

## CHAPTER 2 INDUSTRIAL HYGIENE SURVEYS AND SURVEY REPORTS

1. **GENERAL.** Industrial hygiene (IH) surveys are conducted to accurately assess worker exposures to chemical, physical and biological agents in the workplace and to provide recommendations for their reduction or elimination. Periodic workplace evaluations are made to assure the effectiveness of the implemented controls and determine the need for continued medical surveillance. If there is a significant production, process, material or control change for a particular work operation, that operation must be reevaluated. The procedures in this chapter, along with Chapters 3 and 4, should be followed to evaluate employee exposures, determine compliance with standards regulating occupational exposure to air contaminants, and to assess the effectiveness of controls. An exposure assessment strategy (Chapter 4) should be developed to define acceptable and unacceptable exposures as related to exposure standards and guidelines.

**Note:** Bureau of Medicine and Surgery (BUMED) field industrial hygienists and other Navy medicine occupational health personnel do not determine personnel exposures to chemicals from an environmental source (except during spill events where first responder safety is the primary medical concern (as specified in reference 2-1)). Please see section 3e below, Areas Specifically Excluded from IH Surveys, for more information.

2. **DEFINITIONS.**

- a. Action Level (AL). One-half the 8-hour TWA value designated as the OEL unless a specific AL is established in an Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) adopted by the Navy (e.g., 60% of the OSHA standard for inorganic lead). The AL may initiate the implementation of specific actions, such as periodic monitoring, training or medical surveillance if specified by a Navy safety and occupational health (SOH) or OSHA standard.
- b. Employee Exposure. Exposure that occurs not considering of the use of personal protective equipment (PPE).
- c. Experienced Industrial Hygienist. For the purposes of this chapter, an experienced industrial hygienist is a civil service General Schedule 690 Series employee GS-12 and above, or a military Industrial Hygiene Officer (IHO) (Medical Service Corps subspecialty 1861) Lieutenant (O-3) and above. Additionally, a Certified Industrial Hygienist (CIH®) is considered experienced at any grade or rank.
- d. Industrial Hygienist. Those professionals classified in the civil service as General Schedule 690 Series, or military IHO.
- e. Occupational Exposure Limit (OEL). Limits established to protect workers from workplace exposure to certain chemical substances or physical agents. An exposure assessment cannot be made without an OEL.
- f. Survey. A workplace evaluation to determine employee exposures to chemical, biological and physical hazards and to recommend procedures for reducing or eliminating those exposures. The following categories of IH surveys exist:

- (1) Initial IH Survey. The first comprehensive survey of a workplace. A workplace will have only one initial survey.
  - (2) Periodic Industrial Hygiene Survey (PIHS). Scheduled cyclic surveys following an initial survey.
  - (3) Shop Specific Supplements to a Periodic Industrial Hygiene Survey (SPIHS). Shop specific supplements are used for shop-specific evaluations that are reported independently of the PIHS to ensure that all shops are evaluated at the required frequency based on Defense Occupational Environmental Health Readiness System-Industrial Hygiene (DOEHRS-IH) shop priorities.
  - (4) Other (Special) IH surveys. Surveys that focus on a specific hazard evaluation or generated in response to a customer's special request (e.g., indoor air quality survey, illumination survey, etc.).
- g. Work Operation/Process. A specific job, duty or function. In each work operation/process, the location, ventilation, materials, and equipment used should be considered. For example, welding in a confined space is a different exposure situation than in the open air. A work operation/process might include specific tasks.
  - h. Workplace. The entire unit, command, or activity where a type of work is performed, typically under one Unit Identification Code. Examples include shipyards, fleet readiness centers (FRCs) and naval facilities (NAVFAC) activities/public works centers. Workplace for afloat commands is defined as the entire ship. In this chapter the term command will also be used generically for unit, command, or activity.
  - i. Worksite. The shop, code, or workcenter where a specific work operation/process is performed within a workplace. In this chapter the term shop will also be used generically for shop, code, or workcenter.
3. **SURVEYS**. Workplace evaluations to identify and quantify health hazards are accomplished through IH surveys and will be completed under the supervision of an experienced industrial hygienist. IH technicians or exposure monitors (both military and civilian) may assist in the monitoring portion of a survey as long as technical direction is provided by an industrial hygienist. Under no circumstances will they independently conduct IH surveys, interpret IH data, or recommend control methods.

Copies of all technical assist visits and/or IH surveys shall also be forwarded to the appropriate Regional IH program Office by the cognizant BUMED activity or the carrier/tender IHO.

- a. Initial IH Survey. Since all subsequent surveys will be compared to this survey, it is critical that all aspects of the workplace are evaluated and findings are fully documented.
  - (1) The initial walk-through survey gathers information for workplace characterization. This typically includes documenting information for each shop in the command, including:
    - (a) Based on requirements from references 2-2 Chapter 8 and 2-3 Chapter A3:
      - 1. Location information for work operations/processes, equipment, and controls, including shop diagrams, as needed.

2. Personnel assigned, including total number, number of males and females, numbers by worker classification, and numbers for each work operations/process.
3. Work operation/process descriptions, including tasks, work practices and procedures, locations, frequencies and durations of the work operations/processes, material and equipment usage, hazards involved, controls used, number of personnel assigned.
4. Equipment descriptions for significant equipment used by the shop. Associate any equipment to any work operations/processes.
5. Potential chemical hazards, including all potentially hazardous materials used, stored, handled or produced, including a description of how they are used, amount on hand, and estimated consumption rates. (The command's Hazardous Materials Authorized Use List (HM AUL), as required by Chapter 7 of reference 2-2, provides some of this information.) Identify specific hazards that are reproductive hazards or carcinogens. Associate any chemical hazards and hazardous materials to any work operations/processes.

**Note:** Per references 2-2 Chapter 8 and 2-3 Chapter A3, industrial hygienists shall have access to a copy of the authorized use list for the workplaces being surveyed.

6. Potential physical hazards (e.g., noise, ionizing and non-ionizing radiation, ergonomic risks, temperature, vibration, etc.), including a brief description of their source(s). Identify specific hazards that are reproductive hazards or carcinogens. Associate any physical hazards and sources to any work operations/processes.
7. Biological/infectious agents (e.g., in laboratories). Identify specific hazards that are reproductive hazards or carcinogens. Associate any biological hazards and sources to any work operations/processes.
8. Existing controls such as: substitution, isolation, engineering controls, administrative controls, and PPE. Include evaluations of the controls' effectiveness. Associate any controls to any work operations/processes and specific hazards, as appropriate.

(b) Other information gathered, as appropriate:

1. Direct reading screening measurements for each shop or work area where applicable.
2. Interviews with any employees reporting symptoms or related safety and health problems.
3. Any other information necessary to accurately describe command and shop conditions.

