SPRING 2010 ENGINEERING DYNAMICS CORPORATION

Technical Newsletter

Available on-line in the EDC Library at www.edccorp.com

Version 8, *HVE* Training Partners & More!

EDC has been extremely busy working on important projects and programs to help and support users. Here is a brief rundown of the latest news and activities that will be of interest to you:

Announcing *HVE* & *HVE-2D* Version 8.0

Version 8.0 is coming on June 14th! This latest release continues to add to the more and more capabilities and refinements to the features and enhancements contained in Version 7. A list of what users will find in Version 8 is available on page 4.

Announcing *HVE-CSI*

HVE-CSI is a unique version of *HVE* that focuses directly on the needs of the law enforcement crash reconstructionist. *HVE-CSI* provides the basic reconstruction and simulation capabilities used to investigate a crash by including two well known reconstruction software tools, *EDCRASH* and *EDSMAC*. These tools have been extensively validated, and results have been presented and accepted in courts worldwide for over 20 years. More information about *HVE-CSI* is found on page 5.

HVE Training Partners

HVE and *HVE-2D* users looking to improve their skills, but unable to attend one of EDC's regularly scheduled courses, can contact one of the *HVE* Training Partners for assistance. *HVE* Training Partners are experienced *HVE* and *HVE-2D* users who offer introductory and custom training courses on the use of *HVE*, *HVE-2D* and compatible physics programs. More information about *HVE* Training Partners is found on page 6.

HVE Environment Modeling Partners

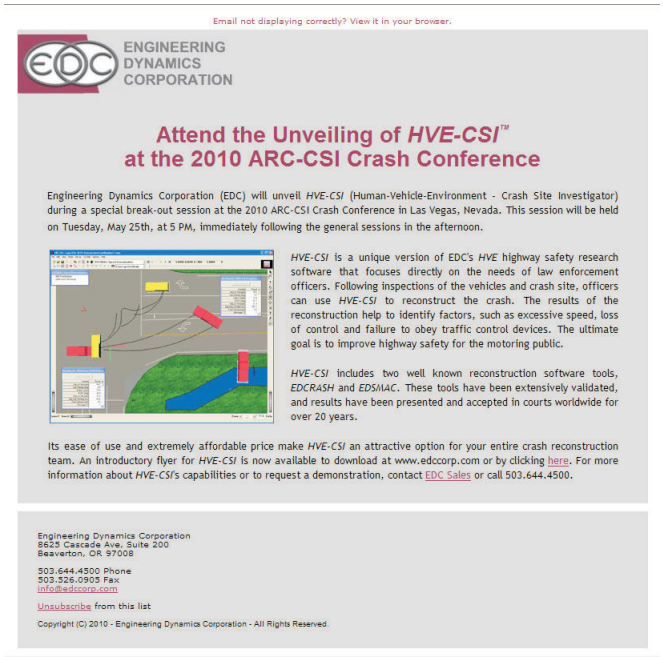
To help users who need highly-detailed environments but don't have the internal resources to build them, EDC has established a network of CAD and graphics professionals experienced in building environments for *HVE* and *HVE-2D*. This network also includes *HVE* users offering to help other users with their expertise in environment (and even vehicle) model building. More information about Environment Modeling Partners is found on page 6.

2011 *HVE* Forum

The date and location of the 2011 *HVE* Forum is set! Mark your calender for February 21 - 25, 2011, at the Chaparral Suites Scottsdale in Scottsdale, Arizona. Whether you're a brand new user of *HVE*, *HVE-2D* and *HVE-CSI*, or you've been attending the Forum for 15 years, you'll find that the workshops are full of helpful tips and techniques for using the latest release. More information about the 2011 *HVE* Forum is available on page 6.

Informative Email Campaign

Are you staying apprised of the latest *HVE* related news and activities? If not, then join the Informative Email subscriber list. Last year, EDC implemented a regular email marketing campaign designed to keep users informed on important announcements and offers. These emails contain the latest details about training courses, features and enhancements in current and upcoming software updates, limited-time sales offers, and other exciting news related to *HVE*. If you would like to include yourself on the list of email recipients, please contact EDC Customer Service.



