1.0 Purpose

To purpose of this program is to establish safe handling and usage requirements for work with materials that potentially expose employees to hexavalent chromium.

2.0 Definitions

2.1 **Chromium (VI) (hexavalent chromium or Cr(VI)):** Chromium with a valence of positive six, in any form and in any compound.

2.2 **Emergency:** any occurrence that results, or is likely to result, in an uncontrolled release of chromium (VI).

2.3 **Employee exposure:** means the exposure to airborne chromium (VI) that would occur if the employee were not using a respirator.

2.4 **High-efficiency particulate air (HEPA) filter** means a filter that is at least 99.97 percent efficient in removing mono-dispersed particles of 0.3 micrometers in diameter or larger.

2.5 **Historical monitoring data** means data from chromium (VI) monitoring conducted prior to July 31, 2006, obtained during work operations conducted under workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

2.6 **Objective data** means information such as air monitoring data from industry-wide surveys or calculations based on the composition or chemical and physical properties of a substance demonstrating the employee exposure to chromium (VI) associated with a particular product or material or a specific process, operation, or activity. The data must reflect workplace conditions closely resembling the processes, types of material, control methods, work practices, and environmental conditions in the employer's current operations.

2.7 **Regulated area** means an area, demarcated by the employer, where an employee's exposure to airborne concentrations of chromium (VI) exceeds, or can reasonably be expected to exceed, the PEL.

3.0 Scope

This program covers all employees who may be potentially exposed to hexavalent chromium through work activities. These are primarily welding and cutting activities on stainless steel.

4.0 Key Responsibilities

4.1 **Managers/Supervisors**: Apollo Management/supervision, supported by safety professional(s) and the medical contractor, conducts the following basic steps to control exposure to chromium:

4.1.1 Determine the types of projects, activities, and operations that could involve chromium, or chromium -containing materials. For those jobs, conduct hazard identification as part of the work design, planning, and control process.

4.1.2 If chromium materials are involved, ensure that project safety conducts a hazard evaluation to determine the potential exposure and to recommend initial controls.

4.1.3 Develop and implement a JSA when exposure is or is likely to be above the PEL. The JSA (or equal) addresses the scope of work activities; provides initial exposure assessment; and prescribes exposure controls, air-monitoring requirements, work practices, personal protective equipment and additional information as required.

4.1.4 Incorporate recommendations from project safety for chromium hazard control measures into any JSA and work control documents.

4.1.5 Provide personal hygiene facilities on jobs that involve welding or cutting of chromium materials.

4.1.6 Ensure that initial training is conducted for all new employees and that retraining is conducted when employee behaviors suggest retraining is warranted.

4.1.7 Provide results of any chromium survey, along with information regarding hazard potential and control measures. As appropriate, make recommendations to modify engineering, administrative, work practice, and personal protection controls.

4.1.8 In evaluating chromium (VI) hazards and specify controls for a job they may (a) utilize reliable historical exposure monitoring data generated from other similar operations or activities (b) utilize objective data and or (c) plans on conducts initial monitoring to determine exposures and assess the effectiveness of hazard controls.

4.2 **Safety Manager**

4.2.1 Assists management/supervision in identification and evaluation of potential hexavalent chromium exposure.

4.2.2 In evaluating chromium hazards and specifying controls for a job, (a) utilizes reliable historical exposure monitoring data generated for other similar operations or activities, (b) utilizes objective data, and/or (c) plans and conducts initial monitoring to determine exposures and assess the effectiveness of hazard controls.

4.2.3 Conducts initial and periodic exposure monitoring in accordance with National Institute for Occupational Safety and Health (NIOSH)/OSHA methods if lacking historical or objective data.

4.2.4 Provide initial and refresher hexavalent chromium training for all employees with potential exposure to hexavalent chromium.

4.2.5 Ensure that medical monitoring is conducted in accordance with 29 CFR 1926.1126 (for chromium) and review results of medical monitoring.

4.2.6 Maintains effective records of jobs monitored, so that an historical database can be used to specify controls and eliminate unnecessary and redundant monitoring for future activities.

4.2.7 As appropriate, participates in pre-job and daily worker briefings regarding task-specific chromium hazards and controls, work practices/plans (such as JSAs), and other applicable information, including any changes that are made to controls or to the work practices or plans.

