

**Supporting Statement
for
Marine Occupational Health and Safety Standards
for Benzene – 46 CFR 197 Subpart C**

A. Justification

1. Circumstances that make the collection necessary.

Benzene is a highly dangerous chemical that is commonly carried by ship and or barge in bulk, both by itself and in hydrocarbon mixtures. Benzene has long been known for its short-term health effects, and its cancer-causing nature was suspected for many years. Since exposure to even low concentrations of Benzene vapor is dangerous, the Coast Guard issued rules to help to reduce the levels to which marine workers are exposed. Title 46 USC 3703 and 49 CFR 1.46 authorize the Coast Guard to issue regulations dealing with handling and storage of cargo and the protection of life and property in the marine area.

Title 46 CFR 197 subpart C requires certain companies to perform Benzene testing and monitoring. This includes testing all U.S.-flag Coast Guard inspected vessels for the Benzene vapor concentration while carrying or transferring any cargo containing 0.5% or more Benzene by volume. Also, this involves providing medical surveillance, training, and other protective measures for those employees exposed to Benzene vapor in excess of the action level of 0.5 parts per million (ppm).¹ Vessel operators must gather and keep records that are subject to Coast Guard inspection. Records are required for all vessels carrying bulk liquid cargoes that have Benzene concentration of 0.5% or more. Recordkeeping topics include—

- Exposure monitoring – determination of personal exposure
- Program to reduce personal exposure
- Respiratory protection – fit testing
- Medical surveillance – medical records
- Provision of a Benzene Materials Safety Data Sheet

Since it is not practical for Coast Guard personnel to monitor each company's compliance with these requirements, the regulations require each company to keep records showing that they meet each requirement. Periodically, Coast Guard personnel review these records to determine compliance. These companies will not send records to the Coast Guard.

This information collection supports the following strategic goals:

Department of Homeland Security

- Prevention
- Protection

Coast Guard

- Safety
- Protection of Natural Resources

Marine Safety, Security and Stewardship Directorate (CG-5)

- Reduce crewmember deaths and injuries on U.S. commercial vessels

¹ Permissible exposure limits (PEL) –Time weighted average: 1 ppm; PEL – Short Term Exposure Limit: 5 ppm.

2. Purpose of the Information Collection.

The regulations require each vessel owner, charterer, managing operator, or agent (referred to as “company”) to collect information on Benzene vapor concentrations, on the health of its employees, and on the effectiveness of its exposure reduction programs. This information will not be routinely transmitted to the Coast Guard, but will be available for inspection by Coast Guard personnel, who will then be able to determine whether there is effective compliance with the regulations. Additionally, operators will inform those personnel whose exposures exceed allowable limits. Operators will give personnel copies of their health records and provide them with safety and health data so that they are aware of the potential hazards in the workplace.

The purpose of these information collection requirements is to ensure compliance with the Benzene regulations. If this information is not collected, there will be no way for the Coast Guard to determine whether the company is complying with the requirements. Also, personnel will not have the information required for informed consent, and the company will not be able to effectively carry out their Benzene reduction/control program. Since the Coast Guard inspects each vessel at least annually, the records review is at least annually. Additionally, if the Coast Guard has reason to believe that a company is in violation of the rules, the Coast Guard will review the facility records.

To date, the Coast Guard has used the information collected to determine compliance with the Benzene regulations.

3. Consideration of information technology to reduce burden.

We have made the burden as small as possible. The required information is the minimum necessary for determining Benzene exposure levels, planning for reducing human exposure to within safe limits, ensuring effectiveness of respirators, monitoring personnel health, and providing health and safety information to personnel. For example—The fit test report ensures that the fit test was performed successfully, and Coast Guard personnel ask for the report to check that the test was performed successfully. In general, these information requirements are similar to those that companies already voluntarily use to implement these safety and health measures. Without records of these measures, neither the companies nor the Coast Guard can be certain that the regulations are being carried out. Furthermore, without such requirements, personnel would not know if their health is at risk and would not have the safety and health information available they need for informed consent.

Since companies do not transfer information to the Coast Guard, the form of information collection is each company’s responsibility. Records may be maintained in paper or electronic format. Each company determines what type of recordkeeping is best for that company. We estimate that 100 percent of the recordkeeping requirements can be done electronically. At this time, we estimate that 10 percent of the responses are collected electronically.