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ENGINEERING DYNAMICS CORPORATION

Attend the Unveiling of *HVE-CSI*™ at the 2010 ARC-CSI Crash Conference

Engineering Dynamics Corporation (EDC) will unveil *HVE-CSI* (Human-Vehicle-Environment - Crash Site Investigator) during a special break-out session at the 2010 ARC-CSI Crash Conference in Las Vegas, Nevada. This session will be held on Tuesday, May 25th, at 5 PM, immediately following the general sessions in the afternoon.

HVE-CSI is a unique version of EDC's *HVE* highway safety research software that focuses directly on the needs of law enforcement officers. Following inspections of the vehicles and crash site, officers can use *HVE-CSI* to reconstruct the crash. The results of the reconstruction help to identify factors, such as excessive speed, loss of control and failure to obey traffic control devices. The ultimate goal is to improve highway safety for the motoring public.

HVE-CSI includes two well known reconstruction software tools, *EDCRASH* and *EDSMAC*. These tools have been extensively validated, and results have been presented and accepted in courts worldwide for over 20 years.

Its ease of use and extremely affordable price make *HVE-CSI* an attractive option for your entire crash reconstruction team. An introductory flyer for *HVE-CSI* is now available to download at www.edccorp.com or by clicking here. For more information about *HVE-CSI*'s capabilities or to request a demonstration, contact EDC Sales or call 503.644.4500.

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Technical Session

During execution, a *SIMON*/*DyMESH* collision simulation produces a significant amount of detailed information about the collision. In addition to a force vs. time history (and, therefore, an acceleration vs. time history as well), the simulation produces a detailed deformation vs. time history. These results are maintained in a new routine, called CollisionData. The CollisionData results may be combined and used to describe in great detail the individual impulses applied to each vehicle. This information is presented in *SIMON*'s new Damage Data report (see Figure 1).

Overview

During execution, *HVE*'s new CollisionData routine keeps track of the following information for each vehicle:

- Impulse Number
- "Other" Vehicle
- Peak Acceleration
- Peak Force
- Pulse Times (start, end, duration, peak force)
- PDOF (azimuth and zenith)
- Delta-V
- Impulse Center Coordinates
- Damaged Vertices

The above information is used to develop a detailed 3-dimensional impulse history that may include secondary and/or multiple simultaneous impacts on the subject vehicle. At the conclusion of the simulation, the CollisionData routine parses the impulse history to produce the data presented in *SIMON*'s Damage Data report. The Damage Data report is divided into three sections:

- Collision Kinetics
- Damage Profiles
- Crush Tables

Collision Kinetics Table

This report displays the following results for each vehicle:

Impulse Number – A sequential index identifying the unique impulse

Collision With – The name of the other vehicle sharing the impulse

Collision Pulse Start, End and Length – The time at which the impulse begins and ends, and the duration (end time minus start time), identified by the presence of a force acting on any of the vertices included in the pulse.

Peak Acceleration – The acceleration peak occurring during the pulse

Peak Force – The peak force acting on the vertices included in the pulse

Delta-V – The integrated acceleration vs. time history for the pulse

PDOF – The direction of the peak force occurring during the pulse

CollisionData calculates the traditional PDOF azimuth angle (i.e., the angle in the vehicle's x-y plane), as well as the zenith angle (the vertical angle). Only the azimuth angle is displayed in the table.

Because each vehicle may have up to 10 collision pulses, the Collision Kinetics table provides detailed impulse information about each collision the vehicle encounters during an event. The individual breakdown for each impulse can be extremely useful when addressing issues involving occupant exposure to injury.

Damage Profiles

This report displays the following results for each vehicle:

Impulse Number – A sequential index identifying the unique impulse (same as above)

Collision With – The name of the other vehicle sharing the impulse (same as above)

CDC – The Collision Deformation Classification, as defined by SAE Recommended Practice J224b, for the pulse.

Damage Width – The width of damage, determined by the minimum and maximum coordinates of the damaged vertices along the end or side of the vehicle. For top or bottom damage, the width is the in the direction of the vehicle's x axis (consistent with SAE J224b).

Damage Offset – The lateral distance from the vehicle CG to the center of the damage width.

Damage Height – The vertical height of damage, also determined by the minimum and maximum coordinates of the damaged vertices along the end or side of the vehicle. For top or bottom damage, the height is the in the direction of the vehicle's y axis (consistent with SAE J224b).

