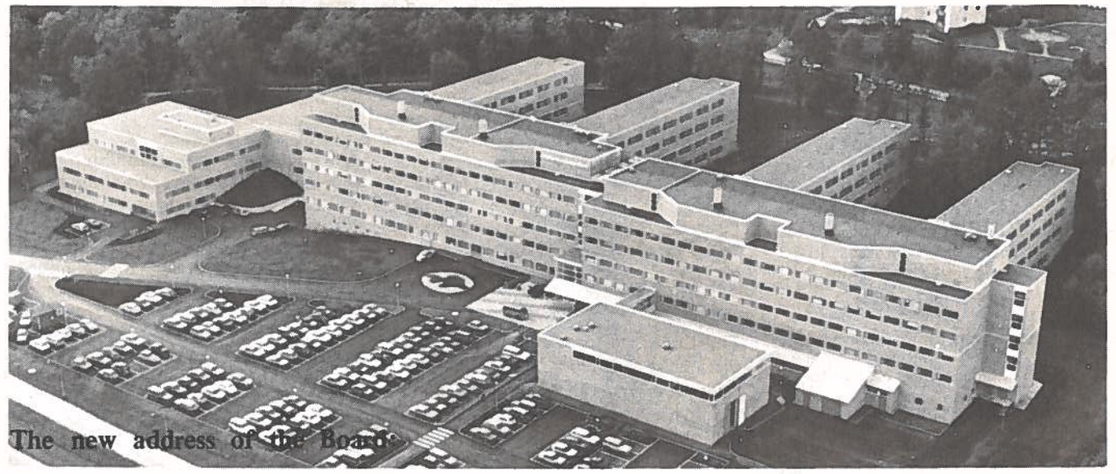
NEWSLETTER

National Board of Occupational Safety and Health · Arbetarskyddsstyrelsen · Sweden
Mailing address: Fack, S-100 26 Stockholm Telephone: 46-8-54 02 60 Publisher: Gunilla Warnbeck

No. 3 October 1979



The new address of the Board

National Board of Occupational Safety and Health, Arbetarskyddsstyrelsen
S-171 84 SOLNA SWEDEN

Telephone: 46-8-730 90 00

The Board's budget proposals for the fiscal year 1980-81

The allocations granted to the National Board of Occupational Safety and Health and the Labour Inspectorate for the fiscal year 1979/80 amounted to Skr 203 million.

In the budget proposals for the fiscal year 1980/81 the Board demands an increase of Skr 50 million and 129 new posts, i.e. a total budget of Skr 253 million (US $59.9 million).

Of the requested budget increase of Skr 50 million a sum of Skr 29 million is intended for the Board and the remaining 21 for the Labour Inspectorate. Of the 129 new posts requested 71 are meant for the Board and 58 for the Labour Inspectorate.

Single copies of the publications of the Board mentioned in this Newsletter are submitted free of charge to foreign addresses on request. See order form.

ISSN 0348-7598

Ordinances issued by the Board

PIPING CODE (ADDENDUM)

The Board has issued **Ordinance No 1979: 2** concerning **Amendments to the Board's Notice 1978: 37 on the implementation of the Piping Code.**

The amendments concern i.a. marking of pipes and transitional rules.

INSPECTION OF POWER POLES DAMAGED BY ROT

The Board has issued **Ordinance No 1979: 3** concerning **Inspection of power poles damaged by rot.**

The Ordinance concerns i.a. marking of dangerous poles, and transitional rules.

STAY BOLTS

The Board has issued **Ordinance No 1979:4** concerning **Stay bolts in certain steam boilers and hot and warm water boilers.** The following is a translation of the Ordinance except the appendix.

Purview

Section 1
These regulations apply to steam boilers, hot and warm water boilers of the return tube type, having a reverse chamber, braced with welded bolts which lack telltale holes, the length/diameter ratio of the bolts being five or less.

Drilling of telltale holes

Section 2
Telltale holes are to be drilled in the ends of all stay bolts of boilers of the kinds referred to in Section 1. These holes are to be drilled in such a way that failures in the stay bolts or their welds will be apparent in the course of examination and testing as provided in Section 3. The holes are to be drilled before any such examination and testing is carried out.

Internal and external examination. Hydraulic pressure testing

Section 3
In addition to such inspection as is otherwise provided for, boilers of the kinds referred to in Section 1 are to be subjected to special internal and external examination and to hydraulic pressure testing. Examination and testing of this kind shall include all stay bolts.

Section 4
Boilers of the kinds referred to in Section 1 must not be used unless

they have passed examination and testing as per Section 3.

Section 5
Examination and testing as per Section 3 shall be conducted by a National Testing Agency. It shall then be for the Agency to decide whether or not to pass a boiler which it has examined and tested.

Note
The National Testing Agency for boilers, among other articles, is the Swedish Plant Inspectorate.

Section 6
Appeals against decisions made by the National Testing Agency pursuant to this Ordinance shall be lodged with the Board by administrative process. Appeals of this kind shall be subject to the provisions of Sections 11-13 of the Administrative Procedure Act. (SFS 1971: 290).

Entry into force. Interim provisions

This Ordinance shall enter into force on 1 st October 1979.

Examination and testing pursuant to Section 3 shall be conducted not later than 30th September 1980. Between 1st October 1979 and 30th September 1980 inclusive, boilers which have not been examined and tested as provided in Section 3 may be used, the prohibition in Section 4 notwithstanding.

Commentary on the Ordinance concerning stay bolts in certain steam boilers and hot and warm water boilers

Inspections and breakdowns have revealed stay bolt or stay bolt weld failures in return tube boilers with braced reverse chambers and particularly rigid stay bolts. There is a clear connection between the frequency of failures and the conditions in which boilers are operated. Rapid and extreme fluctuations of temperature are conducive to fatigue and shorten the service lives of boilers.

