

# Transportation Systems Safety **HAT**

Hazard Analysis Tool



# What is SafetyHAT?

- A software tool that facilitates hazard analysis using STPA
- Customized for transportation systems

# Why Use SafetyHAT?

- Enter data using a streamlined, wizard-like format.
- Use a relational database to store, manage, and organize data.
- Facilitate documentation of your hazard analysis.

# How Does SafetyHAT Work?

## Main Menu

Welcome to the Transportation Systems Safety Hazard Analysis Tool (SafetyHAT). This tool will guide you through hazard analysis using the System-Theoretic Process Analysis (STPA) method.

Please complete the Preparatory Steps before accessing the forms below. The Preparatory Steps can be reviewed using the "Review Preparatory Steps" button at the bottom of this screen. A control structure diagram can be uploaded using the "Upload Control Structure Diagram" button at the bottom of this screen.

Complete the forms in the order presented below to ensure a complete analysis.

### Enter System Information

1.

Components

*This form allows you to enter the components of your system.*

2.

Connections

*This form allows you to enter connections between the components of your system.*

3.

Control Actions

*This form allows you to enter specific Control Actions issued by controllers in your system.*

### Conduct Analysis

4.

Accidents or Losses

*This form will allow you to enter accidents (or losses) specific to your system.*

5.

Hazards

*This form will allow you to enter hazards specific to your system.*

6.

Unsafe Control Action Analysis

*This form will guide you through evaluating Unsafe Control Actions and potentially related system hazards.*

7.

Causal Factor Analysis

*This form will guide you through evaluating Unsafe Control Actions and potential causal factors.*

### Export Analysis

8.

Export Data

*This will compile the STPA results and export the data to MS Excel.*

Advanced Options

Review Preparatory Steps

Upload Control Structure Diagram

Locate Additional STPA Resources

# SafetyHAT uses an eight step process to guide users through STPA

## Main Menu

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Describe your system

Analyze your system

Export your analysis

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# SafetyHAT's preloaded transportation-specific guide phrases can be customized for other domains

## Main Menu

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Advanced Options

Review Preparatory Steps

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Customize the guide phrases



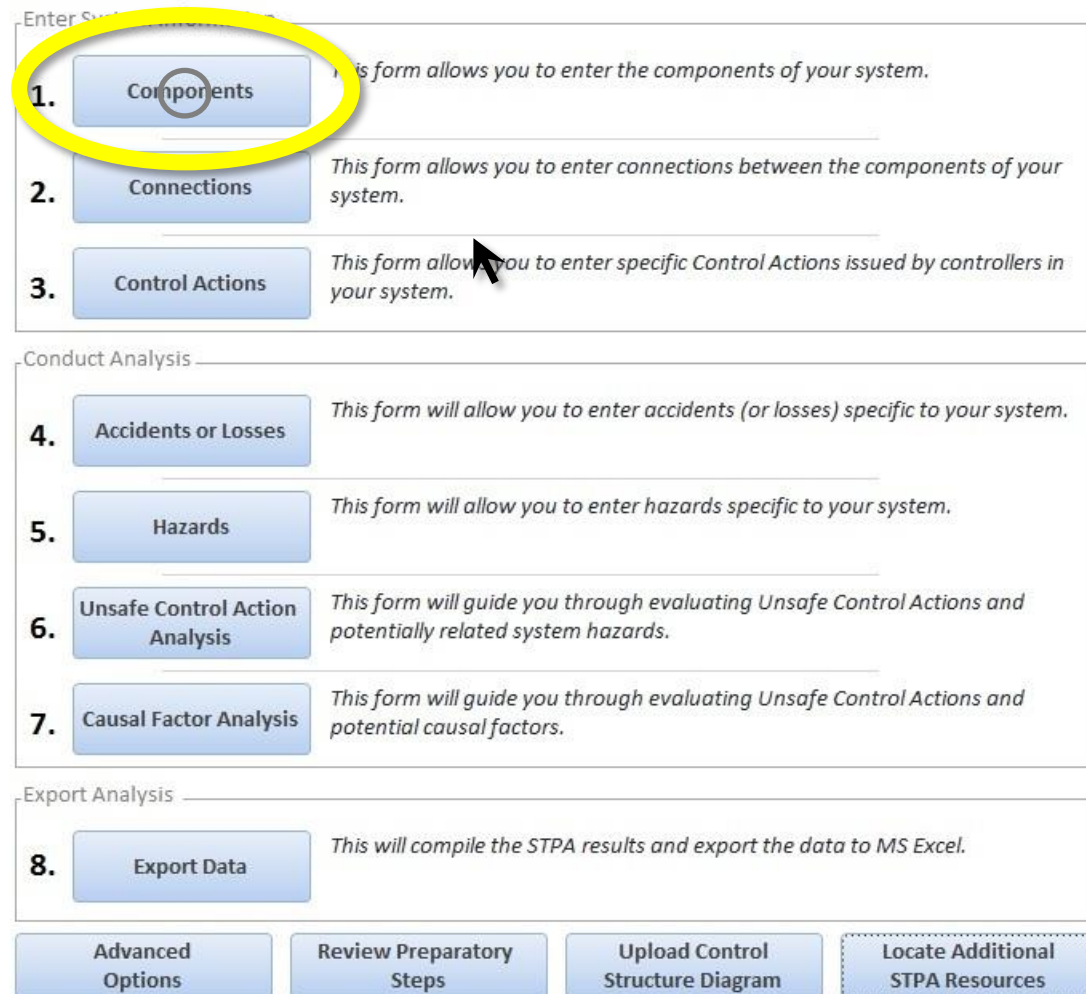
# Directly access any data entry form by clicking on a button in the Main Menu

