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Machine Tools Harmonization with EU Technical Legalizations Requirements

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Abstract: *This paper presents a general approach to the product conformity assessment which is required by EU New and Global Approach. As an example, some of the results of the project TD-7082B are presented relating to the harmonization of machine tools with the requirements of the relevant EU directives and harmonized standards.*

Keywords: *CE mark, machine tools, safety requirements*

1. INTRODUCTION

The requirements for products that could be ready and could satisfy European Union market requirements depend on whether products are included in the technical legislation of the New Approach or not.

If the products are in frame of the technical legislation than the product conformity assessment is defined in eight modules due to Council Decision of European Union for product conformity assessment.

The numbers of these products are in spectrum from 20% to 25% of total ones which are delivered to the European market. (Presern, 2005). These products pass through the so called "mandatory" procedures of conformity. As a verification of successful implementation of the procedure the manufacturer is liable to put a CE mark on his product, and that means an acknowledgement of conformity with essential safety requirements defined in adequate Directives.

If the product is not implied in technical legislation of the New Approach than it belongs to the so called "voluntary" verification. Hence, in other words, it means that the manufacturer is open to choose certification or not to certify a product. The manufacturers used to do the certification in aim to get customers and as an objective to create a market advantage over competition. The size of different systems of certifications could be large. ISO book (ISO 1992) gives eight different systems of third party certification for products.

The purpose of this paper is to represent some of the results of the project TD-7082B, 2008 partly financed by the Ministry of Science of the Republic of Serbia in the period: 2005. – first trimester of 2008. LOLA Institute, Belgrade and the Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Belgrade realized the project **TD-7082B, "Research, development and implementation of methods and procedures of assessment, control and certification of machine tools in accordance with requirements of EU directives"**. Participant and results' user was LOLA Sistem, i.e., Montavar LOLA Belgrade.

2. EUROPEAN APPROACH TO PRODUCT CONFORMITY ASSESSMENT

There are different ways for placing products on the European Union market. The manufacturers and suppliers use diverse techniques, which very often involve engaging an independent body, third party, for conformity assessment of the product.

The picture 2.1 gives an overview concerning the main routes for mandatory or voluntary routes for product conformity assessment.

Required first answer to the question: is the products in frame of the technical legislation of the New Approach or not.