Height Offset – The vertical distance from the vehicle CG to the center of the damage width.

Maximum Crush – The maximum vehicle total crush depth (including free space), defined by the damage vertex with the greatest deformation.

Note that the Damage Profile information is 3-dimensional. The 3rd character may be 'T' (top) or 'U' (undercarriage). The 5th character of the CDC describes the elevation of damage (i.e., below the beltline, under-ride, overall height, etc.). A complete CDC is generated for a rollover (actually, it will probably be a series of CDCs for the individual impulses). This is the industry's first 3-dimensional CDC simulation!

Crush Depth Tables

This report displays the following results for each vehicle:

Impulse Number – A sequential index identifying the unique impulse (same as above)

Collision With – The name of the other vehicle sharing the impulse (same as above)

Elevation – By default, the CollisionData routine divides the damage height into 4 zones, resulting in crush measurements at 5 elevations.

Crush Depths – By default, the CollisionData routine divides the damage width into 4 zones, resulting in 5 crush depths at each elevation.

Crush depth is calculated by creating a vector at each crush location that is parallel to the vehicle x-y plane and perpendicular to the vehicle surface. The vector's origin is on the "shoebox" that is defined by the vehicle's overall dimensions, and is directed inward. The point of intersection with the undamaged surface geometry defines the free space for that crush location. The point of intersection with the damaged surface defines the total crush depth. The actual crush depth is the difference between the total crush depth and free space.

Damage Data-SIMON, Untitled Event

--------- VEHICLE COLLISION KINETICS ----------

Vehicle Name: Acura 3.2TL 4-Dr

Imp No	Collision With	Start (sec)	End (sec)	Length (sec)	Accel (g)	Force (lb)	Delta-V (mph)	PDOF (deg)
		--- Collision Pulse ---			---- Peak ----			
1	Buick Century 4-Dr	0.0160	0.1200	0.1040	23.80	87453	21.4	56.2
2		0.1780	0.2600	0.0820	0.91	1997	1.4	38.6

Vehicle Name: Buick Century 4-Dr

Imp No	Collision With	Start (sec)	End (sec)	Length (sec)	Accel (g)	Force (lb)	Delta-V (mph)	PDOF (deg)
		--- Collision Pulse ---			---- Peak ----			
1	Acura 3.2TL 4-Dr	0.0165	0.1135	0.0970	29.82	87191	26.6	-37.2
2		0.1785	0.2535	0.0750	0.46	1986	0.5	-100.0

---------- VEHICLE DAMAGE PROFILES ----------

Vehicle Name: Acura 3.2TL 4-Dr

Imp No	Collision With	CDC	Damage Width (in)	Width Offset (in)	Damage Height (in)	Height Offset (in)	Max Crush (in)
1	Buick Century 4-Dr	02RZEW4	89.7	26.0	24.5	1.9	19.2
2		01RPEW4	17.1	-20.6	11.3	8.1	13.5

Vehicle Name: Buick Century 4-Dr

Imp No	Collision With	CDC	Damage Width (in)	Width Offset (in)	Damage Height (in)	Height Offset (in)	Max Crush (in)
1	Acura 3.2TL 4-Dr	11FDEW2	66.7	0.1	23.9	2.3	9.9
2		09LZEN1	10.5	46.0	13.3	7.1	0.8

--------- VEHICLE CRUSH DEPTH TABLES ----------

Vehicle Name: Acura 3.2TL 4-Dr

Imp No	Collision With	Elevation (in)	C1 (in)	C2 (in)	C3 (in)	C4 (in)	C5 (in)
			-------- Crush Depths ----------				
1	Buick Century 4-Dr	-10.4	0.0	5.7	0.5	0.0	0.0
		-4.3	3.1	16.4	11.4	11.7	0.0
		1.9	6.9	16.8	19.2	2.4	0.0
		8.0	4.8	16.8	11.0	7.5	1.1
		12.3	1.4	15.6	11.1	6.2	0.0
2	Buick Century 4-Dr	2.5	0.0	0.4	3.1	10.1	13.5
		5.3	0.1	0.5	2.2	9.4	13.2
		8.1	0.1	0.6	2.6	7.9	12.8
		10.9	0.0	0.3	1.1	5.8	11.1
		12.3	0.0	0.1	0.9	4.4	10.2

