

Unit Assignments

Unit IV Case Study

Analysis of an Air-Sampling Report

Click [here](#) to view a PDF of a typical sampling report. Compose a two- to three-page analysis that addresses the following questions:

1. What is the purpose of the exposure assessment?
2. Why was the exposure assessment conducted?
3. What type of sampling (personal or area) was conducted, and why?
4. What are the chemicals that were sampled, and what are their hazards?
5. What are the most likely routes of exposure given the nature of the business?
6. Describe the sampling equipment and methods used to collect the sample.
7. Provide an overview of the results, including an explanation of the "additive formula," and discuss them in relation to the applicable exposure limit.
8. Were there any off-normal or unplanned incidents relative to sample collection?
9. Provide a summary of the recommendations made by Sam "IH" Sampler.
10. Comment on the thoroughness of the study. Did you feel that the exposure assessment was comprehensive? If not, what additional information would you provide?
11. Comment on who the target audience would be for this report. If you were the plant director of ACME Printing, would you be comfortable with sharing this with an auditor from the Occupational Safety and Health Administration (OSHA)? Do you have any concerns related to sharing this with your employees?

In addition to addressing the listed questions, you should consider using additional background materials to support your analysis. Materials should be cited using APA formatting style to include in-text citations and a reference list. You should also paraphrase information obtained from outside sources; that is, use your own words. Do not simply cut and paste materials from outside sources. Limit directly quoted materials to no more than three to five sentences for the entire case study overview, and always use quotation marks for direct quotes of outside sources.

Information about accessing the Blackboard Grading Rubric for this assignment is provided below.

February 4, 2013

SAMPLING REPORT

Mr. Bob Johnson
ACME Printing Corporation, Inc.
100 Main Street
Happy Valley, Washington 70001

SUBJECT: ANNUAL AIR SAMPLING SURVEY

Dear Mr. Johnson:

The subject report is attached and discusses the results of the air sampling survey I conducted on December 13th at the ACME Printing Corporation facility in Happy Valley, WS. The purpose of the survey was to evaluate personal exposures to select components of commonly used chemicals associated with the ACME printing process. An additional sample was collected to assess ambient concentrations of ozone. A discussion of relevant exposure limits is included.

If there are any comments or questions, call me at 720/123-4567.

Thank you.

Signature Here

Sam "IH" Sampler
Industrial Hygienist
1234 1st Street
Gilbert, WS 70002
720/123-4567

EXECUTIVE SUMMARY

ACME Printing Corporation has had an active air sampling program in place for several years. Air sampling was conducted to assess personal exposures to select components of commonly used chemicals associated with the printing process. An additional sample was collected to assess ambient concentrations of ozone. A total of five personal samples were collected and analyzed for ink components; one area sample was collected and analyzed for ozone. Sampling was conducted in accordance with established procedures with results being compared to two relevant exposure limits. Personal samples ranged from 14.8 - 59.0% of the calculated additive Permissible Exposure Limit (i.e. n-propanol and n-propyl acetate combined). The results are in general agreement with samples taken in previous years. The area sample result for ozone was deemed insignificant after it was determined that the lamination process was non-operational the day of the study. Recommendations are made to share results with affected personnel, continue the annual sampling survey and conduct another ozone study.

To evaluate exposure potential, ACME Printing Corporation has been conducting air sampling on an annual basis for several years. Previous year's results have generally shown personal sampling results at or below 50% of the applicable PEL. Several other exposure studies have been conducted on a process-specific basis and have also documented low worker exposure potential. However, given the variable nature of the business, ACME Printing Corporation has taken a prudent approach of documenting worker exposures on an annual basis.

SAMPLING STRATEGY

A sampling strategy was devised in consultation with the Plant Director. In addition to the organic constituents routinely included in past annual surveys, an area sample was collected for ozone. Ozone is a by-product of the lamination process and has been of interest to plant personnel recently. The following samples were collected for this year's study:

Personal Sample – Josh, W&H 3 - n-propanol, n-propyl acetate
Personal Sample – Jake, W&H 2 - n-propanol, n-propyl acetate
Personal Sample – Percy, Vision - n-propanol, n-propyl acetate
Personal Sample – Mike, Pre-Press - n-propanol, n-propyl acetate
Personal Sample – Ronnie, W&H 3 – n-propanol, n-propyl acetate
Area Sample – Laminator Work Station - ozone

SAMPLING METHODOLOGY

A total of 5 personal air samples and 1 area sample were collected. Air sampling was conducted using a sampling pump and appropriate filter media provided by the analytical lab contracted for the project. Pumps were operated for as close to a full shift as possible with a flow rate that ensured collection of the necessary air volume stated in the analytical method established by the National Institute for Occupational Safety and Health (NIOSH). All pumps were pre- and post-calibrated to ensure accurate air flow rates. Personal samples were placed in the breathing zone of the employee with the sampling cassette being attached to the lapel; the area sample was placed in a location where employees are expected to spend most their time. Sampling media was sent for analysis to a laboratory accredited by the American Industrial Hygiene Association (AIHA).

