# **30** Years of the International Scientific Conference Heavy Machinery

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The first conference "Heavy Machinery" was held in Kruševac and Vrnjačka Banja (Serbia) from 8 to 10 October 1993. The conference is triennial so that the eleventh one is in 2023. At the beginning, the main thematic fields were: Design and calculations, Production technologies, Testing and control. New scientific knowledge, fast technological development, lifting sanctions on our country and the globalisation of the world market caused significant changes in science and research. Accordingly, the thematic fields of the conferences have been adjusted. Their number has increased so that the papers from the last conference were classified into seven scientific fields: Earth-moving and Mining machines and Transportation systems, Railway vehicles, Production technologies, Automatic control, robotics and fluid technique, Applied mechanics, Thermal technique and environment protection and Civil engineering and materials.

This year's conference covers similar fields. Thirty years of tradition are also an opportunity to sum up the results from the previous conferences as well as to establish the directions of further research, the place and the role of the conference "Heavy Machinery", regarding both the development of the faculty and the influence on a wider scientific community.

#### Keywords: heavy machinery, mechanical engineering, civil engineering, history

## 1. INTRODUCTION

The name "Heavy Machinery" imposed itself as a term used in studying machines, systems and components of large dimensions, masses and complexity. It covers civil and mining machines, transportation machines, machine tools for deforming and cutting, railway and road transportation systems, power plants, etc.

The name of the conference "Heavy Machinery" is greatly connected with the development of the Faculty of Mechanical Engineering in Kraljevo. At the end of December 1981, the Department in Kraljevo grew into the Basic Organization of Associated Labour for Heavy Machinery within the Faculty of Mechanical Engineering in Belgrade, which provided the conditions for establishing a specific programme for education of mechanical engineers for the Heavy Machinery field. The year 1987 marked the beginning of the procedure of separating the Basic Organization of Associated Labour for Heavy Machinery from the structure of the Faculty of Mechanical Engineering of the University of Belgrade and thus the Faculty of Mechanical Engineering in Kraljevo was formed.

After its foundation, the Faculty of Mechanical Engineering in Kraljevo oriented itself towards research in heavy machinery and tried, in cooperation with the surrounding factories whose production programmes were based on heavy machinery, to contribute to the identification of complex problems and their solutions as well as to enable such research that would involve new production programmes and revitalization of the existing ones [1].

Having in mind the above mentioned, in 1993 the management of the Faculty launched an initiative for the organization of the first international scientific conference. The goal of the conference was to contribute to a more complete and more comprehensive definition of the current state and, particularly, the future development of heavy machinery.

## 2. OVERVIEW OF THE "HEAVY MACHINERY" CONFERENCES HELD SO FAR

### 2.1. First conference "Heavy Machinery - HM 1993"

The first conference "Heavy Machinery – HM 1993" was held in Kruševac and Vrnjačka Banja in the period from 8 to 10 October 1993 [1]. Prof. Dr Ranko Rakanović, Prof. Dr Vučko Mečanin, Dr Milomir Gašić – Docent, Dr Vladan Karamarković – Docent and Dr Svetislav Radović – Docent were appointed members of the Editorial Committee of the first conference "Heavy Machinery". The Editorial Committee was appointed on 08.07.1993 – Figure 1. Prof. Dr Mihajlo Milojević was added to the Editorial Committee by a subsequent decision.

The organization of the conference drew considerable attention of enterprises so that the conference had 50 sponsors. Apart from the enterprises from the surroundings, three enterprises from Montenegro and one from Bosnia and Herzegovina participated as sponsors.

The papers were classified into four sections: plenary papers, Design and Calculations, Production Technologies, Materials – Testing and Control. In 1993, sanctions were imposed on Serbia so that the teachers and associates as well as the researchers were not allowed to travel to other countries. Taking that into account, it is no wonder that an extremely large number of papers were registered for the conference – a total of 228.

There were 5 plenary papers, 93 papers in the session Design and Calculations, 97 in the session Production Technologies and 33 papers in the session Testing and Control. The structure of papers is presented in Table 1.

