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

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

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

Encl: (1) Industrial Hygiene Survey Report ET-0204

1. As required by reference (a), an annual industrial hygiene survey of the
Naval Postgraduate School, Monterey, Exchange Department was conducted on
15 August 2002 by the Naval Medical Administrative Unit, Monterey industrial
hygienist. Only the Auto Port required a review this year. The survey report
ET-0204 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.

3. 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. In order
to provide more effective surveys and allow us to better support your NAVOSH
Program, responses to this survey are needed. It is requested that a response
with corrective actions annotated (which can be as simple as an e-mail
message) be returned to the industrial hygienist in the Safety Office by
29 November 2002.

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
NAVAL MEDICAL ADMINISTRATIVE UNIT, MONTEREY
INDUSTRIAL HYGIENE SURVEY

of

NAVAL POSTGRADUATE SCHOOL, MONTEREY
EXCHANGE DEPARTMENT

SURVEY #ET-0204

15 August 2002

Survey Conducted By:    Eric Thurston,
                                      Industrial Hygienist
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EXECUTIVE SUMMARY

- The department’s Hazardous Material Control Program shows continuing improvement. The number of different products at the Auto Port has been greatly reduced. However, there were a few products in storage and use that lacked the accompanying Material Safety Data Sheets (MSDSs), and whose purchase has not been approved by the Code 223 Hazardous Materials Program Manager. A few products in use did not appear on the work center’s inventory list.

- The Auto Port Manager needs to be scheduled for initial and annual respirator training.

Specific details of these findings can be found in sections II and III of this report. The cooperation of your staff, especially Art Reynolds and Dave Cohen, 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/m3  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**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
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<tr>
<td>PEL</td>
<td>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.</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment. Clothing or devices furnished to protect employees in performance of work in potentially hazardous areas or conditions.</td>
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<tr>
<td>ppm</td>
<td>Parts per million. A means for expressing the concentration of gases and vapors in air.</td>
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<td>RFR</td>
<td>Radiofrequency/Microwave Radiation.</td>
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<td>RPPM</td>
<td>Respiratory Protection Program Manager.</td>
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<td>SCBA</td>
<td>Self Contained Breathing Apparatus.</td>
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<tr>
<td>SOP</td>
<td>Standard Operating Procedures.</td>
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<tr>
<td>STEL</td>
<td>Short term exposure limit. A 15 minute time weighted average exposure which should not be exceeded at any time during a workday.</td>
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<tr>
<td>Stressor</td>
<td>Potential Hazard (e.g. Noise, Chemicals, Dusts)</td>
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<tr>
<td>TLV</td>
<td>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.</td>
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<tr>
<td>TWA</td>
<td>Time Weighted Average. A method for averaging varying concentrations over a specified period of time (usually 8 hours).</td>
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<td>WC</td>
<td>Work Center</td>
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<tr>
<td>WMP</td>
<td>Workplace Monitoring Program. A program to evaluate workplace health hazards through surveys and exposure measurement.</td>
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SECTION I

INTRODUCTION

This department is responsible for provision of specialty store services to military personnel and their dependents.

If an operation has been overlooked or significant changes made which are believed to put personnel at serious risk, the industrial hygienist must be contacted to conduct an additional exposure assessment.

REPORT ORGANIZATION

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

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 through provision of a short overview of each program's status. Any deficiencies are addressed here and are identified by Finding numbers "ET-0204-A, ET-0204-B, etc.".

Section III - Contains industrial hygiene assessments of specific work areas. These address the status of workplace hazards and required control procedures.

Section IV - contains the results of noise measurement 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 by reference (a) 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 (b). 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. 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.

By returning the completed forms to the Industrial Hygienist, all new operations or workplace changes can be evaluated as required by reference (c).
**SURVEY SCHEDULE**

In accordance with reference (c), 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 (c) 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 your Safety Office. The year of the last survey appears after each work center listing.