The failure of a sufficient number of stay bolts can cause a boiler to burst, resulting in considerable damage.

If telltale holes are drilled in the stay bolts, this will make it possible to determine in the course of examination and testing whether stay bolts or their welds have failed, since a failure of this kind will cause water to leak from the boiler via the holes.

Boilers of the kinds referred to in Section 1 include, for example, Tubox boilers, with the exception of the Tubox Td-S type with serial numbers from 2399 upwards and the Tubox HV type with serial numbers from 2626 upwards.

The telltale holes referred to in Section 2 are illustrated in the appendix to this Ordinance and in Hot Water Code I published by the Pressure Vessel Commission. Each stay bolt is drilled at both ends.

BLASTING OPERATIONS (ADDENDUM)

The Board has issued **Ordinance No 1979: 5** concerning **Amendments to the Board's Directions No 3, Blasting operations,** The amendments enter into force on 1st January, 1980.

New issues of "Arbete och Hälsa"

The Board's scientific series "Arbete och hälsa" contain results of the research carried out within the Board's Occupational Health Department. As a rule the issues *appear in Swedish with a summary in English.*

Summaries contained in the latest issues follow below.

ARBETE OCH HÄLSA 1979: 21

Ingvar Lundberg, Bengt Sjögren, Ulf Hallne, Lars Hedström and Margareta Holgersson:
Work environment problems in welding. 8. Work environment factors and cadmium uptake in brazing with cadmium-containing hard-solders.

In Sweden in 1974 about 600 persons were occupied more than 10% of their working day brazing with cadmium-containing hard-solders. The number of brazers has probably decreased some-what since then. This study is concerned with the uptake of cadmium to the blood of 102 brazers working at least 10% of their working day with the above mentioned solders.

The importance of simple observable personal or environmental factors on the blood-level of cadmium was studied with discriminant analysis. For this analysis the brazers were divided into two groups, with blood-levels below and equal to or above 1.0 microgram/100 ml whole blood (89nmol/1) respectively. 31 brazers belonged to the latter group. The blood concentrations varied between less than 0.1 and 11.3 microgram/100 ml. The extension of the splice seemed to be the almost solely determining factor for the blood-level.

All brazers working with splices of less than two cm's extension had blood concentrations below, while 87% of the brazers working with splices of more than 10 cm's extension had blood concentrations equal to or above 1,0 microgram/100 ml. Other factors like age, gender, exposure time, smoking habits and brazing method were devoid of any measurable importance.

The relationship between total dust and cadmium concentrations in the breathing zone of 21 brazers was found to be moderate. We infer that total dust levels cannot be used as an index of cadmium exposure for brazers.

A moderate linear relationship was found between the cadmium air— and blood-levels of 21 brazers exposed for more than three months. When data were fitted to a mathematical model accounting for the elimination from blood the relationship was considerably strengthened. For the 17 brazers exposed for more than six months a relatively strong linear relationship between air- and blood-levels was established.

ARBETE OCH HÄLSA 1979:22

Åke Swensson:
Experimental evaluation of the fibrogenetic effect of an amorphous silica.
This issue does not contain any English summary.

ARBETE OCH HÄLSA 1979: 23

Jan-Erik Hansson and Bengt-Olov Wikström:
Comparison of some technical methods for evaluation of whole-body vibration.

The aim of the investigation was to compare technical measurements of vibrations transmitted through the driver's seat to operators of off-road forestry machines, with the driver's subjective evaluation of discomfort from vibration in different driving situations. The subjective evaluation was performed using a rating scale. Technical measurements and analyses were performed in accordance with ISO-standard 2631 and certain amendments currently under consideration. A total of 13 different vibration analysis methods were considered.

The investigation consisted of 7 studies. The machines were driven on 5 test tracks, each consisting of 6 to 10 shorter intervals representing easy to moderately difficult terrain conditions. A single machine was used on each test track. Vibration on the driver's seat was measured in 3 directions, vertical, front to back and lateral. The subjects consisted of 42 male experienced forestry machine operators.

Subjective ratings correlated better with technical evaluations based in the two most dominant vibration directions or all three directions than with only the critical direction according to ISO 2631.

Calculations based on vibration energy in the entire frequency range 1 — 80 Hz gave better correlation than calculations based on energy in the critical frequency band according to ISO 2631.

The weighted sum of vector method gave the best correlation with subjective ratings. The correlation coefficients of this method was clearly higher than with the method recommended in ISO 2631, i.e. 1/3-octave-band critical direction and frequency.

The correlation was not improved when energy from the frequency range 0,5 — 1 Hz was taken into consideration.

Crest factors for different tests varied between 3 and 7. Crest factors had no effect on the relation between subjective ratings and technical evaluation methods.

The investigation demonstrates that it is possible to use a simple measurement, i.e. a ride-meter, for evaluating the vibration load on forestry vehicle drivers. We suggest that evaluation of the vibration load shall be primarily based on the weighted sum of vector analysis 1 — 80 Hz using the two most dominant vibration directions relative to ISO 2631.

ARBETE OCH HÄLSA 1979: 24

Inorganic lead. Nordic Expert Group:

The document contains a review and an evaluation of selected literature on inorganic lead to be used as background for discussions of maximum permissible levels. This discussion ought to be based on the amount of erythrocyte protoporphyrin, the urinary excretion of aminolevulinic acid and coproporphyrin the peripheral nerve conduction velocity and effects on the central nervous system.

