

Location	Employee	Sample #1	Sample Time #1	Sample #2	Sample Time #2	Sample #3	Sample Time #3
Stationary Grinding Wheel	Robert Jones	82 dBA	90 min	91 dBA	125 min	83 dBA	265 min
Drill Press #4	Clara Tucker	89 dBA	135 min	79 dBA	249 min	81 dBA	96 min
Metal Shear #2	Rick Starnes	75 dBA	283 min	94 dBA	39 min	84 dBA	158 min
Metal Shear #3	Jennie Gump	83 dBA	114 min	73 dBA	239 min	95 dBA	127 min
Bench Press #7	Bernie Edwards	73 dBA	203 min	79 dBA	172 min	83 dBA	105 min

Carpentry Shop #2

Inside Carpentry Shop #2, there are six machines operating almost continuously, including table saws, planers, exhaust systems, jointers, with 10 employees working in this area. To determine whether this table should be designated as a hazardous noise environment, thus requiring employees to be entered into the hearing conservation program, you must calculate combined exposures and treat the entire area as one noise source. The following table indicates the recorded measurements that you collected during your on-site assessment. Does the data from this table indicate a hazardous noise environment, and do you recommend entering employees into a hearing conservation program?

Machine	Noise Level (dBA)
Table Saw #3	92 dBA
Jointer #4	87 dBA
Table Saw #5	90 dBA
Exhaust Ventilation System	80 dBA
Planer #2	84 dBA
Drill Press #1	79 dBA

Electronic Communication Repair Shop

Acme Manufacturing is currently considering remodeling this shop in order to install a new noise absorbing wall and floor insulation. They have asked that you review the previous history of noise level exposures in this area and provide your recommendations. However, this data is given in measurements of N/m^2 , but the Project Engineer is requesting the information in W/m^2 . Given the following data, convert N/m^2 to W/m^2 and include it in your report:

Date	Location	SPL (N/m^2)
4/12/10	East Wall	0.0683 N/m^2
4/12/10	West Wall	0.0742 N/m^2
4/12/10	South Wall	0.0813 N/m^2
4/12/10	North Wall	0.0699 N/m^2

Respond to the details in each section, and format your report in APA style. Include *at least* each of the following in your report for this unit:

- Introduction-briefly describe why the studies were performed (*why you started the study*).
- Report details-briefly discuss the details of the scenario (*what you found from the study*).
- Conclusions and recommendations-briefly describe your recommendations based on your findings (*what you recommend to resolve any deficiencies*).
- Appendix-Measurements and calculations (show your work).
- At least one page (double-spaced) in length (*not including the reference page and appendices*).

Prepare your report in a word-processing application (i.e., Word) using APA formatting for all references and in-text citations.

Unit V Project

Thermal Stressors Report

Bob Sanders (your supervisor) has another job for you. Acme Manufacturing Co. was impressed by your last report, and they have asked you to return to complete another job. BSCI has been contracted by Acme Manufacturing Co. to conduct a study at one of its facilities to determine employee exposures to various thermal stressors at different times. You are to conduct this study in January and July of 2012. After collecting and recording data from the field assessments, prepare a written report for Bob Sanders (CSP) to present to the Board of Directors. During your field investigations, you find the following field observations:

Security Personnel

The security personnel, while contracted by Acme, are still employees that need to be monitored. There are three main entries that are staffed with security personnel. These entries have a booth, which is roughly 5'x5' with no heating or cooling. Each security officer works an eight hour shift, with two separate fifteen minute breaks (one during the first half of the shift, and the second during the second half of the shift) and one 30-minute meal break. The only opportunity to rehydrate is made during the break or meal periods. There are no drinking fountains or coolers in the security booths. Calculate the wind chill factor and wet bulb globe temperature (WBGT) for each location.

January findings

Location	Temperature °F	Wind Velocity (mph)	Wind Chill Factor (Calculated)
North Entrance	-3	20	
South Entrance	-4	26	
East Entrance	-6	17	

July findings

Location	Wet Bulb (°F)	Dry Bulb (°F)	Globe Temp (°F)	Calculated WBGT Index
North Entrance	98	89	92	
South Entrance	102	91	94	
East Entrance	99	88	87	

Based on this information, determine which category each security location is exposed to and make a recommendation as to what changes, if any, you would make.

