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ENGLISH

JUNE, 1989

SUPPLY OF
TUNNEL KILN, SPARE PARTS AND MATERIALS
AND
PROVISION OF
ENGINEERING SERVICES
FOR THE
ESTABLISHMENT
OF A
BARIUM FERRITE PILOT PLANT
IN THE
SOCIALIST REPUBLIC OF VIET NAM
DP / VIE / 80 / 028
FINAL REPORT

Prepared for the Government of the Socialist Republic of Viet Nam by the United Nations Industrial Development Organization acting and executing agency for the United Nations Development Programme - based on the work of TESCO/UVATERV as Subcontractor

UNIDO -- VIENNA

This report has not been cleared with the United Nations Industrial Development Organization which does not therefore, necessarily share the views presented

Synopsis of Abstract

The aim of the Contract is to supply Tunnel Kiln, including spare parts and materials, technical know how, engineering drawings and technical specifications, as well as the training services and certain technical supervision personnel, as specified in the Contract for the erection, installation, testing, commissioning and initial operation, in the Project Area of a Barium Ferrite Pilot Plant.

In this report Contractor declares that the Tunnel Kiln is ready; all the spare parts and materials, engineering drawings, production technology, technical specifications with training services have been delivered.

Contractor's activity on this Project will be over on 21st October 1989, when warranty time will be expired.

Hand over - take over procedure was held on 13th January 1989, with full satisfaction of all parties concerned.

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Introduction

In accordance with Clause 2.20.c/ of the subject contract we submit you herewith enclosed the Draft Final Report on UNIDO project No. DP/VIE/80/028 summarizing the most important phases of the erection of the Tunnel Kiln and our related activities in Hanoi, Viet Nam.

As a preambula we have to express our thanks to all the representatives of the Government, the Implementing Agency, UNDP Resident Representative's Office in Hanoi and last but not least UNIDO Vienna, who contributed and assisted in the performance of our job.

Problems and difficulties occurred naturally in the course of erection of the Tunnel Kiln. Most of them have been rectified and the Tunnel Kiln has been adjusted to the most possible extent to the prevailing local conditions. We did our utmost to secure the smooth operation of the Tunnel Kiln and upon the successful performance test that took place in January, 1989 we trust that it will serve as a good basis for ferrite magnet production in the premises of the Implementing Agency on the long run contributing to the development of the electronic industry in Viet Nam.

Summarizing our actions taken so far we state that the erection and installation of the Tunnel Kiln is completed and the kiln proves to be capable to operate and manufacture

- 5 -

barium ferrite magnetic material according to the requirements, i.e. terms and conditions of the subject contract.

Preliminary Section

According to UNIDO's rules, projects of this magnitude are subject to international competitive bidding. Upon the request for proposal of UNIDO No. P85/60 of October 9th, 1985, TESCO/UVATERV - among several internationally well-known companies - participated in the bidding and submitted its revised proposal on November 21st, 1986.

In the framework of their study tour organized by UNIDO, a four-member Vietnamese competent team of high ranking experts and officials visited Austria and Hungary. TESCO/UVATERV's reference plant VIDEOTON was visited as well - in April 1986 - where both the technology and the Tunnel Kiln was studied in operation.

In conjunction with the evaluation of the proposals, the representative of UNIDO [Mr T. Watanabe] visited our reference plant as well and studied the technology as well as the applied equipment.

Upon the evaluation of the bids by UNIDO, TESCO/UVATERV won the bidding procedure with the lowest price, technically acceptable level and within the budget. Thereafter, the Terms of Reference and the Contactor's Proposal were evaluated and finalized during the Tripartite Review Meeting in November 1986 in Hanoi. The award of contract was received by late

December, 1986 and the contract No. 86/1525 was signed in April, 1987 with all its Annexes.

The project implementation was launched on the basis of the above, i.e. being in aware that the subject Tunnel Kiln is a multi-purpose one suitable for both ferritizing and sintering and taking into consideration the aim of the project and the proposed capacity of the pilot plant.

Summary of Production Technology

Raw material of barium ferrite magnet is iron oxide (hematite) excavated in a local mine in Viet Nam in ore form in excellent quality, contents up to 97% of iron oxide and minimal silicon oxide cca. 0.1%.

Crushed ore goes into a ball mill mixing with barium carbonate and milling to small peaces. Wet technology means that water is needed as additive to mix milling and the milled product is the slurry.

The hematite/barium-carbonate slurry became in the Ferrite Annealing Furnace -Tunnel Kiln- into barium-hexaferrite at temp. cca. 1320°C. This mass should be crushed again (add. water) and the pulp is going under the pressing machine having the required form. Pressed soft rings run into the Tunnel Kiln for sintering at temp. cca. 1230°C. Annealed rings have untrimmed form and surface grinding is needed to reach final dimensions. According to final control the barium ferrite magnet rings get quality certificates loud-speaker production.

The Tunnel kiln basicly determines quality of intermediar products and final magnets depending on the Kiln's parameters and the interrelation between Kiln and technology.

Technical Specifications of Tunnel Kiln

Main dimensions of kiln (in mm)

Maximum length:	26550
Maximum width:	2450
Height of kiln without vents and piping:	1984
Inner width:	350
Inner height:	390
Inner length:	24600
Useful inner width:	270
Useful inner height:	340

Electrical data

Supply voltage:	3 x 380 V, 50 Hz
Built-in power:	221 kW
Average simultaneous power consumption:	145 kW
Short current of mains:	max 50 kA
Operating voltage:	220 V, 50 Hz, TTL
Shock protection:	zero method
Protection:	IP 20
Operating temperature of control box:	max 40°C
Control accuracy:	+/- 10°C
Absolute error of temperature taking:	+/- 1°C.