Vehicle Name: Buick Century 4-Dr

Imp No	Collision With	Elevation (in)	C1 (in)	C2 (in)	C3 (in)	C4 (in)	C5 (in)
			-------- Crush Depths ----------				
1	Acura 3.2TL 4-Dr	-9.6	0.0	0.0	1.9	0.0	0.0
		-3.6	0.0	6.1	9.9	6.2	0.0
		2.3	0.2	4.4	0.6	1.4	0.0
		8.3	0.0	6.5	2.4	1.9	0.0
		13.3	0.0	0.3	1.0	0.0	0.0
2	Acura 3.2TL 4-Dr	0.5	-0.2	0.2	0.1	0.1	0.2

Figure 1 - Damage Data output report for a two vehicle collision that includes secondary impact

The CollisionData routine calculates the actual crush depth, free space and total crush depth on the impacted surface. However, only actual crush depth is displayed in the table.

DamageStudio

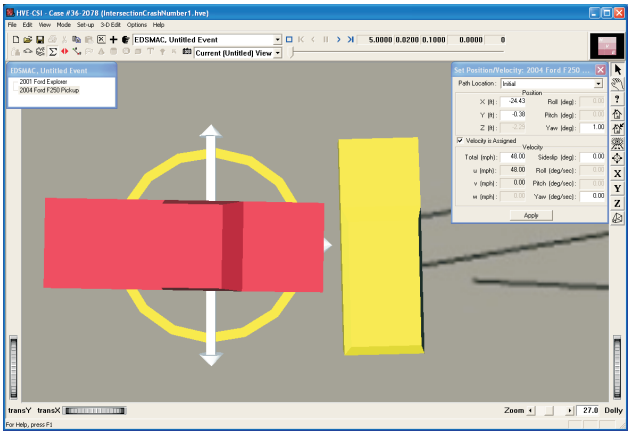
DamageStudio is a tool that allows the user to visualize the CollisionData results. In addition to visualizing the final damage profile, DamageStudio allows the user to step through time and watch as the individual impulses occur during the simulation. DamageStudio also allows the user to directly compare simulated damage to phonographs of damage by overlaying the two views.

Our Summer Newsletter's Technical Session will illustrate the use of DamageStudio.

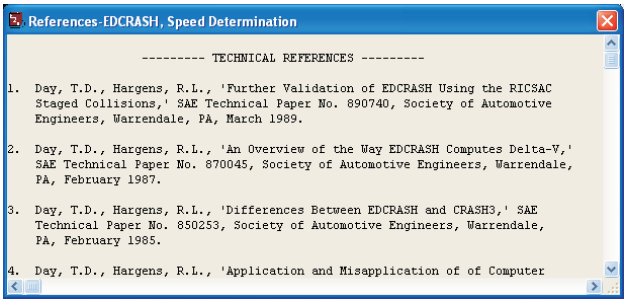
HVE & *HVE-2D* Version 8.0 Features Overview

The list of new features, enhancements and capabilities found in Version 8.0 includes:

- ***HVE-CSI*** - *HVE-CSI* is a unique version of *HVE* that focuses directly on the needs of the law enforcement crash reconstructionist. *HVE-CSI* will be released as *HVE-CSI* Version 8, in conjunction with *HVE* and *HVE-2D* Version 8.
- **Clutch Model** - The *HVE* Drivetrain Model will include a clutch in Version 8. The clutch allows the user to accelerate a vehicle from a stop. Like a real clutch (manual transmission) or torque converter (automatic transmission), the *HVE* clutch allows slippage between the engine and the transmission that allows greater torque to be transmitted to the drive wheels. The amount of slippage and torque increase is a function of throttle application. Users are encouraged not to spend too much time setting up drag races between vehicles!
- **Vehicle Editor Enhancements** - Vehicle Editor dialogs for suspension, brake and tire parameters now allow the user to copy the values across the axle and also to copy to other axles on the same vehicle. The Wheel Images menu selection now allows a user to quickly apply a wheel image to 'This Wheel', 'This Axle' or 'All Wheels' of the vehicle.
- **3-D Editor Viewer Customization** - User can now select between the traditional 4-viewer layout or a single full screen X-Y, X-Z, Y-Z or Perspective viewer.
- **Improved Vehicle Positioning** - *HVE-2D* users will find the yaw rotation manipulator has been modified to allow them to easily select and rotate a vehicle from their overhead camera view.