It should be emphasized that in the first year of the organization of the conference the relevant Ministry did not clearly define what requirements should be fulfilled by a conference so that it could be recognized as international. The authors were required to write the title and the abstract in English, and the official languages of the conference were: Serbian, English and Russian. The papers of the authors coming from Montenegro were treated as domestic papers. The Chairman of the Editorial Committee was Prof. Dr Ranko Rakanović.

#### UNIVERZITET U KRAGUJEVCU MAŠIKSKI FAKULTET KRALJEVO

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#### ODLUKU

 U redakcioni obbor Hedjunarodnog naučnog ekupa Teška mašinogrednja TM 93 imemuju se:

- prof. dr Ranko Rakanović
- prof. dr Vučko Hočanin
- dr Milonir Gažić docent
- dr Vladan Karamarković decemt
- dr Svetislav Radović docent
- 2. Ostali učesnici skupa imenovaše svoje predstavnike u Redakcioni odbor.
- Ožluka destaviti imenovanim članovina Redakcionog odbora i uz materijal sa seinice,

HASTAVNO	NAUČNO	VECS	MASINSKOC	PAKUL	TETA

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Figure 1: Decision of the Scientific-Teaching Council of the Faculty of Mechanical Engineering Kraljevo on appointing the Editorial Committee of the conference

Table 1: The structure of papers	at the first conference
"Heavy Machinery - I	HM 1993"

Session	Number of papers		
Session	Domestic	Foreign	Total
Plenary	5	0	5
Design and Calculations	83	10	93
Production Technologies	88	9	97
Testing and Control	30	3	33
Σ	206	22	228

#### 2.2. Second conference "Heavy Machinery - HM 1996"

The second conference "Heavy Machinery - HM 1996" had ten members of the Programme Committee, four of them from abroad. It was held in Kraljevo-Mataruška Banja in the period from 28 to 30 June, 1996 (Figure 2) [2].

The conference was organized under the auspices of the Ministry of Science and Technology of the Republic of Serbia. This conference also attracted a lot of attention among enterprises so that the conference had 25 sponsors.

The Chairman of the Programme Committee was Prof. Dr Ranko Rakanović.

The total number of published papers was 130. The papers were classified into eight sections, and the structure of papers is shown in Table 2.



Figure 2: Presiding (from the left to the right): Prof. Dr Milisav Kalajdžić, Faculty of Mechanical Engineering in Belgrade, Prof. dr Mircea Alamoreanu, Technical University of Civil Engineering of Bucharest, Romania, Prof. Dr Ranko Rakanović, Faculty of Mechanical Engineering in Kraljevo, Igor Pavlovich Filonov, Belarusian State Polytechnic Academy, Belarus, Dmitry Pavlovich Volkov, Moscow State University of Civil Engineering, Russia, behind the lectern Prof. Dr Vučko Mečanin, Faculty of Mechanical Engineering in Kraljevo

Table 2: The structure of papers at the first conference
"Heavy Machinery - HM 1996"

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	3	0	3	
Railway engineering	8	3	11	
Civil and mining	14	3	17	
machines				
Production engineering	43	7	50	
Control systems and	14	2	16	
components				
Transportation systems	16	1	17	
Thermal power plants	7	0	7	
General joint session	8	1	9	
Σ	113	17	130	

### 2.3. Third conference "Heavy Machinery - HM 1999"

The third conference "Heavy Machinery – HM 1999" was organized in difficult conditions, in the year when our country was bombed and devastated by the NATO alliance.

However, even in such conditions, but with enormous efforts, the conference was held. It should be mentioned that, unlike the previous conferences, the Ministry of Science and Technology of the Republic of Serbia defined more precise conditions for recognizing the conference as the international one. The third conference had the International Programme Committee – even 9 members, out of 18, were from abroad. The language of the conference was English, and the papers were published in Russian, too. The conference was held under the auspices of the Ministry of Science and Technology of the Republic of Serbia, but 23 domestic companies were sponsors as well. The conference was held in Kraljevo-Mataruška Banja in the period from 28 to 30 October 1999 [3]. The Chairman of the Conference was Prof. Dr Vučko Mečanin, and the editors were Prof. Dr Vučko Mečanin and Prof. Dr Novak Nedić.