SAMPLING RESULTS

Attachment A contains Tables 1-6 that summarize the sampling results. All personal monitoring results were compared to the applicable PEL. For n-propyl alcohol and n-propyl acetate, an additive formula method was used. Since both materials have similar potential adverse health effects (e.g. both affect the central nervous system), it is acceptable to consider exposure to each in an additive fashion (see data tables for specific calculations).

Table 1 shows personal air sampling results for Josh, W&H 2. This sample showed an ambient concentration of n-propanol of 47.0 parts per million (ppm) and 14.0 ppm of n-propyl acetate. The additive percentage of the PEL is 30.5%.

ATTACHMENT A
PERSONAL & AREA SAMPLE DATA
TABLES 1-6

TABLE 2 - PERSONAL AIR SAMPLING RESULTS

Jake
W&H 2

ACME Printing Corporation, Inc.
Sampling Date: December 13, 2012
Sampling Conducted by: Sam "IH" Sampler

LOCATION	SAMPLE TYPE	ANALYTE	RESULT (ppm)	OSHA PEL (ppm)	(% PEL)* >PEL?
Jake W&H 2	Personal	n-Propanol	64.0	200	(40.0)
		n-Propyl Acetate	16.0	200	No

NOTES:

1) **Abbreviations:**

ppm = part of analyte per million parts of air
OSHA = Occupational Safety & Health Administration
PEL = Permissible Exposure Limit
% PEL = what percent the measured concentration is of the PEL

2) **Definitions:**

PEL - legally enforceable, 8-hour, time-weighted average concentrations allowed during a work shift; concentrations below OSHA PEL are not expected to cause adverse health effects in the majority of workers.

3) **Additive Formula Calculation:**

“*” = % PEL calculated using OSHA additive formula: (concentration of contaminant 1 divided by OSHA PEL for contaminant 1) + (concentration of contaminant 2 divided by OSHA PEL for contaminant 2):

$$(n\text{-propanol: } 64.0/200) + (n\text{-propyl acetate: } 16.0/200) = 32.0 + 8.0 = 40.0$$

TABLE 4 - PERSONAL AIR SAMPLING RESULTS

Mike
Pre-Press

ACME Printing Corporation, Inc.
Sampling Dates: December 13, 2012
Sampling Conducted by: Sam "IH" Sampler

LOCATION	SAMPLE TYPE	ANALYTE	RESULT (ppm)	OSHA PEL (ppm)	(% PEL)* >PEL?
Mike Pre-Press	Personal	n-Propanol	32.0	200	(21.0)
		n-Propyl Acetate	10.0	200	No

NOTES:

1) **Abbreviations:**

ppm = part of analyte per million parts of air

OSHA = Occupational Safety & Health Administration

PEL = Permissible Exposure Limit

% PEL = what percent the measured concentration is of the PEL

2) **Definitions:**

PEL - legally enforceable, 8-hour, time-weighted average concentrations allowed during a work shift; concentrations below OSHA PEL are not expected to cause adverse health effects in the majority of workers.

3) **Additive Formula Calculation:**

“*” = % PEL calculated using OSHA additive formula: (concentration of contaminant 1 divided by OSHA PEL for contaminant 1) + (concentration of contaminant 2 divided by OSHA PEL for contaminant 2):

$$(n\text{-propanol: } 32.0/200) + (n\text{-propyl acetate: } 10.0/200) = 16.0 + 5.0 = 21.0$$

TABLE 6. AREA SAMPLING RESULTS

**Area Sample
Laminator Work Station**

**ACME Printing Corporation, Inc.
Sampling Date: December 13, 2012
Sampling Conducted by: Sam "IH" Sampler**

LOCATION	SAMPLE TYPE	ANALYTE	RESULT (ppm)	OSHA PEL (ppm)	(% PEL) >PEL?
Laminator Work Station	Area	Ozone	<0.013	0.1	(<1.25) No

NOTES:

1) **Abbreviations:**

ppm = part of analyte per million parts of air
OSHA = Occupational Safety & Health Administration
PEL = Permissible Exposure Limit
% PEL = what percent the measured concentration is of the PEL

2) **Definitions:**

PEL - legally enforceable, 8-hour, time-weighted average concentrations allowed during a work shift; OSHA PEL are not expected to cause adverse health effects in the majority of workers.

3) **NOTE:** It was determined after sampling that the laminator unit was not operational on the day of sampling. Accordingly, the above data is of no significance from an exposure perspective.