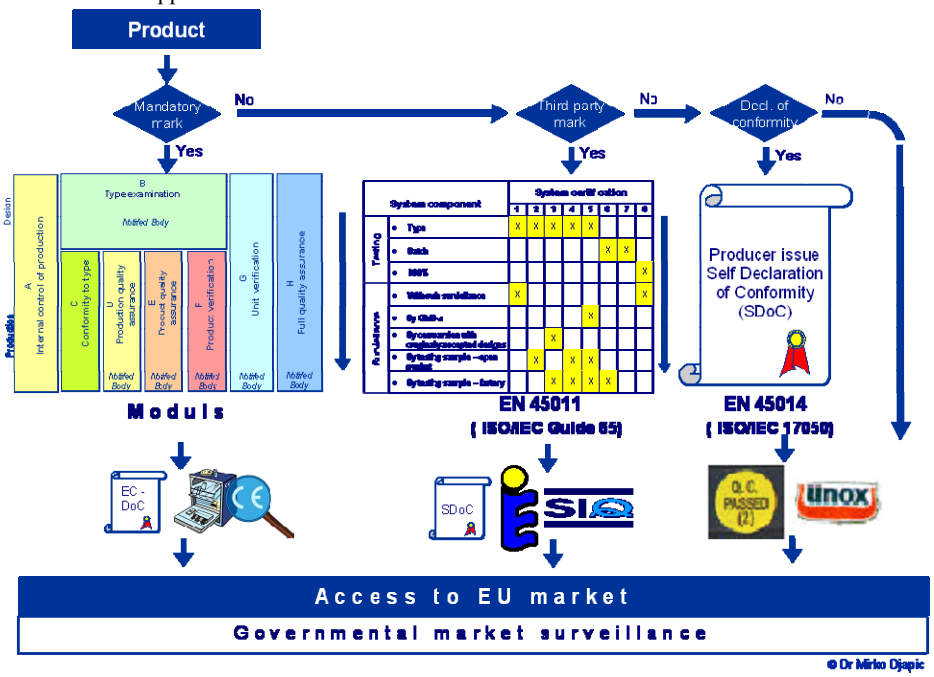


Figure 2.1 European approach to product conformity assessment

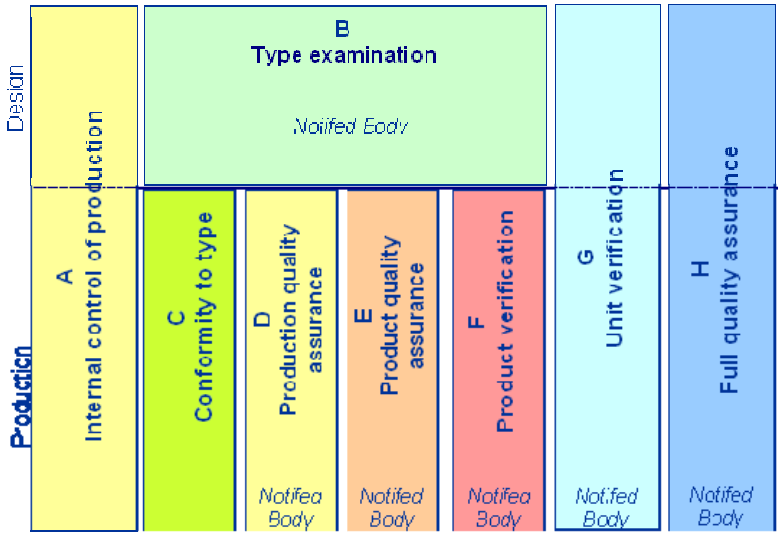


Figure 2.2 Modules of mandatory certification

If the product pertains to technical legislation, namely it is enclosed by directives of the New Approach, the procedures of conformity assessment are defined in Council Decision (93/465/EEC: Council Decision of 22 July 1993.) of European Union as introduction of conformity assessment modules.

Procedures of conformity assessment included

in directives are based on modules for conformity assessment (Figure 2.2). Variety of modules require from producer to include an independent third party in the procedure of conformity assessment, notified bodies respectively. Engagements of these bodies are principally required in procedures of conformity assessment, which are related to high risk products hazardous to human health and environment. Hence, it is very important that these bodies act their function with previously validated high level of competence, integrity and professionalism. The obligation of the member states is to nominate those bodies if they have demand from market. In other words, member states have no obligation to nominate the bodies for all directives, only for the ones that they have a demand from the market or interest to do so.

The nomination of bodies for assessment of conformity is an obligation according to directives of the New Approach and the criterions are in Council Decision No EU 93/465/EEC about introduction of conformity assessment modules and annexes of directives. There is no mention in those documents of prior accreditation but it is implied "de-facto". Decision 93/465/EEC clearly denotes that member states which authorize bodies that were not prior with accreditation must maintain an objective proof about their ability of competence.

The second question placed to the producers is about the product that does not pertain to technical legislation of the New Approach: is the verification of the product necessary or not depending on the market or due to some other reasons.

The ISO book concerning "Certification and Related Activities" (ISO 1992) gives eight systems for *third-party* certification systems for products (Figure 2.3).

Principally product certification systems should contain at least two activities:

- the acceptance of the product based on testing of the (design of the) product and or the production process,
- the surveillance of the continuing ability of the manufacturer to produce a conforming product.

System component		System certification							
		1	2	3	4	5	6	7	8
Testing	• Type	X	X	X	X	X			
	• Batch						X	X	
	• 100%								X
Surveillance	• Withouth surviellance	X							X
	• By QMS-a					X			
	• By comparsion with oruginally accepted designs			X					
	• By testing sample – open market		X		X	X			
	• By testing sample – factory			X	X	X	X		

Figure 2.3 Voluntary product certification systems

Certification system 1, type testing only, is not seen as a "mature" certification system, because it provides no form of surveillance by which continuing assurance of conformity is usually assessed. The same is valid for system 7, whereas for system 8, surveillance is not relevant because 100% testing is a system where each and every item

"marked" is tested against the applicable requirements.

Certification system 6 relates to the determination of compliance of the supplier's quality management system (ISO 9000) for designated products. No mark on a product is allowed for this system.