Heating and cooling sections

Heating is distributed into six controlled electric heating sections. The first, second and third sections are fitted with "Kanthal-A", the fourth, fifth and sixth sections with "Kanthal-Super" heating elements.

Temp. in first, second and third zones: max 1000°C.

Temp. in fourth, fifth and sixth zones: max 1400°C.

The six controlled heating zones are followed by three cooling sections.

Cooling section No I is hand controlled one with direct air;

cooling section No II is the same;

cooling section No III has direct air cooling.

Moving of carriage and doors

The carriages and doors are moved by pneumatic automation controlled work-cylinders. Pressure of compressed air should reach min 6 bars.

Special services: electrical energy supply from network or stand by generator.

Kilning furniture

The recommended refractory boxes are characterized by the following parameters:

Material:	sillimanite
Dimensions:	230 x 230 x 77 mm
Bending strength at 20°C:	900 N/cm ²
Bending strength at 1350°C:	600 N/cm ²
Coefficient of heat expansion:	5.6 x 10 ⁻⁶ /K
Load softening point:	1350°C

Characteristics of the sandwich plates:

Material:	sillimanite with SiC insert
Dimensions:	270 x 205 x 15 mm
Bending strength at 20°C:	1200 N/cm ²
Bending strength at 1350°C:	1100 N/cm ²
Coefficient of heat expansion:	4.8 x 10 ⁻⁶ /K
Load softening point:	1550°C

Figure 1 shows the heating curve and main sections of Tunnel Kiln.

Figure 2 shows the scheme of heating and controlling system of Tunnel Kiln.