ARBETE OCH HÄLSA 1979: 25

Tetrachloroethylene. Nordic Expert Group:

Survey of literature on tetrachloroethylene to be used as background for discussion of TLV. CNS-effects and eventual cancerogenicity are recommended to be used in this discussion.

ARBETE OCH HÄLSA 1979: 26

Bertil Magnusson, Sigfrid Fregert and Jan Wahlberg:
Determination of allergenic properties of chemicals in respect of skin allergy. Predictive guinea pig testing of sensitization capacity of substances.

It is possible to make reliable allergenic tests of chemical substances on guinea pigs. The Guinea Pig Maximization (GPM) test (the Magnusson-Kligman test) is the recommended standard method in Sweden.

The GPM test is used to determine the sensitization capacity of the substances under conditions of maximum exposure, i.e. its potential for inducing contact allergy. The extent to which an allergen causes contact dermatitis in exposed persons depends on the mode of use and on various environmental factors.

It is not possible with the GPM test to determine the concentration of a contact allergen that may be regarded as safe from the point of view of sensitization.

For an allergenic test at least 15 guinea pigs and as many control animals should be used.

If the test results is entirely negative or if only 1 animal out of 15 or 2 out of 20 have become sensitized, the experiment should be repeated with at least 15 animals. If the same result is obtained, the substances may be considered as being slightly allergenic and may until further notice be used without restriction.

ARBETE OCH HÄLSA 1979:27

Erik Lindberg:
Exposure to saw-fumes. Correlation between exposure and irritation as well as between exposure and certain lung-function variables.

Although new saw-mills are usually built as modern closed industrial plants, ventilation-problems often occur. When resinous pine timber is sawn, fumes are produced which are mostly terpenes with their characteristic odour of turpentine. If, however, the timber has been stored in water for a long time, another pungent smell is added, which was suspected to cause irritation of the respiratory passages in exposed workers.

In a group of workers sawing water stored wood and exposed to 50-200 mg of mixed terpenes per cubic metre of air, there was a higher frequency of chronic bronchitis than in a group exposed to less than 25 mg per cubic metre, and those with symptoms also had lower spirometer values.

However, in a group of workers, exposed to the 50-200 mg level of terpenes from pine stored on land we found only a few respiratory complaints. Surprisingly, in this group we found spirometry values as low as in the group exposed to fumes from water-stored timber. We believe that there is a positive correlation between exposure to saw-fumes - from land- as well as from water-stored pine - and reduced lung-function.

The subjective symptoms of irritation in the throat and airpassages, however, seem mostly to be due to compounds, formed in water-stored timber that vaporize on sawing.

If the mean exposure value is less than 100 mg/m^3 there are no complaints of symptoms other than throat irritation and cough. At 100-200 mg/m^3 there are also complaints of headache, tiredness and nausea.

The situation would be even graver in a less selected population of saw mill workers, since in the Swedish lumber industry, workers sensitive to saw-fumes are often transferred to other departments by the local industrial health service or at time of employment so that the workers studied here were probably a selected fume-tolerant population.

The results indicate that in general storing timber on land instead of in water could reduce the subjective symptoms of saw mill workers. But there would probably be no influence on the decrease in respiratory function.

ARBETE OCH HÄLSA 1979:28

Bengt Sjögren, Jan Persson, Ester Randma and Åke Swensson:
Welding problems connected with work environment.
Part 9. A cross-sectional study of track welders at the Swedish State Railways.

About 200 persons are occupied welding tracks at the Swedish State Railways. This is a cross-sectional study of 149 track welders. 70 out-door working controls were selected from the same company. All participants were males.

We did not find any significant differences between the groups concerning complaints of back pain, childlessness or experience of stress. It was not possible to relate complaints as arc-eye and metal-fume fever to any particular exposure levels. Chronic bronchitis was somewhat more common in the welding group (7/149) than among the controls (1/70), however the difference not being statistical significant. The frequency of eye, nose and airway

complaints during work was higher among the welders. There was no difference between the groups as regards blood pressure or proteinuria. X-ray of the lungs revealed no abnormalities indicating pneumoconiosis. Spirometric measurements with a Vitalograph showed differences which were related to tobacco smoke but not to welding fume exposure. The electrodes being used were basic or zirconium-basic. As these electrodes contain fluoride the urine concentration of fluoride was higher among welders compared to controls at the end of the working day. The urine fluoride concentration was correlated to the air-particle exposure. Almost all welders had urine fluoride concentrations below 4 microg/ml.

Finally, binding studies with different catalytically relevant ligands, gave further support to the kinetic model as the complexities could not be explained by cooperative effects of the two subunits of the enzyme.

This investigation throws light on the mechanism of action of glutathione S-transferase A, a detoxification enzyme important for the biodegradation of many industrial xenobiotics. A kinetic mechanism supported from so much independent information as in the present study has never been presented before for any of the glutathione S-transferases.

212 references are cited.

Lars Hedström:
Part 10. A cohort study of track welders at the Swedish State Railways concerning tumours and mortality.

The incidence of tumours and mortality, by all causes, have been studied among all track welders who have been working at least five successive years with welding at the Swedish State Railways. Thus 296 workers, successively entering into the cohort, have been followed from the start of track welding in 1938 up to 1977.

Controls were chosen among two groups of employees working under approximately the same conditions as the welders without being exposed to welding fume. One of the groups consisted of men working with building or repairing tracks, while the other group consisted of men working with electric installations. The controls were matched according to age and year of employment. In addition it was required that the controls should have worked at the Swedish State Railways at least five years after the years the corresponding welder began welding. Two controls were chosen from the former and one from the latter group.

A comparison has also been made between welders and the whole nation using age-specific incidence rates from males.

Concerning incidence of tumours the statistical analysis showed no differences between welders and the control groups.

