already happened. Analytic efforts and project evaluation towards the changes enable the development of preventive measures concerned with the services rendered together with other items of static and dynamic components.

Predictive approach involves application of dynamic information. Such an approach to management processes enables non-conformances identification under conditions of day-to-day operations of the ANS system and taking adequate measures for it correction, based on prompt response and predicting the actual state of services if relevant deviations, occurrences, etc. are present [6,7,8].

According to the information received from the results of operation of static and dynamic components of information collection process, routine and periodic analysis, management review, risk assessment and other measures the appropriate corrective measures are being developed. The above measures address the following:

Corrective measures are planned in line with the procedure for planning of the Integrated Management System operation.

Turning now to a description of the major trends in the matter of rational choice of strategies aimed at ensuring and maintaining a guaranteed result, it is necessary first of all to emphasize that the activity is no unambiguous relationship between the prediction of the results (outcomes) and the problem of decision-making. It has been said that the chaos of possible outcomes facing the decision maker; At the same time, decision should be made, and it should eventually be uniquely. It is important to draw attention to the fact that even the mathematically and the information problems of forecasting and decision-making is usually not the same.

At present there are the following principles of rational choice. Isolationism-replacement of the i-th participant only its criteria so as to reduce the number of variables that affect the i-th criterion of efficiency, and ideally to reduce it to the criterion of the type that has to be optimized and no matter what the rest of the participants. This method of action is generally accepted in the presence of random factors as efficiency criterion is replaced by its expectation.

Collectivism-introduction of a single general criterion (general purpose) for the group participants. In this case we speak of coalition and compromise between the parties. The second principle is the formation of rational strategies in the pursuit of good mutual awareness, allows for constant performance criteria form a rational strategy.

The quest for knowledge as the basis of rational choice behavior, of course, is not contrary to the first principle, but rather complements it. For example, the coalition unthinkable substantially without a collective sharing of information, and the extracted individual information reduces the amount of required clotting individual member separate criterion.

The third and very important principle of developing rational behavior consists in the pursuit of sustainability,
understanding which vary widely. Here, above all it deserves special mention the principle of guaranteed result
calling side operates with the lack of information based on the consideration of the worst possible situations,
taking into account available information. It is widely understood principle of guaranteed result can be applied
in the selection of rational strategies and the results expected. This principle includes, of course, the usual
maximum is used in an antagonistic activity and interaction with the environment, but is not limited to it.
It should be emphasized, however, that a reasonable reduction of the number taken into account the values
of $x_1$ is reasonable and even an inevitable Development of non-conformances correction strategy; Approval of
non-conformances correction strategy; Allocation of responsibilities on non-conformances correction; Execution
of non-conformances correction strategy; Development of preventive measures which will disable recurrence
of non-conformances in the field of services provision [3,4]. The most common form of representation of the
relationships and interactions of disparate processes and events is a cause-and-effect relationship. [7,8, ??]
The causal relationship and interaction of processes, events and phenomena in real systems are formed and
implemented between objects of different nature.

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Related technological, informational, administrative, economic, social and other processes are combined in a
complex interaction, which is currently not sufficiently precise and easy to use mathematical models. Development
of models and methods focused, usually for a specific kind of process and results in a formal apparatus, which
is not always convenient to combine disparate processes, objects and phenomena. With the development of
common models and methods for solving problems with the use of such models is needed to move from specific
and specialized concepts to more general categories of causation. An important and crucial tool models are
tangible, imaginable, math.

Isolation in a variety of interactions between objects (processes, events, phenomena) causality is fundamentally
difficult.

One option for harmonization of the complex set of developers and users is the availability of the agreement
the developer and the user of the universe of objects, processes, events and phenomena used in the synthesis of
the complex. Cybernetic sense of purpose related to the behavior of cybernetic systems, presented the process
of changing states of the system and the achievement of the desired state of the system. This behavior can be
represented by a phase trajectory in the space of states of the system and the set of all possible trajectories of
the phase picture [??].

Model is not a second copy of the original. The model contains or may contain:?? ??