4.3 **Employees**

4.3.1 Shall follow all safe work procedures for hexavalent chromium outlined in this document.

4.3.2 Follow good hygiene practices regardless of other control measures in place.

4.3.3 Shall report any signs or symptoms of hexavalent exposure to immediate supervisor.

5.0 Hexavalent Chromium Background Data

4.1 **Regulatory limits in Oregon, Washington, Idaho, and Colorado**

5.1.1 Permissible Exposure Limit (PEL) = 5.0 micrograms/meter 3

5.1.2 Action Limit (AL) = 2.5 micrograms/meter 3

5.2 **Welding, Cutting, Grinding**

5.2.1 Plasma and air arc cutting and gouging operations have been shown to expose the worker and helpers within 10 feet of the work to levels of hexavalent chromium above the permissible exposure limit (PEL) under most circumstances and conditions.

5.2.2 Certain welding and cutting activities have been shown to expose the welder/cutter, and potentially helpers, to hexavalent chromium above the action level when exhaust ventilation is not used. The activities have included the following: Sub Arc, MIG, TIG, Flux Core, Stick, Carbon Arc Cutting, Plasma Arc Cutting.

5.2.3 The types of metal involved have been stainless steel, chromium-containing alloy steel, and chromium-containing nonferrous alloys. Exposure has also occurred when the welding rod or wire in use contains chromium and exhaust ventilation is not used.

5.2.4 Exhaust ventilation is always prescribed as a control measure when activities with the materials mentioned above are in use unless historical personal monitoring data performed when similar materials, using similar methods, under similar environmental conditions are used shows conclusively that the welder/cutter and helper (if applicable) are not exposed above the action level without regard to respiratory protection.

6.0 Safe Handling Procedures

6.1 Each discrete welding or cutting task where hexavalent chromium materials have been identified as a potential exposure must begin with local exhaust ventilation in place. See appendix A for recommended controls based on work conditions and type of welding performed.

6.2 Flux core and stick welding or carbon arc or plasma arc cutting require additional controls and should be evaluated by the Safety Manager prior to start of work.

6.3 Regardless of the type of welding performed, any work in restricted or confined spaces must be evaluated by the safety manager prior to the start of work.

6.4 Where historical or objective data indicates the potential to exceed the action limit exposure level, controls must be addressed on a JSA and should include these elements:

6.4.1 Exposure determination

6.4.2 Ventilation controls

6.4.3 Respiratory protection controls

6.4.4 Protective work clothing

6.4.5 Housekeeping

6.4.6 Medical surveillance if exposure anticipated to exceed 30 days per year

6.4.7 Training – as per hazard communications

6.4.8 Recordkeeping

6.5 Personal hygiene is very important while working with chromium products. To avoid accidental ingestion of chromium, employees should wash thoroughly (regardless of other controls) prior to eating, chewing, smoking, or drinking.

6.6 If skin or eye contact to hexavalent chromium is expected, employees may need to wear protective clothing such as gloves, coveralls, aprons, foot coverings and goggles.

6.7 Where skin contact with chromium (VI) occurs, Apollo management shall establish and provide change rooms, or washing facilities in conformance with State and Federal standards for hygiene facilities and practices.

6.8 Eating and drinking areas shall be provided and separate from any known chromium (VI) sources or known chromium (VI) contamination hazards and shall also be in conformance with State and Federal standards Hygiene facilities and practices.

6.9 Regardless of personal protective equipment, employees who are exposed at or above the action level 30 days or more for 12 consecutive months, must be enrolled in a medical surveillance program.

6.10 If the exposure level is above the PEL for 30 days or more then engineering controls and work practices shall be provided to reduce exposure to the lowest feasible level.

6.11 If engineering controls do not reduce exposure levels to below the action limit, then controls should be supplemented with respiratory protection equipment.

6.12 The employer shall not rotate employees to different jobs to achieve compliance with the PEL.

6.13 In stainless shops, all surfaces shall be maintained as free as practicable of chromium. Use HEPA filtered vacuums as the primary method, dry or wet sweeping as secondary methods to minimize the likelihood of exposure to chromium.

6.14 Do not use compressed air to remove chromium from any surface.

7.0 Regulated Areas

7.1 Apollo Supervisor shall establish a regulated area wherever an employee's exposure to airborne concentrations of chromium (VI) is, or can reasonably be expected to be, more than the PEL.