- ***HVE* Human Occupant Positioning** - When setting up an event, a human within a vehicle will automatically appear in the location assigned in the Human Editor. For example, a human assigned to the Front, Left position in the Human Editor will appear in the front, left seat of the vehicle as expected!
- **Resizable File Browser** - Users will now be able to easily select case, and vehicle or environment geometry files using a new, resizable file browser.
- **Driver Controls Table Editing** - Users will now be able to select multiple fields in their Driver Control tables for the purpose of deleting entire rows of values.
- **Vehicle Wizard Enhancements** - The Vehicle Wizard now allows the user to edit the Front and Rear Overhang dimensions of a Generic Vehicle.
- **Key Results/Variable Output** - Users can now choose which default variables to display in their Key Results and Variable Output reports. Users will also find that their Key Results settings will also be applied when they copy events as well.
- **References Reports** - A new report is now available in Playback. The References report provides a list of Technical Reference Publications that explain the calculation routines and provide application and validation information for each physics program.



- **New Damage Data Report** - *SIMON*'s Damage Data report now includes individual tables for each individual collision impulse. The tables display 3-dimensional damage profile data (CDC, PDOF and damage profile), impulse data (start time, end time and duration of impulse, peak acceleration and force and delta-V), and a table of crush depths at up to five elevations.
- **Vehicle Database** - The following vehicles will be included in the *EDVDB* Vehicle Database :

Vehicle	Year Range
Ford Ranger Flareside Pickup	1998 - 2010
Volvo V70 Cross Country	2002 - 2010

HVE-CSI Crash Reconstruction Software for Law Enforcement

HVE-CSI is a unique version of *HVE* that focuses directly on the needs of the law enforcement crash reconstructionist. *HVE-CSI* provides the basic reconstruction and simulation capabilities used to investigate a crash by including two well known reconstruction software tools, *EDCRASH* and *EDSMAC*. These tools have been extensively validated, and results have been presented and accepted in courts worldwide for over 20 years.

Following inspections of the vehicles and crash site, *HVE-CSI* is used to reconstruct the crash. Users quickly create vehicles and a scaled environment from an aerial photo, crash site drawing or other source. *EDCRASH* and *EDSMAC* are then used to identify the severity and possible causes of the crash, such as excessive speed, loss-of-control or failure to obey traffic control devices. *HVE-CSI* creates extensive reports and simulation movies, allowing the reconstructionist to quickly complete an analysis, document their work and move to the next case.

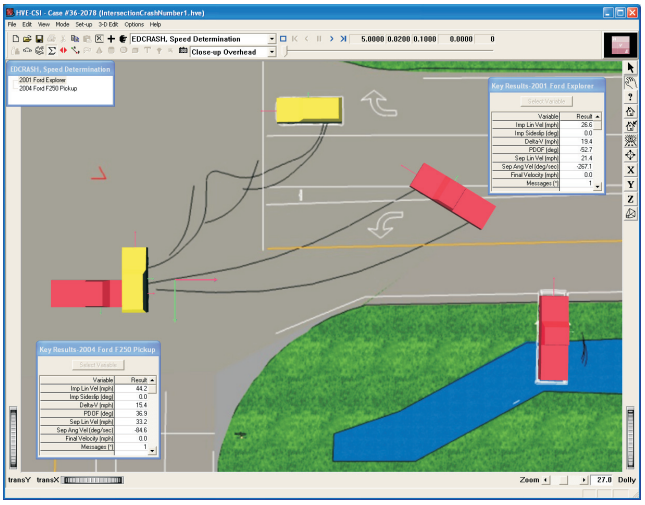
HVE-CSI's ease-of-use and extremely affordable price mean your entire crash reconstruction team will be able to use the program, rather than limiting its use to a single team member.

