



DEPARTMENT OF THE NAVY  
NAVAL MEDICAL ADMINISTRATIVE UNIT  
PRESIDIO OF MONTEREY HEALTH CLINIC  
MONTEREY, CALIFORNIA 93944-5012

IN REPLY REFER TO

6260

04M/258

4 Dec 02

From: Officer in Charge, Naval Medical Administrative Unit, Monterey  
To: Superintendent, Naval Postgraduate School, Monterey,  
1 University Circle, Monterey CA 93943-5100

Subj: ANNUAL INDUSTRIAL HYGIENE SURVEY OF NAVAL POSTGRADUATE SCHOOL,  
MONTEREY, METEOROLOGY DEPARTMENT

Ref: (a) OPNAVINST 5100.23F, Section 0803.a

Encl: (1) Industrial Hygiene Survey Report ET-0214

1. As required by reference (a), an annual industrial hygiene survey of the Naval Postgraduate School, Monterey, Meteorology Department was conducted on 3 December 2002 by the Naval Medical Administrative Unit, Monterey industrial hygienist. The survey report ET-0214 is forwarded as enclosure (1).

2. Due to the size and complexity of your command, separate reports will be issued as surveys of individual areas are completed to ensure the timeliness of the information. This survey is a service provided under the overall Occupational Health Program. It is not an inspection report but is designed to assist your Command's Occupational Safety and Health Program by identifying and evaluating actual and potential occupational health hazards and the status of their controls. The Navy Oversight Inspection Unit and other inspection teams rely on these surveys and the corrective actions taken as indicators of an aggressive and comprehensive Navy Occupational Safety and Health (NAVOSH) Program.

3. A response to this survey is unnecessary since there were no findings and corrective actions are unnecessary.

4. Further clarification or consultation with respect to these findings and recommendations is available from Eric Thurston at commercial (831) 656-3466, e-mail sethurst@nps.navy.mil.

S.E. THURSTON

By direction

Copy to:  
Industrial Hygiene Department, NAVHOSP Lemoore  
Army Medical Clinic, POM/DLI, Occ Med Div

NAVAL MEDICAL ADMINISTRATIVE UNIT, MONTEREY

INDUSTRIAL HYGIENE SURVEY

of

NAVAL POSTGRADUATE SCHOOL, MONTEREY

METEOROLOGY DEPARTMENT

SURVEY #ET-0214

3 December 2002

Survey Conducted By:

Eric Thurston,  
Industrial Hygienist

Enclosure (1)

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## **EXECUTIVE SUMMARY**

There were no findings that require corrective action. All departmental programs are functioning satisfactorily.

Specific details of survey information can be found in sections II and III of this report. The cooperation of Keith Jones was greatly appreciated.

## COMMON ABBREVIATIONS AND GLOSSARY

(The following abbreviations may be used in this report)

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	Asbestos Containing Material.
AL	Action Level. Normally ½ PEL. Exposure level at which air sampling, employee training, medical surveillance are required.
ANSI	American National Standards Institute. A national consensus standards developing organization.
Ceiling	A toxic material exposure level which cannot be exceeded for any length of time.
CFM	Cubic feet per minute. Air flow rate.
dba	A sound level reading in decibels as measured on the A-weighted network of a sound level meter.
EL	Excursion Limit. Is a concentration limit which cannot be exceeded at any time.
EPA	Environmental Protection Agency.
f/cc	Fibers per cubic centimeter. A means for expressing airborne asbestos fiber concentrations.
FPM	Feet per minute.
HAZCOM	Hazard communication. A system for training employees about job hazards through the use of chemical inventories, MSDSs, labels, and personnel training.
HCP	Hearing Conservation Program. A program to prevent hearing loss from exposure to noise through the use of hearing protection, training, and medical surveillance.
HEPA	High-efficiency particulate air filter. A filter capable of trapping and retaining 99.97% of 0.3 micron diameter, or larger, particles.
HM	Hazardous material. A material which is a physical or health hazard per 29 CFR 1910.1200.
HW	Hazardous waste. Any discarded or abandoned hazardous substance as defined in 40 CFR 261.
LEV	Local exhaust ventilation. Exhaust system at source of contamination.
mg/m <sup>3</sup>	Milligrams per cubic meter of air. A means for expressing concentrations of dust and metal fumes in air.
MMVF	Man made vitreous fibers. (Fiberglass, mineral wool, ceramics)
MSAL	Medical Surveillance Action Level. A concentration of an air contaminant at which medical surveillance examinations must be provided to exposed personnel.
MSDS	Material Safety Data Sheet. A form used by manufacturers to communicate to users the chemical and physical properties of their products.
NAVOSH	Navy Occupational Safety and Health
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health. Recommends safety and health standards for OSHA.
NPEL	Navy Permissible Exposure Limit.
OSHA	Occupational Safety and Health Administration.
OV	Organic vapors.
PCB	Polychlorinated Biphenyl

