SAFECOS 05

SAFEty **CO**mpetition for **S**tudents **05**

Contract no.: 516423

SPECIFIC SUPPORT ACTION

SIXTH FRAMEWORK PROGRAMME

PRIORITY 1.6.2 Sustainable development, global change and ecosystems - Sustainable surface transport

Final Activity Report

Period covered: from 01 October 2004 to 30 November 2005

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Executive summary

The general objective was to organise and support the European part of a worldwide competition for the design, development and demonstration of technological innovations proposed by students with the objective of improving road vehicle safety and users crash protection.

It was considered that, in European countries as well as in North America and in Japan, students are not attracted by science and technology.

Every two years, an International Technical Conference on the Enhanced Safety of Vehicles takes place alternatively in North America, Europe and Asia/Pacific; this conference is attended by representatives of governments, industry and the scientific community and it has become a reference for vehicle safety improvement over the years.

The 19th ESV Conference took place in Washington DC, USA on June 6-9, 2005, and it is planned that the 20th conference will be organised in Europe two years after. Each conference is organised by one of the ESV country members which are: USA and Canada for North America, France, Germany, Hungary, Italy, The Netherlands, Poland, Spain, Sweden and the United Kingdom for Europe, and Australia, Japan and South Korea for Asia/Pacific.

Taking into account the above statement, and with the view of attracting more young researchers, the ESV International Committee has decided to organise a student competition to design, develop and demonstrate technological innovations to improve road vehicle safety and users crash protection.

The aim of this specific support was to organise and support the European part of this competition. This would allow European students to compete with North American, Asian and Australian students.

The competition was organised along the same procedure in the three world areas (Europe, North America and Asia/Pacific).

For Europe, the information on the competition has been distributed, through EEVC, APSN and IRCOBI mailing lists; to universities through the 25 European countries.

Eleven written proposals were received out of which five were selected by a group of experts belonging to EEVC.

The five selected projects were:

1) "Development of a Mechanical Neck for a 6-Year-Old Pedestrian Dummy"
   Chalmers University of Technology - Crash Safety Division (Sweden)
2) "Lateral Safety for Children"
   E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)
3) "Smart Helmet"
   E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)
4) "A Novel Active Head Restraint System"
   School of Mechanical and Manufacturing Engineering, Loughborough University (UK)
5) "Virtual Proving Ground for Active Safety System Testing Based on Software Fusion"
   Belarusian National Technical University - Dept. of Automobiles (Belarus)

Each selected team was granted a financial support through the SAFECOS05 project to build a (scale) model of its proposal.

A jury of three international experts, appointed by EEVC, visited the five teams. Each team presented their project during half a day to those experts who had the opportunity to ask questions to students. Each project was rated using the same criteria including potential benefits, technical feasibility, and innovation degree.

Based on the rating results, two projects were selected to be presented during the 18th ESV Conference, which took place in Washington D.C. on 6-9 June, 2005.

The selected projects were:

1) "Lateral Safety for Children"

   E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)

2) "A Novel Active Head Restraint System"

   School of Mechanical and Manufacturing Engineering, Loughborough University (UK)

SAFECOS 05 supported the travel of two students of each team to Washington, and their projects were exhibited to compete with 5 other projects (two from North America, three from Asia/Pacific region).

An international jury of 9 experts evaluated the 7 competing projects during a formal presentation at the exhibition site, using a standard procedure, in order to select the final winner of the competition.

The project: "Lateral Safety for Children" presented by the University of Valladolid (Spain) won the competition and the two students were congratulated during the closing session of the Conference.

Section 1. Project execution

This project was aimed at supporting the European participation in a worldwide competition for the design, development and demonstration of technological innovations proposed by student teams, with the objective of improving road vehicle safety and users crash protection.

This objective was reached as we were able to organize the different steps of the competition for Europe, and to coordinate with counterparts in North America and Asia/Pacific.

This coordination with other parties was made through telephone conferences, exchange of E-mails and two meetings.

This allowed using the same rules for the competition in different parts of the world and, at the end, to select a winner.

The competition was organized in several steps, the main ones being:

- the distribution of competition rules, including deadlines, to university teams around Europe,

- the organization of a jury to analyse the eleven written proposals which were received, and select five among them,

- the visit, by a jury of three experts, of each of the five selected teams who presented their scale model,

- the selection of two of them for the next step, which was the exhibition of the model during the ESV Conference.

Finally, one of the two European teams won the worldwide competition.

The objective of SAFECOS05 was to attract European young researchers to the theme of technical innovations for the improvement of road safety. The results were even above the expectations since we received more proposals than the other world regions and those proposals were very innovative.

Section 2. Work package progress of the period

2.1. Work Package 1 - Organisation of the 1st stage of the competition

WP Objectives

- Co-ordination with NHTSA and JMLIT
- Information to Universities
- Analysis of proposals and selection of the 5 final competitors

Progress towards objectives

The first stage of the competition was aimed at agreeing on common rules to apply to the competition in the three world regions (North America, Asia/Pacific and Europe), then distributing the information to universities throughout Europe, analyse and rank the proposals received in order to select five of them.

We have agreed on rules to apply to the competition during telephone conferences and E-mail exchanges. These rules were sent to university teams in Europe using mailing lists from different organizations linked to universities. These rules are appended to this report in annex 1.

The announcement of the competition was even sent before the beginning of the project, in order to allow the student teams to think about the innovations they would develop.

We received eleven proposals early October 2004 and these proposals were examined by the EEVC Steering Committee members following a rating procedure, and the five proposals which got the highest score were selected.