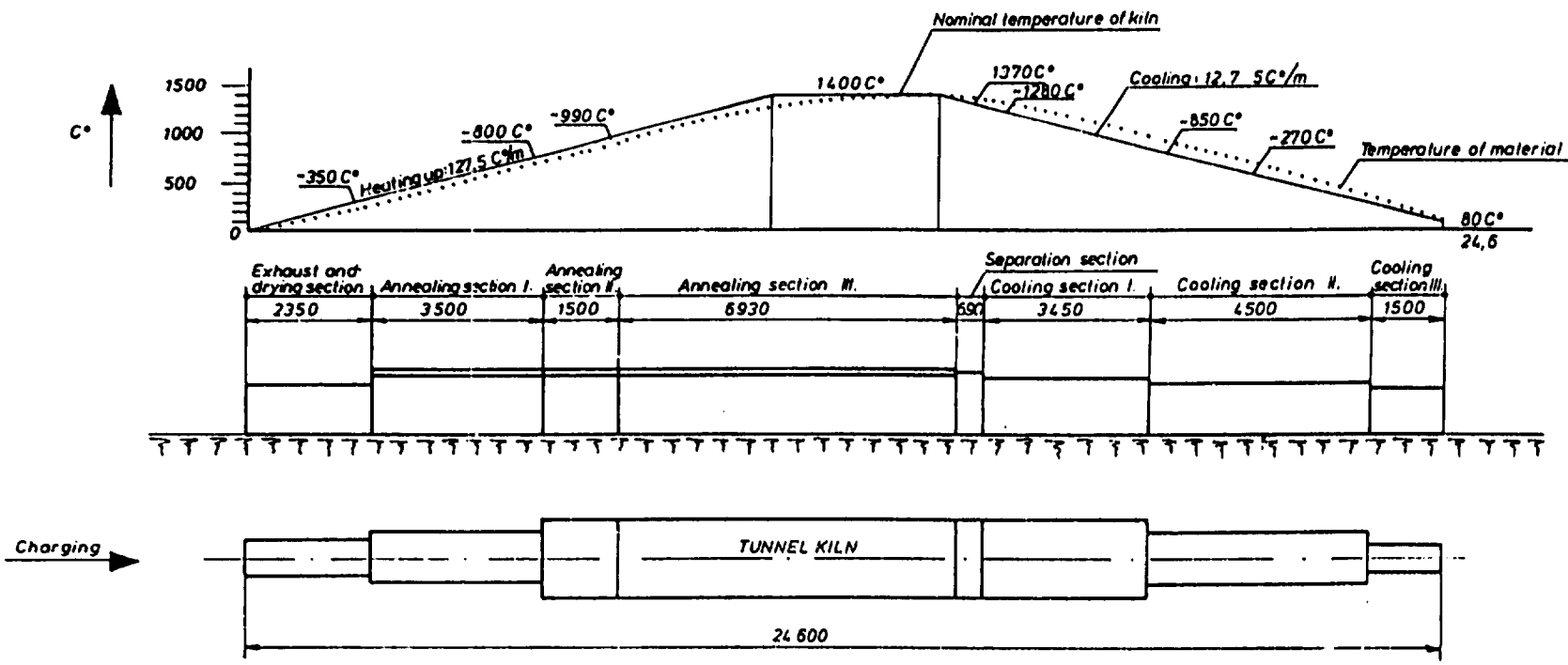


Figure 1

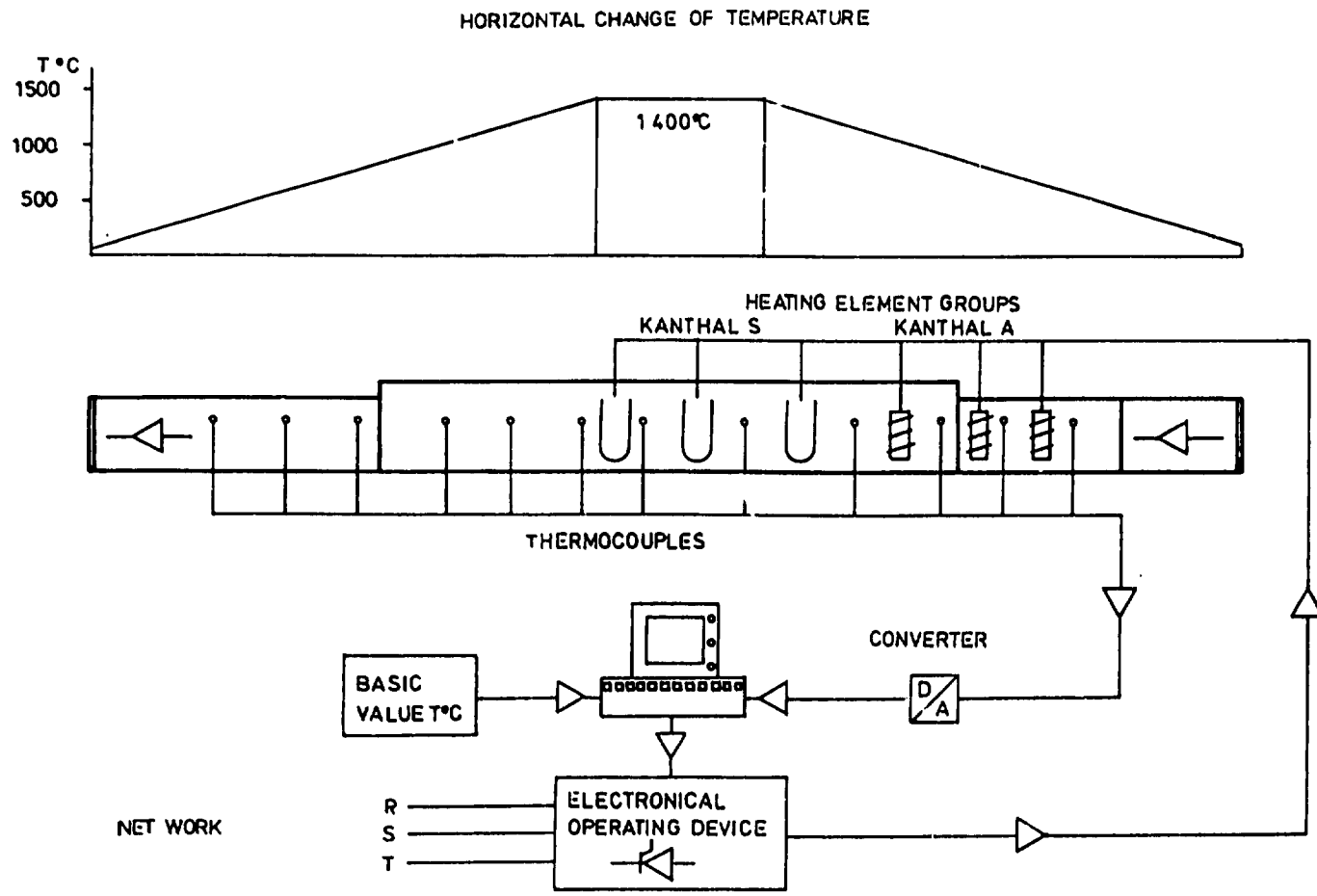


Figure 2

Short Description of Tunnel Kiln

The applied Ferrite Annealing Furnace for producing barium ferrite magnets is a Tunnel Kiln (sign No.FK/003/A), nearly 25 m long. Electrical heating along both side of kiln secures exact temperature curve with good quality magnet rings. The tunnel is formed by the furnace body with built-in heating elements in six zones. The train is the kiln's carriages delivering ceramic boxes upon, containing the slurry for ferritization or magnet rings for sintering. Each carriage contacts the next one when entering the Tunnel Kiln in 60-90 minutes intervals depending on the quality of slurry or water content and type of magnet rings.

The car pushing and pullig device is working by compressed air automatically in closed system. Electrical power for heating elements and push-pulling devices controlled by a special computer system and form a complete unit. This system is devoted to eliminate disturbances in the mains voltage fluctuations, various thermal load and other faults between the technical limits.

Tunnel Kiln has two main functions in the production technology. At first one is ferritization, converting hematite/barium-carbonate slurry into barium-hexaferrite; second one is sintering the green magnet rings satisfactory

hardness and untrimmed form. These two functions show Tunnel Kiln plays a central role in barium ferrite production technology and indicate importance of relations between Tunnel Kiln and other technological units.

Accuracy and reliability are secured by Computer Control System because the limitations of temperature curve range is 10°C in all heated zones. If the applied pushing time is 90 minutes per carriage, the charge spends 52 hours in the Tunnel Kiln and particularly 7.5 hours at the highest set temperature. When a carriage has been pulled out from kiln and the workers empty it, making it available for a new charge and enabling the straining with "waste" heat.

Operating of Computer Control System is very simple. On the keyboard have to enter following data:

required temperature in zone 1...6

pushing time

clock time.

If some fault happens on the kiln, the type of error appears on display and a buzzer sounds.

Due to local electric supply cut-offs Tunnel Kiln has a special service: it is able to work with a stand-by generator supply. Naturally, its functions by generator mode are limited, depending on the generator's load possibility. Preventing the generator off overloading, in generator mode the kiln is working only for keeping the set temperature.

Contents of Know How

KNOW HOW Anisotropic Barium Ferrite Magnet Manufacturing describes for the most important properties of permanent magnets with implementation studying of barium ferrite magnets - see Chapter One to Three.

Detailed and specified Production Technology of Barium Ferrite Magnets adjust USER producing high quality of magnets and help developing structure all the technological line from the raw materials to storage of magnetic rings - see Chapter Four.

One of the most important instrument of producing is Tunnel Kiln. Technical specifications and operating method is written in - Chapter Five.

Provide USER with instructions in theoretical and practical questions in the annealing technology, computer program and kilning furniture - see Chapter Six to Eight.