The total number of published papers was 84. The papers were classified into seven sections, and the structure of papers is shown in Table 3.

Table 3: The structure of papers at the first conference"Heavy Machinery - HM 1999"

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	2	1	3	
Mining and earth-moving	5	6	11	
machines				
Production technology	21	8	29	
Automatic control and	9	1	10	
fluid power technology				
Railway machines	10	1	11	
Transportation systems	7	3	10	
Applied mechanics and	7	3	10	
structure strength				
Σ	61	23	84	

2.4. Fourth conference "Heavy Machinery - HM 2002"

The fourth conference "Heavy Machinery - HM 2002" was held in Mataruška Banja in the period from 28 to 30 June 2002 [4].

Having the previous conference as its model, the fourth conference also had the International Programme Committee – out of its 35 members, 12 was from abroad. The Ministry of Science, Technology and Development of the Republic of Serbia, the Federal Secretariat for Development and Science as well as Magnohrom Kraljevo supported the conference. The Chairman of the Conference was Prof. Dr Milomir Gašić, the Chairman of the International Programme Committee was Prof. Dr Milomir Gašić, and the Vice-Chairman of the international Programme Committee was Prof. Dr Miroslav Vesković.

The total number of published papers was 114. The papers were classified into seven sections, and the structure of papers is presented in Table 4.

Table 4: The structure of papers at the fourth conference
"Heavy Machinery - HM 2002"

C	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	1	2	3	
Earth-moving and mining	18	8	26	
machines and				
transportation systems				
Thermal power plants	7	0	7	
Railway vehicles	10	6	16	
Production technology of	28	6	34	
the heavy machinery				
Automatic control and	6	6	12	
fluid technique				
Applied mechanics and	12	4	16	
basic machine structures				
Σ	82	32	114	

2.5. Mini Jubilee – Fifth Conference "Heavy Machinery -HM 2005"

The fifth conference "Heavy Machinery - HM 2005" was held in Kraljevo-Mataruška Banja in the period from

28 June to 3 July 2005 (Figure 3) [5]. From the fifth conference, the last day of the conference was traditionally closed by participation in the rafting down the Ibar river within the manifestation "Jolly Regatta". The faculty, as the organizer of the conference, provided the boats as well as an experienced guide for all participants who wanted to participate in this manifestation.



Figure 3: Presiding (sitting – from the left to the right): Prof. Dr Ljubomir Lukić, Faculty of Mechanical Engineering in Kraljevo, Prof. Dr Milomir Gašić, Faculty of Mechanical Engineering in Kraljevo, Prof. Dr Igor Stepanovich Surovtsev, Voronezh State University of Architecture and Civil Engineering, Rector, Russia, Prof. Dr Pavel Ivanovich Nikulin, Voronezh State University of Architecture and Civil Engineering, Russia, behind the lectern Prof. Dr Miloš Đuran, Rector of the University of Kragujevac

The International Programme Committee consisted of 50 members, and 17 of them were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Milomir Gašić, the Chairman of the International Programme Committee was Prof. Dr Milomir Gašić, and the Vice-Chairman of the International Programme Committee was Prof. Dr Milan Dedić.

The total number of published papers was 114. The papers were classified into seven sections, and the structure of papers is shown in Table 5.

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	1	0	1	
Earth-moving and mining	14	9	23	
machines and				
transportation systems				
Automatic control and	12	1	13	
fluid technique				
Construction and	12	4	16	
machines				
Railway vehicles	12	8	20	
Production technology	26	10	36	
Urban engineering	7	2	9	
Σ	83	34	117	

Table 5: The structure of papers at the fifth conference "Heavy Machinery - HM 2005"

2.6. Sixth conference "Heavy Machinery - HM 2008"

The sixth conference "Heavy Machinery - HM 2008" was held in Kraljevo-Mataruška Banja in the period from 24 - 29 June 2008 [6].

The International Programme Committee consisted of 49 members, and 21 were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Novak Nedić, and the chairman of the Programme Committee was Prof. Dr Milomir Gašić.

The total number of published papers was 108. The papers were classified into nine sections, and the structure of papers is shown in Table 6.