## Main Menu

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Enter System Information

- 1. Components** This form allows you to enter the components of your system.
- 2. Connections** This form allows you to enter connections between the components of your system.
- 3. Control Actions** This form allows you to enter specific Control Actions issued by controllers in your system.

Conduct Analysis

- 4. Accidents or Losses** This form will allow you to enter accidents (or losses) specific to your system.
- 5. Hazards** This form will allow you to enter hazards specific to your system.
- 6. Unsafe Control Action Analysis** This form will guide you through evaluating Unsafe Control Actions and potentially related system hazards.
- 7. Causal Factor Analysis** This form will guide you through evaluating Unsafe Control Actions and potential causal factors.

Export Analysis

- 8. Export Data** This will compile the STPA results and export the data to MS Excel.

Advanced Options   Review Preparatory Steps   Upload Control Structure Diagram   Locate Additional STPA Resources

# All data entry and analysis forms share basic features

System Component Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

Review Existing System Components

**Existing System Components** Sort: Order Entered ▼ ▲ A-Z ▼ ▲

- Air Bag Control Unit
- Air Bag Module
- Crash Sensor
- Driver
- Passenger Air Bag Indicator Light
- Passenger Presence Sensing Module
- Passenger Presence Sensor
- Seat Belt Pretensioner
- Seat Belt Tension Sensor
- Seat Track Position Sensor
- Vehicle (including Occupants)

Add New System Component

**Enter Component Name:**

Passenger Air Bag Button

**Enter a Component Description:**

Dashboard button to enable or disable the passenger side air bag.

Delete Existing Modify Existing Save As New

The navigation bar allows you to move easily between data entry forms

Return to Main Menu Previous Step Step 2: Connections View Control Structure Diagram Close Form

Form Guidance

**Volpe** The National Transportation Systems Center



# All data entry and analysis forms share basic features

## System Component Input Form

Step: 1 2 3 4 5 6 7 8

### Review Existing System Components

#### Existing System Components

Sort: Order Entered A-Z

Air Bag Control Unit

Air Bag Module

Crash Sensor

Driver

Passenger Air Bag Indicator Light

Passenger Presence Sensing Module

Passenger Presence Sensor

Seat Belt Pretensioner

Seat Belt Tension Sensor

Seat Track Position Sensor

Vehicle (including Occupants)

Review entered data ...

### Add New System Component

Enter Component Name:

Passenger Air Bag Button

Enter a Component Description:

Dashboard button to enable or disable the passenger side air bag.

Delete Existing

Modify Existing

Save As New

...and add, modify, or delete data

Return to Main Menu

Previous Step

Step 2: Connections

View Control Structure Diagram

Close Form

Form Guidance

**Volpe** The National Transportation Systems Center

# All data entry and analysis forms share basic features

## System Component Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Review Existing System Components

#### Existing System Components

Sort: Order Entered ▼ ▲ A-Z ▼ ▲

Air Bag Control Unit  
Air Bag Module  
Crash Sensor  
Driver  
Passeng  
Passeng  
Passeng  
Seat Be  
Seat Be  
Seat Track Position Sensor  
Vehicle (including Occupants)

Description boxes let you enter additional details about your system

### Add New System Component

#### Enter Component Name:

Passenger Air Bag Button

#### Enter a Component Description:

Dashboard button to enable or disable the passenger side air bag.