COMMON ABBREVIATIONS AND GLOSSARY

PEL	Permissible Exposure Limit. The maximum permissible allowable exposure level of a toxic chemical or harmful physical agent (normally averaged over 8 hours) to which an employee may be exposed.
PPE	Personal Protective Equipment. Clothing or devices furnished to protect employees in performance of work in potentially hazardous areas or conditions.
ppm	Parts per million. A means for expressing the concentration of gases and vapors in air.
RFR	Radiofrequency/Microwave Radiation.
RPPM	Respiratory Protection Program Manager.
SCBA	Self Contained Breathing Apparatus.
SOP	Standard Operating Procedures.
STEL	Short term exposure limit. A 15 minute time weighted average exposure which should not be exceeded at any time during a workday.
Stressor	Potential Hazard (e.g. Noise, Chemicals, Dusts)
TLV	Threshold Limit Value. Established by ACGIH as levels of airborne contaminants or physical hazards under which it is believed workers may be exposed on a day after day basis without adverse effect.
TWA	Time Weighted Average. A method for averaging varying concentrations over a specified period of time (usually 8 hours).
WC	Work Center
WMP	Workplace Monitoring Program. A program to evaluate workplace health hazards through surveys and exposure measurement.

## SECTION I

### INTRODUCTION

The Naval Postgraduate School Meteorology Department has a wide variety of teaching, research, and support facilities. The potential health hazards in the department and the processes carried out in individual laboratories vary with the type of research being conducted by both staff and students.

If an operation has been overlooked or significant changes made which are believed to put personnel at serious risk, the industrial hygienist should be contacted, and an evaluation requested.

### REPORT ORGANIZATION

Reference: (a) OPNAVINST 5100.23F, Section 0803.f

Section I - contains the background information associated with this report and the schedule for follow-up surveys.

Section II - addresses the status of the command's occupational health programs and contains a short overview of each program's status.

Section III - Contains industrial hygiene assessments of specific work areas. These assessments address the status of workplace hazards and required control procedures. Any deficient conditions or recommended improvements in specific work areas are addressed in this section.

Section IV - contains the results of all the sampling/monitoring data conducted in support of this survey.

Section V - identifies the occupational health medical surveillance requirements for each work area based on survey findings.

Section VI - details the sampling required to be conducted for OSHA or NAVOSH regulated stressors or stressors which have been found to result in personnel exposures equal to or in excess of the MSAL.

Appendix A - contains the OPNAV 5100/14 forms which are required by reference (a). These forms detail the occupational exposures of employees by work center or functional group.

Appendix B - is a copy of the Change In Operation Notification form, which should be filled out whenever a major operational change occurs. By returning the completed forms to the industrial hygienist, all new operations can be evaluated as required by reference (a). This form can be copied as needed for your use.

## SURVEY SCHEDULE

References: (a) OPNAVINST 5100.23E, Chapter 8, Sections 0803.b and c  
(b) OPNAVINST 5100.23E, Chapter 8, Paragraph 0803.g

In accordance with reference (a), each workplace must be thoroughly evaluated to identify and quantify potential occupational hazards. To document these evaluations, an initial comprehensive (baseline) survey is needed, followed by periodic updated surveys. Reference (b) requires workplaces with recognized potential health hazards to be evaluated annually, and other workplaces to be evaluated periodically. Medical surveillance recommendations and a workplace monitoring plan are developed from the findings of these surveys. Any comments or suggestions regarding these survey schedules should be forwarded to the industrial hygienist in the Code 223 Safety Office. The year of the last survey appears after each work center listing.

### WORKPLACE SURVEY SCHEDULE

<u>Annual Required</u>	<u>2 Year Schedule</u>	<u>4 Year Schedule</u>
Minor maintenance rooms (2002)	Bldg 540(2002)	None
Buoy Lab (2002)		

#### **Change of Operations Notification:**

Reference (b) requires an industrial hygiene re-evaluation when workplace changes occur. Please notify the industrial hygienist via your Safety Office whenever major changes occur in a workplace. Examples of major changes include:

- Exposure times have changed.
- New types of equipment are used.
- New chemical/chemical product usage.
- New operations are performed.
- Increase in major chemical usage.
- Changes in exhaust ventilation.

