

# The Canadian Delegate Report

---

International Institute of Welding Commission  
VIII Health and Safety

**David Hisey**

This is a brief summary of the actions of IIW Commission VIII during the conference in Helsinki, Finland. Should additional information be required often the specific document which is published on the IIW web site can be made available.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**Monday, June 29<sup>th</sup> 2015: 14:00-18:00**

**Session I: General Matters / Administrative matters**

1. The acting chair PD Dr. Wolfgang Zchiesche Wolfgang welcomed everyone, various individuals were recognized.
2. The latest agenda was reviewed and approved for the meeting, there had been several last minute changes.
3. Self-introductions completed the introductory session.
4. Current State of Members of Commission VIII / Invitation procedure
5. The list of members not attending was reviewed and regrets were noted. Some discussion continued over the invitation by China to have a longer than normal session during the Shanghai conference or to have the next intermediate meeting in Shanghai. It was decided that we would have a longer than normal annual session during the 2017 Shanghai conference.
6. Approval of the minutes of the meeting in Mogliano de Veneto, March 2015 (Doc VIII-2197-15): Steve Hedrick, Wolfgang Zschiesche

**7. National Reports:**

**Canada** - Female Welder Reproductive Health Study was reported on.

Regrettably, Dr. Weckman of the University of Waterloo has informed me that she has had to put the hot work study on hold, she will inform us of any change in status. Canada had another welding related fatality – death through electrocution from electric shock from the welding electrode on June 25, 2014. It was a quarry crusher accident, while the welder was alone doing repair welding. He was found dead at the scene, and I am told that the contact point was his neck with his body prone on the steel crusher base. This year Canada formed a new national committee to provide Canadian perspective to the IEC TC26 Transformer Welder committee. The CSC IEC TC26 committee has both Canadian and American representation. This year was the first gathering of Canada's welding educators since the launch of Acorn – Canada's first comprehensive welding education program. We now have support from the various education bodies across Canada and believe that within a few years the Acorn program will be adapted by most of

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

our educational institutions. With the assistance of our CWA Foundation charity, all high schools in Canada will be provided with free online welding instruction materials. We believe that we need to engage our students in the primary and secondary schools before they get into college and apprenticeship trades.

**USA** – OSHA has identified crystal and silica as substances which they are continuing to monitor.

**Finland** – The “drive to zero” direction for OEL’s is continuing in Finland. All welding fume elements are gradually being lowered.

**France** – has implemented a National Action Plan for welding fume, there is some concern over aluminum twig welding. The welders have voiced concerns that they only want to weld using solid wire due to health concerns. There was a terrorist activity where the terrorist tried to get a welding gas cylinder to explode.

**China** – attended but did not give a report

**Japan** – The actual protection supplied by welders half masks has been unclear, some have doubted the effectiveness of them. Testing was conducted on 12 welders at the Iron Bridge Company, they performed under the mask measurements, which proved that 50% of the masks exceeded 10% leakage. Their study showed that conventional high quality half mask is not suitable for welding. PAR is recommended.

**Korea** – They have introduced increased control over radioactive sources, what was an annual testing and check must now be done on a daily basis. This is causing some concern to the NTD personnel with their management of sources.

**Netherlands** – They have had a continuous annual 3% improvement in the average reduction in welding fume inhalation since 1983. Their emphasis is on education not enforcement.

**Germany** – There are 2 studies being done on welding through zinc coatings as there appears to be an increase in metal fume fever disease. They are examining flux coatings for health related hazards. It has been suggested that there is a tie between cardiovascular condition and welding i.e. heart attack and stroke, they are looking for a connection, a possible cause could be from inflammation. Carbon fiber is being looked at for a connection to mesothelioma, the fiber has some similarities to asbestos.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**Sweden** – Their welding health and safety website has been funded by the labor unions and insurance industry, with the understanding that increased education would lower insurance costs. It has been very useful. The site is maintained by the Swedish Welding Commission. Manganese is being looked at by 2 different programs, see the study by Stockholm University later in the program. A program on vaccination of welders to prevent pneumococcal pneumonia has been started, it is a voluntary program but the costs are borne by the health program.