The mathematical models of the iconic, not all designs have a direct interpretation in the model application.
Broadly speaking, the development of the formalism of causal systems connected, first of all, with the desire
for representation of determinism in the interaction of system components and system actions. "In order to use
mathematical methods for the analysis of those or other processes necessary for a mathematical description of
this process, ie, a description of the language of mathematics. It is what we call a mathematical model." The
human mind from the experience tends to perceive reality through the causality. It comes down to a causal
relationship.

In assessing the overall meaning of the exchange of information, it should be noted that it should help to
reduce the uncertainty in the production process, leaving a narrow variation limits for the selection of operators
-in a word, to make the situation more definite.

So, it is advisable to introduce the information sent by one operator to another.

Intuition and experience suggest the reasonableness of collective decisions. One can distinguish three levels of
collective action operators) (n m m ?

-we assume that the coalition includes the first m operators):

The exchange of information on activities and process conditions;

The joint selection vector ?? = (??, . . ., ??) on the basis of a joint information;

The pooling of resources and the subsequent selection of a joint course of action, based on the combined
resources.

It is clear that each successive stage creates great opportunities coordination. The possibility of combining in
the second or third stage is, in fact, collective rules of conduct, collective strategy. Unification, producing such a
strategy, according to tradition will be called coalitions.

A very common type of collective aspirations should be considered joint mixed strategies distribution laws The
use of mixed strategies associated with the introduction and averaged criteria coalition:?? = = . . ., 1), ( m i x
d w e c i i ?

Regarding the criteria for operators outside the coalition, they are averaging can only be discussed as one of
the possible options. Notice that pure strategies take the form coalition ??(??+1 . . ., ??, ?) = x?. The set of
admissible strategies of the coalition will be denoted by ??; these designations may be accompanied by a number
I coalitions, such as ??1.

In discussing the possibilities of coalition cannot forget about the additional interactions between the members
of the coalition, and between members of coalition and the rest of the operators, although they can be considered
as already included ? ??, in the future, given their importance, we usually write them separately. Therefore,
6 CONCLUSIONS

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5 III.

6 Conclusions

To implement risk management related to security movement, necessary task solution is shown in the fig. ??.

Absolute safety does not exist - after acceptance protective Actions there is always some residual risk; Safety is
reached by decrease in risk to established Admissible level, at the same time the residual risk is below admissible
level; The admissible risk level is established and corrected at all stages of life cycle of the object or process
connected with safety. The purpose of the management of risks related to traffic safety, is to reduce the existing
levels of risk to the established level, and to maintain the achieved levels of risk at the established maximum
allowable level. The main tasks of risk management related to traffic safety: quantitative, semi-quantitative or
qualitative assessment of the levels of risks of different types; development of criteria for establishing acceptable
levels of risk and effective measures to reduce risks to established admissible levels; analysis of the hazards that
arise as a result of security breaches movement and systematic assessment of the conditions of production or
activity, are considered potentially dangerous; ensuring the management of risks in accordance with the rules,

rules and procedures, the execution of which has been ordered by international and corporate standards.

4 Conclusions

Total actual damage due to accidents and other adverse events is determined by the sum of these components
as a consequence of the damage of each individual event, and taking into account the real damage for a certain
period. To correctly predict the losses need to evaluate two factors determines their value: the average value of
the expected losses in the event of an accident or an event and the probability of an accident or event.

In some cases, implemented in the area of guaranteed safety of air navigation services investment project is
aimed at reducing the incidence of accidents and events. In this embodiment, a complex calculation that takes into
account all types of losses should be performed. Building a risk management system in the area of guaranteed
safety and reliability of air navigation services, it is necessary to provide: Full and timely implementation of
measures aimed at achieving the strategic security objectives;
Optimal use of resources allocated to the investment; obtaining additional effect due to optimal matching of mutual investment projects implemented, including their location and the time of implementation;

More efficient use of technical means used and the optimal use of the results of projects implemented in previous periods.

Objectives strategy of the guaranteed flight safety level.

Objectives 8

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[Methods and system of decision making support] Methods and system of decision making support, 2002.