**WORKPLACE SURVEY SCHEDULE**

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<td>Retail Store(1999)</td>
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<td>Barber Shops(1999)</td>
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**Change of Operations Notification:**

Reference (b) requires an industrial hygiene re-evaluation when workplace changes occur. Please notify the industrial hygienist in 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.
The following programs are not required to be maintained by the Naval Postgraduate School, Monterey, Exchange Department because these hazards are not present:

- Manmade Vitreous Fiber (MMVF) Control
- Non-Ionizing Radiation Control
- Polychlorinated Biphenyls (PCB’s) Control
- Process Control Ventilation

**ASBESTOS CONTROL PROGRAM**

References:  
(a) 29 CFR 1910.1001  
(b) OPNAVINST 5100.23E, Chapter 17

Asbestos exposure is limited to removal of old brake pads and shoes in the Auto Port. Only new, non-asbestos, organic brake pads and shoes are installed on vehicles. SOPs have been developed to document the variety of required hazard control procedures required by Appendix F of reference (a). Currently, brake replacements are being conducted using the low pressure, wet cleaning method, while brake inspections utilize the aerosol can wet method, where the solvent is allowed to evaporate instead of being wiped off with a rag. Procedures and training requirements of references (a) and (b) are being followed.

**ERGONOMICS PROGRAM**

Potential hazards involve heavy lifting in the Auto Port while mounting and dismounting vehicle wheels and tires, and carrying 5 gallon buckets of used motor oil to containerize in 55 gallon drums. A review of injury logs indicates the absence of recent occupational injuries in this department. Back injury prevention training has been provided to workers performing heavy lifting. Ensure that any new mechanics hired who perform these jobs are provided back injury prevention training.
HAZARDOUS MATERIALS CONTROL PROGRAM

References:  (c) OPNAVINST 5100.23E, Chapter 7, paragraph 0702f(2)  
(d) OPNAVINST 5100.23E, Chapter 7, paragraph 0702f(3)  
(e) OPNAVINST 5100.23E, Chapter 7, paragraph 0702f(4)  
(f) OPNAVINST 5100.23E, Chapter 7, paragraph 0702f(5)  
(g) NAVPSCOLINST 5100.2F, Section 1, pages 1-29 and 1-30

Great improvement has been made with this program since the previous survey.  Authorized hazardous materials use and inventory lists have been developed as required by references (c) and (d).  An MSDS has been obtained for, and a unique identifier has been assigned to, most but not all items used by the Auto Port as required by references (e) and (f).

Finding ET-0204-A:  The Auto Port is purchasing new products without following the NPS Hazardous Material Control Program.  
Recommendation:  Ensure that a Hazardous Material Control and Management Requisition Screening Form and the item’s MSDS is first submitted to the Code 223 Hazardous Material Control and Management Coordinator, Kathy Franklin, Bldg 245, Room 125-A for review and approval of use prior to purchase of a new product as required by reference (g).

Finding ET-0204-B:  The Auto Port does not have MSDSs for the following products:  
  a. BWD Pro Cleen Professional Fuel Injector Cleaner #CSF56 with Intake Valve Cleaner Additive,  
  b. Snap Wire Drier Super Spray,  
  c. Gunk Carb Medic Carburetor, Choke, and Valve Cleaner,  
  d. Permatex Battery Protector and Sealer,  
Recommendation:  Obtain MSDSs for these products as required by reference (f) Notify the Industrial Hygienist, Eric Thurston, COMM 656-3466, e-mail sethurst@nps.navy.mil when they are available for review to help assess exposure to the chemicals as part of the industrial hygiene survey process.

Finding ET-0204-C:  The hazardous materials inventory list kept in the Auto Port Manager’s office is not current (dated 1997).  There is another such list posted in the inside of the flammable liquids storage locker that is more accurate, but it does not quite include all products stored/in use.  
Recommendation:  Archive or dispose of the list kept in the office.  Update the list found in the locker as required by reference (d).

HEARING CONSERVATION PROGRAM

Significant noise exposure is limited to Auto Port mechanics’ use of pneumatic impact wrenches and tire mounting/dismounting equipment, and during vehicle smog check inspections.  Exposures are being controlled by use of hearing protection.
LEAD CONTROL PROGRAM

Exposure to lead is limited to use of lead counterweights during tire balancing in the Auto Port. The antiseize compound used by the mechanics is copper- rather than lead-based. Since minimal exposure is expected, most of the requirements of the Navy’s Lead Control Program are unnecessary. The acting Auto Center manager was provided a copy of the Federal Lead Standard during the 2000 survey.

REPRODUCTIVE HAZARDS CONTROL PROGRAM

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

Materials that contain reproductive hazards, as defined by Appendix 29-A of reference (g), are limited to lead present in tire counterweights, toluene present in carburetor cleaner and tire patching chemicals, and carbon monoxide from vehicle exhaust during smog check tests at the Auto Port.