**Hungary** – they have a national safety regulation, they must supply training. It was not enforced, but now they are enforcing training standards.

**United Kingdom** – There is movement occurring which is intended to train young welders <http://www.badairday.info/about.asp> is the website – the purpose is to teach young people how to reduce respiratory ill health due to inhalation of hazardous fumes from welding and thermal cutting applications. A directive is coming out on EMF exposure within this year.

**Russia** – attended but did not give a report.

**Session II: Technical Papers**

8. **Reduction of Fume Emission of Flux Cored Wires: Update of a research project**  
(Doc VIII-2199-15; for information see also: VIII-2177-14): Kevin Hoefer

This was a report but on by a young professional and he was given a few pointers by the attendees as he did not adequately support his conclusions.

9. **Lung cancer in welders** – request from Mr. Smallbone of Australia: short communication  
(Doc VIII-2200-15): W. Zschiesche

There was a workers compensation case in Australia where the worker was granted a cash settlement due to the lung cancer he was diagnosed with. This had been reviewed by Commission VIII at the intermediate meeting in Italy. The commission had responded with a letter to the effect that it would be unwise to comment on the issue as these types of cases and decisions vary according to the country and jurisdiction under which they occur.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

10. **Thermite Welding** – needs for protective measures – request from David Hisey: short communication (Doc VIII-2201-15), further information on critical situations:  
David Hisey, John Petkovsek, Wolfgang Zschiesche

This was a case brought to the intermediate meeting for recommendation. A response was sent out, but then additional information was sent to Dr. Zschiesche, so he requested that a presentation be made. The situation was thermite welding in northern Ontario Canada, which had caused headaches in the workers. The situation was described and actual pictures from the work site were shown. A YouTube video was shown which the respondent had claimed represented the situation she was dealing with. The suggestions made by the Commission was to have the workers tested for the presence of fume during the thermite welding process, this should be done on the workers most exposed. Most thought it was doubtful that excessive fume would be measured due to the openness of the work area.

**Session III: Fume Exposure, Biological Monitoring, Occupational Limit Values and Regulation**

This next session was a collection of short summary presentations to show what direction current philosophy is headed.

11. Fume exposure: development of occupational exposure limits over time;  
fume exposures, biological monitoring:

David Jordan, Tom Johnsson

- 11.1 **Demand of harmonized occupational limit values** – Review on current values  
(Doc VIII-2202-15): David Jordan

Current OEL's for several jurisdictions were reviewed and the end result is that there is no harmony within these values. The only common ground is that all are being reduced although not in the same time period. Of course it was recommended that all jurisdictions world-wide should be the same, then compliance and problem resolution would be simpler. The facts are that all jurisdictions do not have the same concerns and/or political pressures, so the situation we have will not likely change.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**11.2: Occupational exposure limits: Recent trends in Finland:** Tom Johnsson

Testing in Finland has determined that it takes both local exhaust as well as PAR protection for welders to be meeting current OEL's. Using pre-determined charts and half-mask breathing protection you are unlikely to meet current regulations unless proper care and fit are closely monitored.

**11.3: Fume exposures of welders in the past and now – examples from German studies**

(Docs VIII-2203-15; VIII-2204-15; VIII-2190-15; VIII-2205-15; VIII-2206-15):

Wolfgang Zschiesche

This presentation demonstrated that over the years we have seen a steady decline in acceptable exposure limits and it is expected that this trend will continue.

**11.4: Biological Monitoring of Metals in Welders:** Findings in Germany

(Docs VIII-2203-15; VIII-2204-15; VIII-2205-15; VIII-2206-15): Wolfgang Zschiesche

With the dramatic reduction in OEL's over the years, it is becoming increasingly difficult to measure that we are meeting these limits. Biological monitoring to monitor any increase in body toxins compared with the normal population, is one way to understand the effectiveness of engineering controls, local exhaust ventilation and PPE to the welder's health.