Concerning mortality no statistically significant difference was found between welders and electricians. In comparison with track workers and the whole nation the welders had a significantly lower mortality rate. The higher mortality rate among track workers as compared to welders depends on a higher frequency of accidents during work, infarcts, non-reumatic pericarditis and arteriosclerosis.

ARBETE OCH HÄLSA 1979:29

Inga Jacobson:
Kinetic and binding studies designed to establish a mechanism of action of glutathione S-transferase A from rat liver. *The whole issue is in English.*

The present work, a thesis in biochemistry, is an investigation on the kinetic and binding characteristics of glutathione S-transferases. The first part is a review on glutathione S-transferases concerning nomenclature, distribution, exogenous and endogenous substrates, biochemical characteristics of homogenous enzymes, binding properties and inducibility. Many electrophilic compounds, belonging to different chemical groups, e.g. compounds of interest for occupational toxicology, are biotransformed by enzymatic conjugation to the natural tripeptide glutathione (GSH), catalyzed by the glutathione S-transferases. The conjugation often results in a decreased toxicity of the parent compound, an increased water solubility and thus in a more rapid urinary excretion.

The second part of the thesis presents the results of studies on the purification and characterization of glutathione S-transferases from rat liver. Using gel filtration and ion exchange chromatography the S-transferases A and C were highly purified; in the case of transferases A to homogeneity. The transferases A and C were closely related with respect to kinetic behaviour, inhibition by alkyl glutathione derivatives and by different thiol group reagents, but the enzymes could be separated because of different ionic properties.

A kinetic mechanism is proposed for glutathione S-transferase A, acting on 3,4-dichloro-1-nitrobenzene and GSH. The mechanism is a complex random-sequential steady-state model, where enzyme-product complexes are involved in the forward reaction. The model was suggested from studies on initial velocity and product inhibition. This model is further supported by inhibition studies with different GSH derivatives. It was further shown that the complex kinetics was not an effect of ethanol, the solvent for the electrophilic substrate. Non-linear regression analysis methods were used in the statistical treatment of data and a new method för weighting purposes was presented.

ARBETE OCH HÄLSA 1979:30

Kjell Hansson Mild, Ulf Landström and Bertil Nordström:
Biological effects of electromagnetic fields of radiofrequency and microwaves hazards and norms.

The present paper is a review of the biological effects and health hazards associated with exposure to electromagnetic fields in the frequency range from 10 MHz to 300 GHz. The papers included in the review are selected mainly on basis of their significance for the standard setting in this area.

In order to facilitate the understanding of the paper, some of the basic facts about electromagnetic fields from a physical point of view are given in chapter 2. Terms and expressions frequently used in connection with radiofrequency and microwaves are explained.

Chapter 3 deals with the occurrence of RF/microwaves at different workplaces. In this respect special attention is given to plastic welding machines, microwave ovens, shortwave diathermy equipment, and portable radio transmitters. The leakage fields typically encountered around these apparatus are discussed.

The main effect exerted by RF/microwave on biological objects is the thermal effect. Chapter 4 gives a broad presentation of this special problem, starting with energy deposition in simple planar tissue models and at the end of the chapter more complex models of man are discussed. Terms such as Specific Absorption Rate (SAR) are explained.

Chapter 5 is a presentation of some biological effects on: eyes, reproduction, nerves, hormones-metabolism, blood, and blood circulation. The chapter also includes effects on human as found in epidemiological studies, acute overexposure and pacemakers.

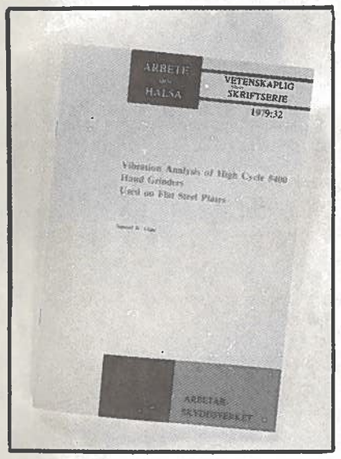
The norms and maximum exposure levels for RF/microwaves in different countries are given in chapter 6.

The paper is finished with a discussion and a recommendation for Swedish threshold values for occupational exposure to RF/microwaves (chapter 7).

ARBETE OCH HÄLSA 1979:31

Ulf Ulfvarson:
Welding problems connected with work environment
Part 11. Survey of air contaminants from welding, a summary of results

During the period 1974 to 1976 altogether almost 500 work sites with welding were investigated at about 70 workshops and 21 track sections of the Swedish State Railways. Concentrations of air contaminants were measured in the breathing zones of the welders and in the work rooms. The welders were occupied with several different welding methods in various materials and with different production conditions. In this report results from earlier publications have been summarized and compared over the whole investigation.



ARBETE OCH HÄLSA 1979:32

Samuel W. Glass:
Vibration analysis of high cycle 5400 hand grinders used on flat steel plates. *The whole issue is in English.*

Technical measurements of hand grinding machine vibration levels are described. The measurements, spectral analysis and health risk evaluation for vibration injury was carried out in accordance with the International Organization for Standardization's proposal, ISO/DIS/5349. The resultant evaluation was then compared to medical data from a health control of the grinding machine operators.

Vibration levels were measured for both right and left hands on High Cycle 5400 rpm hand grinders used on flat steel plates. Measurement situations included 4 machines, 4 operators, 2 types of grinding stones, new and worn grinding stones, different plate thicknesses and different working positions. A total of 18 triaxial acceleration spectra were taken for different situations. Differences between spectra of different situations were then subjectively evaluated.