We discuss in detail the main steps of Production Technology specially for grinding, pressing, construction of press die, montage of oriental magnetic coarse for press, surface grinding - see Chapter Nine to Fourteen.

Separated Chapter is No. Thirteen, which shows how to open improvement of hydraulic presses automatical control system.

All the good conditions of high quality producing need a well-organised Quality Control System. Pattern of functional

parts described in Chapter Fifteen.

Final control realises technical datas of barium ferrite rings and the quality certificate is based upon this control -see Chapter Sixteen.

Naturally there is no production without reject. Analysis of rejects shows USER specified types of rejects and precautionary measures along the technological line - see Chapter Seventeen.

Labour-safety measures consist of technological proceeding recommended to leaders of factory protecting workers of accident - see Chapter Eighteen.

In Chapter Nineteen we take a proposal to build a National Standard for barium ferrite magnets.

History of Implementation

Part One - Preparation

On the basis of signing the subject contract the team of experts of TESCO/UVATERV visited the project site in April, 1987 to ascertain the local conditions, definition of the location of the Tunnel Kiln, studying the necessary adjustments of the existing building to host the pilot plant. A memorandum of understanding was signed by the facilities in terms of machinery, tools, utilities, skilled labour etc.

During this ascertaining mission the conditions of the existing machines were examined and a report was prepared and submitted by TESCO/UVATERV on the proposed rehabilitation of the existing equipment.

On the basis of the above visit to the project site the manufacturing of the Tunnel Kiln was continued in May, 1987 taking into consideration some modifications necessary due to the local conditions.

The manufacturing of the Tunnel Kiln was almost completed when the representative of UNIDO visited the site of production and examined the equipment by late September, 1987, before shipment, i.e. packing.

At the same time the construction and the regulating system of Tunnel Kiln was examined by the Fire Engineering and the Automatization Faculties of the Technical University of

Miskolc, Hungary. It was confirmed, that the construction, regulating system, i.e. the technology represented by the Tunnel Kiln fully fits to the requirements: it is capable for magnetizing and sintering on an efficient level.

The Tunnel Kiln was dispatched from Hungary in eleven 20-foot containers by late October, 1987.

Part Two - Training

The two-month training programme of seven Vietnamese experts took place in the reference plant of TESCO/UVATERV, i.e. in VIDEOTON in the period of November-December, 1987. The experts were trained on all the phases of the subject technology so that they can be prepared to co-operate with the Hungarian team during the installation of Tunnel Kiln, commissioning, trial run and they will be capable to operate the kiln later on.

Part Three - Investigation of difficulties

A Hungarian team visited the project site in January, 1988 investigate the availability or facilities to be provided by the Implementing Agency. Some shortcomings, difficulties were revealed. Their rectification was agreed upon and incorporated in a protocole.

Part Four - Building of Tunnel Kiln

The eleven containers including Tunnel Kiln arrived to the project site in March, 1988. On March 16th, 1988 the actual location for the erection and installation of Tunnel Kiln was handed and taken over to start the work. It was concluded that the foundation to the Tunnel Kiln is ready, but it is not prepared in the expected and necessary standard. The adjustments and modification on the building were in process. From the first day of erection on a log was conducted in the Hungarian language and signed by representative of TESCO/UVATERV and the Implementing Agency - after translation - every day. The log contains all important events, problems, successes and is available at TESCO/UVATERV for easy reference.

Part Five - Problems during the building

At the end of March, 1988 the major problems hindering our work were indicated to Implementing Agency, such as lack of some machines and equipment to be provided by Implementing Agency, rather frequent cut-offs and deviations in the voltage of the electric network. However, it must be emphasised that the staff of Implementing Agency showed full preparedness for co-operation and they rendered significant assistance towards facilitating our work in the Project Area.

The process, successes and difficulties of the project implementation were studied and discussed during the Tripartite Project Review meeting, which took place late March, 1988. In the light of the actual situation and the facilities available, a new project implementation schedule was drawn up clearly indicating the responsibilities of the participant.

Part Six - Building goes on

On April 4th the whole steel structure of Tunnel Kiln was ready. On April 9th the brick-laying of the kiln was started, which was followed by the electrical and electronic mounting and assembling by May 6th. During this period cut-offs and significant deviations in the electrical supply were registered and the attention of Implementing Agency was drawn to the problems prevailing and/or foreseen due these problems in the electrical supply. This problem has not been solved so far, although in all our correspondence its influence on the project implementation was emphasized.

Part Seven - Cause of problem is the rain

In May, there were heavy rainy days which led to the flud in the cable channel as well as in the operation-maintenance channel under the kiln due to non-proper isolation of them by Implementing Agency.

TESCO/UVATERV submitted a proposal to solve this problem and avoid life danger which might be caused by the water in above mentioned channels.

Our proposal for this activity has not been evaluated so far. Eventual danger of this situation were reflected in our correspondence.

Part Eight - Building goes on

By May 19th, the brick-laying of the kiln was completed, whilst the electric and electronic mounting and assembling was ready on June 3rd.

Part Nine - Vietnamese raw material test in Hungary

In the meantime, by the end of May, a consignment arrived to Hungary containing Vietnamese raw materials to the barium ferrite production. This material was tested in laboratories in Budapest and a semi-industrial pilot production of barium ferrite rings out of this material was undertaken in the reference plant in VIDEOTON in Szekesfehervar, Hungary. The

results are good and promising and it has been proved that the Vietnamese raw material provided in May, 1988 is suitable for barium ferrite magnet production. The chemical composition of sample as well as the magnetic parameters of final product prepared in VIDEOTON were submitted to UNIDO.

Part Ten - Building goes on

In June the adjustment of the electronic-regulating system and the pneumatic system was undertaken. The heating elements were installed in the Tunnel Kiln also this month.