7.2 Apollo Supervisor will ensure that regulated areas are demarcated from the rest of the workplace in a manner that adequately establishes and alerts employees of the boundaries of the regulated area.

7.3 The employer shall limit access to regulated areas to:

7.3.1 Persons authorized by the employer and required by work duties to be present in the regulated area.

7.3.2 Any person entering such an area as a designated representative of employees for exercising the right to observe monitoring procedures.

7.3.3 Any person authorized by the Washington Industrial Safety and Health Act (WISHA) or regulations issued under it to be in a regulated area.

7.4 Employees remove all protective clothing and equipment contaminated with chromium (VI) at the end of the work shift or at the completion of their tasks involving chromium (VI) exposure, whichever comes first.

7.5 When contaminated protective clothing or equipment is removed for laundering, cleaning, maintenance, or disposal, it shall be stored and transported in sealed, impermeable bags or other closed, impermeable containers.

8.0 Exposure Monitoring

8.1 To identify and prevent over exposures, air monitoring should be performed at the beginning of each job task with potential exposure to hexavalent chromium unless historical or objective data is available to sufficiently characterize exposure levels.

8.2 Justification for waiving initial monitoring shall be included in the Job Safety Analysis or equal. Employees involved are briefed regarding the existence of such data.

8.3 Within 5 work days after making an exposure determination the employer shall individually notify each affected employee in writing of the results of that determination or post the results in an appropriate location accessible to all affected employees.

8.4 Whenever the exposure determination indicates that employee exposure is above the PEL, the employer shall describe in the written notification the corrective action being taken to reduce employee exposure to or below the PEL.

9.0 Medical Surveillance

9.1 Medical surveillance shall be provided when:

9.1.1 Employees are occupationally exposed above the action limit for more than 30 days per year.

9.1.2 An employee experiences signs or symptoms of the adverse health effects of Hexavalent Chromium (dermatitis, asthma, bronchitis, etc.).

9.2 Medical evaluations will be provided at no cost to employees.

9.3 Examinations will be performed by or under the supervision of a physician or another licensed health care professional.

10.0 Recordkeeping

10.1 Apollo is required to maintain and make available an accurate record of all employee exposure monitoring, medical surveillance and training records.

11.0 Respiratory Protection & PPE

11.1 The appropriate respirator shall be used when engineering controls and work practices cannot reduce employee exposure during work operations where engineering controls and work practices are not feasible and emergencies. Respirators shall be provided in accordance with 1910.134 (Respiratory Protection) (see Apollo Respiratory Protection Program).

11.2 PPE will be provided when there is a hazard from skin or eye contact and employees are required to use the PPE. Gloves, aprons, coveralls, goggles, foot covers and other as needed PPE shall be provided at no cost to the employee and will be removed at the end of the work shift. Apollo must clean, launder and replace all protective clothing as needed.

11.3 A change area shall be established where employees can remove PPE and dispose of contaminated PPE without a hazard of cross contamination of their own clothing that will be worn home.

12.0 Training

12.1 Safety Manager shall provide appropriate types of training for employees who are potentially exposed to chromium prior to their initial assignment and annually thereafter. Safety Manager will assure employee participation and maintain a

record of the training contents. This training includes:

12.1.1 Hazard communication training for potentially exposed employees.

12.1.2 Training specified by the applicable chromium standard for workers exposed at the action level for any one day or who are exposed to chromium compounds that are skin irritants.