Table 6: The structure of papers at the sixth conference"Heavy Machinery - HM 2008"

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	2	2	4	
Automatic control and	9	4	13	
fluid technique				
Earth-moving and mining	9	13	22	
machines and				
transportation systems				
Railway vehicles	4	8	12	
Thermal technique,	10	0	10	
environment protection				
and urban engineering				
Machine design and	10	6	16	
mechanics				
Production technologies,	5	9	14	
material application and				
entrepreneurial				
engineering and				
management				
Computer-integrated	8	0	8	
processes and design of				
machining processes				
Urban engineering	7	2	9	
Σ	64	44	108	

2.7. Seventh conference "Heavy Machinery - HM 2011"

The seventh conference "Heavy Machinery - HM 2011" was held in Vrnjačka Banja in the period from 29 June to 2 July 2011 (Figures 4 and 5) [7].

The International Programme Committee had 61 members, and 31 of them were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Novak Nedić, the Chairman of the International Scientific Programme Committee was Prof. Dr Milomir Gašić, and the Vice-Chairman was Prof. Dr Mile Savković.

The total number of published papers was 109. The papers were classified into nine sections, and the structure of papers is presented in Table 7.

The first student conference SRMA 2011, at which the papers of students from Serbia and abroad were presented, was held together with the conference "Heavy Machinery HM 2011".

Table 7: The structure of papers at the seventh conference"Heavy Machinery - HM 2008"

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	2	2	4	
Railway vehicles	3	9	12	
Earth-moving and mining	13	10	23	
machines and				
transportation systems				
Automatic control and	9	3	12	
fluid technique				
Design and mechanics	12	5	17	
Production technologies	16	1	17	
Urban engineering	9	4	13	
Structures and materials	9	2	11	
in civil engineering				
Σ	73	36	109	



Figure 4: Presiding at the conference "Heavy Machinery - HM 2011" (sitting – from the left to the right): Prof. Dr Ljubomir Lukić, Prof. Dr Novak Nedić, Dragana Sladoje –student, Milica Panović – MC, all from the Faculty of Mechanical Engineering in Kraljevo



Figure 5: Participants in the plenary session of the conference "Heavy Machinery - HM 2011"

2.8 Eighth conference "Heavy Machinery - HM 2014"

The eighth conference "Heavy Machinery HM 2014" was held at Zlatibor in the period from 25 to 28 June 2014 (Figures 6-9) [8].

The International Programme Committee consisted of 63 members, and 32 of them were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Milomir Gašić, the Chairman of the International Scientific Programme Committee was Prof. Dr Mile Savković, and the Vice-Chairman was Prof. Dr Milan Kolarević

The total number of published papers was 110. The papers were classified into eight sections, and the structure of papers is presented in Table 8.

Table 8: The structure of papers at the eight conference"Heavy Machinery - HM 2014"

Session	Number of papers			
Session	Domestic	Foreign	Total	
Plenary	0	4	4	
Earth-moving and mining	12	18	30	
machines and				
transportation systems				
Production technologies	8	5	13	
Civil engineering and	6	3	9	
materials				
Automatic control,	7	9	16	
robotics and fluid				
technique				
Mechanical design and	11	1	12	
mechanics				
Railway vehicles	5	9	14	
Urban engineering,	10	2	12	
thermal technique and				
environment protection				
Σ	59	51	110	

The second student conference SRMA 2014, at which the papers of students from Serbia and abroad were presented, was held together with the conference "Heavy Machinery HM 2014".



Figure 6: Presiding at the conference "Heavy Machinery HM 2014" (sitting – from the left to the right): Prof. Dr Ivan Ivanovich Nazarenko, Kyiv National University of Construction and Architecture, Ukraine, Prof. Dr Mircea Alamoreanu, Technical University of Civil Engineering Bucharest, Romania, Prof. Dr Milomir Gašić, Faculty of Mechanical and Civil Engineering in Kraljevo, Prof. Dr Nenad Filipović, Vice-Rector of the University of Kragujevac, behind the lectern Prof. Dr Desimir Jeftić, at the back Milica Panović – MC



Figure 7: Plenary session of the conference "Heavy Machinery - HM 2014"



Figure 8: Closing of the working part of the conference, socializing at the gala dinner



Figure 9: Social programme – visit to the "Šargan Eight"

2.9. Ninth conference "Heavy Machinery - HM 2017"

The ninth conference "Heavy Machinery - HM 2017" was held at Zlatibor in the period from 28 June to 1 July 2017 (Figures 10-13) [9].