Slight differences ranging from 4 to 20 dB were noted among different operators, different machines, and new versus worn grinding stones. No substantial differences were noted as a function of the type of grindstone, different plate positions or different plate thicknesses. Acceleration levels were lowest along the vibration axis parallel to the rotating shaft. Frequency bands with the highest levels related to ISO/DIS/5349 exposure guidelines were either from 80 Hz to 125 Hz corresponding to the motor rotation frequency of from 160 to 250 Hz. Right handle levels were always above the highest exposure guideline. Left handle levels were considerably lower however they were always above the 8 hour continuous exposure (lowest) guideline.

A high risk of vibration induced damage is therefore associated with continuous operation of these machines. This also agrees with the medical findings from the health control of the operators (appendix 1).

Corrective action has been taken by the company in an effort to reduce the vibration exposure.

OTHER REPORTS PUBLISHED BY THE BOARD

INVESTIGATION REPORT 1979: 4, 171 pages.

Bo Holmberg and Birgitta Sjöström: A toxicological survey of chemicals used in the Swedish plastic industry. *In Swedish.*

INVESTIGATION REPORT 1979: 5, 39 pages.

Hans Jonasson and Bo Ljung: Investigation of different types of portable noise dosimeters. *In Swedish.*

INVESTIGATION REPORT 1976: 6, 68 pages.

Gudrun Hedberg, Marianne Björkstén and Elisabeth Ouchterlony-Jonsson: Engine drivers' body measures and occurence of pains in joints and muscles in relation to the design of the driver's cabin. Report 4. *In Swedish.*

INVESTIGATION REPORT 1979: 7, 23 pages.

Anders Kjellberg: Underground work sites. Psychological aspects. *In Swedish.*

INVESTIGATION REPORT 1979: 8, 27 pages.

Ronnie Lundström and Ludwik Liszka: High-frequency vibrations — ultrasound in hand-operated machines. *In Swedish.*

INVESTIGATION REPORT 1979: 9, 25 pages.

Ludwik Liszka, Johnny Hedendahl and Per Löfstedt: Infrasound in trucks — a hygienic evaluation. *In Swedish.*

INVESTIGATION REPORT 1979: 10, 39 pages.

Jan-Erik Hansson, Lars Klusell, Anita Johansson and Magnus Uppsäll: Description of some straining lifting operations within the engineering industry. *In Swedish.*

INVESTIGATION REPORT 1979: 11, 12 pages.

Anders Kjellberg and May Strandberg: The effect of anaesthetic gases on the reaction among nurse anaesthetists. *In Swedish.*

INVESTIGATION REPORT 1979: 12, 219 pages.

Gunnela Westlander: Approaches towards equality between sexes in enterprises. A study of conditions of increased equality through personnel policy and personnel treatment. *In Swedish.*

INVESTIGATION REPORT 1979: 13, 34 pages.

Anders Bjelle, Mats Hagberg and Gunnar Michaelson: Ergonomic and mechanic factors in shoulder-neck pains among industrial workers. *In Swedish.*

FROM THE BOARD'S FOREIGN VISITORS FILE

May 11, 1979
Dr E.J. McArdle, Dir. of Public Health, Tasmania, Australia

Dr Stephan Otte, Editor, "Die Tribüne" Berlin, German Democratic Republic

May 15
US Department of Labour Delegation, USA

June 6
Dr Prahlad Seth, Industrial Toxicology Research Centre, Lucknow, India

Delegation from International Woodworkers of America (IWA), USA

June 14
Mr Shlomo Amir, Adviser to the Minister of Labour and Social Affairs, Israel

June 18-21
Dr Alan Stevens, Dir. of Training and Manpower Development, NIOSH, Cincinnati, Ohio, USA

July 3
Ms Irene Wilson, President of Policy Research Incorp, USA

August 1-3, 9, 22
Mr Peter Magnus, Labour District Superintendent, Jerusalem, Israel

August 6
Senator Harrison Willians Jr, Staff Dir. Stephen Paradise, Counsel Michael Goldberg, US Senate, Washington D.C., USA

August 8
Forestry Delegation Quebec, Canada

August 20
Mr Peter McCrodan, Dir. of Mining Health and Safety Branch, Ministry of Labour, Ontario, Canada

August 29
Mr John Juchau, N. East London Polytechnic, London, UK

September 3
Ms Linda Krops, ILO, Geneva, Switzerland

September 5
Mr Richard Elsy, British Argricultural Export Council, London, UK. Mr Geoffrey Ricards, Commercial Officer, British Embassy Stockholm

Mr Young Seop YI, Vice Chief of Construction Safety, Nat. Institute of Labor Science, Seoul, Korea

September 6
Professor Krystyna de Walden-Galuszko Dr Kruminis-Lozowski, Professor Dolmierski, Nat. Inst. of Maritime Medicine, Poland

September 11-12
Professor Indur Dudani, Jaipur, Dr Habibullah Saiyed, National Institute of Occupational Health, Guajarat, India

September 17
Mr Makato Onodera, Japan

September 17-21
Mr Lajos Hirsch, Deputy Manager, Occupational Safety Research Institute, Budapest, Hungary

September 18
Mr J.K. Thurman, ILO, Geneva, Switzerland

Ms Fay Castles, Conference Interpreter and Translator, London, UK

September 19
Mr Nils Asbjörn Lien, Lawyer, Norwegian Employers' Confederation, Oslo, Norway

Mr Assa Lifshitz, Vice-Pres. of Engineering Ind. Buildings Corp. Ltd, Tel-Aviv, Israel

September 24
Mr Steve Early, Editor, Lawyer, Professional Drivers' Council, Washington D.C., USA

September 25
Professor Steven Deutsch, Labour Education and Research Center, Univ. of Oregon, USA

Change of address:

Write to

International Secretariat,

Arbetarskyddsstyrelsen,

National Board of

Occupational Safety

and Health,

S- 17 184 Solna

Sweden

NEWSLETTER

National Board of Occupational Safety and Health · Arbetarskyddsstyrelsen · Sweden
Mailing address: Fack, S–100 26 Stockholm · Telephone: 46-8-54 02 60 Publisher: Gunilla Warnbeck

No. 1 April 1979

ORDINANCE ISSUED BY THE BOARD

The duty of doctors to report diseases which may be occupational by origin

The Board has issued **Ordinance No 1979:1** concerning **The duty of doctors to report diseases which may be occupational by origin.** The following is a translation of the Ordinance except the appendix.