The former departmental safety coordinator and the Code 223 Hazardous Materials Control and Management Coordinator reported a search for toluene-free carburetor cleaner, but a feasible substitute is not available.

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 (h), and request an evaluation by the occupational health provider (from the cognizant branch medical clinic) and the local industrial hygienist.

• Follow all recommendations from the occupational health provider and industrial hygienist regarding exposure to reproductive hazards in the workplace.
RESPIRATORY PROTECTION PROGRAM

References:  (i) OPNAVINST 5100.23E, Chapter 15
(j) 29 CFR 1910.134
(k) OPNAVINST 5100.23E, Chapter 15, paragraph 1513a(2)
(l) OPNAVINST 5100.23E, Chapter 15, section 1511

Respiratory protection use is limited to Auto Port personnel during vehicle brake work. Personnel wear respirators on an elective basis, and are properly medically qualified, trained, and fit-tested to do so. In addition, the Auto Port manager has received respirator training. Respirator use is complying with the other requirements of references (i) and (j). Asbestos brake SOPS address proper use of respirators as required by reference (k).

Finding ET0204-D: Supervisors of respirator users are required to attend annual respiratory protection training. The manager of the Auto Port has not received such training. Since he will not actually wear a respirator, he will not required fit testing of the facepiece and medical surveillance.

Recommendation: Contact the NPS Code 223 Respiratory Protection Program Manager, Michele Marnach by NPS e-mail or telephone 656-2475 to schedule attendance at one of her training courses as required by reference (l).
SECTION III

INDUSTRIAL HYGIENE ASSESSMENTS
FUNCTION: Provides retail sale of gasoline, oil and auto parts. The garage performs a variety of service operations, including brake inspection and replacement, oil changes, parts and battery replacement, tuneups, smog checks, tire balancing, recharging air conditioning systems, and tire repair. An electric-powered forklift is occasionally used to move pallets of supplies.

INDUSTRIAL HYGIENE ASSESSMENT

The following operations potentially expose personnel to hazardous occupational stressors:

1. Noise during use of pneumatic impact wrenches.
2. Noise during use of tire mounting and dismounting equipment.

Exposure during both operations is controlled by use of banded ear plugs.

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

3. Asbestos and manmade fibers during brake work. Monitoring data of this operation indicates exposures during brake inspection are controlled if the aerosol can wet method is used. Minimal exposure is similarly expected during brake replacements where the low pressure, wet method involving the solvent hose and catch basin is properly used. Some personnel also wear respirators on an elective basis to further control exposures.
4. Solvents during use of brake cleaning solvents during the above vehicle brake operations. Significant exposure is unlikely based on minimal usage.
5. Stoddard Solvent during degreasing of auto parts. Exposure is controlled by isolating the chemical in a self-contained cleaning unit, and skin contact is prevented through use of neoprene rubber gloves.
6. Auto service chemicals during fluid addition and changing, and spraying. Significant exposure is unlikely based on low toxicity and minimal usage of chemicals.
7. Lead during balancing of tires with lead counterweights. Significant exposure is unlikely, provided workers observe required personal hygiene procedures, because the weights are handled intact, with no dust or fumes being created.
8. Freon R12 during recharging of vehicle air conditioning systems. Significant exposure is unlikely because a Freon recovery system is used.
9. Toluene and other solvents during use of Chemtool B-12 Carburetor Cleaner. Significant exposure is not expected based on minimal time of exposure.
10. Ergonomics during tire mounting and dismounting, and carrying 5 gallon buckets of used motor oil to containerize in 55 gallon drums. No injuries have occurred from this heavy lifting, and personnel have received back injury prevention training. Manual transfer of waste motor oil is being phased out through the recent purchase and use of a pumping system.
The following operations will not expose personnel to hazardous occupational stressors in excess of established health standards (con'd):

11. Toluene, methylene chloride, and aliphatic naphtha during use of chemical compounds during tire patching.
11. Toluene and methylene chloride during tire patching. Significant exposures are unlikely based on minimal time of exposure, minimal usage, and minimal (less than 1%) presence of toluene in NAPA/Camel products. Monitoring data of a tire patching job performed using NAPA/Camel Tire Repair Universal Cement, Boot Cement and Liquid Buffer Tire Repair indicated insignificant airborne methylene chloride exposures. The NAPA/Camel products are being replaced by use of Tech International Products Fast Dry Chemical Vulcanizing Fluid (cement) and buffing liquid, which only contain aliphatic naphtha as hazardous ingredients.
12. Carbon monoxide and noise during vehicle smog check inspections. Calculated noise exposures generated by vehicle operation during this job are minimal based on measured noise levels and duration of exposure. The test station is located near the garage bay entrance, where carbon monoxide levels would be diluted to insignificant levels by mixing with outdoor air.