Part Eleven - Heating up process is starting

On June 28th the heating up process of Tunnel Kiln was launched, the Kanthal A elements reached their operational temperature soon. The heating up of the Super Kanthal heating elements had been delayed due to some problems occurred in the meantime with the climatic conditioning of the control room and mainly with the continuous cut-offs and falls of the voltage [the voltage frequently reached 160-170 V instead of 220 V and 300-320 V instead of 380 V]. These phenomena led to the disintegration of the software package of the control system as the system normally can be run with 220 V +/- 10%.

Part Twelve - Problems with network again

On June 8th, the main cable connecting the street network with the transformer was burned out due to its undermeasured realization by Implementing Agency. TESCO/UVTERV's experts rendered assistance in giving advise on suitable measuring of this cable. The heating up could have been continued by July 15th, 1988.

Part Thirteen - Training of technology

Two Hungarian experts provided in-plant training of technology in period of July 11th - August 23rd, whereas detailed training of technological phases was conducted and proposals were provided to improve the production with existing possibilities available at the project site.

Part Fourteen - Kiln's temperature on the nominal value

July 21st, 1988 is a very important day in process of the project implementation, as the Tunnel Kiln reached its nominal heated up temperature of 1230°C on this particular day. Tunnel Kiln was fed with the first magnet rings on the same day and the first products came out on July 23d. On July 22nd bulging of the rails occurred in a certain point which was caused by insurting a carriage by the counterpart experts opposite to the required way. this led to increase in heat-radiation and dilatation of the rails.

Anyhow, Hungarian experts rectified the error in a couple of hours.

Part Fifteen - Kilning furniture arrives

The kilning furniture procured by UNIDO from TESCO arrived to project site by air by the end of July, whilst the shipment by sea arrived in the second half of September. The guarantee on kilning furniture applies only for hot breakages during the heating periods and does not apply to mechanical breakages of any kind or of any reason. Therefore, Hungarian team in the Project Area continuously drew the attention of the managers and the workers of the plant to careful and professional handling of kilning furniture. It seems that in Viet Nam there is non applicable kilning furniture specially for barium ferrite magnet producing.

Part Sixteen - Tunnel Kiln starts producing

On July 27th, 1988 the full-scale production of barium ferrite magnets was started in the project plant and it has been carried on since that date. Tunnel Kiln provides both magnetizing and sintering securing its multipurpose functions according to the contract.

The quality control unit of the plant realized and acknowledged that the standard and parameters of the magnets

produced by Tunnel Kiln were and are much more favourable compared with the ones before installing the Tunnel Kiln. Since that day Tunnel Kiln serves as a basis for magnet production of the plant and contributed to secure a continuous supply of magnetic materials to the electronic industry of Viet Nam.

Part Seventeen - Trial run with voltage disturbances

In the period of July 30th - September 1st TESCO/UVATERV's experts laid significant efforts to enable Tunnel Kiln to operate smoothly under low and changing voltages. On the basis of local experience and being aware of local possibilities necessary modifications were made on the hardware and software of electrical regulation system. This activity way beyond TESCO/UVATERV's contractual obligations but we did it to facilitate a reliable operation even under the prevailing difficult circumstances related to the unstable electrical supply. However, Tunnel Kiln was in operation under this period, as well.

Part Eighteen - Heating up to 1320°C temperature

Upon the request of Implementing Agency the Tunnel Kiln was heated up to 1320°C on August 6th, 1988. The kiln showed reliable performance on this temperature, as well. The cooling down, back to 1220°C was done on August 20th.

Part Nineteen - Adaptation of control and regulation system

During September the adaptation of electrical control and regulation system of Tunnel Kiln was undertaken so that it can best fit to the local conditions. By the end of September talks were carried out in Hanoi with the participation of Implementing Agency, the SIDFA of UNIDO and TESCO/UVATERV. Tunnel kiln was tested in period of 27-30th September and all functions of kiln were studied.

During the test inaccuracies in temperature measurements were registered, therefore TESCO/UVATERV sent a team of experts to the project site to investigate the reasons and rectify the error. It was found that the problems in temperature measuring, i.e. registering were caused by the default, i.e. non-proper contact in the main switch attached after the transformer supplying the Tunnel Kiln with electric power. Eventough the link between the default in the main switch and the inaccuracies in temperature measuring were evident and acknowledged by Implementing Agency on the project site, this

source of trouble-making has not been eliminated so far, i.e. the main switch has not been improved yet.

Part Twenty - Formal handing and taking over procedure

The formal handing and taking over procedure was scheduled to take place in period of 18-21st October, 1988.

The performance test was carried out and according to the log also signed by representative of Implementing Agency the operation of Tunnel Kiln was perfect, failures were not observed and not registered, furthermore the kiln was operating satisfactorily both in normal electrical network and in generator modes. The requirements to Tunnel Kiln were met and a report was written on the operation of the kiln to prove accuracy of regulation system. The parameters of kiln fell in the range as specified in the contract, some parameters proved to be significantly better than ones in contract.

Part Twenty One - CTA's negotiations

Eventough results of performance test were positive and satisfactory the handing over and taking over protocole prepared previously was not signed due to the recommendation of CTA of UNIDO. He made observations related to stucture, control and regulation system of the kiln, i.e. the

technology represented by Tunnel Kiln in general.

We have to emphasize here again that cut-offs and deviations in supply of electric energy were typical during the whole period covered by this report. This particular problem caused us several difficulties and hampered our performance of job, however Tunnel Kiln proved to be able to operate smoothly due to the efforts laid from our side and the assistance from the side of Implementing Agency.