4. Efforts to identify duplication.

Among its many responsibilities, the Coast Guard is charged with ensuring the health and safety of marine workers aboard inspected vessels, and is the only Federal agency charged with this responsibility, so the Coast Guard's recordkeeping requirements do not duplicate those of any other Federal agency. Some companies already perform many of the proposed safety and health measures, and most of these prepare written records as any Benzene exposure reduction program requires extensive recordkeeping. To the extent that these company records exist, they will satisfy the Benzene recordkeeping requirement. Since the Coast Guard does not specify the form of the required recordkeeping, any records a company maintains containing the required information will satisfy the Coast Guard's requirements. In effect, due to the way the regulations are drafted, information collection duplication is impossible.

5. Methods used to minimize burden to small business if involved.

The information requirements are the minimum necessary to ensure a healthy marine environment. To a great extent, without these recordkeeping measures, the company would find it difficult or even impossible to implement a Benzene reduction program. The Coast Guard periodically reviews these requirements to be certain that they are neither insufficient nor excessive.

The Coast Guard has minimized the burden on small as well as large entities by the following:

- a. Keeping the required recordkeeping to the absolute minimum to ensure compliance;
- b. Not requiring record submission to the Coast Guard; and
- c. Not specifying the form or format of the recordkeeping.

6. Consequences to Federal program if the collection were not conducted or conducted less frequently.

With less frequent data collection, the program will not accomplish its goal of protecting health. Through our work with industry, other agencies, and our trial implementation of the rules, we determined that it is not possible to collect the required information less frequently and still determine whether companies are in compliance with the regulations; without the ability to determine compliance, the Coast Guard will not be able to protect the safety and health of marine terminal and vessel personnel. In particular, the recordkeeping intervals are tied to the testing intervals, so reducing the collection frequency will prevent personnel from determining whether a company is in compliance with the requirements. We will periodically review these requirements to be certain that the information collection requirements are neither insufficient nor excessive.

Clearly, without information collection the Coast Guard will not be able to determine compliance at all. Furthermore, companies need to keep records to efficiently operate their Benzene exposure reduction programs.

7. Special circumstances that require collection to be conducted in an inconsistent manner.

This information collection is conducted in manner consistent with the guidelines in 5 CFR 1320.5(d)(2).

8. Consultation.

A 60-day Notice (See [USCG-2009-0115], March 12, 2009, 74 FR 10752) and 30-Day Notice (June 24, 2009, 74 FR 30102) were published in the *Federal Register* to obtain public comment on this collection. The Coast Guard has not received any comments on this information collection.

9. Provide any payment or gift to respondents.

There is no offer of monetary or material value for this information collection.

10. Assurances of confidentiality provided to respondents.

There are no assurances of confidentiality provided to the respondents for this information collection.

11. Additional justification for questions of a sensitive nature.

There are no questions of sensitive language.

12. Estimated hour and cost burden.

- The estimated number of respondents is 200.
- The estimated number of annual responses is 200.
- The estimated annual hour burden is 59,766 hours.
- The estimated annual cost burden is \$2,386,585.

The hour burden and costs to industry are based in part on experience from trial implementation of the SouthWest Research chemical exposure program.

Estimated hour burden

a. Initial exposure monitoring: Each company must determine whether the Benzene exposure level is sufficiently high to require reduction/control measures for each Coast Guard inspected vessel involved in the carriage of Benzene or Benzene-containing bulk cargoes. This assessment must be performed initially and whenever there is a major change in vessel design or operation. We estimate that on average an assessment will be valid for ten years. Companies will not have to assess exposures on each vessel, but rather will assess typical ones they use. Furthermore, we estimate that 200 companies will have to perform the assessment, and that each initial assessment will require three weeks (120 hours) for an industrial hygienist to perform. This assessment includes time for industrial hygienists to purchase, test, and calibrate equipment; time to familiarize themselves with the marine environment, equipment, and operations; time to take a statistically valid series of Benzene-vapor concentration measurements and analyze the

measurements; and time to prepare the report. Using \$73 per hour for industrial hygienist time², the 10-year cost of preparing the initial assessment is as follows:

$$200 \times 120 \text{ hours} \times \$73/\text{hour} = \$1,752,000$$

On an annual basis, assuming an assessment every 10 years, the annualized (non-discounted) cost is:

