January 3, 2004

Mr. Jonathan L. Snare  
Acting Assistant Secretary  
Occupational Safety and Health Administration  
United States Department of Labor  
200 Constitution Avenue, N.W.  
Washington, DC 20210 

Re: Docket No. H054A – Comments to Proposed Rule on Occupational Exposure to Hexavalent Chromium 

Dear Mr. Snare:

On behalf of the Steel Tank Institute and the Steel Plate Fabricators Association (STI/SPFA), we submit the following comments on the Occupational Safety and Health Administration’s (OSHA) Proposed Rule on Occupational Exposure to Hexavalent Chromium (Docket No. H054A).

The comments will serve as the outline for our presentation at the public hearings that will be held in Washington, DC, during February. Mr. Patrick O’Connor will represent STI/SPFA at those hearings.

STI/SPFA is an association of companies engaged in the high quality fabrication of ferrous and non-ferrous products that meet or exceed the standards established by the industry and government regulations. Our members perform welding in fabrication shops and on works sites; and will be directly impacted due to the exhaustive nature of the engineering controls and administrative measures mandated by both the general industry and construction standards.

We appreciate the limitations that were imposed on OSHA by the decision of the U.S. Court of Appeals for the Third Court which set deadlines of October 4, 2004 for publication of a proposed standard and January 18, 2006 for publication of a final standard. These deadlines, however, have limited OSHA’s ability to fully assess the impact of the proposal on industries where welding is an integral process, such as the steel fabrication industry.

Our industry will bear a substantial portion of the cost of compliance with the proposed standards. According to OSHA, welding accounts for 47 percent of the total costs of compliance with the new requirements in the proposal (69 FR 59414). STI/SPFA does not feel that the benefits from the proposed standard justify the $100 million+ compliance costs for welding.
The proposed OSHA standard for hexavalent chromium (CrVI), as it relates to welding, is neither supported nor justified by the site visits, the preliminary economic analysis or the preliminary risk assessment. The existing information and data relate to various forms of CrVI use and applications which are not particular to welding issues.

OSHA has not demonstrated sufficient evidence to indicate that welding presents a likelihood of the significant exposures that may, or may not, exist in other industries that use CrVI. STI/SPFA requests that OSHA exclude welding from the proposed standard until such time that studies can be done in our industry that clearly indicate the need for a standard.

The Steel Fabricating Industry

The steel fabricating industry will be competitively disadvantaged by adoption of this rule. Because of the significant costs of compliance in the initial years, jobs will be lost to China and Korea as the cost to industry to implement the new regulation will price U.S. fabricators out of the market.

Exposure levels to CrVI can be an issue in the following kinds of operations:

- Welding chromium-containing steel or over coatings that contain chromates
- Painting (if pigments in the paint contain chromates)
- Abrasive blasting existing tanks/vessels coated with paint that contains chromates
- Maintenance & repair of existing structures
- Torch cutting chromium-containing steel or tanks/vessels coated with paint that contains chromates
- Polishing or grinding chromium-containing steel or tanks/vessels coated with paint that contains chromates.

There are various other operations that may generate CrVI exposure but the above are most closely related to the operations performed by STI/SPFA members.

The extent of welding fume exposure depends upon the type of welding equipment, the type of welding electrode material, the welding procedure, the position in which they are welding, the material on which they are welding, the natural ventilation patterns within the building or structure, the general ventilation and/or local exhaust ventilation, the volume of the space they are working in and whether or not it is an enclosed space.

Any grinding, polishing, blasting or cutting releases more particulate into the air. Particulate sizes will be larger for these operations than for welding fumes. The majority of the particles generated from grinding are not respirable and therefore will not represent an increased exposure risk to the operator. However they will be detected by samplers and will skew the samples, increasing the likelihood that exposure levels will be greater than the PEL.

Different types of welding produce varying amounts of weld fumes. Based on the general experience of our members, GMAW welding on stainless (MIG), FCAW (flux core), and SMAW (shielded metal arc welding or stick) produced the greatest amount of fumes (and highest exposure levels). In the shop, GMAW (MIG), FCAW (flux core), SAW (submerged arc welding), and
GTAW (TIG) are commonly used in stainless steel welding applications. In the field, SAW is not often used, but stick welding is.

**Challenges Presented by the Proposed Rule**

- **Weld procedures** – Welding procedures and processes cannot be changed “overnight.” A significant amount of testing is required to ensure that procedures will provide the proper weld strength, size, etc. Customers mandate the weld procedures based upon their own requirements for the product.

- **Field operations** – It would be very difficult to change procedures in the field – substantial re-training would be required.

- **Alternative welding methods** – Automated welding machines may produce lower exposures since the breathing zone of the operators are further away from the plume than manual welding operations, however they are not practical for all welding operations. When volume is considered, there might not even be any lower exposure when using automated welding equipment. Similarly field operations employ FCAW, MIG, TIG and stick welding, whereas alternatives such as pulsing current MIG welding simply do not do the job properly. Fit up and set up is where problems will be encountered, and these may require the use of multiple types of welding on one job, such as very heavy stainless.