(2) Exposure assessments are to be made by an industrial hygienist who is familiar with the shops and work operations/processes being evaluated. Details on exposure assessment can be found in Chapter 4. Based on requirements from references 2-2 Chapter 8 and 2-3 Chapter A3:

- (a) Define Similar Exposure Groups (SEGs).
  - (b) Characterize each SEGs exposure profile, estimating personal exposures using qualitative or quantitative data. Representative personal exposure monitoring is the primary means of quantifying exposures for use in assessing exposure profiles.
  - (c) Perform qualitative or quantitative exposure assessments for hazards in each SEG. For quantitative exposure assessments, consult Chapter 4 for information on statistical tests (e.g., 95<sup>th</sup> percentile, Upper Tolerance Limit 95/95, etc.). Judge the SEG's exposure profile as unacceptable, acceptable or uncertain. An unacceptable determination indicates personnel exposures exceed (or are expected to exceed) the OEL. An acceptable determination indicates that personnel exposures do not exceed (or are not expected to exceed) the OEL for current/normal or foreseeable operating conditions. An acceptable determination is not permitted if personnel are required to wear respirators to control exposures to the hazard being assessed. All determinations must be fully and accurately documented to support the decisions. Any designated ALs should also be taken into consideration. Lastly, exposure assessment could lead to the decision of uncertain. (i.e., There is insufficient information available for an immediate unacceptable or acceptable determination with high confidence.) In that case, further information gathering is required to assess exposures.
  - (d) Evaluate and determine the effectiveness of existing controls.
- (3) Make appropriate control strategy recommendations based on the exposure assessments, using accepted IH practices, which comply with appropriate regulatory requirements. (Per references 2-2 Chapter 8 and 2-3 Chapter A3)
  - (4) Further information gathering may be quantitative or qualitative. (This might be performed as part of the initial IH survey or later.) Based on requirements from references 2-2 Chapter 8 and 2-3 Chapter A3:
    - (a) Representative quantitative exposure monitoring, especially personal exposure monitoring, is the primary means of assessing personnel exposures, the need to control exposures, and the effectiveness of controls. If exposure monitoring is to be conducted, an exposure assessment strategy should be developed (see Chapter 4).
    - (b) Qualitative exposure decisions might involve using exposure modeling, professional judgement, etc.
  - (5) Reports and records of workplace characterizations, exposure profiles, exposure assessments, findings, control recommendations or other recommendations (including medical surveillance) are critical elements of the exposure assessment process. Reports and records are needed to ensure effective communication of workplace findings and successful continuity of the IH survey. (Per references 2-2 Chapter 8 and 2-3 Chapter A3) The basic elements of IH survey reports are detailed in Appendix 2-A, and summarized in Appendix 2-B.

- (6) Exposure Monitoring Plans (EMP) shall be prepared and implemented to collect sampling/measurements required by regulation, or needed to statistically assess exposures, determine trends or validate professional judgement of unchanged exposure assessments. (Per reference 2-2 Chapter 8) The plan should also include monitoring necessary to document the need for controls and the effectiveness of existing controls (e.g., ventilation measurements or other sampling/measurements to assess engineering or administrative controls) Reference 2-3 Chapter A3 requires that exposures needing monitoring and specifically routine ventilation system evaluation be included on the EMP.
- (7) BUMED established a ship IH survey template on one ship in each class. This survey template is intended to be used as a model for industrial hygiene surveys for all ships of the same class. Baseline IH ship surveys, in the standardized format, are required to be forwarded by the cognizant BUMED activity to the Navy and Marine Corps Public Health Center (NMCPHC) to assist enterprise industrial hygiene technical and policy solutions. Survey templates will be appropriately sanitized to meet Privacy Act requirements and eliminate specific hull references. Such reports will also be forwarded to the Regional IH Program Offices. Standardized baseline afloat IH survey templates for a specific class of ship can be obtained by e-mailing NMCPHC IH Department at [usn.hampton-roads.navmcpubhlthcenpors.list.nmcp hc-ask-ih@mail.mil](mailto:usn.hampton-roads.navmcpubhlthcenpors.list.nmcp hc-ask-ih@mail.mil).
- b. PIHS. Once the initial survey has been completed, it is updated on a regular basis with the PIHS (in combination with shop specific supplements discussed in paragraph 3.c). The PIHS process provides a review of available exposure monitoring results, information on new work operations/processes, changes in on-going work operations/processes, and evaluates and documents the current effectiveness of existing controls (e.g., PPE, ventilation, etc.). Additionally, findings of other surveys or consultations made during the specified period are summarized. Exposure assessments need to be performed for hazards in each new SEG, or updated for existing SEGs based on further information gathering or changes in policy or OELs. Monitoring may not be required for the PIHS. If no sampling/measurements are required in the EMP and there are no additional work operations/processes or significant changes to existing work operations/processes, a walkthrough survey documenting these findings is adequate. Requirements for periodic surveys are discussed in references 2-2 Chapter 8 and 2-3 Chapter A3. Command hazard categories are outlined in Appendix 2-C.
- (1) Category I (CAT I) PIHS reports will include all Priority 1 shop evaluations every year as a minimum, and any applicable Priority 2 and 3 shops as determined by the Industrial Hygiene Program Office (IHPO) so as to ensure these reassessments do not exceed the two/three and four year shop survey periodicity cycles, respectively. In some cases it might be administratively simpler to include all category shops (i.e., Priority 1, 2 and 3 shops) in the annual report every year for smaller CAT I commands with predominantly Priority 1 shops. However, workload and administrative efficiencies should be realized by using the shop specific supplemental approach for larger CAT I commands (e.g., shipyards, FRCs, etc.).

- (2) Category II (CAT II) PIHS reports will include all Priority 2 shop evaluations every two years for ashore commands and every three years for afloat commands as a minimum, and include applicable Priority 3 shops as determined by the IHPO so as to ensure Priority 3 shop evaluations do not exceed the four year shop survey periodicity. Additionally, all Priority 1 shops shall be reassessed annually and reported as discussed in paragraph 3.c below as part of the shop specific supplement to the PIHS. When an IHPO sub-categorizes CAT II command survey to apportion workload, the IHPO will ensure Priority 1, 2 and 3 shops are evaluated and results reported in accordance with applicable intervals.
- (3) Category III (CAT III) PIHS reports will include all Priority 3 shop evaluations every four years as a minimum. In addition, Priority 1 shops shall be reassessed annually and Priority 2 shops biennially (ashore) or triennially (afloat), respectively, and reported per the shop specific supplement report discussed in paragraph 3.c below. When an IHPO sub-categorizes CAT III command survey to apportion workload, the IHPO will ensure Priority 1, 2 and 3 shops are evaluated and results reported in accordance with applicable intervals.

Note: Priority 1, 2 and 3 shop classification guidance and re-evaluation frequencies are contained in Appendix 2-D.

- c. SPIHS: SPIHS are used for shop-specific evaluations that are reported independently of the PIHS to ensure that all shops are evaluated at the required frequency based on the shop's priority. For example, this type report would be used annually for Priority 1 shop evaluation conducted at CAT II or CAT III commands during the non-periodic survey year. See Appendix 2-B for a summary of the basic elements for both PIHS and SPIHS reports.
- d. Shop Priority Exceptions: All afloat command shops will be designated as "Priority 2" shops but will receive a singular command based PIHS every three years as outlined in Appendix 2-C. All Reserve Center shops will typically be designated as "Priority 3" shops and will receive a singular command based PIHS every four years as outlined in Appendix 2-C. Reserve Centers with industrial work operations/processes, work operation/process changes, changes to work practices, or other occupational health concerns should contact their supporting IHPO for consultation or possible evaluation outside of the four year periodicity.
- e. Areas Specifically Excluded from IH Surveys.
  - (1) Unless BUMED IH personnel are specifically trained, equipped, and currently certified through the National Sanitation Foundation (NSF) program for Field Certification of Biological Safety Cabinets (BSC), IH surveys should not include evaluation of BSCs. Refer to Chapter 6 of the Industrial Hygiene Field Operations Manual (IHFOM) for a more detailed discussion of BSC ventilation measurements.
  - (2) BUMED field industrial hygienists and other Navy medicine occupational health personnel do not determine personnel exposures to chemicals from an environmental source (except during spill events where first responder safety is the primary medical concern (as specified in reference 2-1)).