**11.5: Biological Monitoring of Metals in Female Welders in Alberta (Doc VIII-2207-15):**

Nicola Cherry

As a part of the study that Dr. Cherry has been doing on the reproductive health of female welders, through biological monitoring, she has been able to determine that Cr VI and Manganese are higher in female welders than the general population.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

12. **How do welding shops meet the requirement of low exposure limits** – Facts, Approaches, Results, Tasks for the future: Round Table Discussion: David Jordan, all

David felt that the IIW lacked sufficient fabricators as members, and that if this segment of the welding population was represented we might have a better chance of proper decision making on the protection of welders.

Most shops use the specified ventilation and PPE method of protection.

Welder education in correct use of all levels of protection i.e. proper placement of local exhaust, proper positioning of the welder to the work to minimize exposure, proper use and care of PPE.

Holland has steadily reduced their exposure levels by 3% each year since 1983 through education and monitoring.

**Tuesday, 30<sup>th</sup> of June 2015: 14:00-18:00**

**Session IV: Technical Papers –Research Work**

13. **Speciation of manganese in welding fume and welders' blood:**

Goeran Lidén

In this study by the University of Stockholm they did a comparison between the respirable dust measured in the welders breathing zone and compared the readings with blood samples, blood was broken down into its various components and again the values found in the various blood products were compared. They were trying to understand how manganese could be transported past the Blood Brain Barrier (BBB) and into the brain. While the study appeared to be very thorough, the results were inconclusive. More testing will continue next year. 75 welders were used in this study and they were working in their normal work environment.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**14. Hazardous Substances in Welding Processes (Doc VIII-2188r2-14, VIII-2188r3-15):**

Vilia Spiegel-Ciobanu, Luca Costa

Luca Costa made the presentation on this booklet and is the lead on this project. This book on hazardous substances in welding deals with the chemicals and fumes found in the welding industry. It is a very comprehensive document written in simplified language with an effort to refrain from using references within the document which date or define a locale. This document is something which should be posted within the CSA COI.

It was decided that we needed to refrain from using references within the document which date or define a locale as this booklet is intended for world-wide use, so existing references shown within this document will be removed during the next rendition. More work is needed.

**15. Multilingual Booklet on Safety in Welding (Docs VIII-2141\_Annex-15; VIII-2141r-14;**

**VIII-2141r2-15): Luca Costa, John Petkovsek, Steve Hedrick, Geoff Melton, David Werba**

This booklet needs to be reviewed by the CSA W117.2 TC for input. The intent of this book is to provide a universal book on welding safety to the world with emphasis on the 3<sup>rd</sup> world countries.

**Session V: Administrative Matters**

**16. Information from IIW CEO / TMB: Cecile Mayer, Luca Costa**

Changes are occurring to the IIW website: they have 15,000 records of papers and data currently on line. Records from 1980 – 2000 are in the process of being scanned in. This will be an additional 3000 documents. A new brochure is available on line which describes the workings of the IIW.

Facebook and Twitter accounts have been opened to provide information and access to the Young Professional program.



**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**17. Election of a chairman:** Mireille Aubert, Cecile Mayer







An election was held with Dr Wolfgang Zschiesche and Geoff Melton as candidates. Only member country delegates were allowed to vote. The vote was 7 to 2 in favor of Wolfgang Zschiesche with 9 countries voting.

**18. Information from WIW Board/John Lippold**

**19. IIW Awards: Which are relevant to Commission VIII**

19.1: The new IIW Fellow Award: Philosophy and background; Candidates from Commission VIII  
The awards which are possible to be and the process to nominate a person was reviewed.

