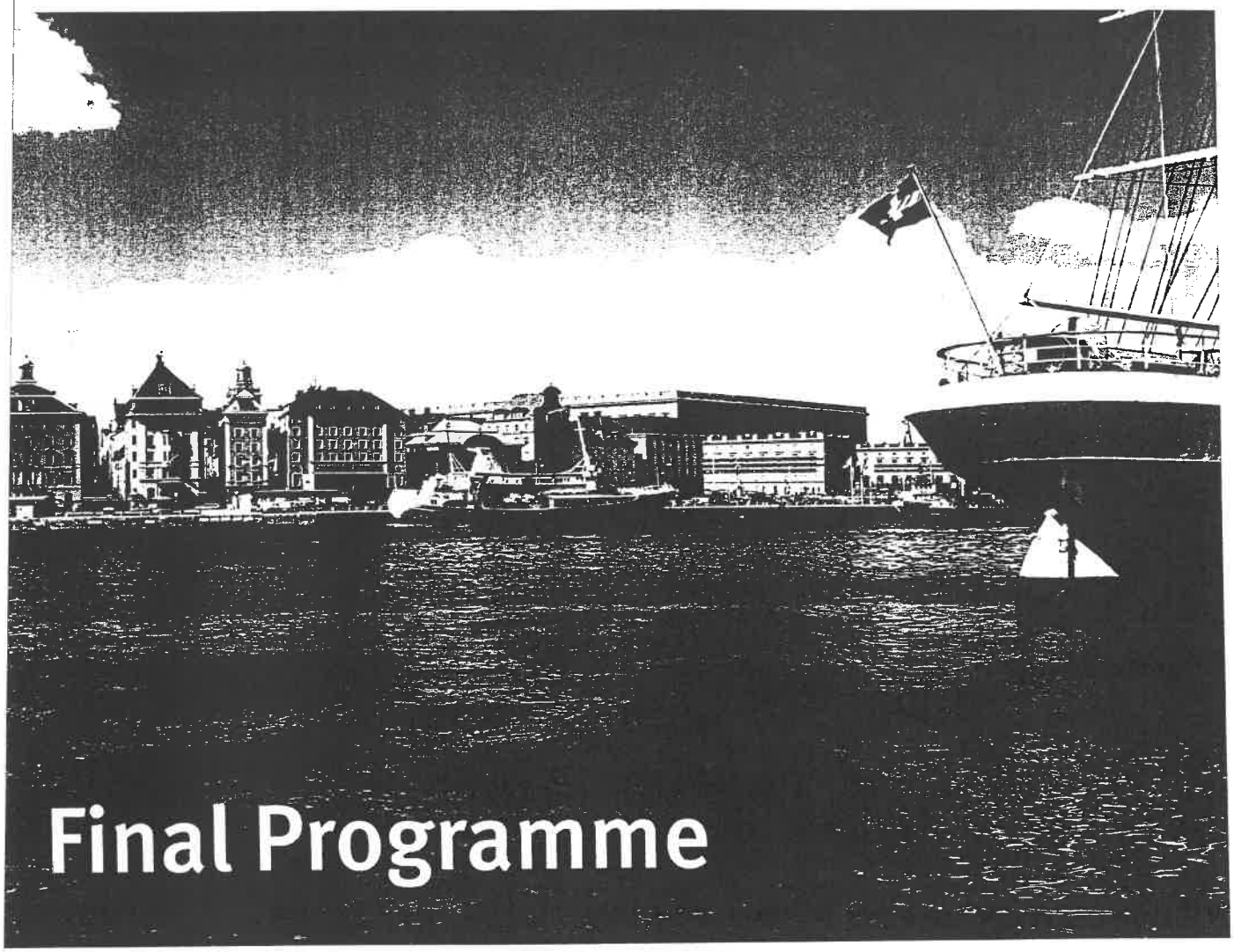

Final Programme

Tenth International Congress
on Sound and Vibration

Stockholm
Sweden
7–10 July, 2003

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A RESEARCH ON NOISE POLLUTION AT THE TEA FACTORIES IN THE EASTERN BLACKSEA REGION (TURKEY)

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Abstract

Nearly all of Turkey's tea production is done in the Eastern Blacksea region. The tea produced is processed at tea factories belonging to the government or private sector at the same region. The constant noise caused by tea processing machines during this operation is a negative factor effecting the workers' psychological and physical health.

The article aims at determining the scope of the noise pollution inside and outside the factory buildings and thus finding out what needs to be done in order to protect the workers' and inhabitants' health and to create acoustic comfort.

In the study, the noise at the tea processing factories in Trabzon and Rize, has been determined by doing observations done at work locations and audiometric measurements (hearing record measurements) of the factory workers has been performed in acoustic rooms as a result of the evaluation based on the observations, alternative suggestions for preventing noise pollution have been put forward.