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

7. Lead, which is a male, female, and developmental reproductive hazard, during use of lead counterweights.
9, 11. Toluene, which is a developmental reproductive hazard, during use of the Chemtool B12 carburetor cleaner and NAPA/Camel Tire tire patching chemicals.
12. Carbon monoxide during vehicle smog check inspections.

Exposures are 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 wear hearing protection during use of pneumatic impact wrenches and tire mounting/dismounting equipment, and during vehicle smog check inspections, as required by reference (a).

2. Ensure that the mechanics continue to wash their hands and face after use of lead counterweights and before eating, drinking, smoking, chewing, or applying makeup or lip balm as required by reference (b).

REFERENCES / NOTES:

(a) OPNAVINST 5100.23E, Chapter 18, paragraph 1807a
(b) OPNAVINST 5100.23E, Chapter 21, paragraph 2104f(4)

FINDINGS: Action items are identified and discussed in section II of this report.
SECTION VI
INDUSTRIAL HYGIENE SURVEY DATA

No noise measurements were collected in support of this survey. It should be noted that any noise levels measured are then 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 use of personal hearing protective devices is not required.

Documentation concerning the types of instruments used and their calibration records are held by the Naval Medical Admin Unit, Monterey Bay Industrial Hygienist.
The Medical Surveillance Matrix is provided to assist commands in assigning personnel to required medical surveillance. Medical surveillance for exposure to chemical agents by 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.

Only a preplacement examination is needed for barbers enrolled in the Health Code 723 program; unless necessary for local reasons, there is no requirement for periodic examinations for personnel enrolled in this program.
<table>
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<th>EXAM</th>
<th>Auto mechanics</th>
<th>Auto mechanics respirator</th>
<th>Auto Center forklift operator</th>
<th>Barbers</th>
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<td>711</td>
<td>HAZARDOUS WASTE WORKER/SPILL RESPONSE</td>
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<td>714</td>
<td>POLICE/SECURITY GUARD</td>
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<td>RESPIRATOR USER CERTIFICATION EXAM</td>
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<tr>
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<td>NONE REQUIRED</td>
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</tbody>
</table>
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
Exchange Department

WORKPLACE MONITORING PLAN

August 2002

<table>
<thead>
<tr>
<th>LOCATION/JOB</th>
<th>STRESSOR</th>
<th>REQUIRED</th>
<th>METHOD¹</th>
<th>FREQUENCY</th>
<th>MAN HRS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None required.</td>
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</tbody>
</table>


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

<table>
<thead>
<tr>
<th>SAMPLER:</th>
<th>SAMPLING LOCATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-direct reading instrument</td>
<td>GA-general area</td>
</tr>
<tr>
<td>DT-detector tube</td>
<td>BZ-breathing zone</td>
</tr>
<tr>
<td>AT-adsorption tube</td>
<td>HZ-hearing zone</td>
</tr>
<tr>
<td>IM-impinger/bubbler</td>
<td>SZ-source zone</td>
</tr>
<tr>
<td>FI-filter</td>
<td>OT-other (specify)</td>
</tr>
<tr>
<td>ND-noise dosimeter</td>
<td></td>
</tr>
<tr>
<td>PD-personal dosimeter</td>
<td></td>
</tr>
<tr>
<td>OT-other (specify)</td>
<td></td>
</tr>
</tbody>
</table>
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:** Art Reynolds  
**Phone:** (831)373-7271

**Bldg#:** 348  
**Shop:** Exchange, Auto Center

**Total Personnel:** 7  
**Male:** 6  
**Female:** 1

Personnel include 3 mechanics, 2 cashiers, 1 service representative, and 1 manager. 1 female service representative is on disability because of an on-the-job injury.