Pursuant to Section 18 of the Work Environment Ordinance and following consultations with the National Board of Health and Welfare, the following provisions have been made by the Board.

Section 1
A doctor who in the discharge of his duties becomes apprised of a disease which in his opinion may be occupational, i.e. connected with employment, is to report the disease to the Labour Inspectorate. If, however, the causal connection between the disease and the occupational environment is well known, a report need only be made if the disease has occurred in unforeseen occupational environments or has become conspicuously widespread at a particular workplace or in a particular sector.

Section 2
Reports are to be made in writing and shall contain the following particulars.

1. The disease which is believed to be occupational, together with the symptoms or complaints which it involves.

2. Working conditions or environmental factors at work which it is believed can have given rise to the disease.

3. The number of persons observed by the doctor to be suffering from the disease.

4. Other circumstances influencing the doctor's assessment.

5. Reports referring to conditions at one or more particular workplaces are to contain the names and addresses of each individual workplace and employer.

Section 3
Doctors are to furnish the Board and the Labour Inspectorate with information and assistance concerning connections between working conditions and ill health when called upon to do so.

These provisions shall enter into force on 1st July 1979. At the same time, Notice No. 1975:15 from the Board shall cease to apply.

Commentary on the Ordinance concerning the duty of doctors to report diseases which may be occupational by origin.

Reports pursuant to this Ordinance are not to be confused with the reports concerning occupational injuries which shall be made by employers but can also be made by doctors to social insurance offices under the Occupational Injury Insurance Act and the Ordinance concerning Occupational Injury Insurance and State Injury Coverage.

All connections which a doctor believes to exist between ill health and employment and which are unexpected or noteworthy are to be reported. The terms "disease" and "ill health" as used here include both mental and physical complaints, symptoms and signs. Special attention is to be paid to the possibility of a causal connection when the same disease is observed in several persons sharing the same occupational environment or a common environmental factor at work. Working conditions should be analysed as far as possible with reference to suspected factors. In this connection, occupational history is just as important as description of the disease, if not more so.

Reports should preferably be made using the form reproduced in the appendix. Forms of this kind are obtainable from the Labour Inspectorate and the Board.

After district consideration of possible local actions, all reports will be forwarded by the Labour Inspectorate to the Board.

Names and national registration numbers mentioned in reports made pursuant to the Ordinance are confidential under Section 14 of the Secrecy Act. Chap. 7, Section 13 of the Work Environment Act also contains rules concerning the discretion to be observed by officers of the Labour Inspectorate and the Board concerning among other things, particulars relating to the circumstances of private persons and to professional or trade secrets and processes.

Even if a report is not obligatory under this Ordinance - as, for example, in the case of well-known connections between employment and ill health - a doctor is of course still at liberty to bring the attention of the Labour Inspectorate to unsuitable conditions existing at a particular workplace. There are medical officers within each Labour Inspectorate district who can be consulted in doubtful cases.

Change of address:

Write to

International Secretariat,

Arbetarskyddsstyrelsen,

National Board of

Occupational Safety

and Health,

Fack,

S-100 26 Stockholm,

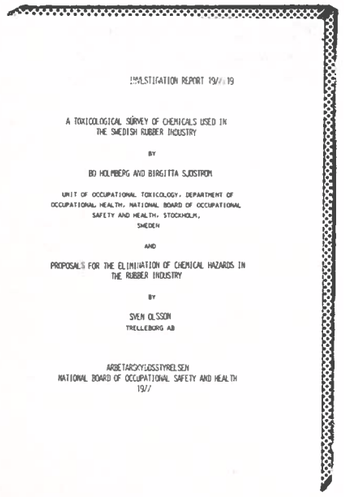
Sweden.

TRANSLATIONS OF THE BOARD'S DIRECTIONS CONCERNING GENERAL MACHINERY

The Board will publish rough translations into English and German of the Board's **Directions No 29 General Machinery.** The English translation is expected to be published in June this year and the German translation will appear this autumn. The translations will be sold at a price of Skr 50.— each. For orders from abroad a service charge of Skr 15/order will be added. For Swedish customers purchase tax will be added. Orders can be made already. See order form.

TRANSLATION OF THE BOARD'S REPORT ABOUT THE RUBBER INDUSTRY

The Board has published an English translation of the Board's **Investigation report 1977:19.**
Part I. Bo Holmberg and Birgitta Sjöström:
A toxicological survey of chemicals used in the Swedish rubber industry.
Part II. Sven Olsson:
Proposals for the elimination of chemical hazards in the rubber industry.
The report can be obtained from the Board at a price of Skr 15.
For orders from abroad a service charge of Skr 15/order will be added. For Swedish customers purchase tax will be added



NEW ISSUES OF "ARBETE OCH HÄLSA"

The Board's scientific series "Arbete och hälsa" contain results of the research carried out within the Board's Occupational Health Department. As a rule the issues appear in Swedish with a summary in English.

Summaries of the latest issues follow below.