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Previous Step

Step 2:  
Connections

View Control  
Structure Diagram

Close Form

# Step 1 allows you to enter and modify component information

## System Component Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Review Existing System Components

#### Existing System Components

Sort: Order Entered ▼ ▲ A-Z ▼ ▲

- Air Bag Control Unit
- Air Bag Module
- Crash Sensor
- Driver
- Passenger Air Bag Indicator Light
- Passenger Presence Sensing Module
- Passenger Presence Sensor
- Seat Belt Pretensioner
- Seat Belt Tension Sensor
- Seat Track Position Sensor
- Vehicle (including Occupants)

### Add New System Component

#### Enter Component Name:

Passenger Air Bag Button

#### Enter a Component Description:

Dashboard button to enable or disable the passenger side air bag.

Delete Existing

Modify Existing

Save As New

Use the navigation bar to move sequentially between steps

Return to Main Menu

Previous Step

Step 2:  
Connections

View Control  
Structure Diagram

Close Form

Form Guidance

# Step 2 allows you to enter and modify connections between components

## System Connections Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Review Existing System Connections

#### Existing System Connections

Sort: Order Entered ▼ ▲

▼ ▲ A-Z	From	Type ▼ ▲	▼ ▲ A-Z	To	Type ▼ ▲
	Air Bag Control Unit	Controller		Passenger Air Bag Indicator Light	Actuator
	Air Bag Control Unit	Controller		Air Bag Module	Actuator
	Air Bag Control Unit	Controller		Seat Belt Pretensioner	Actuator
	Air Bag Module	Actuator		Vehicle (including Occupants)	Controlled Process
	Crash Sensor	Sensor		Air Bag Control Unit	Controller
	Passenger Air Bag Indicator Light	Sensor		Driver	Controller
	Passenger Presence Sensing Module	Controller		Air Bag Control Unit	Actuator
	Passenger Presence Sensing Module	Controller		Air Bag Control Unit	Actuator
	Passenger Presence Sensor	Sensor		Passenger Presence Sensing Module	Controller
	Seat Belt Pretensioner	Actuator		Vehicle (including Occupants)	Controlled Process
	Seat Belt Tension Sensor	Sensor		Passenger Presence Sensing Module	Controller
	Seat Track Position Sensor	Sensor		Air Bag Control Unit	Controller
	Vehicle (including Occupants)	Controlled Process		Seat Track Position Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Seat Belt Tension Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Crash Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Passenger Presence Sensor	Sensor

### Add New System Connection

#### Connection Originating Component

Name:

Type:

#### Connection Terminating Component

Name:

Type:

#### Enter a Connection Description:

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 1:  
Component

Step 3:  
Control Action

View Control  
Structure Diagram

Close Form

# Step 2 allows you to enter and modify connections between components

## System Connections Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

Review Existing System Connections

Existing System Connections

Sort: Order Entered

A-Z	From	Type	A-Z	To	Type
	Air Bag Control Unit	Controller		Passenger Air Bag Indicator Light	Actuator
	Air Bag Control Unit	Controller		Air Bag Module	Actuator
	Air Bag Control Unit				
	Air Bag Module				
	Crash Sensor				
	Passenger Air Bag Indicator				
	Passenger Presence Sensing Module				
	Passenger Presence Sensing Module				
	Passenger Presence Sensor	Sensor		Passenger Presence Sensing Module	Controller
	Seat Belt Pretensioner	Actuator		Vehicle (including Occupants)	Controlled Process
	Seat Belt Tension Sensor	Sensor		Passenger Presence Sensing Module	Controller
	Seat Track Position Sensor	Sensor		Air Bag Control Unit	Controller
	Vehicle (including Occupants)	Controlled Process		Seat Track Position Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Seat Belt Tension Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Crash Sensor	Sensor
	Vehicle (including Occupants)	Controlled Process		Passenger Presence Sensor	Sensor

SafetyHAT uses information about your system to simplify data entry

Add New System Connection

Connection Originating Component

Name:

Type:

Connect

Name:

Enter a C

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 1:  
Component

Step 3:  
Control Action

View Control  
Structure Diagram

Close Form



# Step 3 allows you to enter control actions issued by system controllers

## Control Action Input Form

Step: 1 2 3 4 5 6 7 8

### Review Existing Control Actions

View Control Actions by Controller

Sort: Order Entered ▼ ▲ A-Z ▼ ▲

Air Bag Control Unit ▼

Deploy air bag  
Deploy seat belt pretensioner

### Add New Control Action

Select Controller

Air Bag Control Unit ▼

Enter Control Action:

Illuminate Passenger Air Bag Disabled Light

Enter Detailed Description of the Control Action:

Turn on the "Passenger Air Bag Disabled" light when the passenger air bag is not activated

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 2:  
Connections

Step 4:  
System Accidents or Losses

View Control  
Structure Diagram

Close Form

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Form Guidance



# Step 4 allows you to enter system-level accidents

## Accident (or Losses) Input Form

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Review Existing System Accidents or Losses

Existing System Accidents (or Losses)

Sort: Order Entered ▼ ▲ A-Z ▼ ▲

### Add New System Accident or Losses

Enter System Accident (or Loss):

Vehicle Occupant Injury or Death

Enter Detailed Description of the Accident (or Loss):

Vehicle occupant is injured or killed. This may occur during a crash or as a result of normal vehicle operation.

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 3:  
Control Actions

Step 5:  
System Hazards

View Control  
Structure Diagram

Close Form

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The National Transportation Systems Center

Form Guidance

# Step 5 allows you to enter system-level hazards

## Hazard Input Form

Step: 1 2 3 4 5 6 7 8

### Review Existing System Hazards

#### Existing System Hazards

Sort: Order Entered A-Z

### Add New System Hazard

**Enter System Hazard:**  
Restraint System Malfunction (Failure, Loss or Degradation)

**Enter Detailed Description of Hazard:**  
Restraint system malfunctions. This includes cases where the restraint system deploys inappropriately, does not provide adequate protection, or fails to deploy in a crash situation.

**Select Associated Accident(s):**  
Vehicle Occupant Injury or Death

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 4:  
System Accidents or Losses

Step 6:  
Unsafe Ctl Action Analysis

View Control  
Structure Diagram

Close Form

Form Guidance

Hazards can be linked to one or more system-level accidents

# Step 6 guides you through analysis of Unsafe Control Actions

## Unsafe Control Action (UCA) Analysis

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

Current Control Action

### Select Controller

Air Bag Control Unit

### Control Action: 1 of 3

Deploy air bag

Control Action  
Analysis Completed

Previous Control Action

Next Control Action

Existing Unsafe Control Actions

### Select Unsafe Control Action Category

Provided, but executed incorrectly

Complete Add Note

### Existing UCAs for Selected Control Action and UCA Category

Air bag deploys, but the positioning is incorrect and does not adequately protect occupants.

Unsafe Control Action Analysis

### Enter or Select a Detailed Description for UCA

Air bag deploys, but does not inflate correctly.

(All UCAs for Selected Controller)

### Select Relevant Hazards (if applicable)

Restraint System Malfunction (Failure, Loss or Degradation)

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 5:  
System Hazards

Step 7:  
Causal Factor Analysis

View Control  
Structure Diagram

Close Form

# Step 6 guides you through analysis of Unsafe Control Actions

## Unsafe Control Action (UCA) Analysis

Step: 1 2 3 4 5 6 7 8

Current Control Action

### Select Controller

Air Bag Control Unit

Control Action: 1 of 3

Deploy air bag

Control Action  
Analysis Completed

Previous Control Action

Next Control Action

Existing Unsafe Control Actions

### Select Unsafe Control Action Category

Provided, but executed incorrectly

Complete Add Note

Select Unsafe Control Action Category	Complete	Add Note
Provided, but executed incorrectly	<input type="checkbox"/>	<input type="checkbox"/>
Provided when control action is not needed and unsafe	Y	N
Provided, but the intensity is incorrect (too much or too little)	Y	N
Provided, but executed incorrectly	N	N
Provided, but duration is too long or too short	N	N
Provided, but the starting time is too soon or too late	Y	N
Not provided when needed to maintain safety	Y	N

Unsafe Control Action Analysis

### Enter or Select a Detailed Description for UCA

(All UCAs for Selected Controller)

### Select Relevant Hazards (if applicable)

Restraint System Malfunction (Failure, Loss or Degradation)

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 5:  
System Hazards

Step 7:  
Causal Factor Analysis

View Control  
Structure Diagram

Close Form

SafetyHAT comes preloaded with six UCA guide phrases

# Step 7 guides you through the causal factor analysis

## Causal Factor Analysis

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Unsafe Control Action Details

#### Controller 1 of 2

Air Bag Control Unit

#### Description 7 of 8

Air bag deploys when the vehicle is not in a crash.