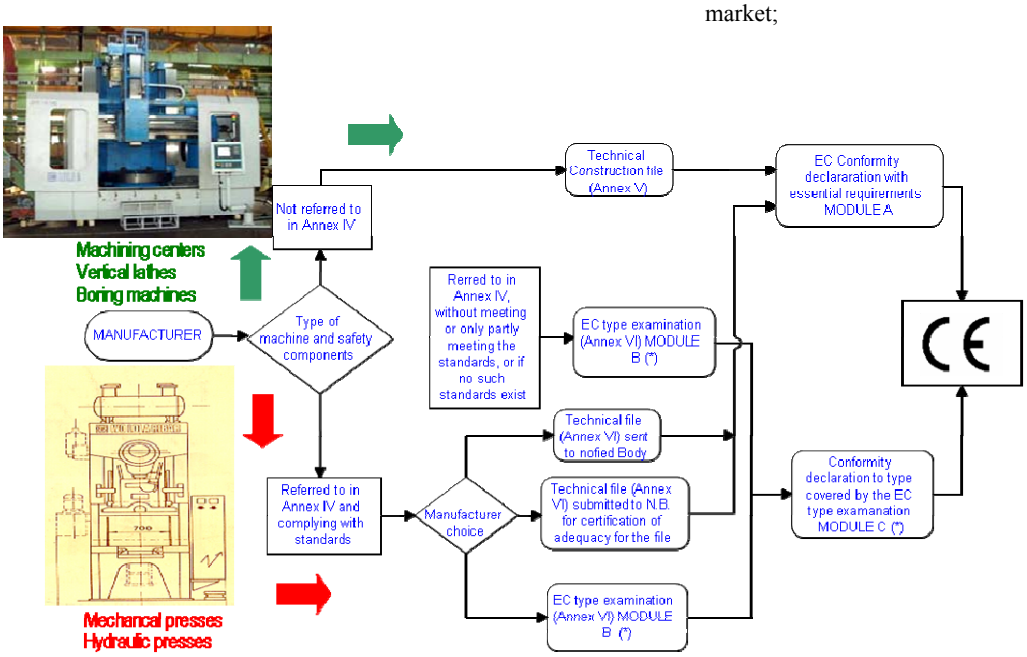
Comprehensive system of certification is number 5. It frames type testing in the development phase and QMS supervision in the production phase as well as sample testing where the samples are taken from market and production line.

3. MACHINE TOOLS HARMONIZATION WITH EU TECHNICAL LEGISLATION REQUIREMENTS

3.1 Goals and Results of the TD-7082B Project

Project goals were:

- Harmonization of technical legislation for assessment of
- compliance of machine tools with the relevant EU directives (Machines 98/37/EC:1998) and accompanying standards;
- Improved production technologies and development of methods and procedures for assessment, control and certification of machine tools complying with the requirements of the harmonized technical legislation;
- Improved system for assessment, control and certification, and providing prerequisites for the Serbian economy to manufacture, in priority areas, high quality products on the required level, competitive on the global market;



The following results were achieved:

- Mechanical presses were designed and manufatured to comply with the requirements of the Directive on machines (98/37/EC 1998) and with the EN 692:1996 standard
- Hydraulic presses were designed and manufatured to comply with the requirements of the Directive on machines (98/37/EC 1998)

and with the EN 693:2001 standard

- Vertical lathes were designed and manufatured to comply with the requirements of the Directive on machines (98/37/EC 1998) and the EN 12497:2000 standard
- A new laboratory facility was formed for the assessment and verification of safety measures according to the EN 692 and EN 693 standards
- New educational tools were developed – courses, seminars on:
  - Implementation of the New and Global Approach
  - Machine directive
  - Machine risk assessment

Five papers were published in journals of national significance, 11 papers were presented at national and 1 at an international seminar

Mechanical press ARP 16

Verification of safety measures (Measuring braking time)

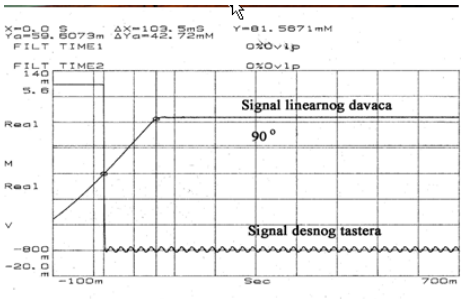


Figure 3.3 Verification of safety measures – mechanical press ARP 160 braking time

Project results were implemented at the machine tool factory incorporated in the LOLA Sistem from Zeleznik, Belgrade. This factory was recently purchased by the MONTAVAR company from Maribor, in the Republic of Slovenia. In spite of the ownership change, the project leader and project team members continued successful cooperation in order to harmonize other LOLA Montavar products with the requirements of the technical legislation of the European Union (EU).