ARBETE OCH HÄLSA 1979: 1

Hans E Persson, Bengt Knave, J Michael Goldberg, Bo Johansson and Ivar Holmqvist:
Long-term exposure to lead. III. A neurological and neuro-physiological study of the personnel at Rönnskärsverken, Boliden Ltd.

In the present study 58 lead-exposed metal industry workers were examined and compared to an age-matched reference group of 58 non-exposed workers from the same factory. Lead exposure documented as blood lead levels were available since 25 years at the factory. Mean exposure time was about 20 years and the average blood lead level during this time was 472 µg/1000 ml among the exposed. The average blood lead level the year before examination was 394 µg/1000 ml. Three of the exposed had > 600 µg/1000 ml as mean blood lead level during the years of exposure and two > 500 µg/1000 ml as an average level the year before examination. The investigation included routine medical examination with special attention paid to symptoms and signs of neurasthenia and polyneuropathy. Peripheral nerve function was also assessed by measuring conduction velocities of slow and fast motor nerve fibres and by determining vibration thresholds at the extremities.

Symptoms of neurasthenia and polyneuropathy and signs of polyneuropathy were found more often among the exposed than among the non-exposed workers. However, with the exception for pain as an unspecific, early symptom of polyneuropathy, the differences were not statistically significant. In the neurophysiological tests on nerve conduction velocities and vibration thresholds no differences were found between the groups. Attempts to relate test results among the exposed to different parameters of exposure were not unambiguous. However, workers with high average blood lead values were found to have more symptoms and signs of polyneuropathy than those with relatively low average values. As to the symptoms the difference was statistically significant. Furthermore, on the basis of duration of exposure, there were differences in the expected direction. Otherwise, no clear-cut differences or systematic trends were found.

ARBETE OCH HÄLSA 1979:2

Rolf Alexandersson:
Studies on effects of exposure to cobalt.
II. Reactions in the respiratory organs to cobalt in relation to exposure in hard metal industry.

Six groups of workers from the tungsten carbide industry with different degrees of exposure to cobalt have been studied. For comparison we also had non-exposed control groups from the same industries, matched with regard to sex, age, length and smoking. Irritative effects from the respiratory tract were reported in higher frequency among exposed persons than among their controls. From the results it would appear that an average exposure to 0,06 mg Co/m^3 of air gives rise to a reaction in the respiratory tract with changes of mainly obstructive type. This reaction can be demonstrated over a working shift. The reaction decreases over a night and even more over a week-end. However, the regress is not complete, because there is a difference between the exposed persons and their matched controls on Monday morning before work. The same trend could be demonstrated in some of the other less exposed groups. The reactions mentioned were most pronounced in smokers who also were exposed to cobalt.

ARBETE OCH HÄLSA 1979: 3

Maria Steby and Mats Levin:
Automobile painters' exposure to organic solvents, dust, and metals.

This investigation consists of a comparison between earlier and present working conditions for automobile painters. It includes studies of working routines, products, ventilation conditions and exposure patterns. The exposure patterns have been established in a simulation paint workshop which has been used since the beginning of the 1950s. In this workshop, occupational measurements related to solvents, dust, and metal content have been carried out.

The study shows that automobile painting has undergone several changes during the last 25 years. The most notable are the change-over to synthetic products, installation of modern ventilation systems, the development of effective grinding machines, the use of personel safety devices. Furthermore, benzene has been excluded from all products since its harmful biological effects have been shown.

The comparison between the exposure levels of the 1950s and the 1970s shows that the automobile painters' exposure to dust and metals has been lowered while the exposure to solvents with the exception of benzene has been relatively unchanged.

ARBETE OCH HÄLSA 1979:4

Bo Holmberg, Stig Elofsson, Lars Holmlund, Rein Maasing, Gustavo Molina and Peter Westerholm.
Mortality and cancer morbidity in Swedish PVC-production workers.

Work lists from four PVC-production industries have been collected for workers in production departments with at least 3 months employment from 1945 until 1974-12-31. 103 individuals from these lists were lost to follow-up. The remaining cohort of 1970 individuals has been compared to the population of Sweden with respect to mortality in different diseases and to cancer morbidity.

The risk for deaths in coronary infarction is higher in the cohort. 11 cases of deaths in coronary infarction appeared in that subcohort, which had at least 2 years of exposure and where the analysis was focused on events which occurred during the exposure or shortly after. The expected number of death in coronary infarction in the same cohort was 5.4.

A tendency to an elevated risk for morbidity and mortality in tumours in the digestive system was observed, although this tendency was not statistically significant. A future follow-up of the present study is necessary to clarify this point.

ARBETE OCH HÄLSA 1979:5

Toluene. Nordic expert group. *In Danish.*

A critical survey and evalution of the recent literature relevant as medical background for discussion of TLV is presented. The Survey is based on "Criteria for a Recommended Standard. Occupational Exposure to Toluene" (1973). Effects to be used in this discussion is recommended.

ARBETE OCH HÄLSA 1979:6

Åke Swensson:
Experimental studies of the fibrogenetic effect of particles from grinding of coal fiber reinforced plastic material.

A suspension in saline of particles from grinding of coal fiber reinforced plastic material was injected intratracheally in rats, 40 mg in one ml saline. A rather moderate foreign body reaction was seen after one month but after that time no progression.

ARBETE OCH HÄLSA 1979:7

Rolf Alexandersson and Göran Hedenstierna:
Studies on effects of exposure to cobalt.
III. Studies on gas distribution and airway closure before and after four weeks of vacation.

