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GENERAL DIRECTIONS OF COMBINE HARVESTER'S FIRE SAFETY IMPROVING

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Qualitative and fast harvesting company is one of the most important tasks of the country's economy. Its implementation depends on the readiness of the machines and its sustained operation. Combine harvesters' fires cause significant damage to farms with the loss of expensive equipment, burning grain arrays, the growth of crop losses due to extension of the terms of harvesting.

Currently used tools can't provide the required level of harvesters' fire safety corresponding to the modern and future stages of development of harvesting equipment. So it's necessary to find a fundamentally different solution of the problem of improving harvesters' fire safety.

1 – cutter and sloping camera, 2 – reel, 3 – engine compartment, 4 – grinding space and belt drive, 5 – hydraulic system

Fig.1 – The main fire hazardous units of combine harvester

On the base of the fire safety system's components' analysis and the math model of the grinding space's fire development thermodynamics in combine harvester we can propose the following measures to improve harvester's fire protection:

– to equip the engine compartment and the grinding space of the harvester with automatic aerosol fire extinguishing installation, which will extinguish fire at the early stage of development;

– to install control panel with light and sound alarm in the cab for state control, verification and start of the automatic fire-extinguishing system;

– to ensure the control over the serviceability of the automatic fire extinguishing system by the central computer of a combine harvester, which will ban the work on combine harvesters with a defective fire-extinguishing system;

– to associate fire-extinguishing system with automatic locking system components. It stops the work in the case of the fire and limit the spread of combustion;

– to establish the control over the temperature of the bearings, to block the operation of all components and assemblies after exceeding the standard value of the temperature;

– to establish the control over the belt tension to prevent them from loosening and slippage, which can cause a temperature rise in the unit with a belt drive;

– to lay electric cables in metal sleeves to ensure their protection from mechanical damage and to limit the spread of combustion in the case of emergency;

– to equip combine harvesters with extinguishers OP-10 in an amount of not less than 2 pieces.

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BUSINESS PROCESS MANAGEMENT FOR EDUCATIONAL ORGANIZATIONS

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Dynamic changes in global economy resulting mainly from fast development of information technology and a wide range of the Internet applications have a considerable influence not only on business companies but also on

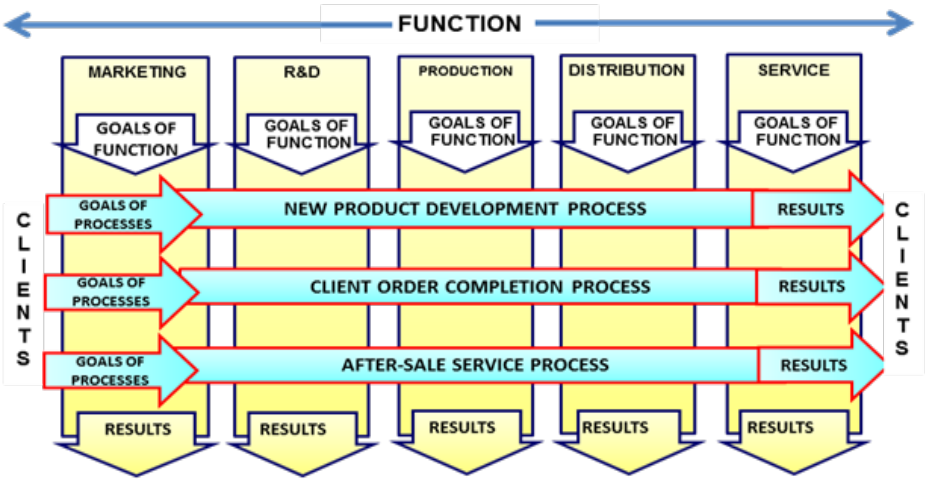
educational organizations which must face the challenge and apply the solutions that allow them to react to the surrounding effectively and win a competitive position on the market.

Considering a specific role of educational organizations they should aim at holistic, transparent and effective organization of processes. The recommended solution is Business Process Management.

BPM expert van der Aalst (van der Aalst et al. 2003), defines Business Process Management as *supporting business processes using methods, techniques and software to design, introduce, control and analyze operational processes involving humans, organizations, applications, documents and other sources of information*.

A **process** should be understood as a sequence of interdependent and linked procedures which begin and end and have clearly defined inputs as well as the end result. In other words, a process is a series of defined actions that lead to a particular result.

In organizations and companies which continue functional approach activities and tasks are not coordinated and each function is performed following its own procedures. This solution is not justified and frequently expensive. A functional system needs extensive supervision and control, creates fixed hierarchical structure and extensive bureaucracy, which generate costs. A functional organization operates (Fig.16) as the goals for single function are defined. In practice, the same actions are performed many times but they do not bring any new value to the work. There is no coordination between single functions and partially existing processes. Managing every single activity (with a particular focus on a given functional departments) is not comprehensive. In process organization the goals are defined for processes, where the emphasis is put on creating value, the way and quality of performance and coordination of functions and the work of individual teams.