Control Action  
Analysis Completed

Previous Controller

Previous Record

Next Record

Next Controller

Add  
Note



#### Associated Hazards:

Restraint System Malfunction (Failure, Loss or Degradation)

### Existing Causal Factor Analyses

Sort: Order Entered

Component Name A-Z

#### Existing Causal Factors for Selected Unsafe Control Action

Causal Factor	Component Name or Connection From	Connection To
Hazardous interaction with other components	Air Bag Control Unit	Air Bag Control Unit
Hazardous interaction with other components	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Software error (inadequate control algorithm,	Air Bag Control Unit	
Sensor inadequate operation, change over tim	Crash Sensor	
Sensor to controller signal inadequate, missing	Crash Sensor	

### Causal Factor Analysis

#### Select: Component or Connection

Component

#### Causal Component

Crash Sensor

#### Component Type

Sensor

#### Select the Appropriate Causal Factor

Sensor inadequate operation, change over time

#### Enter or Select a Causal Factor Description

Lateral crash sensor is too sensitive and issues a crash signal when the doors are closed forcefully.

(All Causal Factor Descriptions for Selected Component / Connection and Causal Factor)

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 6:  
Unsafe Ctl Action Analysis

Step 8:  
Export Data

View Control  
Structure Diagram

Close Form



# Step 7 guides you through the causal factor analysis

## Causal Factor Analysis

Step: 1 — 2 — 3 — 4 — 5 — 6 — 7 — 8

### Unsafe Control Action Details

#### Controller 1 of 2

Air Bag Control Unit

#### Description 7 of 8

Air bag deploys when the vehicle is not in a crash.

Control Action  
Analysis Completed

Previous Controller

Previous Record

Next Record

Next Controller

Add  
Note

#### Associated Hazards:

Restraint System Malfunction (Failure, Loss or Degradation)

### Existing Causal Factor Analyses

Sort: Order Entered ▼ ▲ Component Name A-Z ▼ ▲

#### Existing Causal Factors for Selected Unsafe Control Action

Causal Factor	Component Name or Connection From	Connection To
Hazardous interaction with other components	Air Bag Control Unit	
Hazardous interaction with other components	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Software error (inadequate control algorithm)	Air Bag Control Unit	
Sensor inadequate		
Sensor to control		

SafetyHAT is preloaded with 26 causal factor guide phrases

### Causal Factor Analysis

#### Select: Component or Connection

Component ▼

#### Causal Component

Crash Sensor ▼

#### Component Type

Sensor ▼

#### Select the Appropriate Causal Factor

Sensor inadequate operation, change over time

External disturbances

Power supply faulty (high, low, disturbance)

Hazardous interaction with other components in the rest of the vehicle

(All Causal Factor Descriptions for Selected Component / Connection and Causal Factor)

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 6:  
Unsafe Ctl Action Analysis

Step 8:  
Export Data

View Control  
Structure Diagram

Close Form



# Step 8 lets you export data to a Microsoft Excel spreadsheet

## Causal Factor Analysis

Step: 1 2 3 4 5 6 7 8

### Unsafe Control Action Details

#### Controller 1 of 2

Air Bag Control Unit

#### Description 7 of 8

Air bag deploys when the vehicle is not in a crash.

Control Action  
Analysis Completed

Previous Controller

Previous Record

Next Record

Next Controller

Add  
Note

### Existing Causal Factor Analyses

Sort: Order Entered ▼ ▲ Component Name A-Z ▼ ▲

#### Existing Causal Factors for Selected Unsafe Control Action

Causal Factor	Component Name or Connection From	Connection To
Hazardous interaction with other components	Air Bag Control Unit	Air Bag Control Unit
Hazardous interaction with other components	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Controller hardware faulty, change over time	Air Bag Control Unit	
Software error (inadequate control algorithm, change over time)	Air Bag Control Unit	
Sensor inadequate operation, change over time	Crash Sensor	
Sensor to controller signal inadequate, missing	Crash Sensor	

### Causal Factor Analysis

#### Select: Component or Connection

Component ▼

#### Causal Component

Crash Sensor ▼

#### Component Type

Sensor ▼

#### Select the Appropriate Causal Factor

Sensor inadequate operation, change over time ▼

#### Enter or Select a Causal Factor Description

Lateral crash sensor is too sensitive and issues a crash signal when the doors are closed forcefully.