- (a) Environmental exposure assessments and sampling are based on environmental (generally Environmental Protection Agency (EPA)) standards, screening levels and risk assessment processes and not on occupational health standards, OELs and exposure assessment strategies.
  - 1. Occupational health standards and OELs are intended to protect adult employees from workplace health hazards eight hours a day, five days a week for 20-30 years. Environmental standards and screening levels may be produced looking at risk for exposure across the entire general population for a lifetime. These differences in assessment can result in an environmental standard or screening level being several orders of magnitude lower than an OEL for the same chemical.
  - 2. Since environmental and occupational exposure assessments and standards are so different, sampling and analytical methods to quantify those exposures are also different.
  - 3. Certification for laboratories performing the analyses differs for environmental versus occupational sampling.
  - 4. Environmental concerns regulated by the EPA such as: concerns from environmental source exposures, environmental restoration situations, etc. shall not be treated as occupational exposures using occupational health standards and OELs to measure risk and determine compliance.
- (b) Navy Medicine assets are not intended, prepared, equipped or funded for assessments of exposures to chemicals from an environmental situation regulated by the EPA. Such situations are best addressed by qualified environmental professionals.
- (c) When medical support for environmental issues (other than spills) is requested by Installation Commanders, Naval Facilities Engineering Command (NAVFAC)/Public Works Center (PWC), or base tenants, Medical Treatment Facility (MTF) Commanding Officers and Officers-In-Charge need to inform the appropriate Navy Medicine Region Environmental Program Manager (NAVMED REPM) before committing to a response.
  - 1. The NAVMED REPM shall assist the MTF in coordinating the response, ensuring the participation of all required subject matter experts.
  - 2. Early coordination is exceptionally important because environmental issues might involve the health of family members, union employees, the public and media.
- f. Records Retention. Records of surveys, evaluations, and monitoring shall be retained for a minimum of 40 years, as required in Chapter 8 of reference 2-2, except where specific applicable standards require retention for a longer time. For example, Chapter B4 of reference 2-3 requires records of noise measurements to be kept for a period of 50 years. Also, refer to reference 2-4, which dictates longer retention times for some records. For example, Section SSIC 6200.2a of reference 2-4 dictates some occupational health, industrial and environmental control program records not be destroyed until after 75 years.

- (1) Because of turnover and the transfer of personnel, records should be maintained in a manner to ensure that an industrial hygienist who is unfamiliar with the workplace can access the records and be reasonably confident he/she has all the pertinent information (past and present) on the command, individual shops and the work operations/processes being performed therein.
  - (2) Reference 2-4 provides guidance in the disposition of all records, including records no longer in active use, records of disestablished shore activities, records of decommissioned ships and records of armed conflicts. This reference provides information on naval records retention standards (by standard subject identification code (SSIC) or type of record) and procedures for record disposition, including: disposal, local record retirement (to a storage area within a command) and record transfer (for storage outside a command, as in a Federal Records Center). Occupational health, industrial and environmental control records are specifically discussed in Section SSIC 6200.2 of reference 2-4. Reference 2-4 Appendix A lists step by step procedures for transferring records for storage to Federal Records Centers using form [SF 135](#). Reference 2-4 Appendix B lists procedures for recalling records from Federal Records Centers either by letter or by using the Archives and Records Center Information System (ARCIS). Reference 2-4 Appendix C provides a glossary of terms. However, other sections of reference 2-4 might also be applicable. Additional information on Federal Records Centers can be found at <http://www.archives.gov/frc/>.
- g. Survey Report Format. Appendices 2-A, 2-B and 2-E provide guidance for survey report organization and content. The composition of survey reports for a command (i.e. what shops are included) might vary each year depending upon the DOEHRS-IH priorities of individual shops. Criteria for assigning DOEHRS-IH shop priorities is summarized in Appendix 2-D.
- h. Survey Report Tracking. Survey report completion will be tracked according to DOEHRS-IH shop priorities. Survey reports for each shop will be considered current if the last report date is within 12, 24 (36 for all afloat command shops) or 48 months of the current date for Priority 1, 2 and 3 shops, respectively. A grace period of up to three months can be added to each respective command hazard category or shop priority requirement **on a case by case basis** and depending on the particular circumstances involved, so that under special circumstances if an evaluation exceeds the specified periodicity it can still be considered current.

#### **4. CREATING and UPDATING EMPs.**

- a. Per Chapter 8 of reference 2-2, as part of the IH survey, an EMP (OPNAV Form 5100/14 or equivalent or as part of the IH survey report) will be completed for required or necessary sampling/measurements. This includes sampling/measurements required by regulation, or needed to statistically assess exposures, determine trends or validate professional judgement of unchanged exposure assessments. The plan should also include monitoring necessary to document the need for controls and the effectiveness of existing controls (e.g., ventilation measurements or other sampling/measurements to assess engineering or administrative controls) Reference 2-3 Chapter A3 requires that exposures needing monitoring and specifically routine ventilation system evaluation be included on the EMP.
  - (1) Monitoring required by regulation includes such sampling/measurements as OSHA required initial, quarterly, or semiannual substance specific monitoring.
  - (2) Monitoring results needed to assess exposures are typically used in statistical quantitative exposure assessment. However, please keep in mind, even if you need a certain number of results for the statistical assessment, they do not necessarily need to be collected all at once during a year's exposure monitoring, but can be gathered over time. For example, rather than putting that you plan to collect the needed six samples on the EMP, it might be more realistic and attainable to put that you only plan to collect one or two of the samples for the work operation/process or SEG on the yearly EMP, and then continue to have that sampling, as required on the subsequent yearly EMPs, until you have collected enough results to statistically assess the exposures for the SEG for that work operation/process.
  - (3) The EMP should generally contain just the required or necessary sampling/measurements. If you wish to include additional monitoring desired for informational purposes or to add to existing statistical assessments, those should be marked as "Optional". Such optional monitoring should not be included when determining counts for required sampling/measurements for the EMP annual self-reported fiscal year (FY) IH metrics. If the optional monitoring is completed, it can be counted with completed sampling/measurements conducted outside the EMP in the annual self-reported FY IH metrics.
  - (4) When you create your EMP, the way you write (and lump or divide up) your individual sampling task items should be reflective of the way you will need to count your EMP or outside EMP sampling tasks when your IHPO reports their annual self-reported FY IH metrics. (Consult the latest BUMED self-reported FY IH metrics purpose, definitions, and directions document for the counting directions.)
- b. During the periodic survey (with either shop-based or command-based) the EMP must be updated to reflect current findings. Qualitative or quantitative negative determinations will permit the EMP to be amended to eliminate unnecessary monitoring and redirect resources. New work operations/processes; significant changes to existing work operations/processes; or changes to standards, instructions, or directives might require new evaluations and possible additions to the EMP.

- c. Please keep in mind that the EMP is to reflect an annual FY timeframe, as opposed to the timeframe of the survey based on shop priority or command hazard category.

**5. REFERENCES.**

2-1 [OPNAV M-5090.1 Series](#)

2-2 [OPNAVINST 5100.23 Series](#)

2-3 [OPNAVINST 5100.19 Series](#)

2-4 [SECNAV M-5210.1 Series](#)

2-5 [NMCPHC Technical Manual NMCPHC-TM-OEM 6260.01C](#)), *Reproductive and Developmental Hazards: A Guide for Occupational Health Professional*. 2010.