A "CHANGE OF OPERATIONS NOTIFICATION" form is provided in Appendix B and can be used for this purpose. Copy the form as needed for your use.

## SECTION II

### **NAVY OCCUPATIONAL SAFETY AND HEALTH**

#### **PROGRAM REVIEWS**

The following programs are not required to be maintained by the Naval Postgraduate School, Monterey, Meteorology Department because these hazards are not present:

- Asbestos Control
- Bloodborne Pathogens Control
- Manmade Vitreous Fibers Control
- Polychlorinated Biphenyls (PCB's) Control
- Process Control Ventilation
- Respiratory Protection

#### ERGONOMICS PROGRAM

Heavy lifting involves lead buoy weights, buoys, and other objects. Cranes and other lifting aids are used whenever possible. A hoist present in Building 230 is used to lift the buoys onto and from pallets. Personnel have received back injury prevention training.

#### HAZARDOUS MATERIALS CONTROL PROGRAM

MSDSs have been obtained for all products in use. Products stored at Building 230 are virtually identically to those stored at the Building 232, 6<sup>th</sup> floor work areas. No new products have been added to the departmental authorized use list (DAUL) since the previous survey. The departmental hazardous material coordinator works with the Code 223 Hazardous Materials Control and Management Coordinator to obtain MSDSs for and authorization to use new chemical products.

#### HEARING CONSERVATION PROGRAM

The potential for significant noise exposures does not occur because of the extremely brief usage of battery-powered drills and small machine tools in Building 230, and brief, rare exposure to noise during operation of the radio acoustic sounding system present at Bldg 540. Personnel exposed to these sources wear hearing protection.

### LEAD CONTROL PROGRAM

Personnel perform intermittent, brief duration soldering operations using temperature-controlled irons and lead-tin solder and handling of 30 and 50 pound lead weights attached to buoys. Significant exposures are not expected based on historical monitoring data of similar soldering operations performed at other Naval activities and on brief job duration, and on lack of any processes that would generate airborne lead fumes or dust during handling of buoy weights. As noted in section III of this report, lead is a reproductive hazard. Copies of required information from the Federal Lead Standard were previously provided to the departmental safety coordinator.

Recommendations: Use of respirators and enrollment in the Lead medical surveillance program are unnecessary. Continue observing personal hygiene requirements after soldering or handling lead weights to avoid accidental ingestion of lead. Ensure that personnel exposed to lead are aware of the Lead Standard information discussed above.

### REPRODUCTIVE HAZARDS CONTROL PROGRAM

References: (b) OPNAVINST 5100.23E, Chapter 29  
(c) Navy Environmental Health Center Technical Manual NEHC-TM92-2

Materials that contain reproductive hazards, as defined by Appendix 29-A of reference (b), are discussed in section III of this report.

#### Recommendations:

In order to properly control reproductive hazards in the workplace, employees are encouraged to:

- Inform the supervisor as soon as possible that they are pregnant, completely fill out the questionnaire provided by reference (c), and request an evaluation by the industrial hygienist and the occupational health provider from the Presidio of Monterey Army medical clinic.
- Follow all recommendations from the industrial hygienist and occupational health provider regarding the use of material containing reproductive hazards in the workplace.

SECTION III

INDUSTRIAL HYGIENE ASSESSMENTS

**INDUSTRIAL HYGIENE ASSESSMENT**

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002

DEPARTMENT: Meteorology Dept, Minor Maintenance Rooms POC: Keith Jones

LOCATION: Bldg 232, Rooms 600,602, and 610 IND. HYG: Eric Thurston

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FUNCTION: Room 600, the Balloon Room, contains equipment used for minor equipment maintenance and operation of weather balloons. This room is also currently being used to develop new software for some of the monitoring equipment used by the department. Room 602, which is shared with the Oceanography Department, is a lab where minor equipment maintenance is conducted. Room 610 is an equipment storage room. Balloons are filled with helium. A variety of cleaning solvents and other chemicals are used in Rooms 600 and 602. Occasionally lead-tin soldering is also performed. An aerosol spectrometer, which contains a class 2 laser, is occasionally used during student projects. Various chemical products are used as part of maintenance and repair procedures. Use of small quantities of methanol, acetone (not used in the past year), and ethanol are used as cleaning solvents but are being replaced by Chemtronics Degreaser products; these latter products will be ordered in small bulk quantities in the future instead of the aerosol can forms. Use of Freon TF is being replaced by Flux-Off 2000 because they perform the same function and the latter product is referred.