Figure 3.1 Machine tools categorization according to the requirements of the EU directives

As stated earlier, entire project scope referred to the harmonization of machine tools produced by LOLA Sistem, now Montavar LOLA, with the requirements of the technical EU legislation. Each machine tool produced by LOLA (Figure 3.1) can be categorized in one of two groups: (1) highly hazardous machines referred to by the Annex IV of the Directive on Machines (98/37/EC) and (2) other machines.

Mechanical and hydraulic presses make up the first group. Since these are highly hazardous machines, in the procedure of

assessing their harmonization, engagement of notified bodies is mandatory. These bodies must, according to module B of the Global Approach, assess type testing. Within project activities, all necessary investigations were performed so that the engagement of the notified body was reduced to the inspection of obtained results and generated technical file. To illustrate this, Figures 3.2 and 3.3 display some of the results and verifications performed within the framework of the Project, referring to mechanical presses ARP 160.

All practical project results (technical solutions) obtained in cooperation with the User personnel were implemented, which means that the User is fully qualified to independently perform all tasks referring to the harmonization of products with the requirements of the EU technical legislation.

The only remaining dilemma is whether the User wishes to develop his own laboratory facility for specific measurements required by the harmonized standards or he wants to use for this purpose an accredited laboratory. Project team will aid the User in the process of building a laboratory facility for assessment, control and certification of machine tools if he decides to do so. This implies laboratory accreditation in compliance with the requirements of the ISO/IEC 17025:2005 standard.

3.2 Assessing the Potential and Prerequisites for Implementing Results in a Wider Framework

Project results (technical solutions) refer to machine tools harmonization with the requirements of the EU technical legislation. However, the knowledge generated, testing methods, and procedures can generally be used in other similar technical products. This means that all the necessary knowledge and skills were generated for any product (especially if it is referred to by the Machine Directive) to be harmonized with the requirements of the EU technical legislation. This especially refers to:

- relevant educational tools were developed (seminars, courses, etc.);
- LOLA Institute is qualified to provide consulting services and to;
- perform relevant assessment, inspections and analyses (especially risk analysis)

All the above is a prerequisite for faster harmonization of Serbian companies products with the requirements of the common EU market. Since LOLA Institute, as the executor of this project, is able to offer all these services cheaper than foreign companies, this is certainly a benefit for the entire country.

Facilitating faster implementation of project results is the cooperation with the Serbian Chamber of Commerce (PKS) in the promotion of the technical EU legislation and CE product marking through seminars, presentations, etc. It is important to stress that already two seminars were organized by PKS; one in the PKS Educational center (attending were 19 participants) and the other at the ATB-Sever factory in Subotica (26 participants attended).

Aggravating circumstance for implementation results in a wider framework is that domestic laboratory and control facilities cannot be recognized as legal notified EU bodies. In order to achieve this it is necessary that Serbia becomes a full EU member or that it signs the PECA agreement in the domain of implementation of the Directive on machines. If we had domestic notified bodies, then the procedure to assess product harmonization with the requirements of the directives would be faster and cheaper for domestic manufacturers, because today foreign notified bodies exclusively can perform these tasks.

4.CONCLUSION

Today European Union market is made of 27 states with the common market and population of 480 million. In the aim to create a common market, a New and Global Approach is designed about conformity assessment of products, technical harmonization and standardization. Essential requirements for product safety are defined in the New Approach directives.

The products framed with technical legislation must pass conformity assessment procedure prior to entering market of European Union, with essential requirements of appropriate directives, defined in Council Decision about introduction of modules for Conformity Assessment number 465/93/EEC. All of these products pertain to the so called “mandatory" certification of products. Producers are in obligation, for products that

passed the conformity assessment procedure, to mark with CE sign and issue a declaration of conformity of their product with essential requirements of directives and harmonized standards respectively.
Machine tools are one of these products. The paper presents some of the results of the project TD-7082B partly financed by the Ministry of Science of the Republic of Serbia relating to the harmonization of machine tools with the requirements of relevant EU directives and harmonized standards. Using these results and participating in the project is LOLA System, now MONTAVAR LOLA, almost exclusively exporting machine tools on the European Union market.

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