HVE-CSI has the following components:

- **Vehicle Editor** – Users create and quickly modify a generic vehicle to match their actual vehicles. The Vehicle Wizard provides an excellent template for quickly assigning vehicle dimensions, weights and weight distribution. Additionally, the user can click on icons on the vehicle to change the color, crush stiffness values and tire friction and cornering properties.
- **Environment Editor** – Aerial photos, crash site drawings and Google Earth maps are used as environment models. The user enters the dimensions of their scene and *HVE-CSI* automatically builds a scaled surface with their selected image. It's that easy!
- **Event Editor** – Users set up their *EDCRASH* and *EDSMAC* runs by entering positions, velocities, driver controls and crush damage measurements. Efficiency tools, such as the Distance Tool, allow the user to quickly determine distances between vehicles, skidmarks, tire-tracks and other important reference points. Results of *EDCRASH* and *EDSMAC* calculations are displayed in the main viewer. Numeric results are presented in Key Results windows. The Event Controller allows the user to change inputs, reset the event, and quickly analyze alternative scenarios.
- **Playback Editor** – Output reports documenting the user's work are available in the Playback Editor in several formats, including text reports, variable output spreadsheets and graphical vehicle trajectories and damage profiles. AVI format video can also be produced directly from the Playback Window, providing movies of simulations that are easily incorporated into presentations.

When questions arise during their work, *HVE-CSI* users can access detailed User's Manuals directly within their installation. On-line assistance is also available via the "How Do I?..." link found on the EDC website. *HVE-CSI* users looking to further their skills can attend regularly scheduled EDC training courses or contact an *HVE* Training Partner for introductory and customized training courses.

HVE-CSI will be available in conjunction with the release of Version 8. Additional details about *HVE-CSI* will be provided by direct e-mail announcement and posted on www.edccorp.com and www.HVE-CSI.com.



This screenshot is from a reconstruction in HVE-CSI using EDCRASH to calculate impact speeds and the delta-V of an intersection crash between an SUV and a pickup. The impact and final rest positions of the vehicles have been input, along with drag at each wheel. Increases in tire friction due to tire blow-out and damage to the axles of the target vehicle have been included.

HVE Training Partners

HVE, *HVE-2D* and *HVE-CSI* users looking to improve their skills, but unable to attend one of EDC's regularly scheduled courses, can contact one of the *HVE* Training Partners for assistance. *HVE* Training Partners are experienced *HVE* and *HVE-2D* users who offer introductory and custom training courses on the use of *HVE*, *HVE-2D* and compatible physics programs. A list of "*HVE* Training Partners" is available through the Partners link on the EDC website or by contacting EDC Customer Service.

Experienced users of *HVE* and *HVE-2D* are encouraged to become an *HVE* Training Partner servicing a local region. If you are interested, please complete and submit the *HVE* Training Partner application. The application form requires contact information as well as identifying your experience in the industry and the types of training courses that you will be offering. Application forms are available on the Partners page of the website and also by contacting EDC Customer Service at 503.644.4500.

HVE Environment Modeling Partners

To help users who need highly-detailed environments for simulations but don't have the internal resources to build them, EDC has established a network of CAD and graphics professionals experienced in building environments for *HVE* and *HVE-2D*. This network also includes *HVE* users offering to help other users with their expertise in environment (as well as vehicle) model building. A list of "*HVE* Environment Modeling Partners" is available through the Partners link on the EDC website or by contacting EDC Customer Service.

HVE Partners

If your project requires advanced simulation modeling or expertise, you may wish to contact one of the organizations listed on the *HVE* Partners page in the Partners section of the EDC website. The *HVE* Partners are trained, experienced users of *HVE* and *HVE*-compatible physics programs. This list does not identify all *HVE* users worldwide, but only those who have asked that their contact information be displayed for referral purposes only.

If you are an experienced *HVE* user and would like to be included as an *HVE* Partner, or as an *HVE* Training Partner or *HVE* Environment Modeling Partner, please contact EDC Customer Service.

2011 *HVE* Forum Scottsdale, AZ February 21 - 25, 2011

Make plans now to attend the 2011 *HVE* Forum, February 21 - 25, 2011, at the Chaparral Suites Scottsdale in Scottsdale, Arizona. The 2011 *HVE* Forum is your opportunity to learn how to use the latest features and capabilities of *HVE*, *HVE-2D* and *HVE-CSI*. An excellent selection of workshops designed for beginning, intermediate and advanced users, along with User's Groups, the *HVE* White Paper session and interactive social hours at the end of each day are waiting for you.