**20. List of Best Practice Documents: implementation of newly finished documents, publications and Technical Reports – Below is the current list which is on line, a list of documents to be added was reviewed. The intent of Commission VIII is that these documents are available and downloadable to the general public.**





	Contact lens use in industry.	VIII-1298-85;IIW-831-85		1985
	On the question of drinking of milk by welders as a health protection measure.	VIII-1588-91;IIW-1124-91	ZSCHIESCHE W.	1991
	Personal ultraviolet radiation exposure of workers in a welding environment.	VIII-1817-97	TENKATE T.	1997
	Statement on welding and cutting on containers.	VIII-1823-97;IIW-1374-97		1997
	Welding adds hazards to work in confined spaces.	VIII-1856-98;IIW-1416-98		1998
	Health hazards from exposure to electromagnetic fields in welding.	VIII-1858-98;IIW-1415-98		1998

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

	IIW Statement on Manganese: Chromium and manganese in welding - Exposure and the need of control measures.	VIII-2029-06	GAVELIN F.	2007
	Health and safety in fabrication and repair of welded components: aspects, impacts and compliance to regulations.	VIII-2078-08;IIW-1986-09	COSTA Luca	2008
	Lung cancer and arc welding of steels	IIW-2223	IIW Commission VIII	2011
	List of standards relevant to health, safety and environment.	VIII-2079r3-11	COSTA Luca;LUNDIN Mathias	2011

**21. Future Work of Commission VIII – Working plan:** Chairman, Luca Costa

### **C-VIII Operational Plan**

The activities are mainly devoted to the study of phenomena occurring during welding which may affect the health and safety of welders and the environment, and to the development of technical guidance for the correct management of the fabrication process. To reach this ambitious goal, members come from a wide range of expertise, including medicine, epidemiology, chemistry, welding science and technology; consequently the commission also acts as an international forum for exchange of high level knowledge with the support of members coming from all the areas of the world, including Europe, Americas, Africa, Asia and Australia.

The Commission activities include production of best practices and IIW statements on specific matters, as well as review of international research and national regulations on the specific matter and standardization.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**Work items and topic leaders**

<b>WORK ITEM</b>	<b>TOPIC LEADER</b>
Exposure to nitrogen oxides	V. Spiegel Ciobanu
OHS and Environmental management systems	L. Costa
H&S assessment of welding fabrication	N. Koenig-Moureau
Lung Cancer and other lung dysfunctions	W. Zschiesche
Welding fumes in arc welding	N. Floros
Exposure limits	D. Jordan
Welding electrical hazard	D. Hisey
Welding ergonomics	W. Zschiesche
EMF	G. Melton
Education and training on Health, safety and environment	L. Costa

**22. Hot topics for the future: IIW Commission VIII 2015**

**Hot Topics at present and for the future**

- EMF –including impact on active implants
- Electric Shock
- Underwater welding and cutting
- Manganese
- Welding and cutting of plastics including carbon fiber reinforced materials (Contact with commission XVI and with Commission on Laser)

**23. Next Intermediate Meeting:** will be held in Bochum, Germany - March 9 & 10, 2016 - Dusseldorf is closest port of entry

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**24. Upcoming Annual Assemblies**

Melbourne, Australia, July 10-15. 2016

Shanghai, China, June 25 – 30, 2017

Istanbul, Turkey, July 2018

Bratislava, Slovakia, 2019

**Wednesday, 01<sup>st</sup> of July 2015: 14:00-16:00**

**Session VI: Technical Papers**

**25. Intelligent robots behaving like welders:** Granjon Award Cat. D 2015 (Doc VIII-2208-15):

Yukang Liu, John Petkovsek

This paper discusses a concept of monitoring a welder with various sensors and video so that these habits can be mimicked by a robotic welder. This concept is not unlike the current method of developing video game animation. So far the conclusion is that there is a great deal more work to do as the welder person does a lot of things simultaneously which at the moment cannot be duplicated by a robot.

