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GUIDE TO CONTRACTOR INDUSTRIAL HYGIENE PROGRAMS

OBJECTIVE

The objectives of contractor Industrial Hygiene related programs are to comply both with OSHA and site requirements of host companies, as well as to provide assurance to the site that contractor employees are not exposed to excessive levels of chemicals or physical agents resulting from their work activities.

This guidance document is intended as an aid in setting up a contractor program. Due to the complexities of the programs there is no way to cover everything in a brief document so only the basics are covered. A list of reference documents is provided at the end which should be consulted for more in depth information. Also a contractor IH program template is attached to provide a starting point for contractors to develop their own program if they do not already have one in place. It is not meant to be a cookie cutter program nor would a contractor be expected to rewrite their program to match the template as long as it included the essential elements of a program.

EXPECTATIONS

Contractors are expected to meet OSHA health related standards as well as site policies. Health related programs need to be included as part of an overall safety program. These programs could include noise, respirators, hazard communication, and exposure assessment among others. The extent of contractor Industrial Hygiene programs will vary depending upon the nature and scope of work being performed. Those contractors with significant chemical and noise exposures (for example: welding, asbestos abatement, painting, tank cleaning) will require several more programs and greater details than for example a company doing work involving minimal chemical usage (for example; crane operations, security, drafting). Most host facilities cannot provide Industrial Hygiene contractor support beyond general program assistance and evaluation of site created hazards. It is the responsibility of each contractor to have appropriate programs and conduct any required assessments including employee monitoring as needed. Qualified individuals are expected to be used for these programs.

GUIDANCE

The following pages contain information to assist the contractor in developing their Industrial Hygiene program through the assistance of an Industrial Hygienist. The information presented is intended to help the contractor better understand what elements will be required for an Industrial Hygiene Program, further define those elements, and provide the tools/resources to help create, implement, and maintain their specific program.

EXPOSURE ASSESSMENT

A key element of Industrial Hygiene is exposure assessment. The exposure assessment process is a systematic process through which the contractor assures their employees are adequately protected from chemical and physical health hazards. Similar to safety audits exposure assessments also provide assurance to the site that hazards are being identified, evaluated, and controlled.

Several of the OSHA regulations specifically require health hazards to be assessed, including respiratory, noise, benzene, methylene chloride, hexavalent chromium, lead, asbestos, confined space,

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and personal protective equipment (PPE) among others. Also host sites are starting to require contractors to evaluate health hazards their employees may be exposed to while working on site. To ensure these requirements are met there needs to be a written exposure assessment component of the Industrial Hygiene program for contractors with more than minimal potential exposures to health hazards. A simple exposure assessment process may be adequate for some, while a much more complex process would be needed for others based upon type of work and potential exposures.

Assessments need to be done by qualified personnel who are capable of understanding exposure potentials and making risk assessments. If monitoring is needed to quantify exposure levels that must also be done by personnel qualified to properly conduct the monitoring under a proper level of oversight.

Similar to some safety requirements where there may be a difference between regulations and recommendations, the regulatory and recommended exposure limits for many substances differ. Generally the Threshold Limit Values (TLVs) from the American Conference of Governmental Industrial Hygienists (ACGIH) are the most current vs most of the OSHA Permissible Exposure Limits (PELs) which are over 35 years old. It is recommended that the more protective limits be used in a contractor program. Some sites require the TLVs (or OSHA if lower) to be used while others may only require OSHA PELs as a minimum. Contractors should check with the host site Industrial Hygienist to determine which exposure limits (OSHA, ACGIH, or NIOSH) they will be expected to comply with.

While some conditions are readily identified as needing personal monitoring, it is normally more effective (both cost and time) to use a two part process. First qualitatively evaluate a job to see if there is even a need to sample, and then do sampling as needed to get a better evaluation of exposures.

Qualitative Assessment— Since it is not practical to conduct monitoring for every potential chemical and physical hazard an employee may be exposed to, qualitative assessments are normally first conducted to identify higher priority activities that should be monitored.

A qualified individual will review each job position as well as significant task activities being performed to determine a qualitative exposure level. This assessment is based upon an evaluation of the chemical or physical agent hazards, type of work, task duration, proximity to hazard, control measures in place, interviews, observations, sampling results from similar past jobs, personal experience and expertise.