INDUSTRIAL HYGIENE ASSESSMENT

**There are no operations that potentially expose personnel to hazardous occupational stressors.**

**The following operations will not expose personnel to hazardous occupational stressors in excess of established health standards:**

1. Lead and tin fumes during soldering. Significant exposures are unlikely based on monitoring data of similar operations using temperature-controlled soldering irons and on minimal job duration.
2. Helium during filling of weather balloons. Significant helium concentrations are unlikely because the balloons are filled outdoors, where outdoor air would dilute any helium leakage.

Significant exposures during the following operations are unlikely based on minimal chemical usage:

3. Methanol, acetone, and ethanol during their use as cleaning solvents.
4. Hexane during use of Super 77 adhesive.
5. Petroleum distillates during use of penetrating fluid.
6. Isopropyl alcohol and Freons during use of Flux-off 2000.
7. 1,1,1-trichloroethane during use of Formula 111 Degreaser.
8. Nitroethane, Freons, ethanol, and isopropyl alcohol during use of Chemtronics Degreasers.
9. Isopropyl alcohol during use of Reltek Bondit adhesives.
10. Toluene and methylene chloride during use of Star Brite Liquid Electrical Tape. Monitoring data, traceable to Industrial Hygiene Surveys ET-0162 and ET-0165, collected during use of Star Brite compound indicates no detectable levels of airborne toluene and methylene chloride are expected.
11. Toluene during use of several colors of LHB enamels in aerosol cans.
12. Toluene during use of 3M Skotchkote #14853 Electrical Coating.
13. Use of Freon TF.

**INDUSTRIAL HYGIENE ASSESSMENT (con'd)**

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002

DEPARTMENT: Meteorology Dept, Minor Maintenance Rooms POC: Keith Jones

LOCATION: Bldg 232, Rooms 600,602, and 610 IND. HYG: Eric Thurston

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**The following operations will not expose personnel to hazardous occupational stressors in excess of established health standards (con'd):**

- 14. Significant exposures during use of Chemtronics DPL-2 is likewise unexpected because of minimal usage.
- 15. Laser radiation during use of the aerosol spectrometer. Significant exposure is unlikely because the laser is completely contained within the instrument.

**The following operations potentially expose personnel to stressors identified by OPNAVINST 5100.23E, Chapter 29, Appendix 29-A as reproductive hazards:**

- 1. Lead, which is a male, female, and developmental reproductive hazard, during soldering.
- 10,11,12. Toluene, which is a developmental reproductive hazard, during use of Star Brite Liquid Electrical Tape, LHB Flat Black Enamel aerosol cans, and 3M Scotchkote # 14853 Electrical Coating.

Exposure is expected to be minimal as discussed above. Personnel who wish reproductive hazards counseling should contact the occupational health department of the Presidio of Monterey Army Clinic.

RECOMMENDATIONS:

- 1. Continue to follow proper personal hygiene procedures before eating, drinking, smoking, or chewing after soldering operations as required by reference (a). A copy of reference (b), appendices from the Federal Lead Standard, was previously given to the departmental safety coordinator for distribution to personnel performing soldering as required by reference (c).

REFERENCES / NOTES:

- (a) OPNAVINST 5100.23E, Chapter 21, paragraph 2104f(5)
- (b) 29 CFR 1910.1025, Appendices A and B
- (c) OPNAVINST 5100.23E, Chapter 21, paragraph 2106

FINDINGS: None.

**INDUSTRIAL HYGIENE ASSESSMENT**

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002

DEPARTMENT: Meteorology Dept, Buoy Lab POC: Keith Jones

LOCATION: Bldg 230 IND. HYG: Eric Thurston

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**FUNCTION:** Part of this building houses the department's Buoy Lab, where buoys are prepared for stationing and recovered buoys are stored. Minimal lead-tin soldering of electrical wiring is performed. 30 and 50 pound lead weights are attached to the buoys; these are not ground, heated, or painted, and therefore airborne lead exposure potential from handling is negligible. The Mechanical Engineering Department's small benchtop machine tools, e.g., band saw, located in the other half of the building or the Physics Department's Student Machine Shop are occasionally used. A variety of chemicals, including aerosol paint cans, cements, and electrical coatings, are used during maintenance processes.