Part Twenty Two - Discuss between CTA and TESCO/UVATERV

In the period of November and early December an exchange of observation, opinions and remarks between the CTA and TESCO/UVATERV with the co-operation of UNIDO was carried out. During this period Tunnel Kiln was operating well and it was manufacturing barium ferrite magnets of good quality eventhough neither the rehabilitation of existing machinery, nor the putting into operation to full scale of compacting press and the atomizer was realized. It must be emphasized that Tunnel Kiln is a very important part of the technological manufacturing line, but it is not the only one, therefore it is evident that the output - in terms of quantity, quality, parameters etc. - of the pilot plant is subject to numerous influencing factors beyond the control and responsibility of TESCO/UVATERV.

Part Twenty Three - Performance test in January

Upon mutual agreement the Performance Test of Tunnel Kiln was carried out in the premises of Implementing Agency in the period of 7-11th January, 1989. The preconditions and the method of performance test were laid down and agreed upon in the note dated January 7th, 1989 attached hereto as Annex 1. The test was carried out accordingly. The results of Performance Test were stated in the protocol signed by representatives of UNIDO, Implementing Agency and TESCO/UVATERV; confirming that:

- the results of test analysis of magnetic parameters were in accordance with Clause No.2.08 of the contract;
- all parties concerned signing the protocols confirmed that the ferrite annealing furnace No. FK/003/A supplied by TESCO/UVATERV fulfilled all the requirements as stipulated in the contract;
- CTA confirmed that the temperature curve and temperature differences over the cross section were sufficient to produce good barium ferrite products.

All these documents are attached hereto as Annex 2.

Part Twenty Four - Agreement on warranty

Based upon the successful Performance Test agreement was reached on the warranty of Tunnel Kiln. The contents of warranty regulations as well as the list of mechanical and electronical components transferred to Vietnamese warranty team were incorporated in writing. The relevant documents are attached hereto as Annex 3. The warranty period started on October 21st, 1988 and expires on October 21st, 1989. According to the stipulations of warranty regulations Implementing Agency keeps UNIDO and TESCO/UVATERV informed on using spare parts and component.

Part Twenty Five - First report of Implementing Agency

The first report covering the period January 12th - March 31st, 1989 were sent by Implementing Agency in due course and is attached hereto as Annex 4. The basic statement reflects that Tunnel Kiln has been working normally during this period.

Part Twenty Six - Evaluation of equipment

In the course of Performance Test a short evaluation of the equipment available in the premises of magnetic materials pilot plant was prepared by CTA, attached hereto as Annex 5. Understanding the situation that the Vietnamese side does not intend to implement rehabilitation programme of existing

machinery based on TESCO/UVATERV's proposal submitted to UNIDO in June, 1988. TESCO/UVATERV sent a proposal to UNIDO offering the available spare parts for use of Implementing Agency which is attached hereto as Annex 6.

Part Twenty Seven - Printer to regulating unit

In the previous correspondence as well as during Performance Test Implementing Agency expressed its wish to obtain a printer to the regulating and control unit of Tunnei Kiln. The printer was delivered to UNIDO with an accompanying letter attached as Annex 7.

Part Twenty Eight - List of appliances, tools and spare parts

During the implementation of project TESCO/UVATERV rendered assistance and provided services as well as equipment, appliances and tools over and beyond contractual obligations. These are listed in Annex 8. and 9. attached.

Part Twenty Nine - Transfer of know-how

Concerning the transfer of know-how TESCO/UVATERV's performed their activity in accordance with contract. A short summary was prepared on January 9th, 1989 attached hereto as Annex 10. The written, detailed know-how was submitted to UNIDO in April, 1989.

Part Thirty - Spent time by experts and mounters

A summary of man-days spent by experts and mounters of TESCO/UVATERV in the project area is attached as Annex 11.

Part Thirty One - Conclusion

Summarizing the project implementation the following conclusions may be drawn:

-- there was a close, friendly and fruitful cooperation among UNIDO, Implementing Agency and TESCO/UVATERV which enabled to reach the followings;

-- TESCO/UVATERV performed their job in full accordance with the clauses and stipulations of contract;

-- the project has been completed according to the time schedule set forth;

-- magnetic parameters of Tunnel Kiln's product fully meet the requirements of contract;

-- Tunnel Kiln is in operation since August, 1988 and performs its job satisfactorily.

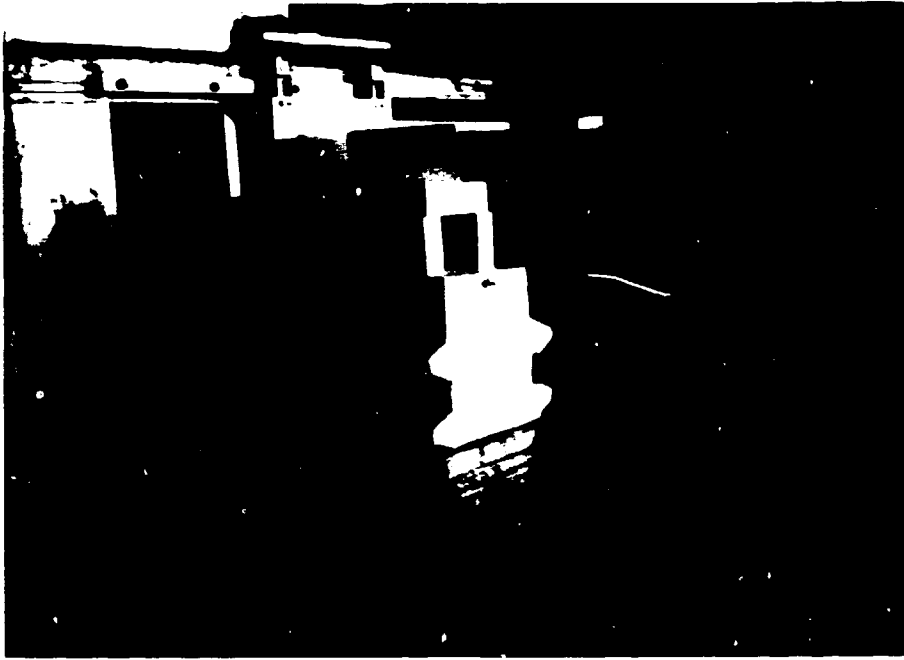
TESCO/UVATERV are convinced that the implemented project contributes to the development of electronic industry of Viet Nam and provides good basis for further expansion and development.