**APPENDIX 2-A**  
**INDUSTRIAL HYGIENE SURVEY REPORTS**

1. **GENERAL.** Industrial hygiene (IH) survey reports document the interpretation of data collected during the walk-through survey, the quantification phase of a comprehensive IH survey, and the resultant exposure assessment. The survey reports also provide a command with the current status of occupational health hazards, recommendations for hazard control, personal protective equipment (PPE), administrative controls and exposure-based medical surveillance. The survey report is a historical document that shows the work operations/processes conducted at given locations and the hazards present at the time of the survey. A survey report must be able to withstand close scrutiny and, as much as possible, be a self-supporting document. Comprehensive initial IH survey reports should be issued within 90 calendar days after the last day of the walk-through portion of the survey. Periodic Industrial Hygiene Survey (PIHS) reports should be issued within 45 days after the last day of the walk-through portion of the survey. Every effort should be made to meet these timeframes so that the serviced command can get the reports in a timely manner.
2. **STYLE.** IH survey reports are technical in nature and use terms and language characteristic of the profession. However, each part of the survey report has a target audience who will have varying degrees of IH background. Consider your target audience when writing reports.
3. **SURVEY REPORT TYPES.** There are essentially four principle types of IH survey reports: initial (aka baseline) surveys, periodic surveys, shop specific supplements, and special surveys. The basic elements of the initial and periodic survey reports are presented in Section 5 of this appendix. The Shop Specific Supplements to a Periodic Industrial Hygiene Survey (SPIHS) are for specific shops that are reported independently of the main PIHS. An example where a SPIHS report might be used is for a Priority 1 shop in a Category II (CAT II) command in a year when the reports for the Priority 2 shops in the command are not due. The purpose of the SPIHS is to ensure that all shops are evaluated at the required frequency as discussed in Section 4. The SPIHS reports may include fewer elements than the PIHS, as outlined in Appendix 2-B. Special IH surveys are used to capture other IH related evaluations for specific hazards, subjects, engineering systems, etc., and may have variable survey formats.
4. **SURVEY REPORT PERIODICITY, COMPOSITION, DISTRIBUTION AND TRACKING.**
  - a. IH surveys will be performed, reported and tracked at periodicities according to both command hazard categories as outlined in Appendix 2-C, and Defense Occupational Environmental Health Readiness System-Industrial Hygiene (DOEHRS-IH) shop priorities as outlined in Appendix 2-D.
  - b. The composition of each survey report (i.e. which shops are included) may vary according to the shop priorities. The basic elements of IH survey reports are detailed in Section 5 of this appendix and summarized in Appendix 2-B.

- c. Survey reports for a command may be distributed in a single document or in separate documents based upon organizational sub-unit (e.g., department, division, directorate, etc.). If the survey reports are in separate documents in the applicable reporting period, a command IH survey report index should be prepared. This index references the provided IH survey reports and lists the included shops in each report, as discussed in Section 6 of this appendix.
  - d. Survey report completion will be tracked according to DOEHRS-IH shop priorities. Survey reports for each shop will be considered current if the last report date is within 12, 24 (36 for all afloat command shops) and 48 months of the current date for Priority 1, 2 and 3 shops, respectfully. A grace period of up to three months can be added to each respective command hazard category or shop priority requirement **on a case by case basis** and depending on the particular circumstances involved, so that under special circumstances if an evaluation exceeds the specified periodicity it can still be considered current. .
5. **SURVEY REPORT ELEMENTS.** The comprehensive initial and periodic IH survey reports contain the following elements:
- a. Cover Letter. A concise letter designating the survey as initial or periodic, naming the command where the survey took place, and giving the survey dates. This letter also identifies the individual(s) responsible for the survey report and credits contributions to the report, including the surveyed command's efforts.
  - b. Table of Contents.
  - c. Executive Summary. This one to two page summary gives the Commanding Officer of the surveyed workplace an overview of the status of command occupational health programs and identifies those problems that require command level attention for resolution. If it is a periodic survey, ensure that repeat findings are annotated.
  - d. Program Findings and Recommendations. This section summarizes overall findings and recommendations the command's major occupational health programs, such as: lead, asbestos, hearing conservation, engineering controls, respiratory protection, ergonomics, medical surveillance, etc. Any references should also be provided. The purpose of this section is to provide information for the Safety Office to manage effectively the occupational health aspects of the Navy and Marine Corps safety and occupational health (SOH) programs. The command receiving the survey report is encouraged to ensure the report is reviewed and recommendations incorporated into command hazard tracking system (hazard abatement logs) for documented follow-up actions. Information presented should come from the survey. (Detailed command-wide summary tables, rolled up from information from individual shop survey sections, which support the program findings and recommendations, can be presented here or included as appendices to the survey report.)

- e. Worksite Evaluations, Exposure Assessments, Findings and Recommendations and References, and Exposure Monitoring Plan (EMP). This section documents the field findings from the walk-through survey; discusses monitoring results; evaluates health risk and exposure assessments; and provides recommendations for improvement, suggestions for medical surveillance, and exposure monitoring required for each shop. If it is a periodic survey, this section also documents changes to the initial survey for each of the sub-sections, as appropriate. Include at least the following information:

(1) Worksite Evaluation by Shop:

- (a) Location. Identify the shop location and the locations of the work operations/processes, equipment, controls, or contaminant sources. When appropriate (e.g., for clarifying or detailing the locations of the work operations/processes, engineering controls, or contaminant sources), create a diagram. Make the diagram detailed enough to graphically describe the locations of the work operations/processes, engineering controls, or contaminant sources (by room number or work station) and the physical relationship of the shop and work operations/processes to the surroundings. For periodic surveys, update the previous information with any changes such as relocated equipment, hazards, or controls.
- (b) Personnel Assigned. The number of personnel, including total assigned to the shop, number of males and females, numbers by worker classification, and numbers for each work operations/process. Make any updates as needed for periodic surveys.
- (c) Work Operations/Processes Descriptions. The descriptions must detail the work operations/processes by task, work practices and procedures, locations, frequencies and durations of the work operations/processes (including the amount of time spent on each task (time course of events)), material and equipment usage, hazards involved, controls used, number of personnel assigned. Include worker classification if appropriate (e.g., welder, carpenter, etc.). This would include a description of the equipment used in the shop for the work operations/processes. For periodic surveys, if a work operation/process changes, the description must detail the changes, including additions of any new work operations/processes.
- (d) Chemical Hazards. List any chemical hazards associated with each work operation/process. Additionally, compare the hazards present with the reproductive hazards listed in reference 2-5, and with the carcinogen listings published by OSHA, National Toxicology Program (NTP), and the International Agency for Research on Cancer (IARC) and the American Conference of Governmental Industrial Hygienists (ACGIH). Identify the specific hazards that are reproductive hazards or carcinogens. It is recommended that this list be in a consistent format for each shop, so that the lists can be rolled up to command-wide summaries. Make any updates as needed for periodic surveys.

