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OCCASION

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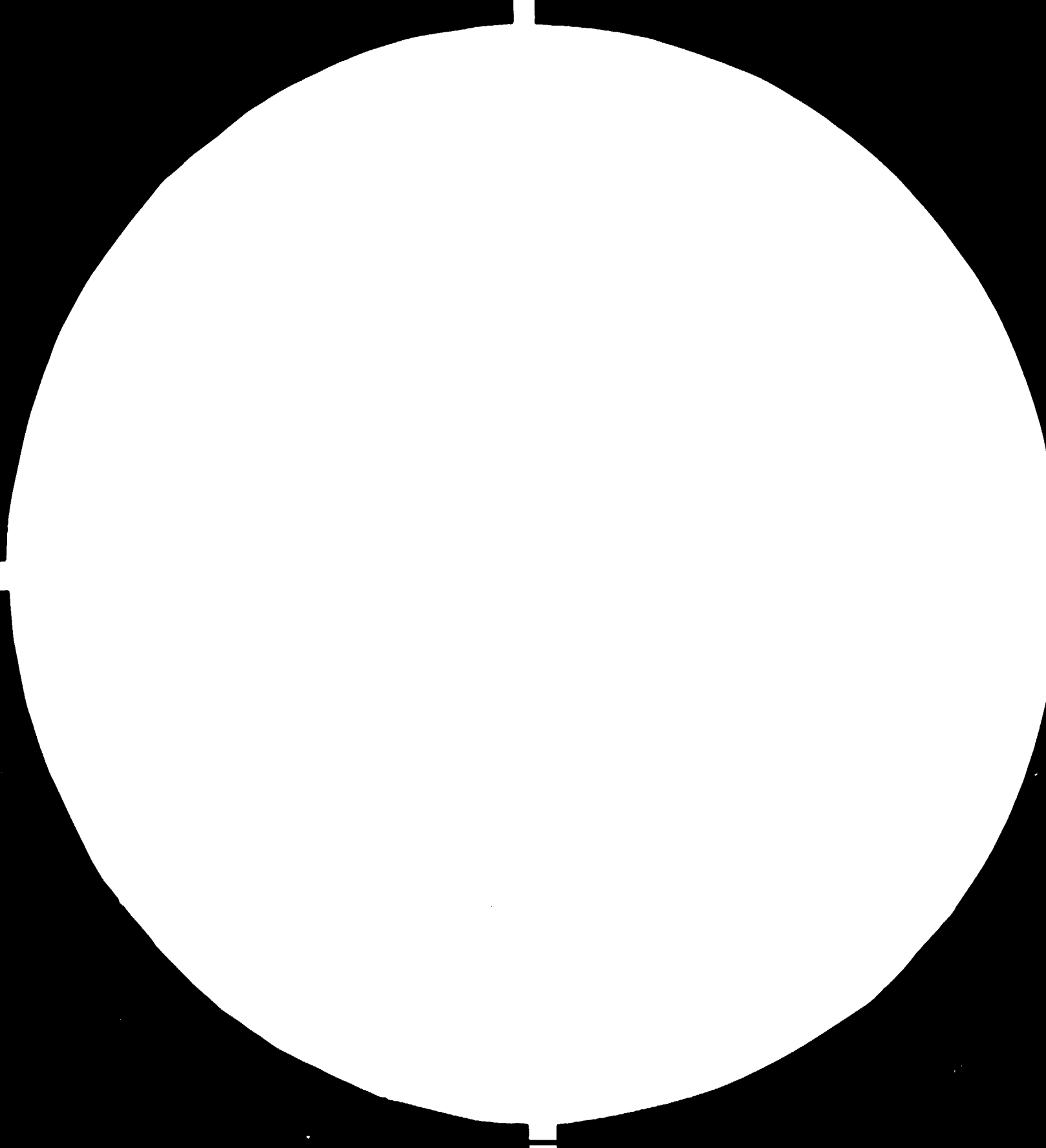
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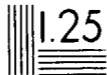


1.1

20



1.8



1.25



1.4



1.6

Resolution Test Chart
This chart is used to measure the resolution of a system.
The resolution is the number of lines per inch (LPI) that can be resolved.
The resolution is measured by the number of lines that can be resolved per inch.
The resolution is measured by the number of lines that can be resolved per inch.