- **Substitution by use of alternative materials** – There is no substitute for chrome or stainless steel and welding is essential to steel fabrication. The proposed standard will also change the way repairs or maintenance of existing products is performed. Paint chip samples from the coating of existing vessels will have to be collected and analyzed for chromates to determine if the CrVI standard applies. This added cost does not appear to be included in OSHA’s cost estimates.

- **Increased ventilation** – It simply is not feasible to set up point of source ventilation (i.e., local exhaust ventilation) to cover every individual welding job. In some cases, too much ventilation can cause the welding process not to work properly (i.e., may remove the shielding gas from the weld potentially causing porosity in the weld).

- **Monitoring** – It is not feasible to monitor every practice on every job every time a new project is begun to determine an exposure level. Manufacturers in the shop and in field operations should be permitted to sample a worst case scenario, rather than every process. Every site and every process would need to be sampled in order to know what type of respirator is needed to protect the operator. This is simply not feasible. [Please note that the proposed construction standard allows flexibility in how the exposure assessment is performed; however, the general industry standard greatly limits the exposure assessment strategy, especially for a “job shop” environment. Also, OSHA’s estimates for initial and periodic exposure assessments for the construction industry seem extremely low and unrealistic.].

- **Allocated space per welder** – It is not possible to allocate an area for each welder. Many times, a welder’s helper is required and that can be a different person depending upon the job being performed. Depending upon the process being used, the material, the direction and the position
of the welding, it is sometimes necessary to make changes within the same job, so it would not be possible to segregate a welder and a specific area.

Compliance Costs

The large majority of the costs identified as necessary costs of compliance are the costs of engineering controls. To determine what engineering controls would be necessary, OSHA conducted site visits to the 30 of the industry sectors OSHA determined would be impacted by the proposal. The assumptions OSHA has made about the number and type of engineering controls that will be needed are, therefore, entirely dependent on how representative the site visit facility is of the industry.

A review of the site reports applicable to welding are not representative of either construction or job shop situations.

The single welding site shop visit (Site 9) was to a facility owned and operated by a large mechanical contracting firm. The facility included in the site survey fabricates stainless steel ductwork. This single site visit does not provide the data on which to base a regulation that applies to all facilities where welding takes place, particularly where custom fabrication takes place. OSHA needs a much broader sample of sites in order to understand the multitude of variables that can exist in steel fabrication before promulgating a PEL of 1 µg/m3.

There were three site visits that could be considered to be construction site visits.

- Site 13 was an evaluation of a shipbuilding operation where the work evaluated was the scrapping operation where retired ships are torch cut up for scrap retrieval. The ship plates being torch cut had been coated with CR VI bearing paint which had been blast removed to some extent. While this is closer to a construction application than the shop scenario in Site 9, it is not a welding operation.

- Site 16 was a shipbuilding operation but in this case it was the assembly of various components of the ship both carbon and stainless by welding. This is the closest application to true field construction.

- Site 20 is indeed a field construction site welding carbon steel with electrode with some chromium content. The narrative indicates that the sampled work was during a high productivity time which would seem to indicate a time when a lot of work was being completed which would indicate that exposures should be high as well.

Risk Assessment

The relationship of CrVI to lung cancer and other adverse health effects in welders has not been adequately identified and quantified. In its preliminary assessment of risk, OSHA has relied primarily on two epidemiologic cohort studies of chromate production workers to estimate the lung cancer risk to workers exposed to CrVI (Luippold and Gibb cohort studies). OSHA relies on these
two studies to make exposure assumptions and data extrapolations to equate to other types of
workers and industries.

OSHA notes that the risk estimates include confidence limits that reflect statistical uncertainty
(69FR59380), but they do not fully discount the data or provide a complete explanation on the
adequacy or the predictive value of the data. The studies do not effectively provide a lung cancer
relationship to welders. For example, the available studies cited in the proposed rule do not
adequately or fully account for other causes of lung cancer in welders such as prior asbestos
exposures or the synergistic effect of tobacco smoke including second-hand tobacco smoke.

In addition, OSHA agrees it does not have adequate information on non-cancer adverse health
effects in the preliminary quantitative risk assessment, and makes a preliminary determination that
suitable data are not available for making quantitative risk estimates for the non-cancer adverse
health effects associated with exposure to CrVI (68 FR 59308).” OSHA presents no significant data
to show that welding causes the non-cancer health effects mentioned in the risk assessment such as
nasal septum perforations and ulcerations, asthma, and dermatitis.

CrVI is a by-product of the chemical sequence during the welding process. OSHA has not presented
significant studies that describe the relationship between the exposure risks and the chemical
sequence. A clear understanding of how CrVI evolves in the welding process is needed.

There does not appear to be sufficient data to base a direct correlation between welding fumes and
lung cancer to create measurable cancer risk estimates, as OSHA has apparently done using the
linear relative risk model. STI/SPFA agrees with other commenters that the use of this dose-
response model to extrapolate results and make assumptions for lung cancer risks to welders is
totally inappropriate due to the differences in the chemistry of CrVI and the perceived versus actual
health effects.