Final Score

Project no.	Title	Institute	Final Rating
762	**Smart Helmet**	ETS de Ingenieros Industriales, Universidad de Valladolid (Spain)	**4**
737	**A Novel Active Head Restraint System**	School of Mechanical and Manufacturing Engineering Loughborough University (UK)	**4**
735	**Development of a**	Chalmers University of Technology, Crash Safety Division (Sweden)	**4**

Project no.	Title	Institute	Final Rating
	Mechanical Neck for a 6-Year-Old Pedestrian Dummy		
763	**Lateral Children's Safety**	ETS de Ingenieros Industriales, Universidad de Valladolid (Spain)	**4**
674	**Active Safety Testing Based on Software Fusion**	Belarusian National Technical University, Minsk (Belarus)	**3**
715	**Improvements of the Biofidelity of the THOR Alpha Shoulder-Complex**	Chalmers University of Technology, Dept. of Machine & Vehicle Systems (Sweden)	**3**
764	**Adaptability of Vehicles to Disabled People**	ETS de Ingenieros Industriales, Universidad de Valladolid (Spain)	**2**
766	**Magnetic Cushion**	ETS de Ingenieros Industriales, Universidad de Valladolid (Spain)	**2**
738	**Multibody Dynamic Model of a Crash Test Dummy**	School of Mechanical and Manufacturing Engineering Loughborough University (UK)	**2**
757	**New Retention System**	ETS de Ingenieros Industriales, Universidad de Valladolid (Spain)	**2**
755	**Crash Prevention Based on an Assistance System**	Universidad Politecnica de Madrid (Spain)	**0**

The jury was composed of 7 people. Each jury member had to rate the projects in order to select five of them. Four projects had a final score of 4, and two projects had a score of 3. In order to get a number of 5 selected projects, it has been proposed to select the project no 674, since the project no 715 comes from a university team which already had one project selected.

The five selected project are listed hereafter, and the report of the jury is appended to this project, in annex 2.

1) "Development of a Mechanical Neck for a 6-Year-Old Pedestrian Dummy"
Chalmers University of Technology - Crash Safety Division (Sweden)

2) "Lateral Safety for Children"
E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)

3) "Smart Helmet"
E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)

4) "A Novel Active Head Restraint System"
School of Mechanical and Manufacturing Engineering, Loughborough University (UK)

5) "Virtual Proving Ground for Active Safety System Testing Based on Software Fusion"
Belarusian National Technical University - Dept. of Automobiles (Belarus)

2.2. Work Package 2 - Organisation of the final competition

WP Objectives

- to select the two winners projects
- to present the two winners projects at the 2005 ESV Conference

Progress towards objectives

A group of three experts visited the five university teams during week 6 of 2005; each team presented their project, made a demonstration of their model and had to answer to the questions from the jury members.

For each of the five projects, each jury member had to rate the proposal according to 4 criteria:

- potential impact on safety problems (max score 40)
- originality (max score 20)
- practicability of creating a functional scale model (max score 20)

- supporting details, quality, technical depth (max score 20).

Based on that procedure, two proposals were selected:

1) "Lateral Safety for Children"
E.T.S. de Ingenieros Industrales - Univ. Valladolid (Spain)

2) "A Novel Active Head Restraint System"
School of Mechanical and Manufacturing Engineering, Loughborough University (UK)

Advices were given to the two winner proposals in order to improve their scale model and to prepare the exhibition at the 19th ESV Conference.

A part of the exhibition space of the 19th ESV Conference was allocated to the student competition booths. This space comprised 9 booths, including the two European ones. Everything was organized to transport the material (models, posters, etc.) to Washington, and two students of each team had their trip paid to attend the 19th ESV Conference, and their living expenses (hotel, food, etc.) refunded.

During the Conference, a jury of 9 experts (including three European) was appointed and on Wednesday afternoon, each team had to present and describe their invention at their booth for half an hour, and then had to answer to questions from the jury.

Each jury member had to fill a rating form; based on the 9 rating forms content, an average rating was calculated for each team, and finally, the European team from E.T.S. de Ingenieros Industrales, University of Valladolid, Spain won the competition.

During the closing ceremony of the Conference, the winner team received a plaque and was congratulated.

Hereafter are the pictures of the winner team booth and of the time of congratulations.

2.3. Work Package 3 - Valorisation of winner's project

WP Objectives

- Build an IPR plan with the Winner
- Build a Business Plan

Progress towards objectives

Once the winners were selected by the jury, they were proposed to elaborate a business plan and an IPR protection plan.

During summer 2005, as planned in the technical Annex, the proposal was sent to both regional winners, CIDAUT and University of Loughborough. The objective was then to enhance the dissemination of results of both participants. It was chosen to propose them to draft both plan. It was not planned to force them to do such plans as these plans must come from a personal decision and can not be done against the will of the owner of the results.

2.4. Work Package 4 - Management of the project

See section 3

Section 3. Consortium management

The consortium remained the same during the all project. The involvement of partners was very good.

The Project meetings were as frequent as needed. They were not made on a regularly basis, because of the small number of participants to the project. It was easier to make meeting on a case to case basis, regarding the needs of the Project.

The participants met especially to solve the problem raised by the Belarussian team. Indeed this team could not receive the money of the grant directly, because of national constrains, as explained above.

Section 4. Other issues

The other issues addressed by the project were the gender issue and the ethical issue.

To address the Gender issue, it was decided that the composition of the team participating to the competition would not be known by the Jury. Indeed, the jury did not take into account the male/female repartition within the teams.

Concerning Ethical issues, no specific ethical issue were raised. The issues foreseen in the Technical Annex of the project did not appear. None of the team worked on Humans beings, Humans Biological samples or Personal Data. The tests did not involved Human Beings, Human Biological samples, and no Personal Data.