- (e) Physical Hazards. List any physical hazards, including a brief description of their source(s), found in review of each work operation/process. Physical hazards include but are not limited to noise, ionizing or non-ionizing radiation, ergonomic risks, temperature, vibration, etc. Additionally, compare the hazards present with the reproductive hazards listed in reference 2-4, and with the carcinogen listings published by OSHA, NTP, the IARC and the ACGIH. Identify the specific hazards that are reproductive hazards or carcinogens. It is recommended that this list be in a consistent format for each shop, so that the lists can be rolled up to command-wide summaries. Make any updates as needed for periodic surveys.
  - (f) Biological Hazards. List any biological/infectious agents (e.g., in laboratories) found in review of each work operation/process. Additionally, compare the hazards present with the reproductive hazards listed in reference 2-4, and with the carcinogen listings published by OSHA, NTP, the IARC and the ACGIH. Identify the specific hazards that are reproductive hazards or carcinogens. It is recommended that this list be in a consistent format for each shop, so that the lists can be rolled up to command-wide summaries. Make any updates as needed for periodic surveys.
  - (g) Existing Controls. Describe any controls, their use, and their effectiveness for each work operation/process. Controls can be hazard specific. Controls can include substitution, isolation, engineering controls, administrative controls, and PPE. Include any sampling/measurements (e.g., ventilation measurement), comparing the results to any standards or guidelines. Reference any standards or guidelines used when discussing the controls' adequacy. It is recommended that this control information be in a consistent format for each shop, so that the information can be rolled up to command-wide summaries. For periodic surveys, record any changes in the controls, their use, or effectiveness.
  - (h) Any other information or issues noted during the survey necessary to accurately describe command and shop conditions.
  - (i) Hazardous Materials Authorized Use List (HM AUL). List any hazardous materials used in the work operations/processes that are not on the command's HM AUL. This will provide the command with the information needed to update the HM AUL. If the HM AUL is not specific (e.g., "organic solvents" rather than "methanol and butyl acetate" or "heavy metal fume" instead of "lead fume"), include that finding in the survey report. For a periodic survey, any changes in the HM AUL triggers an update in listed hazards and an updated comparison with the reproductive hazard and with the carcinogen listings.
- (2) Exposure Assessments by Shop and Similar Exposure Group (SEG). This section documents the analysis of the collected data and the health risk of affected workers for each work operation/process and hazard by SEG for each shop. For periodic surveys, if there are previous monitoring results, the survey should include the analysis of collected data relative to previous surveys. Also, for periodic surveys, if the assessment changes, make a statement about the resultant change in personnel exposure.

- (a) Present qualitative and quantitative exposure assessments, the basis of the exposure assessment, the determination, the rationale for the determination, any data used, any statistical tests used, and the Occupational Exposure Limits (OELs) or guidelines used, as appropriate. Consult Chapter 4 for information on qualitative and quantitative exposure assessments and statistical tests used for quantitative assessments.
1. If monitoring is performed, discuss the results as part of the quantitative exposure assessment. Tables summarizing monitoring results should be included, especially sound pressure levels, personal noise dosimetry and personal air sampling.
  2. If historical monitoring results from the same location or results from similar operations at other locations are used as part of the assessment, the source of the monitoring results need to be cited.
  3. Include appropriate citations of any referenced standards or guidelines.
  4. Include a thorough discussion of the basis of the exposure assessment, the determination and the rationale of the determination.
    - a. An exposure assessment can be based on:
      - (1) Sample results of the actual work operation/processes
      - (2) Results from similar work operations/processes at other commands or locations
      - (3) The hazards of the materials used, amounts used, frequency and duration of the work operation/process, work practices and available engineering controls, etc.
    - b. However, an acceptable determination cannot be based on respiratory protection provided.
    - c. Short duration of the work operation/process is usually not a valid rationale for substances with ceiling or short term exposure limits.
- (b) Ensure that thorough hazard assessments of all identified reproductive hazards and carcinogens are also included. Chapter 29 of reference 2-2 requires that the industrial hygienist specifically address a reproductive hazard assessment (including acceptable determinations) as part of the routine evaluation in the IH survey.
- (c) Exposure assessments should be summarized in a list that shows the current exposure assessment status for each significant work operation/process. It is recommended that this list be in a consistent format for each shop, so that the lists can be rolled up to command-wide summaries. The list should (as a minimum) contain the following elements: shop, SEG, work operation/process, pertinent tasks, hazard, exposure assessment status and basis, and rationale for the determination.

(3) Findings, Recommendations, and References by Shop and SEG.

- (a) Findings. Present the field findings for each work operation/process by SEG for each shop. Findings can be hazard specific. Findings may be positive or negative. For periodic surveys, make any updates as needed regarding the findings and any resultant change in personnel exposure. Also, for periodic surveys, annotate whether the finding is a repeat from any previous survey and cite the source.
1. Monitoring results, in most cases, are best presented in tables to provide a summary of the data that is easily understood.
  2. Discuss workplace assessments, evaluation of controls, exposure assessments and any monitoring; make a definite positive or negative statement as to exposure of personnel relative to established standards or guidelines.
  3. Each finding showing non-compliance with a standard or guideline must include an appropriate citation of the referenced standard or guideline.
  4. Best practices should be documented and shared.
- (b) Recommendations. In sequential order, include at least one feasible recommendation for improvement that corresponds to each finding showing non-compliance with a standard or guideline. Some recommendations might be made even if it is not a non-compliance situation (e.g., some PPE). For periodic surveys, make any updates as needed regarding the recommendations.
1. Recommendations might include controls such as: substitution, isolation, engineering controls, administrative controls, and PPE.
  2. Cite the reference or source of each recommendation.
  3. A recommended PPE chart by shop and work operation/process is often useful for the shop personnel.
  4. It is suggested that the recommendations be in a consistent format for each shop, so that the information can be rolled up to command-wide summaries.
  5. If engineering controls are not installed or used properly, identify them for inclusion in the surveyed command's Navy Occupational Safety and Health Hazard Abatement Log.
  6. Additionally identify those work operations/processes and hazards where employees require enrollment in medical surveillance programs, based upon the exposure assessment. Medical surveillance recommendations are to be rolled up to a command-wide summary.
- (c) References. Findings that document non-compliance with a standard or guideline and recommendations requiring action are based on cited references. Follow the guidance in Chapter 16 of reference 2-2 to select appropriate references. For example, when citing the lack of respirator standard operating procedures (SOPs), use OPNAVINST 5100.23G, paragraph 1513.a.(2). When citing references, be specific enough to assist with improvements without limiting creative responses to problems found in the field.

- (4) EMP by Shop and SEG. Identify any required monitoring for each work operation/process and hazard by SEG for each shop. Per Chapter 8 of reference 2-2, an EMP will be completed for required or necessary sampling/measurements. This includes sampling/measurements required by regulation, or needed to statistically assess exposures, determine trends or validate professional judgement of unchanged exposure assessments. The plan should also include monitoring necessary to document the need for controls and the effectiveness of existing controls (e.g., ventilation measurements or other sampling/measurements to assess engineering or administrative controls) Reference 2-3 Chapter A3 requires that exposures needing monitoring and specifically routine ventilation system evaluation be included on the EMP. Reference 2-2 Chapter 8 requires EMPs to include: what must be sampled, how many samples are needed and how often the sampling should be performed. To meet these requirements, the required exposure monitoring should be to be rolled up to a command-wide summary or documented OPNAV Form 5100/14 or equivalent.
- f. Command-wide Summary Tables and Other Appendices. Include information that enhances or complements the workplace evaluation in an appendix, as appropriate or required. These summary tables and appendices and can include:
- (1) Medical Surveillance Recommendations Summary. This command-wide summary table lists medical surveillance recommendations by shop and SEG, work operation/process, and hazard, based upon the IH exposure assessments. The summary is particularly useful for presentation to designated medical surveillance program managers. It should detail the recommended medical surveillance program, and estimated number of workers. A recommended format for listing medical surveillance recommendations is provided in Appendix 2-E.
- Note:** Industrial hygienists are not required to recommend medical surveillance for job certifications, unrelated to IH exposure assessments since it is a command supervisor's responsibility to provide that information. However, such information would aid both the safety and medical staff in managing the overall occupational safety and health program. To help commands identify medical surveillance requirements for job certifications, this section should include a reference to the ["Medical Surveillance Procedures Manual and Medical Matrix," NMCPHC-TM OM 6260](#).
- (2) EMP. This command-wide summary table or the OPNAV 5100/14 (or equivalent) forms are required by Reference 2-2 Chapter 8 to contain: what must be sampled, how many samples are needed, and how often the sampling should be performed. Additionally, any other clarifying comments or details should be included. It should be grouped by shop and SEG, work operation/process, location (as appropriate), and hazard for the needed monitoring. EMPs should cover all required or necessary sampling/measurements. A command-wide summary table summarizing all exposure monitoring is recommended.