**26. Pneumococcal Infection of Welders:** Results of an ongoing study: Geoff Melton, Reetika Suri

Barts and the London School of Medicine and Dentistry, Blizard Institute

**Purpose:** to look at the epidemiology association between exposure to welding fume and pneumococcal infection. Welders have a 2/1 risk of contracting pneumococcal infection over the normal population. This study was done using mice and showed that welding fume increased the likelihood of mice developing Pneumococcal Infection. Various types of welding fume was used. The PAFR blocker 3988 was used to block the effect of welding fume. Interesting but not conclusive. There are more studies planned. The paper is currently in publication.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**27. Welding Fumes Main Compounds and Structure (Doc VIII-2156R3-15): Nicolas Floros**

The scope: To review the main components formed in welding. Welding fume Fluorides, Welding fume oxides, iron, nickel, chromium Cr3 and Cr6, manganese is usually between 3 and 15%, Titanium, aluminum, silicon

Conclusion: Welding fumes exhibit a large diversity of constituents and chemical elements.

**Wednesday, 01<sup>st</sup> of July 2015: 16:15-18:00**

**Session VII: Joint Meeting with Commission II (Chairman: Gerhard Posch)**

Opening remarks: Gerhard welcomed both Commissions to the joint meeting, which has become an annual event.

**Safety and health issues related to filler metals and arc welding processes**

**28. Women Welders: Work, Health and Pregnancy (for information see Doc VIII-2209-15):**

Nicola Cherry

In Alberta in 1990, the amount of female welders were less than 1% of the total, in 2015 women make up 7 % of total welders within Alberta. One of the purposes of this study is to look at the differences in men and women in the workplace and understand what health effects the differences create, as men and women have definite differences. The body has unique methods of protecting the fetus, and the fetus is very well protected from workplace issues. We currently have 2 studies in place, one for women welders with women electricians as the control cohort, this study is called WhatME. The one for male welders and the male electrician cohort is called WhatMEN. The male study was started at the request of the Alberta government so that they could see if there were differences between men and women in the workplace. The female study is a national study, the one for men is strictly within Alberta. There are some differences showing up within the 2 co-horts, the study is ongoing, currently Dr Cherry has 235 pregnancies within her study group. The permissions given by the study members are lifetime permissions and the data will be able to be collected from the health care system for their lifetimes.

**INTERNATIONAL INSTITUTE OF WELDING  
COMMISSION VIII HEALTH AND SAFETY**

**ANNUAL ASSEMBLY MEETING 29 June – 01 July 2015**

**Crowne Plaza Hotel Mannerheimintie 50,**

**Helsinki, Finland**

**29. Occupational exposure limits – measures to meet the requirements:**

Introduction: **Decreasing occupational limit values worldwide – what can welding shops do?**

David Jordan, Wolfgang Zschiesche

Worth noting here is that France has lowered hexavalent Chromium to 0.001 mg/m<sup>3</sup> the real question is how do you achieve it and how do you measure that you have achieved it. This is why it is critical to know the relationship between what the worker is inhaling and what shows up in biological testing for that worker.

**30. Appropriate Ventilation and Fume Extraction in Welding Shops: Ilpo Kulmala**

This presentation was put on by the Finish Institute of Health. It was a very good demonstration on the requirements of a good ventilation system to maintain a healthy workplace environment in the welding shop. Because of the cold environment, they recommend use of a heat exchanger system, which they claim recovers approximately 80% of heat loss. They do not use a recirculation system as it was felt the maintenance cost is too high, although they did clean up the air before putting it through the exchanger system they use.

**31. Personal Protective Equipment in Welding: Selection and Use: Heli Koskinen**

This presentation was put on by the Finish Institute of Health. The Finnish program is based on the use of qualified occupational health care workers to guide the workplace through the proper use of the various personal protective items which are required to adequately protect the welder or fitter. They use a Risk Management solution sheet so that every worker receives the information which they need. They suggest “House Rules” be posted where PPE is used, so that everyone knows what is required for each task. Warehouse personnel who dispense PPE should be trained in the correct use and fit of all PPE they dispense. Mirrors should be provided in those locations so that the wearer can see that his/her PPE is properly fitting.