INDUSTRIAL HYGIENE ASSESSMENT

**There are no operations that potentially expose personnel to hazardous occupational stressors.**

**The following operations will not expose personnel to hazardous occupational stressors in excess of established health standards:**

1. Lead and tin fumes during soldering. Significant exposures are unlikely based on monitoring data of similar operations using temperature-controlled soldering irons and on minimal job duration.
2. Lead during handling of buoy weights. Significant exposures are unlikely because processes where dust or fume is generated are not performed.

Significant exposures during the following operations are unlikely based on minimal chemical usage:

3. Toluene and other solvents during use of aerosol paint cans.
4. Toluene and methylene chloride during use of Star Brite Electrical Tape. Monitoring data, traceable to Industrial Hygiene Surveys ET-0162 and ET-0165, collected during use of Star Brite compound indicates no detectable levels of airborne toluene and methylene chloride are expected.
5. Solvents during use of PVC cements or Boatlife Life-Calk Solvent and Cleaner.
6. Toluene and solvents during use of 3M Scotchkote #14853 Electrical Coating.
  
7. Noise during use of battery-powered drills or small machine tools. Brief duration usage of this equipment will not result in significant noise exposures.
8. Ergonomics during handling of lead buoy weights and other heavy objects. Cranes, hoists and other lifting devices are used whenever possible, and personnel have received back injury prevention training.

INDUSTRIAL HYGIENE ASSESSMENT (con'd)

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002  
DEPARTMENT: Meteorology Dept, Buoy Lab POC: Keith Jones  
LOCATION: Bldg 230 IND. HYG: Eric Thurston  
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**The following operations potentially expose personnel to stressors identified by OPNAVINST 5100.23E, Chapter 29, Appendix 29-A as reproductive hazards:**

- 1,2. Lead, which is a male, female, and developmental reproductive hazard, during soldering and use of buoy weights.
- 3,4,6. Toluene during use of aerosol paint cans, Star Brite Electrical Tape, or 3M Scotchkote #14853 Electrical Coating.

Exposure is expected to be minimal as discussed above. Personnel who wish reproductive hazards counseling should contact the occupational health department of the Presidio of Monterey Army Clinic.

RECOMMENDATIONS:

1. Continue to follow proper personal hygiene procedures before eating, drinking, smoking, or chewing after soldering operations or handling of buoy weights as required by reference (a). A copy of reference (b), appendices from the Federal Lead Standard, was previously given to the departmental safety coordinator for distribution to personnel performing soldering as required by reference (c).

REFERENCES / NOTES:

- (a) OPNAVINST 5100.23E, Chapter 21, paragraph 2104f(5)
- (b) 29 CFR 1910.1025, Appendices A and B
- (c) OPNAVINST 5100.23E, Chapter 21, paragraph 2106

FINDINGS: None.

## INDUSTRIAL HYGIENE ASSESSMENT

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002

DEPARTMENT: Satellite Area, Old Fort Ord, Fritchie Field POC: Keith Jones

LOCATION: Bldg 540 IND. HYG: Eric Thurston

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**FUNCTION:** This small building is located near old Fritchie Field on old Fort Ord. The building is only occupied about 1 hour per month. Systems present include a RADAR Wind Profiler and radio acoustic sounding system, both which involve use of desktop computers. A class I laser is used in the Ceilometer, which measures height of clouds and fog. Minimal lead-tin soldering is performed, with chemical exposure limited to use of rubbing alcohol for cleaning the laser lens. The RADAR acoustic sounding system operates every half hour for about 5 minutes.

### INDUSTRIAL HYGIENE ASSESSMENT

**There are no operations that potentially expose personnel to hazardous occupational stressors.**

**The following operations will not expose personnel to hazardous occupational stressors in excess of established health standards:**

1. Lead and tin fumes during soldering. Significant exposures are unlikely based on monitoring data of similar operations using temperature-controlled soldering irons and on minimal job duration.
2. Laser radiation during operation of a class I laser associated with the ceilometer. Class I lasers pose no hazard and exposure controls are unnecessary.
3. Isopropyl alcohol during cleaning of the laser lens with rubbing alcohol. Significant exposure is unlikely based on minimal usage and dilution with outdoor air.
4. Radiofrequency radiation during operation of RADAR systems. Significant exposure is unlikely because personnel are not present during their operation.
5. Noise during operation of the radio acoustic sounding system. Significant noise exposure is unlikely because personnel are indoors during operation.