$$\$1,752,000 / 10 \text{ years} = \$175,200/\text{year}$$

b. Periodic exposure monitoring: After the initial assessment, each company must monitor Benzene exposures annually on each vessel where initial exposure monitoring has indicated exposure above limits. The initial exposure monitoring determines whether there is danger from Benzene vapors. Industry uses this data, if above the PEL's, to formulate their personal exposure reduction plan. The periodic exposure monitoring is necessary to determine if there have been any changes in the worker exposure over time. If so, the personal exposure reduction plan may have to be changed to reflect the change in personal exposure. An exposure greater than the PEL's Benzene triggers the preparation of a personal exposure reduction plan. We estimate that 100 companies will initially find vapor concentrations to be above allowable limits, and that an industrial hygienist will require one week (40 hours) to perform each annual assessment and prepare a short report. This time estimate is based on the fact that the industrial hygienist will be familiar with the marine environment and with the Benzene-measurement equipment. Furthermore, the company will need to take only a limited number of measurements rather than the large number needed for the initial assessment. Using \$73 per hour for industrial hygienist time, the cost of annual exposure monitoring is as follows:

$$100 \times 40 \text{ hours} \times \$73/\text{hour} = \$292,000$$

c. Additional exposure monitoring: After the initial assessment, each company must evaluate the personnel exposures to Benzene whenever there is a change in vessel operations, to determine whether the exposure has increased or decreased. This covers non-major changes such as changes in the cargo transfer rate or use of different barges, as opposed to the major changes that require entirely new initial assessments (see item a), such as installation of a vapor recovery system. We estimate that on average 20 companies will change their operations each year and will have to monitor their exposures and prepare a short report. We further estimate that an industrial hygienist will require one week (40 hours) to perform each assessment. This time estimate is based on the fact that the company will need to take only a limited number of measurements rather than the large number needed for the initial assessment. Using \$69 per hour for industrial hygienist time, the cost of preparing the additional exposure monitoring is as follows:

$$20 \times 40 \text{ hours} \times \$73/\text{hour} = \$58,400$$

² Equivalent to GS-13, per Commandant Instruction 7310.1L.

d. Notification of exposure monitoring: After the initial assessment, each company for which the initial exposure monitoring showed above limit exposures must notify affected personnel annually. Notification is required for all Benzene monitoring. If the PEL are exceeded, the notification must contain a description of the measures taken to protect the worker. We estimate that 100 companies will initially find Benzene-vapor exposures above the PELs and so must notify their employees. We estimate that for each company, an industrial hygienist will require one hour to prepare a written notification (the same notification to each employee) to all of that company's affected workers, and clerical workers will require three hours to prepare, copy, and distribute the written notifications. Using \$73 per hour for industrial hygienist time and \$33 per hour for clerical time³, the cost of preparing the annual notification is as follows:

100 x 1 hour x \$73/hour	= \$ 7,300
100 x 3 hours x \$33/hour	= \$ 9,900
Total cost	= \$17,200

e. Written exposure reduction programs: After the initial assessment, each company for which the initial exposure monitoring showed Benzene-vapor exposures above the PELs must prepare a written program to reduce/control exposures. We estimate that 100 companies will initially find exposures above the PELs and will need to prepare a program, and that on average each program will be valid for five years. This program should be only a few pages in length. We estimate that for each company, an industrial hygienist will require one week (40 hours) to prepare a written program, and clerical workers will require two hours to type up the program. Using \$73 per hour for industrial hygienist time and \$33 per hour for clerical time, the five year cost of preparing the written exposure reduction programs is as follows:

100 x 40 hours x \$73/hour	= \$292,000
100 x 2 hours x \$33/hour	= \$ 6,600
Total cost	= \$298,600

On an annual basis, assuming a new program every five years, the annualized (non-discounted) cost is:

\$298,600/5 years	= \$59,720 per year
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f. Written respiratory protection programs: In addition to the written exposure reduction program (see item e), most companies will choose to reduce personnel exposures by requiring respiratory protection be worn. Those companies that choose this option will be required to prepare a written program. Of the estimated 100 companies with above limit exposures, we estimate that 90 will prepare a respiratory protection program, and that on average each program will be valid for five years. This program should be only a few pages in length, and should vary little from company to company. We estimate that for each company, an industrial hygienist will require 24 hours to prepare a written program, and clerical workers will take two hours to type up the program. Using \$73 per hour for industrial hygienist time and \$33 per hour for clerical time, the five-year cost of preparing the written respiratory protection programs is as follows:

³ Equivalent to GS-05, per Commandant Instruction 7310.1L.