(All Causal Factor Descriptions for Selected Component / Connection and Causal Factor)

Delete Existing

Modify Existing

Save As New

Return to Main Menu

Step 6:  
Unsafe Ctl Action Analysis

Step 8:  
Export Data

View Control  
Structure Diagram

Close Form

# The exported spreadsheet summarizes the data you entered into Safety HAT

Air Bag Demo Output - Microsoft Excel

F25			
	A	B	C
1	CATEGORY	COMPONENT_NAME	COMPONENT_DESC
2	Actuator	Air Bag Control Unit	Main controller for the system. Also referred to as the Sensing and Diagnostic Module
3	Actuator	Air Bag Module	Includes squibb, inflator, ignitor, diffuser, tether, bag, etc.
4	Actuator	Passenger Air Bag Button	Button that manually enables or disables the passenger air bag.
5	Actuator	Passenger Air Bag Indicator Light	Dashboard display alerting driver to the status of the passenger air bag.
6	Actuator	Seat Belt Pretensioner	Electrically ignited pyrotechnic charges that cause retraction of the seatbelt around the occupant.
7	Controlled Process	Vehicle (including Occupants)	Air bags are designed to protect the seated occupants.
8	Controller	Air Bag Control Unit	Main controller for the system. Also referred to as the Sensing and Diagnostic Module
9	Controller	Driver	Driver of the vehicle
10	Controller	Passenger Presence Sensing Module	Calculates passenger weight and position, and determines whether passenger air bag should be disabled.
11	Sensor	Crash Sensor	Mechanical or electronic sensors designed to detect sudden vehicle deceleration.
12	Sensor	Passenger Air Bag Button	Button that manually enables or disables the passenger air bag.
13	Sensor	Passenger Air Bag Indicator Light	Dashboard display alerting driver to the status of the passenger air bag.
14	Sensor	Passenger Presence Sensor	Fluid bladder or strain gauge type sensors that detect occupants position and weight.
15	Sensor	Seat Belt Tension Sensor	Secondary sensor used to help classify occupant's position and weight.
16	Sensor	Seat Track Position Sensor	Typicall hall-effect sensor. Detects longitudinal position of front seats.
17			
18			

## Automatically produce the spreadsheet that links accidents to causal factors

The screenshot shows a Microsoft Excel spreadsheet titled "Air Bag Example Export - Microsoft Excel". The spreadsheet contains a table with the following columns: ACC\_NO, ACCIDENT, HAZ\_NO, HAZARD, UCA\_NO, COMPONENT\_NAME, UCA\_DESC, CAUSAL\_FACT\_NO, CF\_USER\_DESC, FROM\_COMP, TO\_COMP, and CATEGORY. The data is organized into rows, with the first row (row 1) serving as the header. The table lists various accidents and their causes, such as "Vehicle Occupant Injury or Death" caused by "Restraint System Malfunction" or "Short circuit in wiring". A large blue text box is overlaid on the spreadsheet, stating: "The spreadsheet is currently produced by hand!".

ACC_NO	ACCIDENT	HAZ_NO	HAZARD	UCA_NO	COMPONENT_NAME	UCA_DESC	CAUSAL_FACT_NO	CF_USER_DESC	FROM_COMP	TO_COMP	CATEGORY
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.	CF1	Interaction with electrical system causes air bag to deploy when key is turned to "on" position.	Air Bag Control Unit		Controller
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.	CF2	Short circuit due to condensation from A/C system	Air Bag Control Unit		Controller
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.	CF3	Manufacturing error with Application Specific Integrated Circuit (ASIC) causes air bag to deploy	Air Bag Control Unit		Controller
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.	CF4	Delamination of internal subcomponents causes air bag to deploy	Air Bag Control Unit		Controller
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.			Control Unit		Controller
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.			Sensor		Sensor
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.			Sensor		Sensor
A1	Vehicle Occupant Injury or Death	H1	Restraint System Malfunction (Failure, Loss or Degradation)	UCA8	Air Bag Control Unit	Air bag does not deploy when the vehicle is in a sufficiently severe crash.	CF8	Short circuit in wiring between crash sensor and the Air Bag Control Unit causes air bag to deploy	Crash Sensor	Air Bag Control Unit	Sensor-Controller

# How Do I Get SafetyHAT?

- SafetyHAT is available for public use and can be downloaded for free
- Visit <http://www.volpe.dot.gov/SafetyHAT> and register to receive a download link