

## SRS

### Exposure Assessment Guidelines

July 25, 2011

#### **Exposure Assessment Guidelines for Subcontractors**

**Purpose:** Occupational exposure assessment is the identification, characterization, estimation, and evaluation of workplace hazards. This Guide has been prepared to provide consistency and to assist subcontractors that need guidance in the exposure assessment process. 10 CFR 851.21 requires an exposure assessment to identify hazards, assess hazard risks and implement suitable control measures to prevent or reduce workers exposure to chemical, physical and biological agents. There are four considerations in any exposure assessment:

1. Probability of exposure
2. Magnitude of exposure
3. Route and frequency of exposure
4. Population exposed

**Introduction:** An exposure assessment shall be conducted by a competent industrial hygienist or other technically qualified person who is knowledgeable of the scope of work. Supervisors and workers familiar with the scope of work can provide valuable information in the development of the assessment. The attached template may be used as an aid in completing the assessment.

**Hazard identification:** Subcontractors must establish procedures to identify existing and potential workplace hazards and assess the risk of associated workers injury and illness. Procedures must include methods to:

- Identify the scope of work (break it down into tasks and subtasks)
- Identify tools and equipment used in the tasks and subtasks
- Identify the hazards associated with each task and subtask (chemical, physical, biological, ergonomic)
- Estimate the duration of the exposure to the worker
- Evaluate the likelihood of an injury or illness occurring, and its severity
- Review all available health and safety information about the hazard such as MSDSs, manufacturer's recommendations, and historical sampling and monitoring results
- Identify actions to eliminate the hazard or substitute with a less hazardous product of operation
- Identify the appropriate controls (i.e. engineering, administrative, work practices, posting, training, PPE)
- Determine a reasonable estimate of employee exposure and provide rationale
- If necessary perform appropriate employee monitoring and evaluate the results to confirm the risk is controlled

Subcontractors must submit to SRNS a list of hazards and the established controls before work commences. SRNS subcontractor safety & health will review the document and accept the assessment or request additional actions to either:

- (1) Achieve technical compliance; or
- (2) Provide additional controls to protect the workers.

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Subcontractors must perform the activities identified in this section, initially to obtain baseline information and as often thereafter as necessary to ensure compliance with SRNS and DOE site requirements. Re-evaluate the hazards and controls when the following occurs:

- Before and during the introduction of a new scope of work
- Before and during alterations or changes to the scope of work
- New information on hazards or control measures becomes available
- A change or addition to tools, equipment, machinery (including locations or the way they are used)
- New employees are hired
- Introduction of new chemicals or substances
- Significant changes in weather conditions that will effect the scope of work and / or safety of the workers

**Hazard risk assessment:** Refers to the process of assessing risks associated with each hazard identified during the hazard identification process. One of the goals of the exposure assessment is to determine if sampling is needed to verify whether potential exposures are within permissible limits.

Assessments for operations determined to have no significant exposure potential should be appropriately documented for rationale and historical purposes. Subcontractors are required to document and maintain records of all worker exposure assessments for chemical hazards, physical hazards, biological agents and ergonomic stressors. In the case of a chemical product where the MSDS ratings for health, fire and reactivity are all zeros, the subcontractor can provide a statement to reflect that information.

Subcontractors should evaluate each hazard to determine its' level of risk. Risk assessments are very important as they form an integral part of a good occupational health and safety management plan. They help to: create awareness of hazards and risks, identify who may be at risk, determine if existing control measures are adequate or if more should be done, prevent injuries or illnesses when done at the design or planning stage, and prioritize hazards and control measures. To research the hazard, subcontractors should consider the following information:

- Health and safety material about the hazard such as material safety data sheets (MSDSs), or other manufacturer information
- Past experience (workers, etc.)
- Legislated requirements and/or applicable standards
- Industry codes of practice / best practices
- Information from reputable organizations
- Results of testing (atmospheric, air sampling of workplace, biological, etc.)
- The expertise of an occupational health and safety professional
- Information about previous injuries, illnesses, "near misses", lessons learned, accident reports, etc.

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Any potential exposure determination shall be made without regard to the use of personal protective equipment. Engineering and work practice controls shall be used to eliminate or minimize any potential employee exposure. Where the possibility of an exposure remains after institution of controls, personal protective equipment shall also be used.

Hazard assessment record keeping: Keeping records of your hazard assessment and any control actions taken is very important. The subcontractor records should provide the following information:

- Evidence that a quality exposure assessment was conducted
- Determination of the risks involved
- Control measures were suitable for the risk(s)
- Hazards in the workplace were evaluated and monitored
- Conclusions and lessons learned

It is most important that the conclusions reached about risks are documented and that any supporting information on how that decision was made is included in associated records.