Key-words: *noise, tea processing industry, noise control regulations*

INTRODUCTION

The transformation of noise into an element of environmental pollution is directly related to technological development (Karabiber, 1991). Considering it as an environmental problem, negative effects of noise on the environment, the

determination of acceptable levels of noise in terms of human and societal health and in relation to this efforts to control noise carry great importance.

Factory buildings located in cities near house settlements create a part of noise pollution (Kurra, 1982). Nearly all tea production in Turkey is done at the coastal parts of Eastern Blacksea Region and the tea produced is processed at the same region in tea factories owned either by government or private sector. In this study, the constant noise produced by tea processing machines inside the factory buildings and the level of noise pollution observed outside the factories have been presented and the effects of this pollution on especially workers and nearby residents have been investigated.

In this presentation, the level of noise at three tea factories owned by the General Directorate for Tea Factories and two private tea factories located in Trabzon (Turkey) has been measured using noise measuring instruments and in the light of the data obtained and the evaluations based on the measurements, suggestions have been made for the prevention of noise in order to establish acoustic comfort.

MATERIAL AND METHOD

The study has been carried out at Sürmene, Araklı and Çamlı tea factories belonging to General Directorate for Tea Factories and Özçay (Of) and Hancı (Of) private tea factories in Trabzon city (Turkey). In this study, sources of noise inside the factories such as production section, generator room and boiler room and the outdoor noise around the factories have been observed.

Noise measurements have been done using a Cel 268-Type 1 noise measurement device. The measurements have been done during the operation of the machines 5-10 meters away from the noise source and 1-1,20 meters high from the ground (Table 1). The measurement interval was 40-110 dBA and the period interval was 1 minute.

In the studies done on noise until today, the method used has been measuring noise pressure level by using a noise level measurement device. In order to measure the acoustic energy and noise pressure, field measurements (on site measurements) have been done. In order to find out the distribution of noise the most suitable method is doing on site measurements. On site measurements are being done at real noise and physical conditions, at selected time and duration and during operation of noise sources.

EVALUATION

Noise criteria for determined sources and environments, required for specific time duration and which have been made standards that cannot be exceeded, are used in order to determine the level of noise prevention studies and the quality of precautions to be taken. The criteria can be grouped as a)hearing health criteria b)societal health criteria c)structural criteria. An example of hearing health given as a function of time of exposure to noise and levels of noise at industrial workplaces, has been provided by Noise Control Regulation (1986) item 11/1 and it has been stated that the values

provided on Table 2 can be taken as 'the highest acceptable noise level for hearing health.

Table 1. Noise sources inside tea factories and outdoors noise values around the factories

TEA FACTORIES	Conveyor Belt		Continue trough fading		Rolling Machine		Green leaf sifter		Rolling Machine with press	
	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ
SÜRMENE	84.8	77.8	91.0	89.9	87.8	84.2	85.7	82.9	86.7	83.9
ARAKLI	87.2	79.7	97.0	89.4	90.2	81.7	93.8	87.4	86.3	83.4
HANCI	-	-	93.2	85.4	89.7	87.3	-	-	89.4	83.8
ÖZÇAY	74.8	70.7	85.8	84.6	95.4	92.0	-	-	91.0	87.0
ÇAMLI	88.5	77.2	87.9	84.9	95.3	88.6	88.4	85.2	90.5	88.5

TEA FACTORIES	Drier		Warming section of Drier .		Electrostatic		Separator		Electrical installation	
	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ	ALM AX	ALEQ
SÜRMENE	90.2	83.3	89.7	86.1	89.1	87.5	83.9	81.7	103.4	100.1
ARAKLI	88.1	80.5	87.5	84.9	94.0	88.8	90.1	82.2	92.3	89.2
HANCI	96.0	83.0	-	-	-	-	92.0	85.0	-	-
ÖZÇAY	-	-	-	-	-	-	87.7	83.6	100.7	99.3
ÇAMLI	84.9	78.7	-	-	82.9	80.0	82.1	80.8	100.5	98.5

TEA FACTORIES	Steam boiler		Surroundings Tea Factory	
	ALM AX	ALEQ	ALM AX	ALEQ
SÜRMENE	84.6	72.9	75.2	70.9
ARAKLI	82.3	71.6	79.1	67.3
HANCI	98.0	87.0	76.2	69.8
ÖZÇAY	92.9	89.2	76.2	69.8
ÇAMLI	73.7	68.0	70.9	61.8

Continue Fermentation		Rotervanes	
ALM AX	ALEQ	ALMA X	ALEQ
88.6	85.5	96.0	86.6
89.3	83.7	95.2	89.8
-	-	91.0	84.0
92.0	88.0	-	-
81.2	77.7	-	-

ALMAX: Maximum Noise Value, ALEQ: Average Noise Value
Note: The data obtained from the measurement, were evaluated considering that working time is 7.5 hours.