Technological and Economic Feasibility

OSHA says in the preamble to the proposal, “PELs lower than 1 µg/m3 could not be achieved by
means of engineering controls and work practices alone for some types of welding (particularly
GMAW and SMAW) and in hard chromium plating. Based on this finding, OSHA has preliminarily
determined that a PEL of 1 µg/m3 is the lowest technologically feasible level.”

The data, in fact, is lacking and does not support OSHA contention that a PEL 1 µg/m3 is either
feasible technogically or economically.

We urge OSHA to consider the following:

- It is not proven that 1.0 is even feasible to obtain. OSHA has not examined all of the
variables. This is a performance standard and the agency is putting the burden on industry
to come up with engineering approaches to meet the standard, without even knowing if it is
possible or at what cost. [Please note the proposed construction is performance-based but
the general industry standard uses more of a specification approach, although the section on
methods of compliance includes performance-based language].
• Our industry has not sampled absolutely every process, so we do not know what the exposures are, nor do we know what will work in all situations. There are so many processes and environments that it would be nearly impossible to obtain a sample of every situation. There is simply insufficient data to accurately determine the impact of the proposed standard. However, the impact could be significant since limited welding fume sampling data for CrVI that was performed indicates that the proposed PEL will likely be exceeded in many situations.

• The preamble says the annualized cost of initial and periodic sampling for welding under the proposed standard for the construction industry standard is $107,472 and $0, respectively. These values seem unrealistic for the entire industry. Although OSHA does not specify initial and periodic exposure monitoring in the construction standard, a great deal of exposure monitoring would be needed based on the various variables involved in welding fume exposure to ensure the PEL is not exceeded.

• OSHA shows the incremental cost per entity for welding compliance with the general industry standard to be $4000 (69 FR 59416). This is extremely low – more indicative of a per welder cost. We are further studying the docket information to better understand how OSHA has arrived at this unrealistically low estimate.

• OSHA has underestimated the cost of engineering controls. For example, work pieces that are very large and/or of varying shapes preclude the common use of welding booths or flex hose local ventilation. If the testing showed action level exposures, weld fume exhaust guns might be the most practical solution to engineering out the exposure. Costs approximate $1500 per station for a gun and exhaust system and an annual expendable budget of $650 for filters and replacement gun parts. At a job shop with sixty welders, for example, this would translate into an initial expenditure of $90,000, and annual costs thereafter for depreciation, maintenance, and welder training. Loss of productivity due to weld defects caused by loss of shielding gas is another cost to be considered. The use of this extraction system could also require requalification of welding procedures as shield gas effectiveness is a key variable in our processes.

• Ventilation and respirators may be sufficient to control airborne particulate in some operations, but not enough data exists to determine what those numbers are or what type of ventilation and respirators are needed for every case.

• The proposed regulation would increase the cost of labor, overhead and equipment by a factor of 20 – 30% (these costs are typically 50% of the cost of the product). The increased costs would come from increased ventilation, additional training, additional equipment, increased setup time for the equipment, additional personal protective equipment, increased monitoring, additional staff members to handle all of these extra steps, and significantly increased paperwork. Productivity will go way down, and time to complete production will go up. Scheduling would take much longer. This significant time and cost increases will cause these jobs to go offshore to companies that do not have these additional time or cost constraints.
The proposed regulation would require sampling of all existing items before any maintenance or repair work can be done. [Please note that the construction standard allows flexibility in how exposures are assessed. That is, it allows for more professional judgment such as conducting worst-case sampling.] For repair work that comes through the shop, this may be the case as the proposed standard for general industry is very specific in monitoring exposures.

With respect to the proposed general industry standard and the “methods of compliance,” we urge that engineering controls be used where “feasible” and not preclude the use of respirators. On certain jobs, such as in tight enclosures, the ability to use respirators is needed.

The concept of a “regulated area” is not feasible with respect to job shop fabrication. Workers are assigned to tasks on a per job basis and routinely work on multiple types of jobs during the course of the year. The work is performed in shops that range in size from 15,000 square feet to 600,000 square feet of shop floor. In all shops, multiple jobs are ongoing at any one time. As custom fabrication orders are received, an employer may be required to reconfigure its entire facility layout.

Most small fabricators will not have the in-house personnel be needed to oversee the initial and periodic exposure monitoring requirements of the standard. As a result, the services of an outside consultant, such as an industrial hygienist, will be required. Although such professional services may be utilized today, the requirements of the proposal will significantly increase the need and cost for such services. The Preliminary Economic Assessment underestimates this burden on small fabricators.

Due to the fact that OSHA has not provided significant or sufficient data to show that CrVI, as a byproduct of welding, presents health effects that would justify the cost of the proposed standard, STI/SPFA requests that welding be excluded from the proposed standard until such time that significant data indicates the need for additional regulatory intervention. We are very willing and eager to work with OSHA to undertake the necessary studies to document the health effects from exposure to welding fumes in the steel fabrication industry.

If you have any questions or comments, please do not hesitate to contact me.

Sincerely,

Wayne Geyer
Executive Vice President