12.1.3 Respirator training if respirators are to be used.

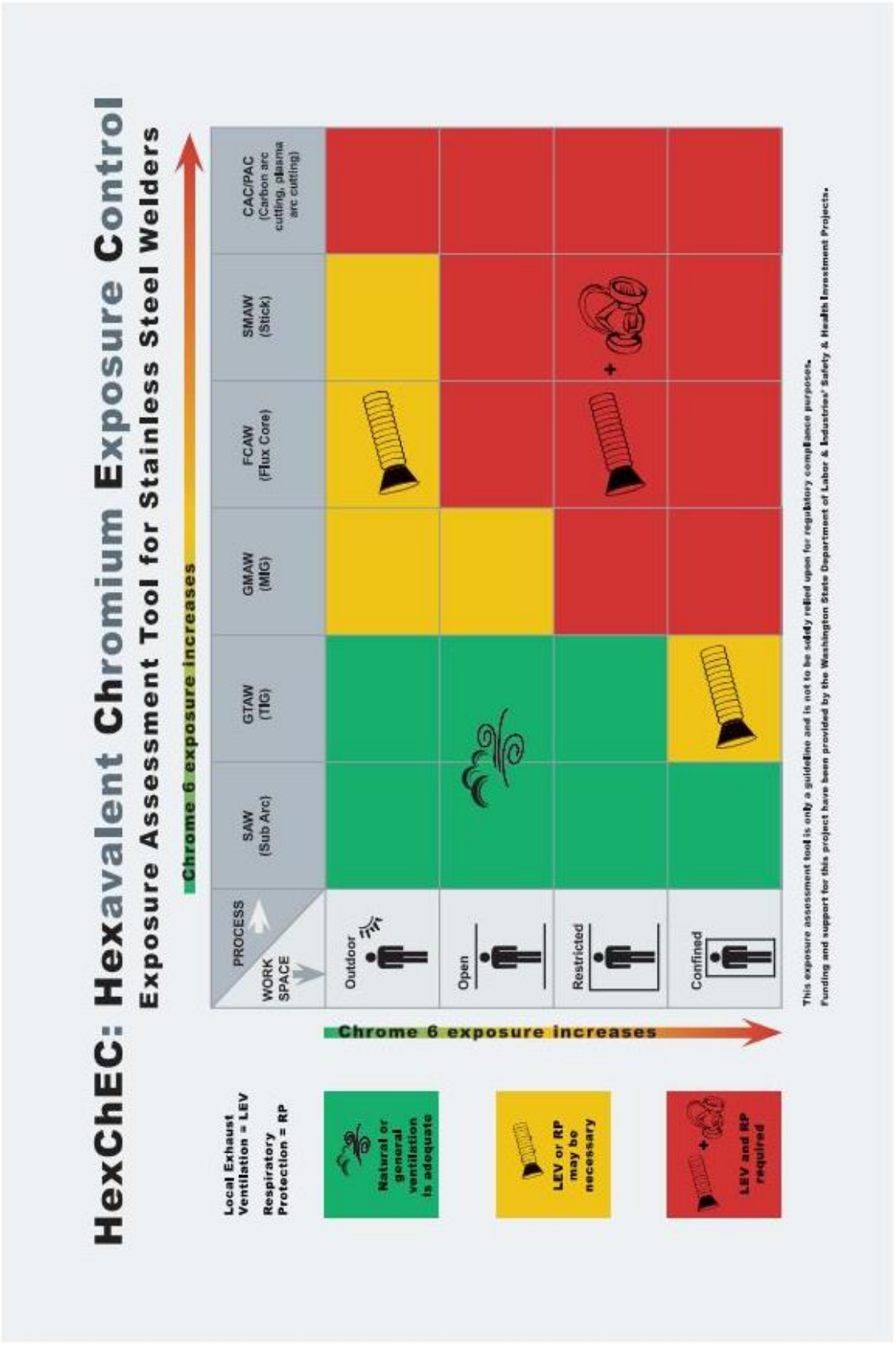
12.1.4 Information to workers regarding task-specific chromium hazards and control methods, the JSA, work practices, medical surveillance and other applicable information, including any changes that are made to these controls.

12.2 Provide training annually, as appropriate, to workers who continue to have exposure to chromium at or above the action level on any one day.

12.3 All training will be recorded and include the identity of the employee trained, the signature of the person who conducted the training and the date of the training.

12.4 Training records must be kept for one year.

Appendix A


HexChEC: Hexavalent Chromium Exposure Control
Exposure Assessment Tool for Stainless Steel Welders
Chrome 6 exposure increases
PROCESS
WORK SPACE
SAW (Sub Arc)
GTAW (TIG)
GMAW (MIG)
FCAW (Flux Core)
SMAW (Stick)
CAC/PAC (Carbon arc cutting, plasma arc cutting)
Outdoor
Open
Restricted
Confined
Chrome 6 exposure increases
Local Exhaust Ventilation = LEV
Respiratory Protection = RP
Natural or general ventilation is adequate
LEV or RP may be necessary
LEV and RP required
This exposure assessment tool is only a guideline and is not to be solely relied upon for regulatory compliance purposes.
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