

# 1TH INTERNATIONAL WORKSHOP "ADVANCED METHODS AND TRENDS IN PRODUCTION ENGINEERING"

## APPLICATION OF RISK CONTROL METHOD INTO THE ENVIRONMENT OF CAPP SYSTEM

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*Abstract:: The paper deals with application options of software device for sorting the resources of technical and human risks and by the following implementation of its outputs into the process of computer aided production planning.*

*Key words: Technical risk, Danger, Assault*

### 1. INTRODUCTION

Important feature of present mechanical engineering factories is effort to decrease production costs with the goal to reach prosperous profit indicators. Essential role is played by technological preparation of production in the activities as starting new product or activities from the point of view of controlling the costs and decreasing the price of product. Increasing flexibility, expedience and quality of realizing the new products together with marked productivity in creation of constructional and technological documentation is interweaved with implementation of modern CAPP (Computer Aided Process Planning) systems based on the principle of GROUP TECHNOLOGY.

These systems enable creation of computer model of each object of production and thus by comparison of two arbitrary models are possible to evaluate the ratio of similarity of these objects [4]. Important instrument belonging to this package of software applications is also the system SYSKLASS, which is product of slovak company GTS Systems Detva. A commonplace is that effort to ensure qualitative preparation of production leads to tendency of maximal elimination of undesirable phenomenon in form of human and technical risks appearing in workplace, respectively on workplaces realizing technological and technical operations. Therefore, option and ability of implementing the system of computer aided technological preparation of production with the system of risk control in technological workplaces is actual.

### 2. PROPERTIES OF CAPP SYSTEMS – SYSTEM SYSKLASS

Principle of group technology is based on identification of similarities between variant parts, by creation of part classes and by sorting the parts into the groups.

Group technology composes natural pressure to simplicity and standardization in construction of products. It results in more transparent and simple own production. This enhancement is then shown in logistics of material flow, shortening process periods, decrease of work-in-process production and increase of machine capacities [1].

Advantages of group technology relies to:

1. *Standardization of production*
2. *Reduction of number of technological operations*
3. *Reduction of time for NC program preparation*
4. *Shortening production cycle*
5. *Increase of utilization of technological operations*
6. *Reduction of setup and operation times*
7. *Reduction of used tools and fixtures*

Dynamically developing complex system performing these functions is system Sysklass. It helps to realize activities from construct development of product through construct and technological preparation to manufacture of tools. Sysklass is created by independent software modules (Syskon, Systep, Sysnorm, Sysnar, Grafklas, Tlgedit). Output material from the system, besides the others, is created by technological procedure consisting from:

- *head of technological procedure*
- *head of individual operations (type of operation, device realizing the operation, machine and auxiliary times of operations, tariff category, number of operating stuff)*
- *description of operations*
- *consumptions of standard and special tools*
- *performance standards,*
- *assembling piece-list*

System Sysklass includes all means of automation making the completion of resulting documentation required for manufacturing the final product easier.