90 x 24 hours x \$73/hour	= \$157,680
90 x 2 hours x \$33/hour	= \$ 5,940
Total cost	= \$163,620

On an annual basis, assuming a new program every five years, the annualized (non-discounted) cost is:

$$\text{\$163,620/5 years} = \text{\$32,724 per year}$$

g. Fit to wear respirator: Prior to issuing a respirator to an employee, each company must have a physician determine that the employee can safely wear a respirator. This determination will probably be made during the employee's first (baseline) annual medical monitoring, and should require thirty minutes of the physician's time and thirty minutes (0.5 hour) of the employee's time. We estimate that on average an employee will work for the same company for about five years, meaning that about 20 percent must be undergo the respiratory fit test each year. Using \$99 per hour for physician time⁴ and \$30 per hour for employee time⁵, the five-year cost of determining whether employees can safely wear a respirator is:

2,000 x 0.5 hour x \$99/hour	= \$ 99,000
2,000 x 0.5 hour x \$30/hour	= \$ 30,000
Total cost	= \$129,000

On an annual basis, with 20 percent new employees each year, the annualized (non-discounted) cost is:

$$\text{\$129,000/5 years} = \text{\$25,800}$$

h. Respirator fit testing records: In addition to a written respiratory protection program, each company using negative pressure respiration protection for compliance must test the respirator fit annually for each employee and maintain a written record. We estimate a safety and health technician will require twenty minutes (0.33 hour) for test preparation for each employee, two hours for each fit test, and twenty minutes (0.33 hour) for each test record preparation. Furthermore, each employee will spend about two hours in the fit test, with about 2,000 employees being tested annually. Using \$33 per hour for safety and health technician time⁶ and \$30 per hour for employee time, the cost of preparing the annual respirator fit testing record is as follows:

2,000 x 2 2/3 hours x \$33/hour	= \$176,220
2,000 x 2 hours x \$30/hour	= \$120,000
Total cost	= \$296,220

i. Medical Monitoring: If the initial exposure assessment demonstrates that the Benzene-vapor level exceeds certain levels, each company will have to provide annual medical

⁴ Equivalent to O-4, per Commandant Instruction 7310.1L.

⁵ Equivalent to GS-03, per Commandant Instruction 7310.1L.

⁶ Equivalent to GS-04, per Commandant Instruction 7310.1L.

examinations (i.e., medical surveillance) for each exposed employee. For example—All employees exposed to Benzene vapor at a concentration of greater than or equal to the Action Level ppm on at least 30 calendar days or at a level above the PEL's on at least 10 calendar days during the coming year. Even if employees wear respiratory protection, they will still need to have a medical exam. The medical exam determines whether the worker has been injured despite the personal exposure reduction plan. The medical exams look for changes in blood and the liver that are precursors to leukemia. The regulations require that the all results of the medical tests be provided to the employee. Benzene is unusual in that the damage it does to the blood and liver at the beginning can be found in routine medical tests, before the onset of cancerous Leukemia. And also unusual is the fact that if the medical tests prove positive for these noncancerous precursors of Leukemia, removal from further exposure to Benzene results in the elimination of these blood and liver changes, and no onset of leukemia. For that reason medical tests are imperative. Since the medical examination level for Benzene exposure is below the reduction/control level, we estimate 150 companies (2,500 affected employees) will have to provide medical examinations, and must prepare an examination report for each employee. Each employee spends time in the examination room, waiting room (both waiting and filling-out forms), and blood lab. Finally, a safety and health technician spends time scheduling, filling-out forms, and assisting employees in filling-out forms. Since companies do not normally provide annual physical examinations, the entire charge represents a new burden on the industry. We estimate that each physical, including physician's time to review the medical history, examine the employee, interpret test results, and write the report, will require one hour. Each employee will spend about four hours in the process, and a safety and health technician will spend about one hour per employee tested. Additionally, each test will involve sending blood samples to an outside laboratory. We estimate that this will cost \$220 per employee. Using \$99 per hour for physician time, \$30 per hour for employee time, and \$30 per hour for technician time, the cost of the medical examinations is as follows:

2,500 x 1 hour x \$99/hour	= \$ 247,500
2,500 x 4 hours x \$30/hour	= \$ 300,000
2,500 x 1 hour x \$33/hour	= \$ 82,500
2,500 x \$220/employee	= \$ 550,000
Total cost	= \$1,180,000

j. Information for physicians: Prior to each medical examination, each company must provide the physician with occupational exposure and medical information for each employee. We estimate that a safety and health technician will spend one hour preparing data for each employee, and that 2,500 employees will be affected. Using \$73 per hour for industrial hygienist time, the cost of preparing the information for physicians is as follows:

2,500 x 1 hour x \$73/hour	= \$182,500
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k. Material safety data sheets: Each company must provide personnel with information on the hazards of the cargoes carried and the Benzene contained in the cargo. This must be placed on the vessel for the crew's use. This information consists of data sheets prepared from information supplied by companies producing the cargoes; alternatively, for pure Benzene, the company can use the information provided in 46 CFR 197 Appendices A and B. Once this

information is prepared, the only burden is selecting, duplicating, and supplying them to each tank ship and tow boat as needed. We estimate that a clerk will require about 15 minutes (0.25 hour) to select, copy, and locate the appropriate information sheet on each tank ship or tow boat. (It is not necessary to post the data sheets on each vessel, only that they be available to the crew). Furthermore, we estimate that on an annual basis there are 700 vessels that carry 10 different cargoes of interest for a total of 7,000 listings each year. Using \$33 per hour for clerical time, the cost of supplying material safety information is as follows:

$$7,000 \times 0.25 \text{ hour} \times \$33 \text{ hour} = \$57,750$$

l. Employee training: Each company must annually train all employees that may be exposed to Benzene or Benzene-containing vapors, in the hazards associated with Benzene and the need for safety measures and health monitoring. In order to document that they have trained their workers, they must record the fact that they have done so. We estimate 3,300 employees will be trained annually, and that recording their names will require five minutes (0.083 hour) of a technician's time per employee. At \$33 per hour for technician time, the cost of recording trained employees' names is as follows:

$$3,300 \times 0.083 \text{ hour} \times \$33 \text{ hour} = \$9,071$$

Estimate of hour burden--Summary: There are approximately 200 respondents, which, depending on the number of employees, the level of Benzene exposure, and the number of vessels each year, will collect information from a few times annually to several hundred times annually. The information collected is not transmitted to the Coast Guard except when required during a spot check or when there is a suspected violation. The total average annual burden in hours is based on the following information collection categories:

a. Initial exposure monitoring	24,000
b. Periodic exposure monitoring	4,000
c. Additional exposure monitoring	800
d. Notification of exposure monitoring	400
e. Written exposure reduction program	840
f. Written respiratory reduction program	468
g. Fit to wear respirator	400
h. Respirator fit testing records	9,333
i. Medical monitoring	15,000
j. Information for physicians	2,500
k. Material safety data sheets	1,750
l. Employee training	275

These information collection requirements will place a total average annual burden of 59,766 hours on the respondents, but no burden on the Federal Government. Dividing the total average annual burden by the estimated 200 companies affected by this rulemaking results in an average annual burden of 299 hours per company. The burden on respondents varies greatly since the size of the operation and the level of Benzene exposure also varies greatly. This variance is beyond the control of the Coast Guard, and it represents the nature of the industry. The burden

was estimated based on the Coast Guard-industry trial implementation of the proposed rules, on the existing level of Benzene exposure in the industry, on current national wage/benefit scales, and on the number and size of companies in the industry.

Estimate of cost burden—Summary: Costs vary depending on the size of the company, level of Benzene exposure, and the amount of employees. The average annual cost for the industry is presented here by category:

a. Initial exposure monitoring	\$ 175,200
b. Periodic exposure monitoring	\$ 292,000
c. Additional exposure monitoring	\$ 58,400
d. Notification of exposure monitoring	\$ 17,200
e. Written exposure reduction program	\$ 59,720
f. Written respiratory reduction program	\$ 32,724
g. Fit to wear respirator	\$ 25,800
h. Respirator fit testing records	\$ 292,220
i. Medical monitoring	\$1,180,000
j. Information for physicians	\$ 182,500
k. Material safety data sheets	\$ 57,750
l. Employee training	\$ 9,071

These information collection requirements will place a total average annual burden of \$2,386,585 on the respondents, but no burden on the Federal Government. Dividing the total average annual burden by the estimated 200 companies affected by this rulemaking results in an average annual burden of \$11,933 per company. The burden on respondents varies greatly since the size of the operation and the level of Benzene exposure also varies greatly. This variance is beyond the control of the Coast Guard, and it represents the nature of the industry. The burden was estimated based on the Coast Guard-industry trial implementation of the proposed rules, on the existing level of Benzene exposure in the industry, on current national wage/benefit scales, and on the number and size of companies in the industry.

13. Annual estimate of capital and startup cost to respondents.

There are no capital, start-up or maintenance costs associated with this information collection.

14. Estimates of annualized cost to the Federal Government.

There is no cost to the Federal Government for these information collection requirements.

15. Reasons for change in the burden.

There are no proposed revisions to this information collection request. The burden hour estimate remains the same.

16. Plans for tabulation, statistical analysis and publication.

This information collection will not be published for statistical purposes.

17. Approval to not display the expiration date.

The Coast Guard will display the expiration date for OMB approval of this information collection.

18. Explain each exception to the certification statement.

The Coast Guard does not request an exception to the certification of this information collection.

B. Collection of Information Employing Statistical Methods.

This information collection does not employ statistical methods.