Introductory workshops are a great way to learn to navigate the user interface and start using the physics programs. Advanced workshops provide details on specific topics such as how to build a custom vehicle model, environment models from survey data and even work through real-world cases maximizing your use of the rich feature set of *HVE* and full capabilities of the physics programs.

A special room rate is available at the Chaparral Suites for 2011 *HVE* Forum attendees. To receive this rate, please make your reservation directly with the hotel using the group code "EDC 2011 *HVE* Forum".

Chaparral Suites Scottsdale
Scottsdale, Arizona
1.800.494.3146
www.chaparralsuites.com

Workshop schedules, descriptions and registration forms will soon be available on the 2011 *HVE* Forum pages at www.edccorp.com/2011HVEForum.

Call for Papers: *HVE* White Paper Session

Users interested in presenting a technical paper in the "*HVE* White Paper" session at the 2011 *HVE* Forum are invited to submit an abstract for consideration. Please submit your abstract to EDC Customer Service before September 1, 2010.

This session is an opportunity for you to showcase your skills to other users as well as to *non-HVE* users who may wish to hire you as a consultant. *HVE* White Paper topics include *HVE* Case Studies, any application of *HVE* showcasing its capabilities, and innovative tips and techniques using *HVE*. Please visit the *HVE* White Paper section of the EDC website library for a complete list of previous papers.

HVE and *HVE-2D* F.A.Q.

This section contains answers to frequently asked questions submitted to EDC Technical Support staff by *HVE* and *HVE-2D* users.

Q. I am trying to add a box to my environment model using the 3-D Editor. It appears that the buttons on my toolbar that used to allow me to quickly add objects are greyed out. They used to work before I installed Version 7.1, but not since. How do I add a box to my environment?

A. A change in the management of features in Version 7.1 accidently resulted in the disconnection with the toolbar buttons for 3D shapes in the 3-D Editor. The functionality to edit the shapes still exists, just the quick button to add the object is temporarily disabled. This has already been fixed for the Version 8.0 release.

We have made a temporary solution available that will allow you to add the objects from the environment objects library of the 3-D Editor. Visit the Support, Downloads section of www.edccorp.com and locate the "Environment Library Shapes" download. Follow the instructions to add the box, cone, cylinder, light and sphere objects to your Library. When you need to add an object now in the 3-D Editor, just click on the Environment Library button and select the desired shape by filename. You'll see the shape added to your environment and the appropriate editor dialog will be displayed.

Q. I am running an EDSMAC4 simulation where the vehicle starts from a stop and accelerates into the intersection and turns left. I am noticing that at the beginning of the run, the vehicle is experiencing an unexpectedly high lateral acceleration which then drops down to a reasonable once the vehicle increases speed. I was trying to address this initial starting condition by reducing the Integration Timestep for Vehicle Trajectory, but it seems to have no effect whereas the Vehicle Separation timestep does. Why is this the case?.

A. The design of *EDSMAC* and *EDSMAC4* uses the setting for the Vehicle Separation timestep as the starting Integration Timestep. If a collision is detected within the first 100 timesteps, then the Vehicle Collision timestep will be used. If not, then the Vehicle Trajectory timestep will be used until a collision is detected. If you'd like to learn more about the internal workings of *EDSMAC* and *EDSMAC4*, attend the EDC Simulations course or download the EDC Simulations Training Manual, Publication 1055, in the Technical Reference Library of the EDC website. (After the initial 100 calculations it switches to the appropriate time step, whether that be collision or trajectory.)

Q. *I have created custom vehicle geometries for my casework and have given them unique filenames to identify the vehicle. I am able to view my custom vehicles with their custom geometries in the Vehicle Editor, but when I am in the Event Editor, the vehicle custom geometry is replaced with a generic image. What's happening and how do I get it to work properly?*

A. There are two possible reasons for this behavior. First, make sure that your vehicle geometry file is located in the supportFiles/images/vehicles directory. Second, make sure that the vehicle geometry filename is shorter than 26 characters plus the .h3d extension. Old versions (pre-5.20) allowed vehicle geometry filenames longer than 26 characters + .h3d so you may have older case files that now exhibit this behavior. The solution is to simply shorten the filename of your custom vehicle geometry and then reapply the geometry to your vehicle in the Vehicle Editor. Your case will work once again as expected.