- (3) Respiratory Protection Recommendations Summary. This command-wide summary table lists areas and processes requiring respiratory protection. It should list the recommended respiratory protection by shop and SEG, work operation/process, location (as appropriate), and hazard. It should detail the minimum type of respirator required for adequate protection. This summary is specifically required by the current reference 2-3 Chapter A3.
- (4) Eye Hazardous Processes Summary. This command-wide summary table lists eye hazardous areas and processes. It should list the recommended eye protection by shop and SEG, work operation/process, location (as appropriate), and hazard. It should detail the type of eye protection required for adequate protection. This summary is specifically required by the current reference 2-3 Chapter A3.
- (5) Eye Wash and Deluge Shower Areas Summary. This command-wide summary table lists areas where emergency eyewashes and deluge showers are present or recommended by shop and/or location. It should detail the type of eyewash or shower, whether it is required for that location, any referenced standard, a brief description of any corrective action required, and any other comments. This summary is specifically required by the current reference 2-3 Chapter A3.
- (6) Noise Hazardous Processes and Areas Summary. This command-wide summary table lists the areas and equipment designated as noise hazardous. It should list the recommended hearing protection and signage by shop (and SEG as appropriate) and/or location, noise source, and work operation/process and/or equipment. It should detail the range of sound pressure levels measured, the type of hearing protection required for adequate protection, and the required labeling (single or double hearing protection required) as noise hazardous. This summary is specifically required by the current reference 2-3 Chapter A3.
- (7) Reproductive Hazard Summary. This command-wide summary table lists the particular identified reproductive hazards by shop and SEG, and work operation/process.
- (8) Carcinogen Summary. This command-wide summary table lists the particular identified carcinogens by shop and SEG, and work operation/process.
- (9) Hazardous Material Storage Locations Summary. This command-wide summary table lists the shops and/or locations where the hazardous material is stored, detailing the type of hazardous material.
- (10) Ventilation Measurements Summary. This command-wide summary table lists the existing industrial ventilation systems (i.e., for contaminant control, but also including flammable and hazardous materials storerooms and laundry, scullery, and galley exhaust systems) by shop (and SEG as appropriate) and/or location, and work operation/process. It should detail system location; hazard controlled; system type, system measurements; any referenced standard, guideline, or design criteria for that system; whether the system meets the standard, guideline or design criteria; a brief description of any corrective action required; and any other comments.

- (11) Repeat Technical Findings Summary. For periodic surveys, if there are multiple repeat findings, it might be useful to include a command-wide summary table listing the findings by shop and SEG, work operation/process, location, and hazard.
  - (12) Monitoring Results Documentation. Supporting documentation for all sampling/measurement results used to make the workplace evaluations during that IH survey can be included as an appendix to the survey report. For example, include copies of field data sheets used to record the results of direct reading instruments such as sound levels, ventilation, radio frequency and illumination. Also include copies of laboratory reports for personal and general area air samples, and bulk and wipe samples.
  - (13) SOPs for Specific Programs. "Boiler plate" SOPs can be included to assist the SOH manager in organizing and operating the occupational health programs, (e.g., any particular SOPs for lead control, asbestos abatement, etc.)
  - (14) Glossary. A glossary of terms common to IH can be included. Technical terms used in the report are listed with a plain English definition.
  - (15) Customer Satisfaction Survey. A customer satisfaction survey can be included. However, inclusion with the survey report alone is not often effective in eliciting responses. Specifically asking for response in the Executive Summary and also in communications with the serviced command or shops might improve response rate.
6. **COMMAND IH SURVEY REPORT INDEX**. If the IH survey reports for a command are provided in multiple documents (e.g., by department, division, directorate, etc.) during the applicable reporting period, then a command IH survey report index needs to be prepared. This index references all of the previously provided IH survey reports and includes a list of all the shops surveyed in each individual report. The shop list should include the shop name, priority (per Appendix 2-D), and survey report date.

**APPENDIX 2-B**  
**SURVEY REPORT ELEMENT REQUIREMENTS FOR  
 INITIAL/PERIODIC INDUSTRIAL HYGIENE SURVEY REPORTS AND SHOP  
 SPECIFIC SUPPLEMENTS TO A PERIODIC INDUSTRIAL HYGIENE SURVEY  
 REPORT**

<b>REPORT ELEMENT</b>	<b>INITIAL/PERIODIC INDUSTRIAL HYGIENE SURVEY REPORT ELEMENTS</b>	<b>SHOP SPECIFIC SUPPLEMENT TO PERIODIC INDUSTRIAL HYGIENE SURVEY REPORT ELEMENTS</b>
Cover Letter	Required	Required
Table of Contents	Required	Required only when MORE than 4 shops are included
Executive Summary	Required	Required
Program Findings and Recommendations	Required	Optional
Worksite Evaluations, Exposure Assessments, Findings and Recommendations and References, and Exposure Monitoring Plan	Required	Required, but only for those shops surveyed
Medical Surveillance Recommendations	As Required Should also be presented as a command-wide or component-wide (directorate, department, etc.) rollup summary	As Required
Exposure Monitoring Plan	As Required Should also be presented as a command-wide or component-wide (directorate, department, etc.) rollup summary	As Required to include updates
Other Command-Wide Summary Tables and Appendices	As Required	As Required

