DVD-16C
An Employee's Right to Know

Below is a copy of the narration for DVD-16C. The contents for this script were developed by a review group of industry experts and were based on the best available knowledge at the time of development. The narration may be helpful for translation and technical reference.

Safety Song Spoof (to melody of Bob Dylan's Blowin' in the Wind))

Oh how many times do we deny
the need for safety **glasses**? [emphasize last word]

How many times do we fall asleep
durin' our safety **classes**? [emphasize...]

Yes, and how many times do we expect
someone to save our **a****** ?
[Censor audio buzz over 2nd syllable of last word – which rhymes with "classes."]

I'll sing it real slow, cause it's your *right to know:*
The answer is in this video...

Narrator

Everyone who's employed in the electronics assembly industry has the *right to know* about any hazardous material they'll be working with – along with the *protective equipment* to prevent injury and exposure to chemical dangers.

The Right to Know is a federal law that was passed in 1986 to provide a safer environment for workplaces and communities. Some states have laws that may be even *more demanding* than federal law regarding safety in the workplace. The Right to Know law was passed following a tragic chemical disaster in Bhopal, India. As part of the right to know law, we also have the right to refuse work if there is the risk of imminent danger to health and safety.

OSHA has the responsibility of implementing and overseeing the Right to Know legislation. OSHA has developed a Hazard Communication Standard. The purpose of the standard is to make companies responsible for providing important information about chemical products used in the workplace. This ensures that we're aware of a chemical's potential hazards and that we're informed of the necessary safe handling procedures and work practices. The standard requires chemical manufacturers to evaluate all products – and to make this hazard information available to employees.

The primary source of information is the Material Safety Data Sheet, or MSDS. In addition, every chemical container must have a caution or warning label – and each company must provide employees appropriate training.

The Hazardous Materials Classification System is an efficient way of determining the severity of four levels of danger associated with a particular chemical. This diamond shaped HAZMAT sign specifies the health hazard of the material; how flammable it is; how reactive it is; and whether there are special dangers associated with the material – such as not mixing water with a specific chemical. This sign is usually printed on the label for any chemical, and may also be printed on the MSDS.

For example, a common cleaner such as methyl alcohol has a health rating of 3, which means severe; a flammability rating of 3, or severe; a reactivity rating of 1, or slight; and a special danger contact rating of 3, or severe – meaning life threatening.

Now, let's examine the MSDS in more detail. As employees, it's our responsibility to *know* when we should consult an MSDS; *how* to read and interpret the information it contains; and *where* the MSDS material is located.

Although the format of the MSDS may vary from manufacturer to manufacturer, the data sheets will contain the following information – beginning with *general information.* This *information* consists of the manufacturer's name; the date of preparation; telephone numbers for emergencies and information; the product name and any synonyms; and the chemical family.

Another section of the MSDS will list the *hazardous ingredients* of the chemical – including various exposure limits that indicate the concentration to which a person can safely be exposed. The *Hazards Identification* section usually consists of an *emergency overview* and *potential health effects,* including *routes of exposure. Routes of exposure* refer to how a chemical enters the body – by inhalation, or breathing; by ingestion, or swallowing; and by contact with the skin or eyes.

Health hazard data is usually followed by *emergency and first aid procedures* – meaning what actions should be taken if overexposure occurs. This section deals with *fire and explosion data* – identifying the flammability of a substance and any conditions that could result in a fire or explosion.

The next section contains *spill or leak procedures*. These *procedures* specify what needs to be done if a substance is released or spilled, and the recommended waste disposal methods.

Hazardous wastes must be disposed of properly in accordance with federal, state and local regulations – and never simply flushed down a drain.

Instruction on *proper handling and storage* is provided in this section. The *protection information* section is extremely important since it informs us of the precautions that need to be taken when handling or storing a chemical. It also includes specific *personal protection equipment* requirements, such as the use of safety glasses, face shields, aprons, gloves and respirators. In addition, any ventilation requirements are indicated.

This section describes the *physical properties* of the substance – such as boiling and freezing points, vapor density and pressure, specific gravity, solubility, percent volatile, and appearance and odor.

The *reactivity data* section identifies any materials with which the substance is incompatible; hazardous decomposition products that can be produced, such as carbon monoxide and carbon dioxide; and what types of conditions to avoid.

Other sections of the MSDS may include toxicological information; ecological information; transportation and disposal considerations; regulatory information; and any special precautions. That's really a lot of stuff to know. But in order to work safely in the electronics industry, it's essential that we become knowledgeable about the chemicals we use.

Now, let's turn our attention to chemical labels. As we stated earlier, the manufacturers of hazardous substances are required to place a caution or warning label on their products. This label must identify the hazardous substance, the name and address of the manufacturer and the hazard warnings. Most labels will also include protective equipment recommendations, first aid, and spill cleanup procedures.

The last element of hazard communication is the company training program – explaining hazardous materials used in the workplace. At a minimum, every employee must be informed of the requirements of the Hazard Communication Standard; the operations in their work area where hazardous chemicals are present; and the location of the written materials – including the list of hazardous substances and the required MSDS file. Your safety trainer will advise you where this information is located.