**The following operations potentially expose personnel to stressors identified by OPNAVINST 5100.23E, Chapter 29, Appendix 29-A as reproductive hazards:**

1. Lead, which is a male, female, and developmental reproductive hazard, during soldering. Exposure is expected to be minimal as discussed above. Personnel who wish reproductive hazards counseling should contact the occupational health department of the Presidio of Monterey Army Clinic.

### RECOMMENDATIONS:

1. A copy of reference (a) was e-mailed to the work center supervisor so it is available for review as required by reference (b). Ensure that personnel performing lead-tin soldering are aware of this information's availability.
4. The command's Code 223 RF Radiation Manager was contacted to coordinate measurements of the RADAR systems during the next comprehensive measurement survey of all RF sources as required by reference (c).
5. Wear hearing protection system during rare outdoor work during operation of the radio acoustic sounding system as required by reference (d).

**INDUSTRIAL HYGIENE ASSESSMENT (con'd)**

ACTIVITY: NPS Monterey FILE NO.: ET-0214 DATE: 3 December 2002

DEPARTMENT: Satellite Area, Old Fort Ord, Fritchie Field POC: Keith Jones

LOCATION: Bldg 540 IND. HYG: Eric Thurston  
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REFERENCES:

- (a) 29 CFR 1910.1025, Appendices A and B
- (b) OPNAVINST 5100.23E, Chapter 21, paragraph 2106
- (c) OPNAVINST 5100.23E, Chapter 22, paragraph 2218c
- (d) OPNAVINST 5100.23E, Chapter 18, paragraph 1807a

FINDINGS: None.

SECTION VI  
INDUSTRIAL HYGIENE SURVEY DATA

This Section contains the sampling/monitoring conducted in support of this survey. It should be noted that the measured levels of chemical and physical hazards are compared to the standards without regard to any personal protective equipment that may be worn or the protection afforded by it. The goal of the NAVOSH Program is to reduce workplace hazard levels by other means so that personal protective equipment is not required.

The sampling and analyses performed in support of this survey follow methods approved and validated by OSHA, NIOSH, or by other appropriate Naval instructions. When such methods are either unavailable or not applicable, other consensus methods may be used. In all cases, accepted professional industrial hygiene practices are followed. Documentation concerning the types of instruments used and their calibration records are held by the Naval Medical Admin Unit, Monterey Bay industrial hygienist.

No new data was collected in support of this survey.

SECTION V

MEDICAL SURVEILLANCE MATRIX

The Medical Surveillance Matrix is provided to assist commands in assigning personnel to required medical surveillance. Medical surveillance for a work group must be based on exposure levels at or above the MSAL and exposure frequency of ten days per quarter or thirty days per year or as required by regulations or instruction.



SECTION VI

WORKPLACE MONITORING PROGRAM

The attached Workplace Monitoring Plan presents stressors and/or systems which need to be evaluated periodically during the coming year. Items included on the plan are based on regulations, professional knowledge and information obtained from supervisors. The plan should be reviewed to ensure operational information is correct. The industrial hygienist will have to be contacted when operations are scheduled so your Command's sampling can be completed. Changes or deletions of operations should also be communicated to the industrial hygienist so that the Workplace Monitoring Plan can be amended.

Naval Postgraduate School, Monterey

Meteorology Department

WORKPLACE MONITORING PLAN

December 2002

<u>LOCATION/JOB</u>	<u>STRESSOR</u>	<u># MEAS.</u> <u>REQUIRED</u>	<u>MEAS.</u> <u>METHOD<sup>1</sup></u>	<u>MEASURING</u> <u>FREQUENCY</u>	<u>MAN HRS.</u> <u>PER YEAR</u>
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None required.

Air samples for each chemical stressor will be collected using sampling methods listed in the Industrial Hygiene Sampling Guide for Consolidated Industrial Hygiene Laboratories, Navy Environmental Health Center Technical Manual NEHC-TM6290.91-2, Revision B, March 1999.