The effect on lung function by exposure of cobalt has been studied in 155 employees and 74 matched control subjects. The cobalt-exposed subjects were divided into five groups: (A) low exposure to cobalt dust (av. exposure $0.005 \leq m < 0.01$ mg/m^3); (B) heavy exposure to cobalt dust (av. exposure 0.06 mg/m^3); (C) dry polishing of sintered material (av. exposure 0.01 mg/m^3); (D) wet polishing of sintered material (av. exposure 0.008 mg/m^3); (F) inspectors (av. exposure 0.002 mg/m^3). Pulmonary function was evaluated by means of spirometry and a single breath nitrogen wash out. Measurements were done (a) on Monday morning before work, (b) on Friday afternoon immediately after work, (c) after four weeks of holiday. Acute effects of cobalt exposure were tested by comparing the lung function values on Monday morning with those on Friday afternoon. Long-term effects were studied by comparing lung function in exposed persons and control subjects on Monday before work and by studying the effects on lung function of four weeks of holiday. Closing volume in relation to vital capacity (CV%) was increased in group B after exposure to cobalt during the work. The less exposed subjects in groups A, C and D tended to increase their CV% and indexes of intrapulmonary gas distribution during the week. Group F showed no changes during the week. Thus, the findings indicated an impaired pulmonary function as a consequence of exposure to cobalt during the week in the moderately and highly exposed employees. A comparison with matched control subjects on Monday morning showed no differences except for those in group B. Thus, lung function returned to normal levels in groups A, C and D, while the most heavily exposed employees in group B had a persisting reduction in lung function, which moreover remained after four weeks of holiday. In conclusion, exposure to cobalt below the threshold limit value (0,1 mg/m^3) at the time of the investigation, 1977– 1978, results in acute but in general subsiding pulmonary effects which are interpreted as airways obstruction. For the most exposed subjects a chronic reduction in lung function can not be excluded.

ARBETE OCH HÄLSA 1979:8

Rolf Alexandersson and Vitauts Lidums:
Studies on effects of exposure to cobalt.
IV. Concentration of cobalt in blood and urine as indicators of exposure.

Methods for determining the low contents of cobalt in blood and urine within normal range have been developed. The methods comprise mineralizing by means of small amounts of nitric acid, ion exchange separation and electrothermal atomic absorption measurements. The cobalt content was about 8.48 nmol/l in blood and 6.79 nmol/l in urine of a non-exposed group. After exposure cobalt was rapidly excreted in urine. When the exposure was relatively high there was rapid continuous decrease in excretion for about 24 hours and then a phase with slower excretion. When the exposure is low the excretion in urine of cobalt is relatively constant although it may be 4–10 times higher than in non-exposed persons. The slow excretion continues for a long time, sometimes at least four weeks after exposure. The variations in cobalt concentrations in blood are smaller but follow the exposure. When blood and urine concentrations of cobalt were compared on Friday afternoon the correlation coefficient was 0.82. When the average exposure to cobalt for the whole week was compared with the cobalt concentration in urine the correlation coefficient on Friday afternoon was 0.79 and on Monday morning 0.81. For blood the correlation coefficient was 0.87 on Friday afternoon and 0.76 on Monday morning.

ARBETE OCH HÄLSA 1979:9

Per Gustavsson, Vitauts Lidums and Åke Swensson:
Studies on effects of exposure to cobalt.
V. Uptake, distribution and elimination after intratracheal injection of a suspension of cobalt to rats.

A suspension of cobalt in destilled water was injected intratracheally to rats of an inbred Spraque-Dawley strain. Already after 4 hours the cobalt content of the blood, liver and kidneys had increased several times the concentration in controls. After that time the concentrations decreased continuously. Excretion in feces was high the first two days and then approximately the same as in the controls. Excretion in urine was considerable the first 4 days and after that there was a continuous, low excretion for 2 – 4 weeks depending on the amount given. The concentration in the lungs decreased continuously.

ARBETE OCH HÄLSA 1979:10

Rolf Alexandersson:
Studies on effects of exposure to cobalt.

VI. Uptake and respiratory effects of cobalt in tungsten carbide workers.

Exposure to particulate cobalt, its uptake and effect on pulmonary function has been studied in employees with different levels of exposure in tungsten carbide manufacturing processes. Pulmonary function was measured by spirometry and with a single breath nitrogen wash out. Unexposed control groups were matched with regard to sex, age, height and smoking habits. Irritation of the respiratory passages was a common complaint of exposed persons. An average exposure level of 0.06 mg Co/m^3 caused symptoms that are mainly obstructive. These reactions can occur during a single 8 hr day and decrease over-night or over the weekend. However, a difference between the exposed workers and the matched controls persists on Monday morning or after four weeks of holiday. A chronic reduction in the pulmonary function can thus not be excluded. There also appeared to be a dose related effect detectable in some of the less exposed groups. The responses to cobalt exposure were more marked in smokers than in non-smokers.

A positive correlation was found between the concentration of cobalt in urine and blood and the average exposure to cobalt in the air. The concentration of cobalt in urine is a better short-term indicator of exposure than is cobalt in blood. For the evaluation of a long-term exposure the concentration of cobalt in either blood or urine can be used.

ARBETE OCH HÄLSA 1979.11

Åke Swensson:
Experimental studies of the fibrogenetic effect of particles from aluminium silicate

Mineral fibers manufactured from kaolin were heated to 1000°C for 100 hours. Particles from this material were suspended in water, 40 mg in 1 ml, and were injected intratracheally to rats in one single injection. Particles retained in the lungs were eliminated slowly. The tissue reaction was very small and no progressive fibrosis could be seen.

No fibrosis occurred in the hilar lymph nodes.

In this respect these particles can be considered almost inert.

Single copies of the publications of the Board mentioned in this Newsletter are submitted free of charge to foreign addresses on request. See order form.

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Ulfvarson, U:
Chemical hazards in the paint industry (pp 62-75)
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