TESCO/UVATERV express their thanks and acknowledgements to all parties concerned who helped their activity and enabled a succesful project implementation.

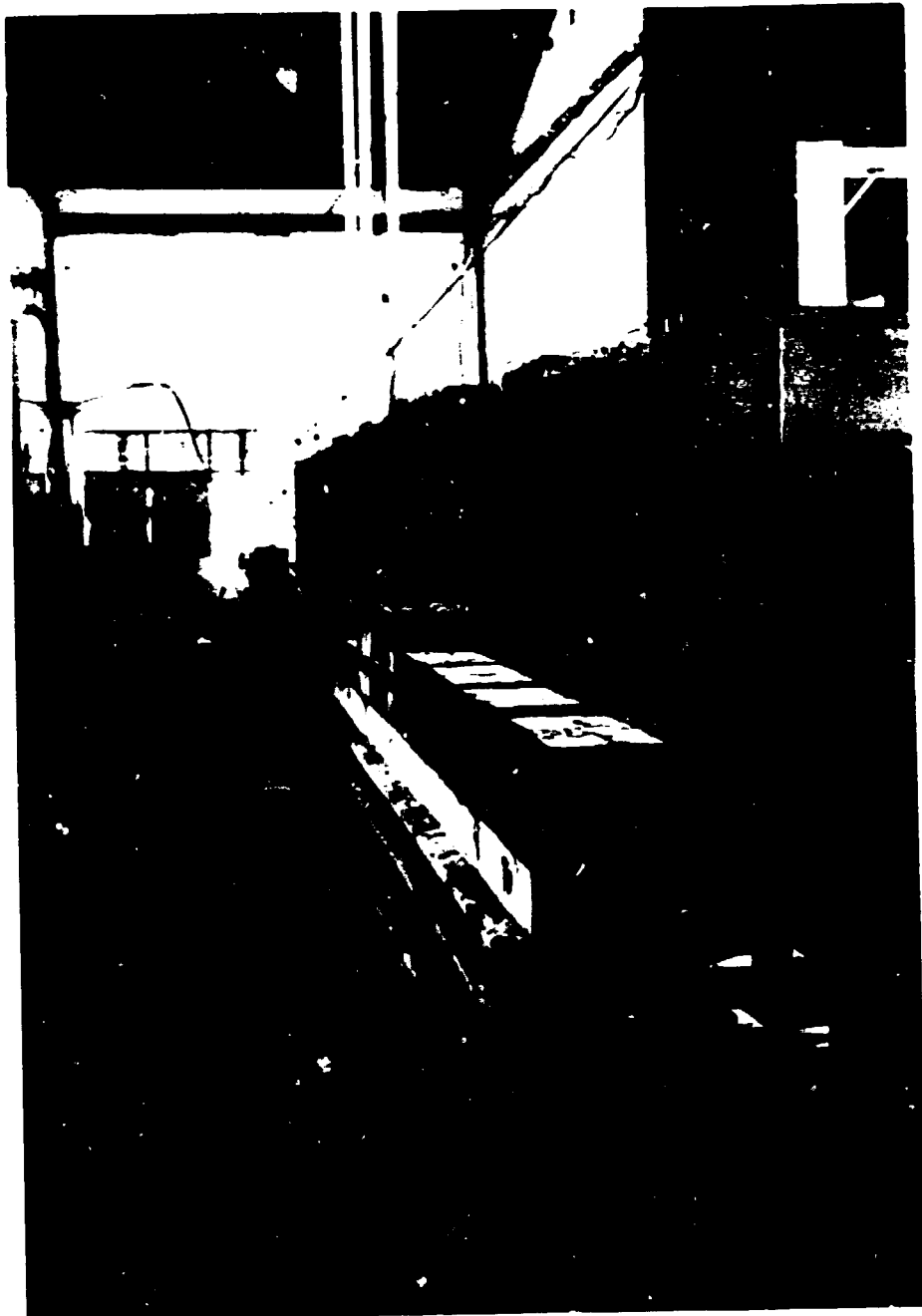
Heating up of Tunnel Kiln starts at 28th of June, 1988.



On photos seems Tunnel Kiln during the period of heating up
to nominal temperature.



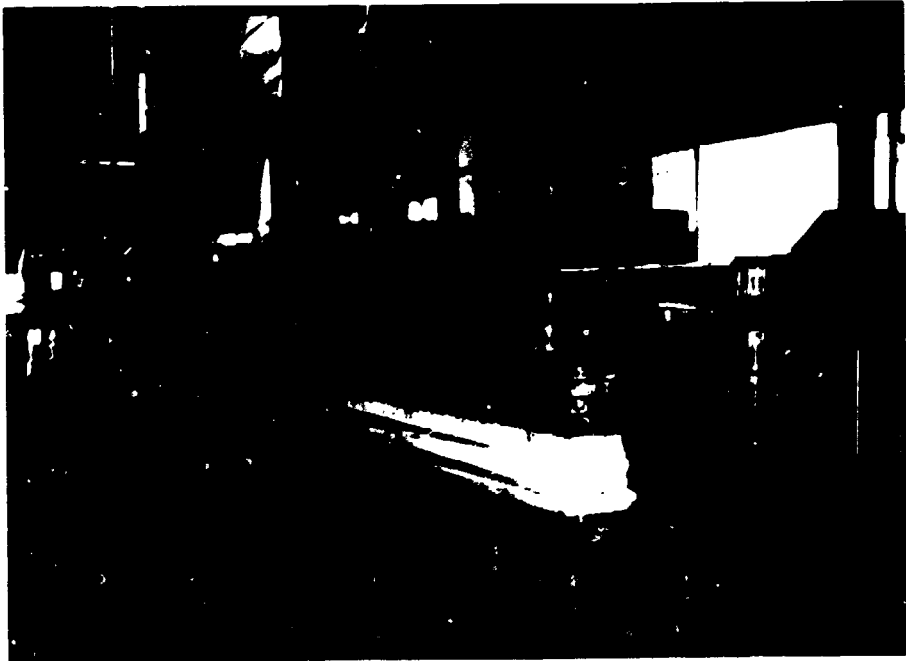
Tunnel Kiln is ready for produce at 27th of July, 1988.