The International Programme Committee consisted of 66 members, and 30 of them were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Milomir Gašić, the Chairman of the International Scientific Programme Committee was Prof. Dr Mile Savković, and the Vice-Chairman was Prof. Dr Milan Kolarević.

The total number of published papers was 94. The papers were classified into eight sections, and the structure of papers is presented in Table 9.

Table 9: The structure of papers at the ninth conference
"Heavy Machinery - HM 2017"

Session	Number of papers		
Session	Domestic	Foreign	Total
Plenary	1	4	5
Earth-moving and mining	11	10	20
machines and			
transportation systems			
Production technologies	10	9	19
Automatic control,	9	1	10
robotics and fluid			
technique			
Mechanical design and	5	5	10
mechanics			
Railway vehicles	5	6	11
Thermal technique and	7	4	11
environment protection			
Civil engineering and	6	1	7
materials			
Σ	54	40	94

The third student conference SRMA 2017, at which the papers of students from Serbia and abroad were presented, was held together with the conference "Heavy Machinery - HM 2017".



Figure 10: Presiding at the conference "Heavy Machinery HM 2017" (sitting – from the left to the right): Prof. Dr Dario Croccolo, Department of Industrial Engineering, University of Bologna, Italy, Prof. Dr Dobrinka Atmadzhova, Department of Transport Equipment, University of Transport, Sofia, Bulgaria, Prof. Dr Mile Savković, Faculty of Mechanical and Civil Engineering in Kraljevo, Prof. Dr Milomir Gašić, Faculty of Mechanical and Civil Engineering in Kraljevo, Prof. Dr Anatoly Dotsenko, National Research Moscow State University of Civil Engineering, Russia, behind the lectern Jelena Tomić – MC



Figure 11: Plenary session of the conference "Heavy Machinery - HM 2017"



Figure 12: Closing of the working part of the conference, socializing at the gala dinner



*Figure 13: Social programme – visit to the national park "Uvac"* 

2.10. Tenth conference "Heavy Machinery - HM 2021"

The tenth jubilee conference "Heavy Machinery -HM 2021" was held in Vrnjačka Banja in the period from 23 to 25 June 2021 (Figures 14 and 15) [10]. This conference was not held three years after the previous one due to the prohibition on group gathering caused by the COVID 19 pandemic – it was postponed for one year.

The International Programme Committee consisted of 72 members, and 30 of them were from abroad. The Ministry of Science and Environmental Protection of the Republic of Serbia supported the conference. The Chairman of the Conference was Prof. Dr Mile Savković, the Chairman of the International Scientific Programme Committee was Prof. Dr Milan Kolarević, and the Vice-Chairman was Prof. Dr Milan Bižić.

The total number of published papers was 110. The papers were classified into eight sections, and the structure of papers is presented in Table 10.

Table 10: The structure of papers at the tenth conference"Heavy Machinery - HM 2021"

Session	Number of papers		
	Domestic	Foreign	Total
Plenary	1	2	3
Earth-moving and mining	11	2	13
machines and			
transportation systems			
Production technologies	10	1	11
Automatic control,	7	5	12
robotics and fluid			
technique			
Applied mechanics	7	1	8
Railway vehicles	6	5	11
Thermal technique and	8	1	9
environment protection			
Civil engineering and	5	1	6
materials			
Σ	55	18	73



Figure 14: Behind the lectern Dr Nataša Pavlović – MC, presiding at the conference "Heavy Machinery HM 2021" (sitting – from the left to the right): Prof. Dr Mile Savković, Faculty of Mechanical and Civil Engineering in Kraljevo, Prof. Dr Nenad Filipović, Rector of the University in Kragujevac, Prof. Dr Milan Kolarević, Faculty of Mechanical and Civil Engineering in Kraljevo



Figure 15: Plenary session of the conference "Heavy Machinery - HM 2021"

The opening of the conference was followed by a signing ceremony at which the agreements on cooperation between the University of Kragujevac and the companies from Kraljevo and its surroundings with which the Faculty of Mechanical and Civil Engineering has a long successful cooperation were signed (Figure 16). The agreements were signed with the following companies: Leoni, Amiga, Radijator Inženjering, FMO Ekonom, Elektromontaža, Unipromet, Eurotermik, Evrotehna, Pekom Inženjering, CIP and Odžačar Kotloremont.