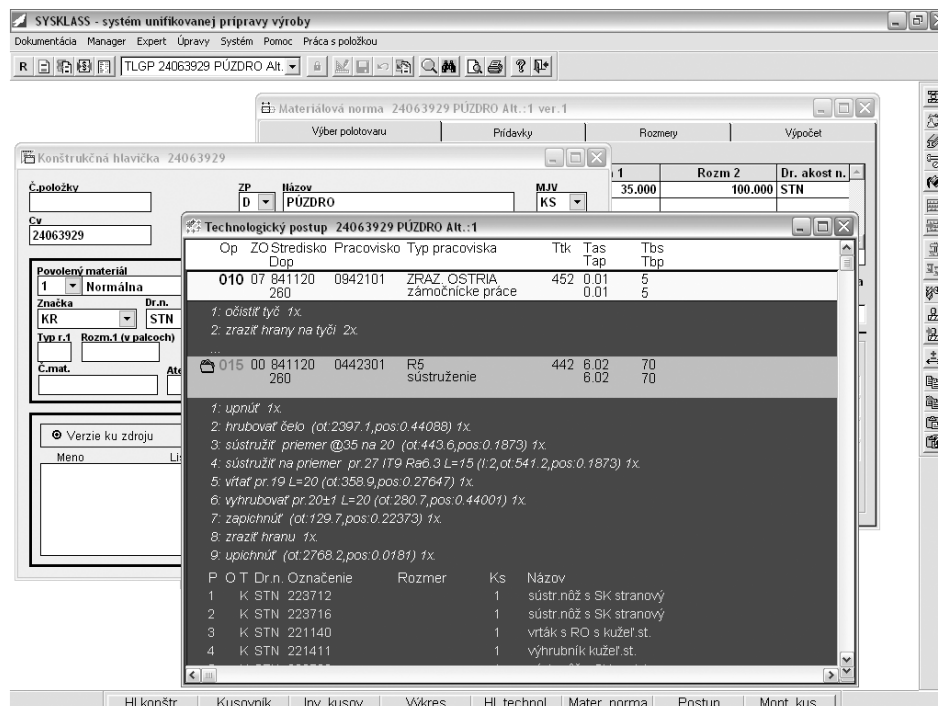


Fig. 1 System Sysklass – creation of technological documentation

### 3.IMPLEMENTATION OF RISK CONTROL METHOD WITH CAPP SYSTEM

To ensure efficient measures for inspecting and controlling the risk, it is not sufficient only to define the types of risks. Assignment of risk factors to concrete functional structures of technical device enables to use risk control methods in corresponding period of lifetime. Such review, fetched in catalogue form, provides the information about risk, risk factors and options for risk control.

Catalogue letter (CL) is for these needs required during all technical life of machine tool. KL is appropriate aid for constructor, producer of technological device, and also for its user. Catalogue letters (creating so-called risk map) includes minimal information about type of danger, kind of assault and its consequences.

The goal of catalogue letter is brief recognition of possible dangers and assaults in concrete workplace during all technical life of device, and their probability symptoms. Following after the identification of danger, it is necessary to determine of negative phenomenon (set of harms, damages, injuries, breakdowns etc.) caused by identified danger [4].

Catalogue letter is explicitly determined by the type of risk on the measured technological device, respectively in measured technological process (see Figure 2).

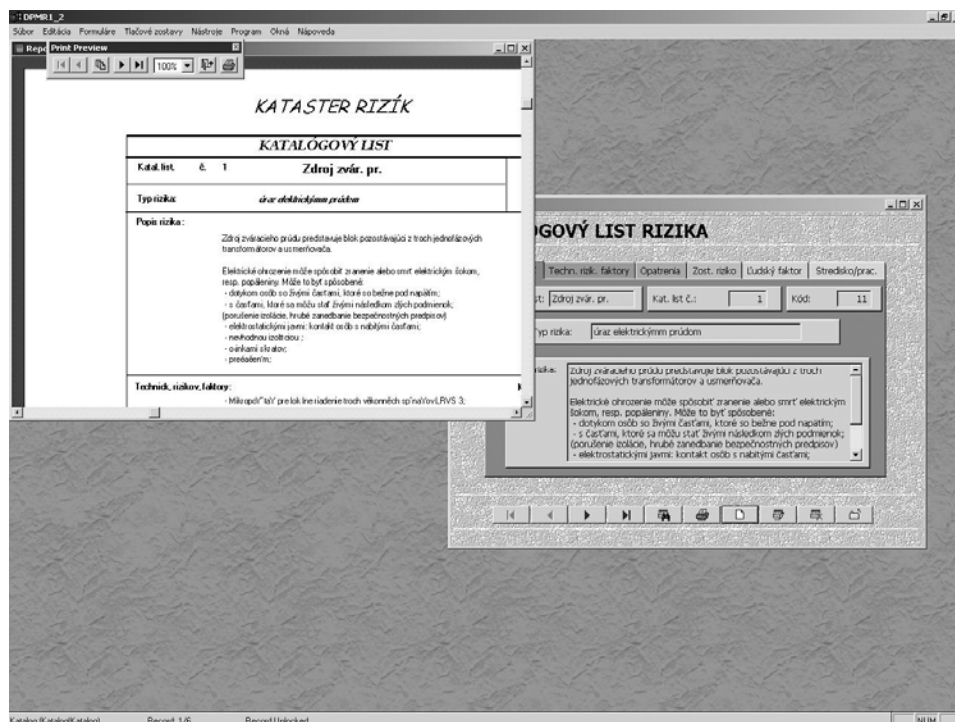


Fig. 2 Working out of catalogue item by software means

It ensures the option of implementation for these needs by created software product with system of computer aided technological preparation or production Sysclass. On the base of defined code-list of workplaces and work-centers, which are denoted in heads of technological operations of technological procedures, it is possible to activate

software application for performing of catalogue letters (Figure 2) with defined of risk factors typical for considered technological device, in considered technological operation. Following process of risk control has to continue by performing its consequences and probability of creation, for example by means of **point method**. The result of this activity has to lead to the proposal of measures that can eliminate resources of the risks growth in concrete productive operation with maximal efficiency.

#### **4.CONCLUSIONS**

Connection of computer aided technological production preparation system with the system of computer aided risk management has the goal to reach prosperous economic indicators, which although exhibit raised costs for safety measures, simultaneously decrease the total costs caused by dangers and assaults of persons and technical devices appearing in process of production realization. The basis axiom is valid, that employer has to apply all means for the safe operation of production device with respect to approved legal laws and instructions to avoid potential risk for user existence, for existence of operating stuff and their working environment.

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