To conduct an adequate qualitative assessment it is important for the evaluator to have training in basic Industrial Hygiene including monitoring and the exposure assessment process. The individual should be an Industrial Hygienist with an IH related degree and several years experience. The process should be overseen by a Certified Industrial Hygienist (CIH) to ensure good quality control. The CIH also should approve of any Industrial Hygienists or monitoring technicians being used.

Once the job evaluation is completed, the significant chemical and physical hazards should be listed and a qualitative exposure range assigned (this is without regard to respirator use). Any PPE or other controls in use should be noted. An example of exposure ranges that may be used are:

- Nil – no more than perhaps a slight trace exposure

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- < 10% - while there is some exposure it is expected to normally be below 10% of applicable limits
- 10-50% - expected to normally be 10-50% of applicable limits
- 50-100% - expected to normally be 50-100% of applicable limits
- 1-5x - expected to normally be 1-5x the applicable limits
- 5-10x - expected to normally be 5-10x the applicable limits
- 10-50x - expected to normally be 10-50x the applicable limits
- 50-100 - expected to normally be 50-100x the applicable limits
- >100x - expected to normally be >100x the applicable limits

Quantitative Exposure Assessment – This involves actual exposure monitoring. A monitoring plan is established based upon the qualitative assessments. Generally if the qualitative exposure level was 50% or above, representative monitoring should be planned to further evaluate the risk and adequacy of the control measures such as respirators. If the level was low (10-25% of the exposure limit) then some random spot check monitoring would be done to help make sure the judgment assigning the low levels was correct. In between these levels, or for higher risk exposure agents the CIH should evaluate monitoring needs.

A person adequately trained in proper monitoring methods can be used to conduct this monitoring (monitoring technician) under the guidance of a CIH or an experienced Industrial Hygienist (with a CIH overseeing the program). The Industrial Hygienist would specify sampling methods, calibrations, representative activities needing sampling, number of samples needed to ensure results are representative, sample handling methods, qualified labs to use, shipping methods, and review/evaluate the results providing appropriate recommendations.

The resulting quantitative exposure assessment is then used to ensure control measures, respiratory protection and other PPE is adequate for the job. Assessments from other work sites can be used to help conduct an evaluation and can reduce the amount of sampling that may otherwise be needed. It is important to make sure good documentation of the sampling conditions (weather, jobsite, work practices, ventilation, duration of activities, unusual events, etc) is done since it is a factor that must be considered when evaluating future jobs.

When exposure monitoring is conducted copies of the results including sample details are to be sent to the site Industrial Hygiene group as well as the contractor coordinator within a month of sampling (or sooner based on site requirements). Immediate notification should be provided if an overexposure is found and adequate protection was not used. Employees who were monitored are to be notified of the sample results within the OSHA time frame for regulated materials (most range from 5 to 10 working days after receipt of results) and within 30 days for others.

PPE ASSESSMENT

A PPE assessment program is required by OSHA to ensure workers are using the correct PPE needed for their jobs. Different approaches can be taken to conducting this assessment ranging from evaluating every individual task and sub task to evaluations of generic activities (similar jobs with similar hazards and risks). These assessments are required to be documented and signed off on. The person conducting them needs to have some level of a safety and health background to ensure they are capable of making knowledgeable evaluations.

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Example of PPE Assessment (example only companies must validate their own assessments)

JOB	EVALUATION	CHEMICAL/ NON-CHEMICAL AGENTS	RECOMMENDED PPE
Operation of Safety Kleen Degreaser	Hand contact with solvent occurs while handling parts, using lowpressure solvent washing the parts, or immersion into liquid with some brushing or scrubbing. Splashing onto clothing and feet or face and eyes is not normally a problem.	Safety Kleen 140 Solvent	Sol-vex or Stansolv Nitrile Gloves Grab-it Gloves Safety Glasses If due to unusual circumstances of splashing out of degreaser, need to use: face shield, apron, other splash gear, and/or neoprene boots as needed to prevent significant and extended contact.

INDUSTRIAL HYGIENE RELATED PROGRAMS

Note: It is the responsibility of each contractor to determine their own program needs and requirements for OSHA compliance and the adequacy of their program. Different sites have certain expectations for contractors performing work onsite and different regulations will apply based upon the type of work being done.