**Hazard control program:** A hazard control program consist of all steps necessary to protect workers from exposure to a harmful substance or system, and the procedures required to monitor worker exposure and their health to hazards such as hazardous chemicals, materials or substance, or other types such as noise and vibration. A written workplace hazard control program will outline which methods are being used to control the exposure and how these controls will be monitored for effectiveness.

Hazard control provides a means by which risks can be systematically evaluated against a set of control options, known as the “hierarchy of controls” to determine the most effective control methods for the risks associated with each hazard. This process involves analyzing the data collected during the hazard identification and risk assessment processes, and developing a strategic plan to control the risks identified.

**Use of hierarchy of controls:** The Hierarchy of Control is a list of control measures, in priority order, that shall be used to eliminate or minimize exposure to the hazard. The hierarchy of control provides a sequence of options which offer a number of ways to approach the hazard control process. The subcontractor’s worker’s protection program (WPP) shall reference the use of the hierarchy controls for controlling workplace hazards.

- **Elimination of hazards:** An option used to get rid of the hazard altogether. The best way to eliminate the risk is to completely remove the hazard. It is the first line of defense for eliminating employee exposure. Subcontractors shall fully exercise this option at every opportunity when feasible or practical.
- **Substitution of hazards:** Substitution involves replacing a highly toxic substance or hazardous work practice with a less toxic substance / hazardous one. **Use this option when feasible.**

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- **Use of engineering controls:** If the hazard cannot be eliminated, substituted or isolated, an engineering control is the next preferred option. It involves such things as guards, introducing remote stop and start buttons, and use of muffling to reduce noise levels. Engineering controls shall be examined and maintained or replaced on a regular schedule to ensure their effectiveness. **Use this option when feasible and practical.**
- **Use of work practices and administrative controls to limit exposure:** Includes the use of warning signs, regular rest breaks for employees exposed to hot environments, reducing employee exposure to noisy machines by using a worker rotation policy, and providing supervision and employee training on the associated hazards.
- **Personal protective equipment (PPE)** should be considered only when other control measures are not practical. Employees must be trained in the proper inspection, use, fitting, donning and doffing, cleaning, maintenance and storage of PPE.

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**EXPOSURE ASSESSMENT – EXAMPLE TEMPLATE**

<b>Activity/Task</b>	<b>Welding on galvanized steel</b>
<b>Tool/Equipment Used</b>	<b>SMAW Manual welding</b>
<b>Location of Task: Building # Outdoors/ Indoors/ Enclosed Space or Confined Space</b>	<b>Outdoors on lamp post outside building 701-34G</b>
<b>Potential Hazard Chemical, Physical, Biological</b>	<b>Inhalation of metal fumes: Zinc, lead</b>
<b>Number Employees Directly Involved</b>	<b>1 welder 1 helper</b>
<b>Estimated Duration of Exposure</b>	<b>3 hours/day each worker for 2 days</b>
<b>Amount Used per Time</b>	<b>2 welding rods/hour</b>
<b>Is Exposure Intermittent or Continuous?</b>	<b>Continuous</b>
<b>Potential for Overexposure Low/ Medium/ High or N/A</b>	<b>Low</b>
<b>Controls used to minimize/eliminate exposure to hazard: 1. Elimination of Hazard 2. Substitution 3. Engineering Controls 4. Administrative Controls 5. Personal Protective Equipment</b>	<b>Auxiliary fan  Welding PPE</b>
<b>Is Exposure Acceptable, Unacceptable?</b>	<b>Acceptable</b>
<b>Technical Basis or Rationale for Decision (Calculations, Monitoring Data) (may include historical sampling data)</b>	<b>Historical sampling data show potential exposure is below permissible exposure level (PEL)</b>
<b>IH Sampling Plan: Yes, No or N/A</b>	<b>Yes: See attached personal sampling plan for Zinc, Lead</b>
<b>If No, Why?</b>	

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**EXPOSURE ASSESSMENT – BLANK TEMPLATE**

<b>Activity/Task</b>	
<b>Tool/Equipment Used</b>	
<b>Location of Task: Building # Outdoors/ Indoors/ Enclosed Space or Confined Space</b>	
<b>Potential Hazard Chemical, Physical, Biological</b>	
<b>Number Employees Directly Involved</b>	
<b>Estimated Duration of Exposure</b>	
<b>Amount Used per Time</b>	
<b>Is Exposure Intermittent or Continuous?</b>	
<b>Potential for Overexposure Low/ Medium/ High or N/A</b>	
<b>Controls used to minimize/eliminate exposure to hazard: 1. Elimination of Hazard 2. Substitution 3. Engineering Controls 4. Administrative Controls 5. Personal Protective Equipment</b>	
<b>Is Exposure Acceptable, Unacceptable? (Defined by Industrial Hygienist)</b>	
<b>Technical Basis or Rationale for Decision (Calculations, Monitoring Data) (may include historical sampling data)</b>	
<b>IH Sampling Plan: Yes, No or N/A</b>	
<b>If No, Why?</b>	