13695

RESTRICTED

February, 1983

INDUSTRIAL TRAINING AND DEVELOPMENT CENTRE (ITDC)
ANKARA—TURKEY

Turkey.

Expert in Industrial Noise Control
Project NO DP/TUR/77/024/11-C3/WV

MISSION REPORT PREPARED BY

B. E. MILES

Expert of the United Nations Industrial Development Organisation
acting as executing agency for the United Nation Development
Programme.

This report has not been cleared by the United Nations Industrial
Development Organisation which does not, therefore, necessarily
share the view expressed.

I. ABSTRACT

A Introduction

The post for an Expert on Noise Control in Industry (DP/TUR/77/02-11-03/WW) had a total mission length of 6 weeks.

The stated object was:

"To prepare a training programme with special consultancy and trouble-shooting services for production, plant and design engineers employed in industry"

B. Summary

A great deal was achieved in a short time to impress that impairment due to excessive noise is now recognised as a major industrial hazard in developed countries. Additionally, manufacturing standards set by those countries.

This was achieved by a series of 25 visits to 17 premises -App. I- for opot consultancy and training there were 8 seminars attended by over 260 people including the whole day conference in Ankara.

There is much left to be done. In retrospect more excursion from the rigid programme of arranged visits and seminars prepared before the arrival if the expert would have been advantageous. However, there had been over 30 written and telephone requests for help so early planning was considered necessary.

In consequence there was no time available to contact the Turkish agents of noise control products or visit the manufacturing companies, whose interest had been made know to the expert from various sources before the mission started, or local based producers of protection devices.

A change in the severe Turkish law on this subject is recommended to bring it move into line with that of developed countries where limitations on progress are recognized and included.

The publication of a basic guide to general expositive reduction practices would be of great assistance to all Turkish Industry. A method of assistance in preparation of such a document is at Appendix II.

II INFORMATION

A. Measuring Instruments

Sound measuring equipment is expensive. However, like all such equipment it is subject to the electronic revolution of rapid accelerating development. This means that instruments in current use in developed countries are often better, more reliable, more suited to the job and a lot cheaper than they were a few years ago.

Previous experience in developing countries has shown that, being unaware of latest developments, often measuring, analysing and other equipment is bought new which is being phased out in developed countries to be replaced by better cheaper alternatives.

Some imminent purchasers of such equipment in Turkey are now reconsidering as a result of consultations. The point was also made most strongly at each seminar.

Others had purchased latest equipment but had selected the most sophisticated when much cheaper versions would have been quite adequate for their needs. They'd also purchased the basic instrument only without the necessary back up kit, particularly calibrators. In these situations I was able to calibrate for them with the equipment I had with me, but proper use requires calibration before and after every measurement for accuracy. They were recommended to purchase calibrators.

As a result of these experiences, in the later seminars time was given to instrument selection. Advice was given not to purchase precision grade when industrial grade was quite adequate, less than half the cost allowing a margin to obtain the necessary back up items.

B. Ear Protectors.

Much time was spent on this subject, too detailed to be included here. However, the strongest point was comparison of attenuation data.

Some companies had been gathering data together in a single form to compare performance. They had obtained data from many sources but mostly manufacturers.

This data, although appearing similar was based on tests to different standards, and sometimes presented as "mean" and sometimes as "mean minus one standard deviation".

Although there may be arguments regarding the merits of individual tests there is no way the results can be compared one with another. Presentation of results as either "mean" or "mean minus one standard deviation" also creates large differences.

This point was made very strongly and those attending the seminar were given the full explanation so should avoid this potentially dangerous error in future. Lists of comparable data I had with me photocopied many times over and distributed.

III LEGISLATION

A Workplace

A law on industrial noise exists in Turkey limiting the level in small factories to 80 dB and in large factories to 95 dB, between these two levels ear protectors are to be used. It is presumed that above the higher level protection should also be used but this is not clear. It is also unclear if "dB" is intended or dB(A) i.e.. "A" weighted, which is normal. It was not possible to obtain a copy of the exact legislation.