Table 2. Exposure time at workplaces according to Noise Control Regulation (1986)

Time of exposure to noise (hour/day)	Maximum noise level (dBA)
7.5	80
4	90
2	95
1	100
0.5	105
0.25	110
1/8	115

Criteria of societal health and environment can vary according to the type of noise source, time, the aim for which the buildings and the environment is being used and the general quality of the environment (Table 3).

Table 3. Noise criteria required at resident areas for outer environment noise sources, Noise Control Regulation (1986)

Noise source	Day (06.00-22.00) Leq dBA	Night (22.00-06.00) Leq dBA
Industry		
-constant	65	55
-sudden	70	60

RESULTS AND SUGGESTIONS

As a result of the noise measurements done at the Sürmene, Araklı and Çamlı tea factories belonging to Caykur and Özçay (Of) and Hancı (Of) private tea factories in Trabzon city(Turkey), considering the working time is 7.5 hours, it has been determined that at these factories especially in the production sections and generator and boiler rooms, the noise level is higher than the maximum level 80 dBA required by Noise Control Regulation (1986) item 11/1 presented on Table 2.

Item 11/3 of Noise Control Regulation (1986) states that "at conditions where suggested noise levels have been exceeded and there are not technical opportunities to reduce noise and vibrations at their source, the employer is required to provide the employees with protective clothes and devices mentioned by employment law no:1475". According to "Working health and safety regulation" item no:22, when there are not technical opportunities to reduce noise and vibrations at their source the employees are to be provided with suitable protective devices such as helmets, headphones or ear plugs.

In addition, at conditions where working time cannot be reduced, in order to prevent workers from being exposed to noise for 7.5 hours, arrangements should be made so that workers may work at a noise level of 90 dBA, maximum noise level for workers, for 4 hours. Other than that, noise barriers and protective separators to prevent noise between production units and workers should be considered according to the working conditions.

At countries where the problem of noise pollution has not been paid enough attention, the solution to the problem is being postponed by various factors such as inadequacy of substructures, absence of knowledge in the application of new techniques, the inadequacy of noise control regulation, lack of education, the inadequacy of basic services, avoiding technical difficulties, lack of coordination between related governmental bodies and most important economical reasons. At this point, the road to follow is to ensure that noise which is accepted as a type of environmental pollution by the government is perceived as so by the society too and to inform the society widely about their responsibilities and rights about the subject.

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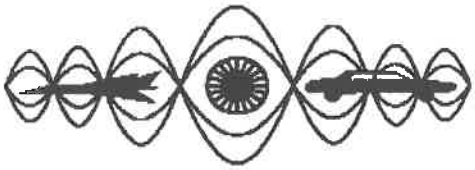

Tenth International Congress on Sound and Vibration
7-10 July 2003 • Stockholm, Sweden

FAX: 00 90 462 325 74 05

Stockholm 26 May, 2003

Dear Yalçýn YAÞAR

On behalf of the Local Organizing Committee we are pleased to inform you that your abstract / paper entitled:

A RESEARCH ON NOISE POLLUTION AT THE TEA FACTORIES IN THE EASTERN BLACKSEA REGION (TRABZON-TURKEY)

has been selected to be presented at the Tenth International Congress on Sound and Vibration and to be published in the conference proceedings book.

Session details:
Session name:
Environmental and occupational noise

Session date and time:
2003-07-10 at 10:15 - 12:15

Your presentation number is:
P-585

Please note that 15 minutes have been allocated for each presenter, followed by 3 minutes for discussion and 2 minutes for changing room. Chairmen are asked to adhere strictly to the time limits of the session.

Please note that all presenting authors must register for the Congress. To register for the Congress please visit: http://www.congrex.com/icsv10/ (if not already arranged).

Please contact us, no later than May 9, if your title is not correct or if you, for any reason, wont bee able to give your presentation.

We look forward to meeting you in Stockholm.

Yours sincerely,
Congrex Sweden AB
on behalf of the Local Organizing Committee

16 Haziran 2003

MİMARLIK BÖLÜM BAŞKANLIĞINA,

04 Temmuz 2003- 13 Temmuz 2003 tarihleri arasında İsveç Stockholm kentinde yapılacak olan "Tenth International Congress on Sound and Vibration" uluslar arası kongreye bildirili katılmak istiyorum. Davet yazım ektedir.

Gereğini bilgilerinize arzederim.

Doç.Dr.Yalçın YAŞAR

Ek: davet yazısı

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Anabilim Dalı	Yapı Bilgisi
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Bildirinin Adı	A Researh on Noise Pollution at the Tea Factories in the Easter Blacksea Region
Bildiri çok yazarlımıdır?	Evet [X] Hayır [ ]
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1- Başvuru dilekçesi (En geç 30 gün önceden) [ ]

2- Bildiri özeti [ ]

3- Bildiri kabul yazısı ve davet mektubu [ ]

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