1: Use the following codes to indicate sampler and sampling location:

SAMPLER:

**DR-direct reading instrument**  
**DT-detector tube**  
**AT-adsorption tube**  
**IM-impinger/bubbler**  
**FI-filter**  
**ND-noise dosimeter**  
**PD-personal dosimeter**  
**OT-other (specify)**

SAMPLING LOCATION:

**GA-general area**  
**BZ-breathing zone**  
**HZ-hearing zone**  
**SZ-source zone**  
**OT-other (specify)**

**APPENDIX A**

**OPNAV 5100/14 Forms**

Reference: (a) OPNAVINST 5100.23E, paragraph 0803.f

This appendix contains the OPNAV 5100/14 forms which are required by reference (a). These forms detail the occupational exposures of employees by work center or functional group. These forms are used to develop the workplace monitoring program in Section VI. They also describe the type of work done in each area and can be used to verify that all work areas were included in the survey.

**WORKPLACE INFORMATION**

**Activity:** NPS Monterey    **Supervisor:** Keith Jones    **Phone:** (831)656-3034

**Bldg#:** 232, Rooms 600,602,610,    **Shop:** Meteorology Department  
Minor Maintenance Rooms

**Total Personnel:** 4    **Male:** 4    **Female:** 0  
# of students varies

**Shop Operation:** Room 600 (the Balloon Room) contains equipment used for minor equipment maintenance and operation of weather balloons. Room 600 is also being used to develop software associated with experimental equipment. Room 602, which is shared with the Oceanography Department, is a lab where minor equipment maintenance is conducted. Room 610 is an equipment storage room. Balloons are filled with helium. A variety of cleaning solvents and other chemicals are used in Rooms 600 and 602; methanol, acetone, and ethanol used as cleaning solvents are being phased out and replaced by Chemtronics Degreasers. Occasionally lead-tin soldering is also performed. 4 aerosol spectrometers that contain completely enclosed class 2 lasers are occasionally used for student projects.

Potential Hazard	Inter or Cont.	# Workers Exposed	Exposure > MSAL?	Controls in Use
*Lead, tin fumes, soldering	30 mins/month	4	No	Temperature-controlled soldering irons
Helium, filling weather balloons	5 months/yr, 2000-6000 pounds/time	4	No	None
Methanol, acetone, ethanol, cleaning solvents	1 pint/year	4	No	None
Nitroethane, ethanol, isopropyl alcohol, Freons, Chemtronics Degreasers, cleaning compounds	24 ozs/year	4	No	None
Hexane, Super 77 adhesive, attach foam to acoustic sounders	½ gallon/5 yrs	2	No	None
Petroleum distillates, penetrating fluid	1 pint/year	4	No	None
Isopropyl alcohol, Freons, Flux-off 2000 (aerosol can)	4 pints/year	4	No	None
Isopropyl alcohol, Reltek Bondit adhesives, brushed on	minimal usage, amount varies	4	No	None
*Toluene, Starbrite Liquid Electrical Tape	½ pint/year	4	No	None
* Reproductive hazard (See I. H. assessment)				

Potential Hazard	Inter or Cont.	# Workers Exposed	Exposure > MSAL?	Controls in Use
*Toluene, various colors of LHB Enamel, aerosol cans, touchup painting, offsite	1 pint/year	4	No	None
Freon TF	1 pint/year	4	No	None
1,1,1-TCA, Chemtronics DPL-2 (penetrating oil)	1 pint/year	4	No	None
Laser radiation, aerosol spectrometer	Sporadic as needed	Varies	No	Complete enclosure
* Reproductive hazard (See I. H. assessment)				

**If no exposure > MSAL, provide rationale:** Lead and tin fumes are unlikely to exceed the MSALs based on monitoring data of similar operations using temperature-controlled soldering irons and on brief job duration. Helium concentrations will not approach asphyxiation levels because the balloons are filled outdoors, where outdoor air would dilute any helium leakages. Chemical exposures are unlikely to exceed the MSALs and PEL-STELs based on minimal usage. Monitoring data, traceable to Industrial Hygiene Surveys ET-0162 and ET-0165, indicates concentrations of toluene and methylene chloride generated during similar use of Star Brite compound in other departments are expected to be below the ALs and PEL-STELs. Laser radiation levels are unlikely to exceed the Maximum Permissible Exposure (MPE) values because the laser is completely enclosed within the spectrometer and because the eye's blink reflex provides adequate protection against significant exposure from class II lasers.