**APPENDIX 2-C**  
**PERIODIC INDUSTRIAL HYGIENE SURVEY REPORT FREQUENCY**

COMMAND HAZARD CATEGORY	PERIODIC INDUSTRIAL HYGIENE SURVEY REPORT FREQUENCY	COMMAND EXAMPLES
I High Hazard	ANNUAL, but focused on Priority 1 shops and other Priority 2 and 3 shops that are due that year	Marine Aviation Logistics Squadrons (MALS), Marine Corps Logistics Base Maintenance Centers (e.g., Barstow, CA and Albany, GA), MEF Corrosion Control, Marine Corps Maintenance Logistics Group Maintenance Battalions, Naval Shipyard, Ship Repair Facility, Fleet Readiness Centers (formerly Naval Aviation Depots), Shore Intermediate Maintenance Activity, Aircraft Intermediate Maintenance Department, Public Works Center, Weapons Ordnance Station, Naval Intermediate Maintenance Facility, Test Center or Laboratory, Medical Centers and Hospitals, Assault Craft Unit, Beach Masters Unit, Amphibious Construction Battalion, Naval Undersea Warfare Center, Naval Surface Warfare Center (NSWC)
II Moderate Hazard	Every 2 years, command wide with Priority 1 shops evaluated annually thereafter	Marine Corps Bases, Marine Corps Air Stations, Marine Corps Community Services (MCCS), Marine Corps Ground Battalions (e.g., Infantry, Artillery, Tanks, Reconnaissance, and Engineers), Naval Stations, Air Stations, Naval Computer and Telecommunications Area Master Station , Fleet and Industrial Supply Center, Sea Air Land Commando Teams, Aviation Squadrons, Submarine Learning Facility, Fleet Imaging, Naval Facilities Engineering Command Engineering Field Division, Naval Criminal Investigative Service, Naval Base, Exchange, Explosive Ordnance Disposal, Naval Computer and Telecommunication Station, Naval Communication Unit, Fleet Training Center, Fleet Aviation Specialized Operational, Naval Education and Training Command/, Fleet Area Control and Surveillance Facility, Naval Ophthalmic Support & Training Activity, NSWC Detachment and, Health Clinic and Branch Clinics.
	Every 3 years, command wide, all shops	All Navy and Military Sealift Command PM1 and PM4 Ships and Submarines
III Low Hazard	Every 4 years, command wide with Priority 1 & 2 shops included in supplement	Reserve Centers and all other activities with primarily office or classroom work, such as: administrative headquarters staffs and administrative support commands

**Exceptions:** All afloat command shops will be designated as “Priority 2” shops but will receive a singular combined command/shop based periodic IH every **3 years** as outlined in COMNAVSAFECEN NORFOLK VA 111457Z Jan 16 (ALSAFE 16/002). All **Reserve Center** shops will typically be designated as “Priority 3” shops and will receive a singular combined command/shop-based periodic IH every **4 years**. Reserve Centers with industrial work operations/processes, work operation/process changes, changes to work practices, or other occupational health concerns should contact their supporting IHPO for consultation or possible evaluation outside of the four year periodicity.

**APPENDIX 2-D**  
**ASSIGNING SHOP PRIORITIES IN DOEHS-IH**

<b>Minimum Assessment Frequency<sup>1</sup></b>		
<b>Priority 1 – Annual</b>	<b>Priority 2 – Every two years (Every three years for all Afloat command shops)</b>	<b>Priority 3 – Every four years</b>
GENERAL DESCRIPTION <sup>2</sup> - Shops requiring complex IH assessment or significant monitoring	GENERAL DESCRIPTION <sup>2</sup> – Shops where work is of moderate to low hazard	GENERAL DESCRIPTION <sup>2</sup> - Shops where work is primarily in an administrative environment
Hazards are poorly defined or controlled. Work environment or processes are unstable	Hazards well defined and controlled. Work environment and processes are stable	Insignificant or no hazards. Work environment and processes are stable
Except as noted below, a recommendation/requirement for exposure-based occupational health exams for all chemical and physical hazards, all mixed exposures and when IH recommends respirator use based on their exposure assessment <sup>3</sup> . <u>Exceptions:</u> Noise 503 or 512; Blood or Body Fluids – 178; Radiation-Ionizing 505; Radiation - Laser 506; Animal Associated Disease 207; Hazardous Drugs 110; and Specialty exams <sup>4</sup>	No exposure-driven occupational health exam recommendations/requirements, other than annual audiograms. <b>Note:</b> The IH must document their rationale for classifying a shop other than “Priority 1” if they recommend medical surveillance for a chemical, physical, or mixed exposure hazard.)	No occupational health exam requirements
Highest rated SEG in shop has a Health Risk Rating (HRR) <sup>5</sup> of 12 or greater or there are high exposures (e.g., 95th percentile > or equal to 50% OEL), other than noise.	Highest rated SEG in shop has an HRR <sup>5</sup> less than 12 and greater than 4 or exposure assessment is moderate to low (e.g., 95th percentile >detectable and < 50% OEL)	Exposure assessment is negligible (e.g., insignificant or negligible exposure)
OSHA regulatory exposure assessment or monitoring requirements (OSH Act Section 6b rulemaking)	Minimal potential for hazards to go out of control or create significant risk	
<b>See footnotes on next page</b>		

**Exceptions:** All **afloat** command shops will be designated as “Priority 2” shops but will receive a singular combined command/shop based periodic IH every **3 years** as outlined in COMNAVSAFECEN NORFOLK VA 111457Z Jan 16 (ALSAFE 16/002). All **Reserve Center** shops will typically be designated as “Priority 3” shops and will receive a singular combined command/shop-based periodic IH every **4 years**. Reserve Centers with industrial work operations/processes, work operation/process changes, changes to work practices, or other occupational health concerns should contact their supporting IHPO for consultation or possible evaluation outside of the four year periodicity.

<sup>1</sup> The required routine assessment frequency establishes a minimum requirement. Shops should be assessed as frequently as necessary to adequately identify, evaluate, and control the occupational health hazards present.

<sup>2</sup> Shop Complexity Categories (A, B, C) established for the 2009 NMAT IH staffing study in Data Call1A may be used as a starting point for revalidating Shop Priority (1, 2, 3) codes as outlined in this appendix for DOEHRSH.

<sup>3</sup> IH respirator use recommendations typically indicate employee overexposures, or are recommended as a control for uncertain exposures requiring additional monitoring/characterization. Concurrently, exposure-based medical surveillance would likely be recommended due to exposures exceeding the OEL or action level (AL). Therefore, more frequent visits (i.e., annually) are warranted by the IH to monitor these higher risk shops/processes or to gather additional monitoring data. Conversely, there are some situations where an IH respirator use recommendation in and to itself **may not** warrant Priority 1 shop designation or annual shop reassessments.

**Potential Exceptions:** 1. When respirator use by shop personnel **is not** based on the IH's exposure assessment and respirator use recommendation(s), **and** there are no IH exposure-based medical surveillance recommendations. Some examples might include: local or higher authority directives/SOPs that automatically mandate respirator use; command RPPM (vice IH) respirator use requirement. 2. When the IH recommends SCBA use by firefighters or respirator use by squadron Emergency Response Teams (ERTs) because annual shop reassessments typically do not provide additional respirator use exposure characterization information. 3. When the IH recommends respirator use by shop personnel as a precautionary/conservative best practice for NAVFAC/PWD/Facility Dept. maintenance employees or welders for intermittent/variable work operations/processes when all corresponding IH monitoring has consistently documented exposures less than applicable OELs **and** there are no exposure-based medical surveillance recommendations. **In summary, with respect to these noted potential exceptions, a Priority 1 shop should not be categorized as a Priority 2 shop if an annual shop reassessment is considered professionally more appropriate. Shop categorization and periodic reassessments should be conducted as frequently as necessary to adequately identify, evaluate, and control the occupational health hazards present.**

<sup>4</sup> Per Navy and Marine Corps Public Health Center Technical Manual NMCPHC-TM OM 6260 Medical Surveillance Procedures Manual and Medical Matrix (Edition 12). Note: Freon (Haloalkane) Worker (718) is incorrectly listed as a Specialty exam; however IH medical surveillance determinations are made using exposure-based criteria.

<sup>5</sup> HRR for a SEG is calculated by multiplying the Exposure Effects Rating (EER) by times the Health Effects Rating (HER), according to the guidance presented in the NMCPHC IHFOM, Chapter 4.