**Shop Operations:** Retail sale of gasoline, oil and auto parts. Automotive brake inspection and replacement following the required low pressure wet method while using aerosols cans of brake cleaning solvents, which are applied during brake parts inspection, removal and reassembly; removal of these parts can also include use of the low pressure hose and catch basin wet method. Degrease parts in a self-contained, water-based degreasing unit. Use of pneumatic impact wrenches for various procedures. Automotive repair operations including oil changes, parts and battery replacement, tuneups, and smog checks. Tire balancing using preformed lead counterweights. Recharge air conditioning systems with Freon R12. Clean vehicle carburetors with aerosol carburetor cleaner, and add fuel injector cleaner to vehicles. Tire mounting and dismounting. Patching tires using tire cement and liquid buffing compound; the NAPA/Camel products are being replaced by Tech International Fast Dry Chemical Vulcanizing Fluid (cement) and buffing liquid. Operation of an electric-powered forklift to move pallets of supplies.

<table>
<thead>
<tr>
<th>Potential Hazard</th>
<th>Inter or Cont.</th>
<th># Workers Exposed</th>
<th>Exposure &gt; MSAL?</th>
<th>Controls in Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asbestos, manmade fibers, brake cleaning solvents, brake work</td>
<td>8-10 times/week, 2 ¼ hrs/time, 4-5 16-ounce aerosol cans/week</td>
<td>3</td>
<td>No</td>
<td>Low pressure solvent pump and catch basin for brake replacement, aerosol solvent can for brake inspection, elective use of ½ mask respirators equipped with HEPA filter cartridges, thin nitrile rubber gloves</td>
</tr>
<tr>
<td>Stoddard Solvent, degreasing</td>
<td>1-2 times/week, 2-3 mins/time</td>
<td>3</td>
<td>No</td>
<td>Self-contained unit, heavy duty neoprene rubber gloves</td>
</tr>
<tr>
<td>Noise, pneumatic impact wrenches</td>
<td>Daily, 2 hours</td>
<td>3</td>
<td>Yes</td>
<td>Banded ear plugs</td>
</tr>
<tr>
<td>Auto service chemicals, fluid addition and changing, or spraying</td>
<td>Daily, 4-5 hrs, intermittent</td>
<td>3</td>
<td>No</td>
<td>Thin nitrile rubber gloves</td>
</tr>
<tr>
<td>* Reproductive hazard (See I. H. assessment)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Hazard</td>
<td>Inter or Cont.</td>
<td># Workers Exposed</td>
<td>Exposure &gt; MSAL?</td>
<td>Controls in Use</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>----------------</td>
<td>-------------------</td>
<td>------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>*Lead, tire balancing</td>
<td>8-10 times/ week, 45 mins/day</td>
<td>1 primary, 2 others occasionally</td>
<td>No</td>
<td>Thin nitrile rubber gloves</td>
</tr>
<tr>
<td>Freon R12, recharging vehicle A/C systems</td>
<td>2 times/day, (summer), Once/week (winter), 40 mins/time</td>
<td>1</td>
<td>No</td>
<td>Freon recovery system</td>
</tr>
<tr>
<td>*Toluene, other solvents, Chemtool B-12 Carburetor Cleaner</td>
<td>Once/week, 5 mins/time</td>
<td>3</td>
<td>No</td>
<td>Thin nitrile rubber gloves</td>
</tr>
<tr>
<td>Noise, tire mounting/dismounting w/ pneumatic impact wrenches</td>
<td>Daily, 2-5 hrs intermittent</td>
<td>3</td>
<td>Yes</td>
<td>Banded ear plugs</td>
</tr>
<tr>
<td>Ergonomics, tire mounting/dismounting</td>
<td>Daily, 1 hour</td>
<td>3</td>
<td>N/A</td>
<td>None</td>
</tr>
<tr>
<td>Ergonomics, waste motor oil disposal in 5 gallon buckets</td>
<td>once/week, 10 mins/time</td>
<td>4</td>
<td>N/A</td>
<td>Back injury prevention training</td>
</tr>
</tbody>
</table>