Figure 16: Rector of the University of Kragujevac Prof. Dr Nenad Filipović signing agreements on business and technical cooperation with companies from the territory of Kraljevo

## 3. COMPARATIVE OVERVIEW OF THE NUMBER OF PAPERS PUBLISHED AT THE PREVIOUS TEN "HEAVY MACHINERY" CONFERENCES

The structure of papers at the previous ten conference can be seen in the diagram in Figure 17.

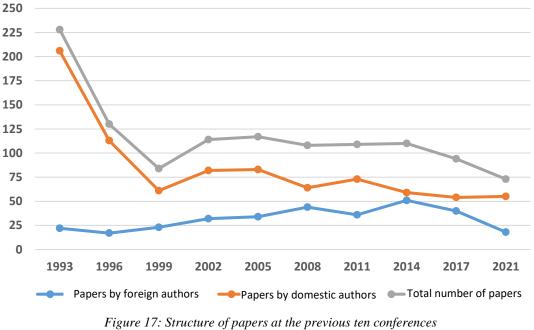
From the diagrams in Figures 17 and 18 it can be seen that a very large number of papers were published at the first two conferences. The main reason lies in the fact that the sanctions were imposed on our country during the mentioned period and, hence, publishing papers at conferences abroad was rather difficult.

What should be taken into account is that the reviews were not too "demanding", the papers were published in Serbian or in the authors' mother tongues. Also, there was a significant support in the form of sponsorship by enterprises so that the conference fee was small.

When the Ministry of Science and Technology of the Republic of Serbia defined more precise conditions for recognition of the conference as international (conference language, number of pages per paper, proofs of reviewing, conference duration, international programme committee,...), both the number of registered papers and the number of published papers were reduced – Figure 18.

The modifications of the Law on Higher Education of 2008 and 2010 and the corresponding Rules for Promotion into Academic Ranks as well as the changes regarding the accreditation conditions significantly diminished the importance of conferences. This relates to international and, especially, national conferences. These facts have become more pronounced in the course of time, and the same can be stated for national journals. The number of papers published in SCI-indexed journals has been imposed as the main condition for promotion of teachers and researchers, which has demotivated authors to participate in international and, particularly, national

conferences. This can be clearly seen from the diagrams in Figures 19 and 20.



Number of papers per year of conference

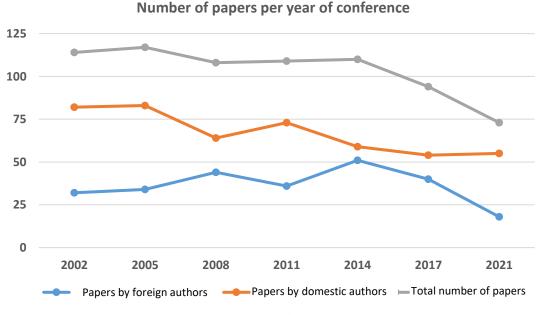
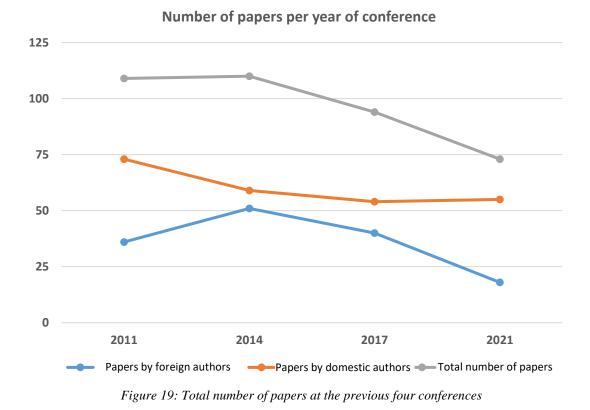


Figure 18: Structure of papers at the previous seven conferences



200 180 160 140 120 100 80 60 40 20 0 2011 2014 2017 2021 Total number of Participants from Participants participants from Serbia abroad

## Number of participants with papers

Figure 20: Total number of participants with papers at the previous four conferences

## 4. CONCLUDING REMARKS

Despite numerous challenges, the conference "Heavy Machinery - HM" has been successfully realized and its tradition has been kept for 30 years.