Law in developed countries differs sometimes in level but all are based on the employer doing what he can to reduce levels and then if the specific legal level is exceeded, ear protectors are used.

Such legislation is recommended for Turkey based on a limit of 90 dB(A). A higher level would probably not be considered acceptable for political reasons.

Suggested suitable wording would be:

"where on any day the level of exposure is likely to exceed 90 dB(A) for eight hours or its equivalent then

(a) Noise should be reduced to the lowest...
feasible level

and

(b) Ear protection should be used".

B Product

A study should be made of legislation and standards now prevailing in developed countries.

These will be found to differ considerably between Western, Eastern and individual European Countries. These differences are between methods of test and not particularly levels to be achieved. However, considerable efforts are being made to bring all these methods into line, particularly in the European Economic Community to facilitate freedom of trade. If Turkish manufacturers wish to export to these markets a study must be made of the current situation and, based on this study, manufacturers be made aware of the situation and provision made for test

facilities to the standards. Almost without exception the tests themselves are very complex and expertise to carry them out does not exist in Turkey at the moment. Expert advice will also be needed on how to meet those standards. A film, one of 8 used on the mission, showing such a test in progress, seemed to compare

IV TRAINING

It is recommended that a programme of training be instituted based at the Health and Safety Institute, Ankara (ISGUM), see appendix I, or at the Industrial Training and Development Centre (SEGEM) or both.

ISGUM because they have the enforcing authority as well as the initial expertise, SEGEM because they are the training experts and have contacts throughout industry.

Previous training in this subject may have tended to be too technical, participants receiving an interesting knowledge of otology and acoustics but still not knowing what to do when they returned to their factories.

PLACES VISITED AND CONTRACT ADDRESSES

1. UNIDO / UNDP
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Mr. Mustafa YAZAR , Head Dept. and M.E.
Mr. Serdar GÜLEN , Counterpart
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(Veneu for main conference)
5. MIDDLE EAST TECHNICAL UNIVERSITY / METU) (2) (S)
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6. SUMMERBANK GENERAL DIRECTORATE (1)
Ulus / ANKARA
Tel : Telex :
Mr. ŞİMŞEK KAPLANCI , Occupational Safety Manager,
7. PETROCHEMICAL INDUSTRIAL ENGINEERING Co. (1)
P.O.Box 33 , Yenışehir /ANKARA
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Mr. G. ALPAY, Mr. ÜRKEYNAK
8. METAL INDUSTRIES EMPLOYERS SINDICATE (3) (S)
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Tel: 46 03 95 Telex : 23682 Mess Tr.
Dr. Alaettin SARP - Training Director

9. BOSPHOROUS UNIVERSITY
 P.O.Box 2, Bebek, ISTANBUL (2) (S)
 Tel: 65 3400 Telex :
 Dr. Akın TEZEL , Chairman Dept. of Mech. Engineering
10. CHRYSLER (TURKEY) LTD. (1)
 Çayirova , Gebze / İSTANBUL
 Tel: 45 13 70 Telex : 24105
 Mr. Methods, Dept.Manager.
11. PARSAN MACHINERY MFG . CO. (1)
 P.O.Box 3, Pendik , ISTANBUL
 Tel: 67 47 07 Telex : 26 347 Parx Tr.
 Mr. Pınar ARAN , General Manager
12. SUMMERBANK TEXTILES (1)
 Bakırköy, İSTANBUL
 Tel : Telex :
 Mr. Fevzi Head Weaving Dept.
 Mr. Mecit Repair and Maintenance Dept.
13. NORTHERN ELECTRIC AND TELECOMMUNICATIONS Co. INC. (2) (S)
 ÜMRANIYE- İSTANBUL
 Tel: 35 11 00 Telex : 22413 Tr.
 Mr. Ahmet GÖKCEN , Personnel and Industrial Relations Director
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 Halkalı Cad. Sefaköy - İSTANBUL
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 Mr. Haluk BAGATUR, Commercial Manager
15. CHAMBER OF TRADE AND COMMERCE (2) (S)
 BURSA
 Tel : Telex :
 Mr.
16. OYAK - RENAULT AUTOMOBILE (1)
 BURSA
 Tel : 31 200 Telex : 32 132 BURSA
 Mr. Ömer ALTUN , Methods Department,
17. SUMMERBANK MERINOS (1)
 BURSA
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 Mr. Rıza SÜNNETÇİOĞLU, Factory Manager,