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Unit VI Project

Hydrostatics and Hydraulics Report

BSCI has another job for you at Acme Manufacturing Co., and Bob Sanders (your supervisor) has asked you to complete it. BSCI has been contracted by Acme Manufacturing Co. to collect measurements of various industrial storage facilities and certain aspects of its fire suppression system. After collecting field measurements and calculating values, prepare a written report for Bob Sanders (CSP) to present to the Board of Directors. During your field investigations, you find the following field observations:

Piping System Repair

A piping system repair must be made to a vertical piping system. Prior to its turn to a horizontal direction, the pipe is 18 inches in diameter and 60 ft. long. There is a repair that must be done at 35 feet above the floor. The pipe is filled with a liquid having the same properties as water. Due to operational considerations, the pipe cannot be drained. The fluid is considered non-hazardous due to its chemical properties. Before the repair can be completed, a decision has to be made about the material to use and the method in which the repair can occur safely. At the location of the pipe repair, what is the pressure of the fluid? (**NOTE: the height of the cylinder is the length of the pipe minus the height of the repair from the floor.**)

Water Storage Tank

Some repairs have been made to the existing water storage tank. New valves and piping systems are to be installed in the distribution system. You have been asked to calculate the velocity of the fluid through the bottom drain opening and prior to entry into the distribution system. This velocity will help to determine the specific valve that must be installed prior to the distribution system. The tank at its highest point is 24 feet. Determine the velocity of the fluid at fluid heights of 24 feet, 18 feet, 12 feet, and 6 feet.

Fire Suppression System

In a horizontally installed piping system, water flows through a 10 inch pipe. The head loss in a 500 foot section is 40 feet. The residual pressure at *Point A* is 55 psi and the velocity at *Point A* is 7 ft./s. If the velocity at *Point B* is 8.5 ft/s, what is the residual pressure at *Point B*?

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Unit VII Project

Fire Prevention and Protection Report

Acme Manufacturing Co. has another job for BSCI, and Bob Sanders (your supervisor) asks you to complete it. BSCI has been contracted by Acme Manufacturing Co. to conduct a fire protection and prevention inspection. During the inspection, you make several notes, which you use to prepare a written report. Later, Bob Sanders (CSP) intends to utilize your report as he presents the details to the Board of Directors. During your field investigations, you find the following data:

Welding Shop

In the welding shop, you collect measurements of the floor space which measures 125 ft. x 80 ft. In the center of the room, near a column, you notice that there is one fire extinguisher, which is a 2A10B:C rated extinguisher. Determine if this is an adequate number of extinguishers for this area. Explain.

Molding Shop

In the molding shop, employees prepare resins to shape the molds used in creating one of the products manufactured by Acme. The area has a strong odor of acetone, which is used significantly in the preparation of the resin molds. In this area, you notice that there is a sprinkler system, and the sprinkler head is green. What is the maximum ceiling temperature for this area?

As mentioned, employees in this shop use a significant amount of acetone in the preparation process. Also while conducting the inspection of this shop, you notice an overhead gas space heater with an open flame. What are the UEL/UFL and LEL/LFL of acetone? What actions would you take immediately in this area? Explain.

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Unit VIII Project

Ergonomics Report

Bob Sanders (your supervisor) has another job for you to complete for BSCI. This time, you have been asked to examine the ergonomic details at Acme Manufacturing Co. Specifically, Acme Manufacturing Co. has asked you to conduct an ergonomic evaluation of the packing line. Given the following worksheet (see the link below to download the worksheet), calculate the (1) *RWL* and (2) the *Lifting Index*. Using the data and results, provide your written recommendations for corrective action against strenuous lifting tasks performed by employees to reduce risks and to prevent injuries.

Click [here](#) to download a copy of the job analysis worksheet included with data.

Respond to the details in each section, and format your report in APA style. Include *at least* each of the following in your report for this unit:

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- Report details—briefly discuss the details of the scenario (*what you found from the study*).
- Conclusions and recommendations—briefly describe your recommendations based on your findings (*what you recommend to resolve any deficiencies*).
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Unit VIII Final Project