**Signature/Title:** \_\_\_\_\_ **Date:** 3 December 2002  
**S.E. Thurston,**  
**Industrial Hygienist**

**MONITORING PLAN**

<b>Stressor to be Sampled</b>	<b># of Meas. Required</b>	<b>* Measure. Method</b>	<b>**Measure. Location</b>	<b>Frequency per Yr.</b>	<b>Man Hrs. per. Yr.</b>
None					
<b>Engineering Controls in Use</b>					
None					

\* Use the following Codes:  
**DR-direct reading instrument**  
**DT-detector tube**  
**AT-adsorption tube**  
**IM-impinger/bubbler**  
**FI-filter**  
**PD-personal dosimeter**  
**ND-noise dosimeter**  
**OT-other (specify)**

\*\* Use the following Codes:  
**GA-general area**  
**BZ-breathing zone**  
**HZ-hearing zone**  
**SZ-source zone**  
**OT-other (specify)**



**If no exposure > MSAL, provide rationale:** Lead and tin fumes generated during soldering are unlikely to exceed the MSALs based on monitoring data of similar operations using temperature-controlled soldering irons and on brief job duration. Lead exposures are unlikely to exceed the AL during handling of lead weights because processes where dust or fume is generated are not performed. Ergonomics during handling of lead weights: personnel use cranes and other lifting aids whenever possible, and they have received back injury prevention training. Chemical exposures are unlikely to exceed the MSALs and PEL-STELs based on minimal usage. Monitoring data, traceable to Industrial Hygiene Surveys ET-0162 and ET-0165, indicates concentrations of toluene and methylene chloride generated during similar use of Star Brite compound in other departments are expected to be below the ALs and PEL-STELs. Noise: minimal usage of battery-powered drills and small machine tools will not result in TWA exposures above the NOEL.

**Signature/Title:** \_\_\_\_\_ **Date:** 3 December 2002  
**S.E. Thurston,**  
**Industrial Hygienist**

**MONITORING PLAN**

<b>Stressor to be Sampled</b>	<b># of Meas. Required</b>	<b>* Measure. Method</b>	<b>**Measure. Location</b>	<b>Frequency per Yr.</b>	<b>Man Hrs. per. Yr.</b>
None					
<b>Engineering Controls in Use</b>					
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**WORKPLACE INFORMATION**

**Activity:** NPS Monterey      **Supervisor:** Dick Lind      **Phone:** (831)656-3110

**Bldg#:** 540      **Shop:** Meteorology Department, Satellite Area

**Total Personnel:** 1      **Male:** 1      **Female:** 0

**Shop Operation:** This small building is located near old Fritchie Field on old Fort Ord. The building is only occupied about 1 hour per month. Systems present include a RADAR Wind Profiler and radio acoustic sounding system, both of which involve use of desktop computers. A class I laser is used in the Ceilometer, which measures height of clouds and fog. Minimal lead-tin soldering is performed, with chemical exposure limited to use of rubbing alcohol for cleaning the laser lens. The RADAR acoustic sounding system operates every half hour for about 5 minutes.

Potential Hazard	Inter or Cont.	# Workers Exposed	Exposure > MSAL?	Controls in Use
Laser radiation, class I laser	Minimal usage, varies	1	No	None
*Lead, tin fumes, soldering	As needed, can endure for 4 hrs maximum	1	No	None
Isopropyl alcohol, laser lens cleaning	<1 ounce/year	1	No	None
RF radiation, use of RADAR systems	As needed	1	Yes	None
Noise, Radio acoustic sounding system	Every ½ hour, 5 mins/time	1	No	None
* Reproductive hazard (See I. H. assessment)				

**If no exposure > MSAL, provide rationale:** Class I lasers are safe to view under all conditions; therefore, significant exposure does not exist and exposure controls are unnecessary. Monitoring data of similar soldering operations has resulted in measured exposures below the Action Levels of both lead and tin. Minimal use of rubbing alcohol and dilution of vapors with outdoor air will not expose personnel to isopropyl alcohol levels above the MSAL. Noise exposures are unlikely to exceed the NPEL based on measured noise levels at the building's rear door (87 dBA) and personnel are usually not outside during system operation.

**Signature/Title:** \_\_\_\_\_ **Date:** 3 December 2002  
**S.E. Thurston,**  
**Industrial Hygienist**

**MONITORING PLAN**

<b>Stressor to be Sampled</b>	<b># of Meas. Required</b>	<b>* Measure. Method</b>	<b>**Measure. Location</b>	<b>Frequency per Yr.</b>	<b>Man Hrs. per. Yr.</b>
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