**Tire patching:**

| *Toluene, methylene chloride, NAPA/Camel Tire Repair Universal or Boot Cement and Liquid Buffer | 3-4 times/week, 10 mins, 1 8-oz can of cement and 1 pint canz of liquid buffer | 3 | No | Thin nitrile rubber gloves |
| Aliphatic naphtha, Tech International, Tech Rub-O-Matic and Tech Chemical Vulcanizing Fluid | | | No | Same as above |
| Noise, use of pneumatic disc sander during tire patching operations | | | No | Banded ear plugs |

| *Carbon monoxide, noise, smog check tests | 6 times/day, 30 mins/time | 1 | No | Banded ear plugs |

* Reproductive hazard (See I. H. assessment)
If no exposure > MSAL, provide rationale:

Retail sale operations conducted by employees will not expose them to harmful chemical stressors or noise hazards. Asbestos and manmade fiber exposures are unlikely to exceed the PELs and MSALs based on monitoring data of the operation using wet methods. Chemical exposures while using brake cleaning solvents during brake work are unlikely to exceed the PELs and MSALs based on minimal usage. Stoddard Solvent exposure during degreasing operations is unlikely to exceed the MSAL based on worker isolation from the chemical used in the self-contained machine, and skin contact is prevented by use of neoprene rubber gloves. Use of low toxicity chemicals in limited quantities during auto servicing will not produce exposures in excess of the PELs and MSALs, provided the manufacturer’s instructions are followed. Lead exposure during the handling of wheel counterweights will not exceed the MSAL because dust or fumes by grinding or heating is not produced; exposure to lead by skin contact will be prevented by personnel following required personal hygiene procedures. Freon R12 exposure above the MSAL is unlikely because a Freon recovery system is used during this process. Toluene and other solvent exposures during use of carburetor cleaner are unlikely to exceed the MSALS and PELs based on minimal time of exposure. Ergonomics during tire mounting/dismounting and manual transfer of used motor oil: no injuries have occurred, and personnel have received back injury prevention training; manual methods of transferring used motor oil are being replaced by the recent purchase and use of a pumping system. Toluene, methylene chloride, and aliphatic naphtha exposures are unlikely to exceed the MSALs and PELs during tire patching based on minimal time of exposure, minimal usage, and minimal (less than 1%) presence of toluene; monitoring data of this operation indicates methylene chloride exposures are below both the PEL-TWA and PEL-STEL. The calculated noise exposures during smog check inspections and during tire buffing will not exceed the NPEL based on measured noise levels and duration of exposure. Carbon monoxide exposure during smog check tests is not expected to exceed the MSAL and PEL-Ceiling based on the presence of the test station next to the bay entrance, where levels would be diluted by outdoor air.

Signature/Title: __________________________ Date: 15 August 2002
S.E. Thurston,
Industrial Hygienist
## Monitoring Plan

<table>
<thead>
<tr>
<th>Stressor to be Sampled</th>
<th># of Meas. Required</th>
<th>* Measure. Method</th>
<th>**Measure. Location</th>
<th>Frequency per Yr.</th>
<th>Man Hrs. per Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

### Engineering Controls in Use

Solvent wetting brake shoes and pads prior to replacement.

* 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)
APPENDIX B

CHANGE OF OPERATION NOTIFICATION

Please use this form to notify the industrial hygienist of any changes to operations conducted by your department. The notification form may be copied as needed. The completed forms can be returned to:

NAVAL POSTGRADUATE SCHOOL, MONTEREY
CODE 223, SAFETY OFFICE (ATTN: INDUSTRIAL HYGIENIST)
1 UNIVERSITY CIRCLE
MONTEREY CA 93943

CHANGE-OF-OPERATION NOTIFICATION

FOREMAN/SUPERVISOR:                                            EXT:

BLDG:          COMMAND/SHOP: Naval Postgraduate School, Monterey, Exchange Department, Auto Center
WORK AREA:

SURVEY REPORT:  ET-0204

INSTRUCTIONS TO FOREMAN/SUPERVISOR:

The industrial hygiene survey evaluated the potential hazards to your employees based on the operations existing at the time. When your operations change, the potential hazards can also change, and these new conditions must be evaluated. Please contact the industrial hygienist if any of the following occur:

a. Exposure times have changed.
b. New operations are performed.
c. New types of equipment are used.
d. An increase in major chemical usage.
e. New chemicals or chemical products are used.
f. A change in existing exhaust ventilation.

List any changes below.
__________________________________________________________
__________________________________________________________
__________________________________________________________

Date Forwarded: ________________

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