The scientific conference "Heavy Machinery" contributes to spreading international scientific-technical

cooperation among universities, especially spreading scientific-technical and educational cooperation with universities from the Balkan countries as well as cooperation with the EU countries, Russia and ex-Soviet Union countries.

The last ten years have shown a noticeable decreasing trend in the number of papers and the number of

participants at the conference if compared to the conferences held in the nineties of the twentieth century.

This problem is also present at the other conferences organized by our universities, and especially national conferences. Papers published at conferences have a lesser or no value for the promotion to academic and research ranks or for applying to national and international projects, which considerably decreases motivation for publishing papers.

The mentioned conditions have already been applied in the EU countries for a considerable period of time. This has affected the motivation of authors to appear at conferences which require additional costs: accommodation, travel, translation of papers, fees, etc.

Regardless all difficulties, the conference "Heavy Machinery HM" has been accomplishing its main goal successfully – to gather scientists and experts in this field, from our country and the region.

The conference also offers a possibility to young researchers to present their results to a wider scientific community.

The participation of scientists and professionals from thematic fields, from our country and abroad, with the presentation of their own results of research represents a significant support to the successful work of educational and scientific organizations in our country. The participants of the conference show that, in spite of currently difficult conditions for work, there are potentials which could contribute to the development of science and economy.

The conferences that have so far provided the presentation of results of research in the fields that are of current interest can significantly contribute to the education of experts in these fields as well as to the application of the results in the companies of our country. Therefore, the organizer of the "Heavy Machinery HM" conference should certainly make further efforts to keep its successful realization in the period to come.

# ACKNOWLEDGEMENTS

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## REFERENCES

[1] International Conference Heavy Machinery - HM 1993, Kruševac-Vrnjačka Banja, 1993, Proceedings, Kraljevo, 8-10 October 1993.

[2] International Conference Heavy Machinery - HM 1996, Kraljevo, 1996, Proceedings, Kraljevo-Mataruška Banja, 28-30 June 1996.

[3] The Third Triennial International Conference Heavy Machinery - HM 1999, Kraljevo, 1999, Proceedings, Kraljevo-Mataruška Banja, 28-30 October 1999.

[4] The Fourth Triennial International Conference Heavy Machinery - HM 2002, Kraljevo, 2002, Proceedings, ISBN 86-82631-55-6, Kraljevo-Mataruška Banja, 28-30 June 2002.

[5] The Fifth Triennial International Conference Heavy Machinery - HM 2005, Kraljevo, 2005, Proceedings, ISBN 978-86-82631-45-3, Kraljevo-Mataruška Banja, 28 June- 03 July 2005.

[6] The Sixth Triennial International Conference Heavy Machinery - HM 2008, Kraljevo, 2008, Proceedings, ISBN 978-86-82631-45-3, Kraljevo-Mataruška Banja, 24-29 June 2008.

[7] The Seventh Triennial International Conference Heavy Machinery - HM 2011, Kraljevo, 2011, Proceedings, ISBN 978-86-82631-45-3, Vrnjačka Banja, 29 June-02 July 2011.

[8] The Eighth Triennial International Conference Heavy Machinery - HM 2014, Kraljevo, 2014, Proceedings, ISBN 978-86-82631-74-3, Zlatibor, 25-28 June 2014.

[9] The Ninth Triennial International Conference Heavy Machinery - HM 2017, Kraljevo, 2017, Proceedings, ISBN 978-86-82631-89-7, Zlatibor, 28 June-01 July 2017.

[10] The Tenth Triennial International Conference Heavy Machinery - HM 2021, Kraljevo, 2021, Proceedings, ISBN 978-86-81412-09-1, Vrnjačka Banja, 23-25 June 2021.