Stand alone health related programs should be referenced in brief summary form in the IH program. Examples include hazard communication, noise, respirators, Methylene chloride, hexavalent chromium, blood borne pathogens, etc. More detailed examples are listed in the attached example IH Program Template. This will help identify them as part of the overall health protection process as well as specify where they may be found. If there is not a separate program for a specific health hazard it may be possible to cover it in the IH Program document if it is not too complex. The IH Program document helps pull all the individual pieces together.

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PROGRAM COMPONENT CHECKLIST

This check list should be used to ensure that the contractor has addressed and included all applicable elements in their Industrial Hygiene program. This list is not all inclusive but does provide guidance as to the information that host facilities may be looking for. Contractors should review their work scope and, using this check list, determine what programs and OSHA standards apply.

IH Program Components	Required (Yes/No)
Exposure Assessment Program	
Exposure Monitoring Plan	
Asbestos	
Benzene	
Bloodborne Pathogens	
Confined Space Entry	
Decontamination Procedures	
Hazard Communication	
Hearing Conservation	
Hexavalent Chromium	
Lead	
Methylene Chloride	
Noise	
Personal Protective Equipment	
Radiation	
Respiratory Protection	
Other:	
Other:	

REFERENCES/RESOURCES

If you have any questions about the information or requested programs in this guide please first contact the person in your company responsible for your safety and health program then the site IH contact.

- Exposure Assessment (AIHA Publication) see www.aiha.org
- **A Strategy for Assessing and Managing Occupational Exposures, Second Edition** Edited by John R. Mulhausen and Joseph Damiano (this is much more detailed than most contractors would need but it does give a good review of the topic for Safety and Health professionals)
- American Conference of Governmental Industrial Hygienists - TLV Booklet see www.acgih.org

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- NIOSH Recommended Exposure Levels (RELs)
- OSHA Regulations 1910 and 1926 - see www.osha.gov
- OSHA website www.osha.gov (excellent source of information)

Support Sources

State of Illinois Department of Commerce and Community Affairs Onsite Consultation Service (free service intended for small companies providing both safety and health assistance)

Illinois Onsite Consultation
Industrial Service Division
Department of Commerce & Community Affairs
State of Illinois Center, Suite 3-400
100 West Randolph Street
Chicago, Illinois 60601
(312) 814-2337 (312) 814-7238 FAX
E-mail: sfryzel@commerce.state.il.us Website: <http://www.illinoisosha.com>
OSHA Compliance Assistance personnel (www.osha.gov to locate nearest office)

Industrial Hygiene Consultants

The American Industrial Hygiene Association has a listing of IH consultants, see www.aiha.org, following are some from that list (check the AIHA listing for others and up dated info):

Chicago Area Consultants (listing only indicates that some sites or contractors have used them in the past or they were listed on the AIHA Consultants List)

Aires Consulting Group, 1550 Hubbard Avenue , Batavia , IL 60510, 630-879-3006
Boelter Associates, 1300 Higgins Road , Park Ridge , IL 60068, 847-692-4700
Bureau Veritas North America, Inc, 3140 Finley Rd., Downers Grove, IL 60515, 630-795-3200 (formerly Clayton Services & NATLSCO)
John Dimos CIH, 209 S. Oak Park Ave, # 301, Oak Park, IL 60302, 708-763-8874
HSE Solutions, Inc, CSP 2816 Kimwood Dr., Charleston, IL 61920, 217-345-2725
Hygieneering, 7575 Plaza Court, Willowbrook, IL 60521, 630-654-2550
MWH, 175 W. Jackson Blvd, Suite 1900, Chicago, IL 60604, 312-831-3000
The Raterman Group, Ltd. (C) 75 East Wacker Drive, Suite 500 Chicago, IL 60601, 312-345-01
Safe Technology, Inc. 728 W. Jackson Blvd, Suite 1212 Chicago, IL 60661, 312-382-0486
United Analytical, 1429 Centre Circle Drive Downers Grover, IL 60515, 630-691-8271

Example of an Exposure Assessment Summary, these can be used to document the basis for an assessment including work area conditions it applies to. Summaries like this can be used for safety meetings and hazard awareness training programs.