Q. *I need to simulate a freeway pile-up collision scenario involving 20 vehicles. I am able to create an EDSMAC4 event with 20 vehicles in it, but when I try to increase beyond 20, I am unable to create the event. Why is this happening?*

A. While it is possible to create *EDSMAC4* simulations with any number of vehicles, there currently is a limitation of 20 vehicles in order to help users work quickly on their collision simulations. Every vehicle involved in an *EDSMAC4* collision simulation requires a certain amount of memory allocation to properly handle the display of the damage to the vehicle. As the number of vehicles increases, more and more memory is required, which if the user's computer is not equipped to handle, could lead to very slow performance during event calculation and playback. By limiting the user to 20 vehicles, it ensures that all users will have the best possible experience. Plus, it is probably advisable to break an entire freeway pileup scenario into several key events anyway, which would definitely involve less than 20 vehicles in each event. Simply stitch the sequence together in the Playback Window to display the entire scenario!

Visit the Support section of www.edccorp.com for the latest Downloads and answers to F.A.Q.'s

EDC Training Courses

EDC Reconstruction & EDC Simulations

EDC offers excellent one-week courses on the use of the *EDCRASH* reconstruction program or the use of simulation programs, such as *EDSMAC*, *EDSMAC4*, *EDSVS* and *EDVTS*. The **EDC Reconstruction** and the **EDC Simulations** courses are designed to fully investigate the inner workings of the physics programs. Lectures are full of helpful hints gained from years of experience. During the course, students will use the physics programs to complete several workshops highlighting the capabilities of each program discussed in the course.

Both new and long-time users of *HVE* and *HVE-2D* agree that these courses are extremely beneficial and challenging. It's the fastest way to learn what you really need to know – how to effectively use the physics programs and get the right results. Note: These courses focus on the physics programs, not on the user interface. For courses on using *HVE*, *HVE-2D* or *HVE-CSI*, check out the *HVE* Forum.

Vehicle Dynamics

The **Theoretical & Applied Vehicle Dynamics** course extends the scope of a general vehicle dynamics discussion by including several direct applications using the *SIMON* vehicle dynamics simulation program within *HVE* and providing a solid theoretical background for such simulations. The course is focused towards engineers and safety researchers with an interest in an understanding of vehicle dynamics and automotive chassis systems development.

Engineering Dynamics Corporation
Training Course Schedule

EDC Simulations

Los Angeles, CA . . . . . January 24 - 28, 2011
Miami, FL . . . . . November 2011

EDC Reconstruction

Los Angeles, CA . . . . . January 2012
Miami, FL . . . . . November 8-12, 2010

Theoretical & Applied Vehicle Dynamics

Upon Request

2011 *HVE* FORUM

Scottsdale, AZ. . . . . February 21 - 25, 2011

HVE Forum

The ***HVE* Forum** offers workshops designed to help *HVE, HVE-2D* and *HVE-CSI* users improve their modeling and application skills. By participating in workshops, attendees learn new techniques and also how to use the latest advancements in the software. The *HVE* Forum is also a great opportunity to meet other users and expand your network of resources.

Course Registration

To register for a course, download and a registration form from the Training pages at edccorp.com or by contacting EDC Customer Service at 503.644.4500 or by email to training@edccorp.com. All courses are eligible for Continuing Education Units and ACTAR credits.

HVE Training Partners

HVE, *HVE-2D* and *HVE-CSI* users looking to improve their skills, but unable to attend one of EDC's regularly scheduled courses, can contact an *HVE* Training Partner for assistance. *HVE* Training Partners are experienced *HVE* and *HVE-2D* users who offer introductory and custom training courses on the use of *HVE*, *HVE-2D*, and compatible physics programs.

HVE Discussion Groups

Websites hosted by experienced *HVE* Users offer information about using *HVE* as wells as moderated online discussions with other users. Be sure to visit:

tech.groups.yahoo.com/group/HVErecon - Discussion group hosted by Roman Beck of Casteel, Beck & Associates.

DiscoverHVE.com - Online training and discussion group hosted by Wes Grimes of Collision Engineering Associates

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