Job Safety Assessment Form

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Instructions

The purpose of the Job Safety Assessment (JSA) form is to identify hazards in a laboratory procedure and to provide a method to control these hazards safely. A **hazard** is defined as "a chemical or physical condition that has the potential for causing damage to people, property, or the environment." Accidents occur when control of a particular hazard is lost. For instance, the chemical aniline has a toxic hazard via skin absorption. An accident occurs if the chemical is spilled (loss of control of containment) on the skin of a person. The toxic hazard due to aniline exists as long as aniline is present in the laboratory – the JSA should identify this hazard and provide control methods to prevent this hazard from becoming an accident.

The JSA is a structured method used to identify hazards and their control. The JSA procedure is best implemented prior to construction and operation of a laboratory experiment. This insures that the changes and improvements identified during the JSA procedure are implemented in the final construction – changes are more difficult as the construction proceeds.

The procedure for the JSA is as follows:

1. The person constructing or operating the laboratory apparatus completes the JSA form.
2. A committee reviews the JSA and makes suggestions. This committee must have experience in the JSA procedure and safety in general. For a graduate student project, this committee should consist of the graduate student, the student's advisor, and two additional faculty or staff members.
3. The JSA is revised based on the suggestions. If the JSA revisions are substantial, an additional committee meeting might be necessary to insure that the changes were done properly.

The JSA is very useful for developing a viable procedure to perform the experiment. A subsequent benefit is that the suggestions made by the committee dramatically improve the operability and success of the experiment.

The JSA document provided is form protected – you may only type in the fields shown.

Specific Detail

Page 1:

Purpose of Experiment / Equipment: Provide a few sentences here describing overall what you are attempting to do.

Personal Protective Equipment (PPE): This section should only list the PPE used during the entire experimental procedure – not all of the PPE. Specific PPE required for a single procedure step should be listed in the Procedures page. For instance, if the laboratory requires safety glasses at all times, then safety classes should be checked here. However, if a chemical transfer step in the procedure requires a specific type of chemical glove, then the chemical glove should not be listed here, but only in the specific step on the procedures page.

Hazard Summary: Check here all the hazards that are expected to be encountered in this laboratory experiment, and list the single major source of the hazard. Do not list all of the sources of a hazard. For instance, under toxicity, if two toxic chemicals are used, then the most toxic chemical should be listed here.

Expected Operating Conditions: List the normal and maximum operating temperature and pressure.

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Special Operating Conditions: Check all of the conditions that apply to your experiment. If any of these items are checked, the Manager of Laboratory Facilities must be consulted.

Available Safety Equipment: Describe the location of each of the items listed. If the item is not available or not required, state this in the space provided. Identify the location of the equipment on the laboratory floor plan.

Spill Response Supplies: Describe the location of each of the items listed. If the item is not available or not required, state this in the space provided. Identify the location of the spill supply on the laboratory floor plan.

Required Attachments: Provide the following required attachments:

1. Flow diagram of process or equipment. Provide a single page flow diagram with adequately labeled valves and other equipment pieces.
2. Laboratory floor plan. Provide a one page sketch of the laboratory layout, showing the location of the process discussed in this JSA, the location of other major equipment in the lab, and the location of safety equipment.
3. Equipment specifications. Provide detail on materials of construction, maximum pressure and temperature of operation, and so forth.

4. Material safety data sheets (MSDS). Provide MSD sheets for all chemicals, including reactants, products and any intermediate or side reaction chemicals that persist long enough to present a hazard.

Additional Attachments: Provide any additional attachments that may be important for the committee to review in order to assess the hazards of the process.

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Chemicals Used: List all chemicals, including reactants, products, solvents and any intermediate or side reaction chemicals that persist long enough to present a hazard. Provide the NFPA ratings for health, flammability, stability and any special hazards ratings. Provide a list of incompatible chemicals that are present within the same laboratory or using in this experiment. Provide the hazardous waste code (see the Chemical Engineering Hazardous Waste Manual). If the chemical is regulated (see the Chemical Engineering Safety Manual) then check the box provided. Finally, list any personal protective equipment specific to this chemical, i.e. type of glove and glove material.

At the bottom of the chemical information page, specify the location of the MSDS library within the laboratory.

Page 4:

Chemical Reactions: List all chemical reactions that may occur, including side reactions and decompositions, if known. List the heat of reaction of each reaction, if known. You cannot type subscripts in the form field provided – write the chemical reactions using the names for the species with the correct stoichiometric coefficients.

Page 5:

The Safe Operation Procedures page is the most important part of the JSA form. In this part you will detail the steps for your experiment, identify the potential hazards and recommend the procedure to control the hazard and the personal protective equipment (PPE) required. Please attempt to be detailed and creative in identifying the hazards.

In the table column on Recommended Safety Procedure, do not include emergency response procedures here. You must focus on the procedures required to prevent an accident.

The specific sections here are:

Emergency Shutdown: List here the 2 or 3 steps required to shut-down the experiment during an emergency situation where you were required to leave the laboratory (such as a fire alarm in the building). It is not always appropriate to turn everything off – it is safer to leave cooling water running than to shut it off.

Start-up Procedure: List here all the steps required to prepare the equipment for operation. This includes proper valve configuration, charging of reactants, filling of vessels, preparation of titration equipment and materials, etc.

Run-time Procedure: List here all the normal operation steps.

Shutdown Procedure: List here all the steps to normally stop the operation of the equipment. This would detail the valves to be closed or opened (and the order of closure), motors to be turned off or on, etc.

Cleanup / Waste Disposal: List here all the steps required to complete the experiment and return the equipment for safe, unattended storage in the laboratory. Detail the vessels to be emptied, the hoses or pipes to be flushed, the equipment to be turned off, and the steps required to clean the equipment. Also list here the steps required to dispose of any waste that is generated by this experiment.