(example only companies must validate their own assessments)

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Refractory Mixing (silica containing) Exposure Evaluation

Mixing of refractory containing silica (30 to 60%) using a portable rotating drum mixer inside a partial field enclosure has been evaluated. The worker moves bags of refractory to the mixer, opens the bags with a knife, empties the bags into the mixer which is operating (water is already in it), places the empty bags onto a discard pile, monitors the mixing making water additions as needed, and when ready transfers it to the pump chamber or buckets depending on application method.

Significant full shift exposure potential was determined to exist from the bag dumping and initial mixing by the mixer paddles until the dry refractory has been wetted. Handling of the empty bags did not appear to be a significant exposure source as long as the worker did not try to fold the bags or squeeze air out to lay them flat.

Air sampling has shown exposure levels to respirable silica up to 30x the permissible exposure limit (PEL) for typical full day operations. Silica levels outside the mix enclosure were above the PEL immediately adjacent to it where visible dust was present, but was below 10x the PEL.

It is recommended the mixer wear a full face respirator with a P-100 filter (quantitative fit testing required) and also utilize work practices to minimize visible dust levels. Half mask dust respirators should be worn by the helper who briefly enters the enclosure and works in the immediate area around the enclosure. Engineering controls such as local exhaust or water fogging should also be investigated to determine if exposures could feasibly be reduced. Employees should be trained as per the HazCom and respirator standards to recognize the potential hazard, understand the risks from silica, and the proper work and PPE practices to use.

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**EXAMPLE OF A JOB POSITION RISK MATRIX AND A TASK QUALITATIVE
ASSESSMENT (from a computerized database system)**

Health - Exposure Risk Matrix						
Organization: > > Contractor XYZ > Field Worker > Host Site A						
Worker Group:		Specialty Worker Z				
Report Date:		1/22/2007				
Exposure Rating Category						
		>= RV	>=50 %	>=10%	>=1%	NIL
		A	B	C	D	E
Health Effect Rating	I				Benzene, Carbon Monoxide, Polynuclear Aromatics (NOS), Hydrogen Sulfide,	Asbestos, all forms, Lead, elemental and inorganic cmpds as Pb,
	II				1,3-Butadiene, Ammonia, Gasoline, Methylene Chloride, Phenol, Sulfur Dioxide, VM&P Naphtha,	n-Hexane, Silica, quartz - respirable, Vanadium Pentoxide, respirable dust or fume,
	III		Fibrous Glass	Total Hydrocarbons (NOS), Noise, continuous in dBA,	Acetone, Asphalt Fume, as benzene soluble aerosol, Diethanolamine, Methyl Ethyl Ketone, Oil Mist, mineral, Sodium Hydroxide, Toluene, Xylene (o-,m-,p-),	Kerosene and other Middle Distillate Fuels, total vapor/aerosol, Pentane, all isomers,
	IV				Naphthalene, Particulates NOC, inhalable fraction, Petroleum Coke, delayed coke as resp. dust, Propylene,	Aluminum Oxide, Butanes, Cobalt, elemental and inorganic cmpds as Co, Methane, Propane, Titanium Dioxide, Propylene,
Other Exposure Indicators Assess As Nil Exposure Potential: 2-Butoxyethanol, Acetylene, High Boiling Aromatic Oils, Molybdenum, Nickel Carbonyl as Ni, Nickel-elemental, Particulates NOC-respirable fraction						

Task Exposure Ratings									
Organization: > > Contractor XYZ > Field Worker > Host Site A									
WorkerGroup: Specialty Worker Z									
Assessment Complete: Yes									
Completion Date: 1/10/2007									
Task Name: Change VX filters					Duration: 60 (minutes)				
Exposure Indicator	Frequency	Task Duration Average		Full Shift TWA		Short Term			
		TDA	Basis	TWA	RV	ST	Basis	RV	Type
Benzene	Monthly	C	Personal Sampling Data	D	0.5 ppm TLV	C	Personal Sampling Data	2.5 ppm TLV	STEL
Total Hydrocarbons (NOS)	Monthly	C	Personal Sampling Data	D	100 ppm working	C	Personal Sampling Data	300 ppm working	Excursion Limit