**TABLE 1-HEALTH RISK RATING CALCULATION**

<b>Health Risk Ratings per DOEHRS-IH Exposure Assessment Strategy</b>						
		<b>Exposure Effects Rating/Category</b>				
		<b>1/Negligible</b>	<b>2/Low</b>	<b>3/Moderate</b>	<b>4/High</b>	<b>5/Very High</b>
<b>Health Effect Rating/Category</b>	<b>5/Very High</b>	5	10	15	20	25
	<b>4/High</b>	4	8	12	16	20
	<b>3/Moderate</b>	3	6	9	12	15
	<b>2/Low</b>	2	4	6	8	10
	<b>1/Negligible</b>	1	2	3	4	5

**TABLE 2-EXPOSURE EFFECTS RATING CATEGORIZATION**

<b>Exposure Effects Rating/Category</b>	<b>IH Exposure Hypothesis based on 95<sup>th</sup> Percentile Exposure Point Estimate</b>	<b>Exposure Profile</b>
<b>5/Very High</b>	Expected to be at or above the OEL	Gross frequent contact with agents at very high concentrations; Materials have high vapor pressure or dustiness
<b>4/High</b>	Likely to be an exposure, but between 50% OEL and OEL	Likely contact with agent at high concentrations or infrequent contact at very high concentrations; Materials have significant vapor pressure or dustiness
<b>3/Moderate</b>	Exposure frequently < 50% OEL, or generally between 10-50% of OEL	Occasional contact with agent at moderate concentrations or infrequent contact at high concentrations; Materials have low vapor pressure or dustiness
<b>2/Low</b>	Exposure infrequent, < 10% of OEL	Infrequent contact with agents
<b>1/Negligible</b>	No detectable exposure	Current science cannot determine that there is exposure to agent

**TABLE 3-HEALTH EFFECTS RATINGS CATEGORIZATION**

Health Effects Rating/Category	Health Effect	Health Effects Codes (OSHA)
<b>5/Very High</b>	Acute life-threatening or disabling injury or illness	<p><b>Health Hazard:</b> HE1 - Regulated carcinogens; HE2 – Chronic (cumulative) toxicity - known or suspect human (IARC Group1 &amp; Group 2A, ACGIH A1 &amp; A2) carcinogens, mutagens; HE17 - Chemical asphyxiants, anoxiants; HE11 – Respiratory effects - acute lung damage, edema</p> <p><b>Safety:</b> Death, Loss of facility or asset</p> <p><b>Noise:</b> Immediate hearing loss, impulse noise</p>
<b>4/High</b>	Chronic irreversible health effects of concern	<p><b>Health Hazard:</b> HE3 – Chronic toxicity - long term organ toxicity other than nervous, respiratory, hematologic, or reproductive; HE5 – Reproductive hazards - teratogens, or other impairment; HE7 – Nervous system disturbances - other than narcosis; HE10 - Respiratory effects (other than irritation) - cumulative lung damage; HE9 - Respiratory effects (other than irritation) – respiratory sensitization – asthma or other</p> <p><b>Safety:</b> Major property damage</p> <p><b>Noise:</b> Noise induced hearing loss, permanent and temporary threshold shifts, will eventually lead to permanent hearing loss</p>
<b>3/Moderate</b>	Severe reversible health effects of concern	<p><b>Health Hazard:</b> HE14 – Irritation of eyes, nose, throat, skin – marked; HE6 - Nervous system disturbances - cholinesterase inhibition; HE12 - Hematologic disturbances – anemias; HE13 - Hematologic disturbances – methemoglobinemia, anemias; HE4 - Acute toxicity - Short-term high risk effects (non-IDLH)</p> <p><b>Safety:</b> Minor property damage</p>
<b>2/Low</b>	Reversible health effects of concern	<p><b>Health Hazard:</b> HE15 – Irritation of eyes, nose, throat, skin – moderate; HE16 – Irritation of eyes, nose, throat, skin – mild; HE8 - Nervous system disturbances - narcosis</p> <p><b>Safety:</b> Minimal threat to personnel, property, first aid, minor supportive medical treatment, but still a violation of a standard.</p>
<b>1/Negligible</b>	Nuisance health effects (Reversible health effects of little concern or no known or suspected adverse health effects)	<p><b>Health Hazard:</b> HE19 - Generally low risk health effects - nuisance particulates, vapors or gases; HE 20 - Generally low risk health effects – odor</p> <p><b>Safety:</b> No violation of a standard.</p>

**APPENDIX 2-E**

**RECOMMENDED FORMATS FOR MEDICAL SURVEILLANCE SUMMARY  
(SHOP/COMMAND/AREA OF RESPONSIBILITY (AOR) BASED SUMMARIES)**

**Shop: CODE 123 AIR OPS DEPARTMENT (SHOP SUMMARY)**

**SEG: FLIGHTLINE**

<b>WORK OPERATION/PROCESS TASK</b>	<b>RECOMMENDED MEDICAL PROGRAM</b>	<b>MEDICAL PROGRAM NUMBER</b>	<b>ESTIMATED NUMBER OF WORKERS</b>
FLIGHT LINE OPERATIONS	NOISE	503	10

**MEDICAL SURVEILLANCE TABLE (COMMAND SUMMARY)**

**Command: XYZ SQUADRON/12345**

<b>SHOP/SEG</b>	<b>WORK OPERATION/ PROCESS/TASK</b>	<b>RECOMMENDED MEDICAL PROGRAM</b>	<b>MEDICAL PROGRAM NUMBER</b>	<b>ESTIMATED NUMBER OF WORKERS</b>
AIR OPS DEPARTMENT (CODE 123) / FLIGHTLINE	FLIGHTLINE OPERATIONS	NOISE	503	10
MAINTENANCE DEPARTMENT – AIRCRAFT DIVISION - CORROSION CONTROL SHOP (CODE 456) / CORROSION CONTROL	SPRAY PAINTING	RESPIRATOR USER-FULL FACE	716	2
MAINTENANCE DEPARTMENT – MATERIAL CONTROL (CODE 789) / SUPPLY	MATERIALS HANDLING AND STORAGE	FORKLIFT	210	12

**MEDICAL SURVEILLANCE TABLE (AOR SUMMARY)**

**AOR: NHC ANYWHERE**

<b>COMMAND/ UIC</b>	<b>SHOP/SEG</b>	<b>WORK OPERATION/ PROCESS/TASK</b>	<b>RECOMMENDED MEDICAL PROGRAM</b>	<b>MEDICAL PROGRAM NUMBER</b>	<b>ESTIMATED NUMBER OF WORKERS</b>
XYZ SQUADRON/12345	AIR OPS DEPARTMENT (CODE 123) / FLIGHTLINE	FLIGHTLINE OPERATIONS	NOISE	503	10
XYZ SQUADRON/12345	CORROSION CONTROL DEPARTMENT (CODE 456) / CORROSION CONTROL	SPRAY PAINTING	RESPIRATOR USER-FULL FACE	716	2
XYZ SQUADRON/12345	MAINTENANCE DEPARTMENT – MATERIAL CONTROL (CODE 789) / SUPPLY	MATERIALS HANDLING AND STORAGE	FORKLIFT	210	12
ABC SQUADRON/98765	AIR OPS DEPARTMENT (CODE 123) / FLIGHTLINE	FLIGHTLINE OPERATIONS	NOISE	503	12
ABC SQUADRON/98765	CORROSION CONTROL DEPARTMENT (CODE 456) / CORROSION CONTROL	SPRAY PAINTING	RESPIRATOR USER-FULL FACE	716	3
ABC SQUADRON/98765	MAINTENANCE DEPARTMENT – MATERIAL CONTROL (CODE 789) / SUPPLY	MATERIALS HANDLING AND STORAGE	FORKLIFT	210	8