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19. SANTRAL DİKİS (COATES) THREAD Co. (1)
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Mr. Temel UANER , Manager
20. E.K.I. NATL. COAL BOARD (2) (S)
ZONGULDAK
Tel: Telex :
Mr. Akın YÜKSELEN , Director
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Mr.Alev ÇAKIN, Health and Safety Director.

(25) No of visits

(S) Seminar held.

APPENDIX II

DP/TUR/77/024/11-03/WW

PROPOSAL FOR FURTHER ASSISTANCE TO
PREPARE A BOOKLET OF BASIC GUIDELINES

POST TITLE : Expert in Industrial Noise Control

DURATION : 4-6 Weeks,

DATE REQUIRED : As soon as possible

DUTY STATION : Ankara

PURPOSE OF THE
PROJECT

: To work in conjunction with a local Engineer from the Institute of Health and Safety on the preparation to final draft of guidelines for the reduction of noise exposure in industry.

A senior committee may be needed as final arbiter and advise on legal aspects such a document may conflict with,

REASON FOR
PROJECT

: There is a lack of basic simple data and workers starting in the field are making expensive and potentially dangerous mistakes.

To avoid this the short booklet should include advice on :

Measurement Techniques

Instrument Selection

Instrument Purchase

Limit Values

Calculation of Equivalentents

Conversion of Octaves

Ear Protector Attenuation

Ear Protector Selection

Methods of Controlling Exposure

Reduction of Exposure

Purchase of New Machinery

Suggested content of a three-day course. Subjects 1-2 first day,
3-5 Second day
6-7 third day

1. INDUSTRIAL ACOUSTICS

- (a) Sound Propagation
- (b) Intensity & Pressure
- (c) The Decibel - dB
- (d) Weighting Networks - dB(A)
- (e) Concept of Equivalent Continuous Loudness - Leq
- (f) Practical Calculations of Leq

2. OTOLOGY

- (a) The Human Ear
- (b) Deafness (incl. simulation)
- (c) Tinnitus (incl. simulation)
- (d) Loudness Recruitment
- (e) Increased production of adrenalin and corticotrophine
- (f) Increased hormone production from thyroid

3. INSTRUMENTS

- (a) Sound Level Meters : Precision and Industrial grades, differences and applications
- (b) Octave Band Filters
- (c) Integrating Meters
- (d) Dosimeters
- (e) Selection, application & purchasing policy
- (f) Practical use of instruments

4. EAR PROTECTORS

- (a) Types
- (b) Uses and Limitations
- (c) The "Adequate and Suitable" concept
- (d) Assumed Protection : by Calculation and Graphical Methods
- (e) Selection, application & purchasing policy
- (f) Practical calculations of resultant exposure

5. STANDARDS

- (a) Code of Practice for the reduction of exposure of employed persons to Noise : HSE *
- (b) Damage Risk Criteria, ISO * Dose/Response relationship
- (c) Instruments, IEC*
- (d) Protectors, ANSI *, BSI*
- (e) New Products, ISO*, EEC*, EPA* (a brief introduction only. To cover this subject in detail would require a complete, individual course)

6. PRINCIPLES OF NOISE CONTROL

- (a) Isolation
- (b) Insulation
- (c) Damping
- (d) Absorption
- (e) Barriers
- (f) Resonators
- (g) Air Silencers

7. PRACTICAL NOISE CONTROL

Case studies demonstrating practical applications of the basic control principles

- * References:
- HSE - Health and Safety Executive (United Kingdom)
 - ISO - International Standards Organisation
 - IEC - International Electrical Congress (European)
 - ANSI - American Standards Institute (USA)
 - BSI - British Standards Institute (UK)
 - EEC - European Economic Community
 - EPA - Environmental Protection Agency (USA)

B.E.M.

25.3.83