Source: H.J. Schmelzer, W. Sesselmann, Geschaftsprozessmanagement…, p.47.

Fig. 16. Functional and process organization.

The literature provides a variety of classifications of processes:

- operational, support (J. Brilman);
- main, support and management (A. Stecyk) ;
- operating processes (main), support processes (American Productivity & Quality Center).

The main business processes in the educational organization are the following: preparing the educational offer (a new or modified product), enrolment (information and marketing), teaching (lectures, classes, evaluation), additional products as creating image, providing additional offer and services, building up confidence.

The processes are efficient if there are right conditions: infrastructure, buildings IT systems, financial means. However, the quality of processes depends on : stakeholders (students, companies, teachers, workers) and non physical resources (knowledge and skills).

Software tools supporting the management of processes are: Business Intelligence systems for managing processes, ARIS tools for logistics, HR and finance and e-learning platforms for educational processes. However, introducing BPM is not about introducing new IT systems or computerizing processes. Neither should it commence before processes are clearly defined in a new dynamic surrounding. Information technology can initiate changes of processes in an organization, yet the most beneficial would be in-depth remodeling of processes. Only such approach may bring the best economic effect. The report by Harmon P. Wolf C., *The State of Business Process Management – 2014*, BPTrends predicts BPM solution will still be growing in popularity.

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EVACUATION OF THE POPULATION IN CASE OF AN EMERGENCY: ORGANIZATION AND METHODS

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The State Law «Protection of the Population and Territories against Natural and Anthropogenic Emergencies» imposes the duty of dealing with the problems of evacuation organization of the population on the bodies of the state power of the entities of Republic Belarus and local community administration. The units directly engaged in this work are evacuation units of respective administrative territories and industries, as well as civil defense and emergency management bodies participate in the evacuation activities. Comprehensive support of the evacuation activities is the task of the respective civil defense services, agencies, enterprises, organizations and offices.

The evacuation process can be conducted on the industrial and territorial principle, according to which evacuation from emergency zones of the workers, clerks, students and pupils of general and special education schools must be organized at enterprises, organizations, offices and educational institutions. Evacuation of the other category population not employed in the industrial or service spheres in this case is conducted in housing estates by municipal housing maintenance offices. In a non-working time (as well as in some other cases) the evacuation is performed on the territorial principle, i.e. directly from the places where the people are at the moment of being notified of the evacuation beginning.

The main method of evacuation is the combined method. It's the most complete and it allows in the shortest possible time to meet all the requirements necessary for its realization. It means that a maximum possible number of evacuees leave the emergency area on foot, while the others are transported by all the available means. The means of transportation are used first of all for children's evacuation from educational institutions, the evacuation of sick persons, women with children under 10 years old, and occupants of elderly people's homes.

Evacuation time and its methods depend on the scale of an emergency, the number of the people in an emergency area, the availability of transportation means, the number of evacuation routes, preparedness and training level of the evacuation unit personnel, the civil defense and emergency management bodies and the population.

The notification of the population on evacuation is carried out by means of local and automated centralized warning systems, local television and radio stations and loudspeakers installed outdoors and on police vehicles. Via the mass media people are instructed about the rules of behavior on polluted territories, learn how to use special emergency shelters, premises adapted for emergency protection and individual protection devices, as well as how to take medical preventive measures.

The evacuees are accommodated in safe localities until a special order is issued, depending on the situation. For short-term accommodation, buildings and premises of public institutions and facilities are used (clubs, holiday inns, resorts, tourist bases). In summer it is possible to temporary house the evacuees in tent camps.

The most complex task is evacuation of the population from the risky zones of possible radioactive contamination. In this case evacuation is carried out in two stages. At the first stage the population is moved to intermediate evacuation points set up at the external borders of the dangerous zones. At the second stage the evacuees leave the intermediate evacuation points for localities of their temporary accommodation outside the range of the impacts of the emergency. Besides (which is very important) they must be provided in advance with the means of the primary life-support.

The administration of intermediate evacuation points conducts counting, registration, dosimeter control and decontamination of the evacuees, rendering them the required medical assistance and dispatching the evacuees to the sites of their temporary accommodation. At the intermediate stage of evacuation, a reserve of the drivers to change those working in the contamination zone is to be formed.

The characteristic and indispensable feature of the population evacuation in case of a nuclear facility accident is the use of covered means of transportation able to protect people from radioactivity. In order to avoid excessive radiation exposure of the evacuees they are taken on board the means of transportation, as a rule, directly from the entrances of houses, offices, protective structures, etc. For evacuation the shortest routes with the lowest levels of radiation are chosen.

Successful evacuation requires its thorough and detailed planning, good preparedness and professional training of all the units engaged in the evacuation activities. Besides very important is the civilian population preparedness and preparation in advance of the sites of temporary accommodation of the evacuees, routes of evacuation and means of transportation. And these are the duties if the civil defense units.