Now, let's take a look at some of the specific chemicals we may be working with in electronics assembly. Categories include toxic substances, poisons, corrosives or irritants, flammables, combustibles and carcinogens. Some of the most common hazardous materials include silicones, epoxy adhesives, cored solder, solder paste, fluxes, masking fluid, acetone, methyl alcohol, isopropyl alcohol, soldering tip tinners and nitrogen.

Again, the MSDS is the best source of information about a particular substance. It's important to read and understand all the details on every potentially hazardous chemical you will be working around. No one but you can make you safe when you're doing your job.

Now that you have an understanding about chemicals, let's examine how using recommended personal protection equipment can prevent overexposure from potentially hazardous conditions. Many companies have policies that require safety glasses to be worn whenever you enter the production area. Safety glasses will protect the eyes against foreign objects – such as the flying metal pieces that are generated when clipping component leads, or from careless use of soldering irons and other tools.

When you're working with chemicals, eye protection is essential – especially when pouring chemicals. A full face shield not only protects the eyes from splashes, but also protects the entire face.

Hands can be protected from chemicals by wearing rubber gloves. These gloves must be *impervious* to liquids. *Impervious* means that the material doesn't allow another substance to pass through or penetrate it. It's a good idea to inspect the gloves for holes before working with a chemical.

Hands also need to be protected from heat. Temperature protective gloves are necessary whenever working around machines and tools with high temperatures. Also, remember to turn your soldering iron off before changing the tip. Always make sure you use gripper hot pads when changing the tip – since a hot tip and cold tip look the same.

The other equipment you'll need when pouring chemicals is a rubber apron to protect your body – and rubber boots to protect your feet. There are also circumstances where substances can release a caustic vapor or dust that may affect the nose and throat. For example, when cleaning dross from a wave soldering machine, it's important to wear a *respirator*.

And when hand soldering, you'll need adequate ventilation. That's because the smoke that comes off solder resin and flux contains a mixture of noxious gasses – including formaldehyde and hydrochloric acid. Therefore, adequate ventilation *is* a requirement.

Another issue during soldering operations involves the lead that may be in solder wire, solder paste and solder bars. Even though our industry has transitioned to lead free soldering processes, there are still military, medical and other high reliability applications that require the use of tin-lead solder.

Lead is a poison that can severely affect your central nervous system. Lead is typically absorbed into the body through ingestion. One common way of accidentally ingesting lead is touching food, cigarettes, chewing tobacco or make-up after handling tin-lead solder wire, solder paste or tin-lead soldered boards without hand protection. To avoid this problem, always wash your hands with soap and water before touching any item that will come into contact with your mouth.

Sometimes, in spite of our best intentions to work safely and protect ourselves, unforeseeable situations occur. That's why it's important to know the locations of safety showers and eyewash fountains. The same applies for knowing both primary and secondary evacuation routes in the event of an emergency.

Our final topic in this training video is hazardous spill response – meaning how to respond to and clean up a chemical spill. Many companies have a *medical team* trained in CPR and other life saving measures, and chemical engineers who understand how to deal with chemical spills. These *emergency first aid responders* are the ones who will remove a chemical, call a doctor, call the fire department, administer first aid, etc. Here are some tips on what to do in the event of an accidental chemical spill.

The first and most important thing to determine is whether first aid is required. The person who had contact with the spilled material should be removed from the spill area and artificial respiration should be administered if the person is not breathing.

If there has been contact with the eyes or skin, eyes should be flushed for fifteen minutes and the skin should be washed with soap and water. If any injury is suspected, a doctor should be called. All accidents must be reported to *Human Resources* – regardless of how small they seem. A *facilitator* is typically required to fill out an accident report for each incident. A *safety committee* then investigates the incident and makes recommendations, if appropriate. In this manner, we can learn from our mistakes and the mistakes of others.

Once the person who had contact with the spilled material has been assisted, then the spill should be attended to. All ignition sources should be removed – meaning all nearby equipment should be powered down. Then, if possible, the leak should be stopped safely. Remember to never touch the spilled chemical. Next, yellow caution tape should be used to control access to the area. If the vapors are strong, use a fan or some other method to ventilate the area.

If possible, the spilled material should be identified. Then the MSDS is checked for clean up recommendations, first aid and personal protection equipment. Personal protection equipment may include chemical splash goggles, impervious rubber gloves, a full body apron and rubber boots. A respirator may also be necessary.

The last step of this process is the actual clean up. It's important to use non-spark tools – which are usually made out of plastic. It's advisable to have a chemical extinguisher available in case of fire. Now, the spill can be contained by covering the spill with an inert absorbent material. Finally, waste materials should be disposed of in accordance with applicable federal, state and local regulations. Never discard the disposed material in ordinary trash.

This program has presented the essential information regarding an employee's right to know about hazardous chemicals used in the electronics assembly industry. First, we discussed the reason for the right to know legislation, along with how OSHA implements the requirements.

Then we explained the three ways you are informed about the hazardous chemicals used in electronics assembly – the MSDS, the product label and your company's training program. We also described the personal protection equipment you can wear to work safely with hazardous materials.

Finally, we illustrated what's involved in responding to and cleaning up a chemical spill. By becoming familiar with the hazards relating to your particular job, you can prevent accidents and injuries – and keep yourself safe from potentially dangerous situations.