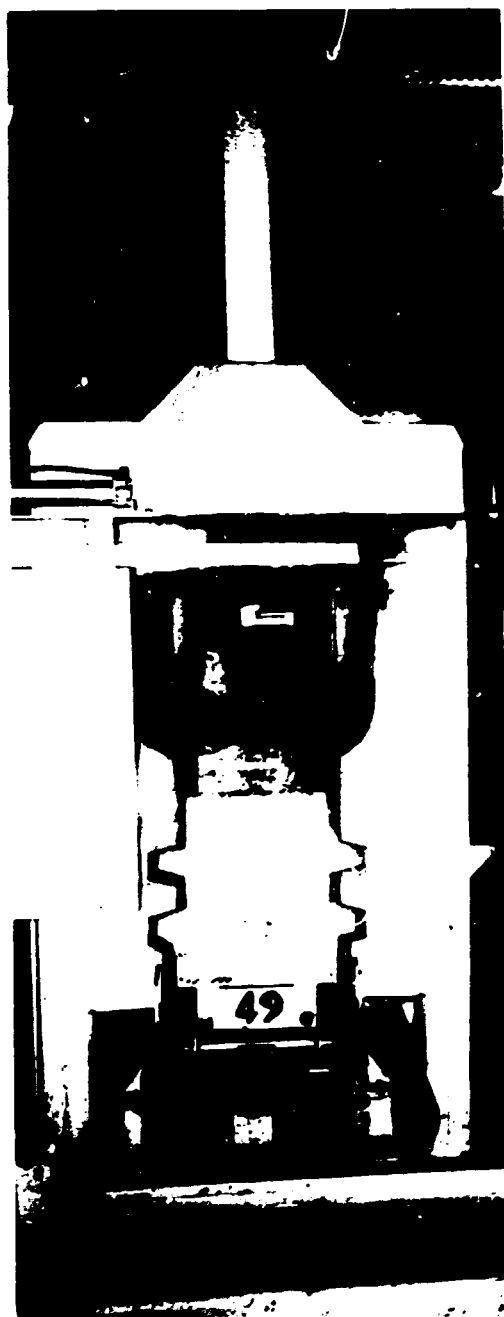
Tunnel Kiln's control room in January, 1989.



Performance Test in January 1989.



Performance Test is finished at 11th of January, 1989.



Fulfillment of the
Responsibilities of
TESCO/UVATERV

TESCO/UVATERV fulfilled their contractual obligations according to the stipulations of the subject contract No. 86/125. The responsibilities of contractor are determined in details in Clause 2.00 of contract, so this may serve as a basis for evaluation.

2.01 Statement of Work and Supply

a)

the design-layouts, specifications and manuals required for the establishment, commissioning, testing and operation of the plant and drawings and instructions on the maintenance of Tunnel Kiln and for the processes to be used have been provided in sequence of the work schedule and enabled a smooth collaboration with Implementing Agency. The formal, written know-how has been handed over upon the agreement on its required content in the course of talks during Performance Test. The drawings, specifications and manuals have been in accordance with Annex E. of contract.

b)

technical specifications of equipment being newly

purchased were consulted and advice/instructions on the rehabilitation of existing machines have been provided. TESCO/UVATERV sent a four-member expert team to project site to undertake a detailed survey. The proposals (findings, suggestions etc) have been presented to UNIDO and Government in different forms, such as reports, evaluations, commercial offer etc. Documentations to support rehabilitation have been handed over during the training course in Hungary in November-December 1987. The costs of the related activity were born by TESCO/UVATERV.

c)

TESCO/UVATERV supplied Tunnel Kiln with the spare parts and materials according to the time schedule and with the content in accordance with Annex G of contract.

d)

TESCO/UVATERV provided experts to supervise and assist in the erection, assembly, commissioning and initial operation of Tunnel Kiln and for the on-the-job training for local personnel according to Annex 11 of present report.

e)

the training of Vietnamese personnel for 14 man-months was conducted in VIDEOTON Co.Ltd.,

Szekesfehervar-Hungary, which is reference base in this project, in November-December 1987.- before starting the erection of Tunnel Kiln in the project area.

f)

advice on initiation of research and development activities to develop new and advanced product were provided during the training course in Hungary as well as in the course of on-the-job training in Hanoi.

2.02 Commencement and Completion of Contractor's Activities

a)

Tunnel Kiln, spare parts and materials were delivered CIF Haipong according to work plan. Minor adjustment in delivery was due to the site preparation activities.

b)

foundation layout and the remainder of documentation were provided before shipment of Tunnel Kiln.

c)

erection, testing and commissioning of Tunnel Kiln was in accordance with estimates of TESCO/UVATERV.

d)

timetable was modified and agreed in March 1988 during the Tripartite Project Review meeting in Hanoi, anyhow TESCO/UVATERV fully followed the original final

completion date.

2.03 Testing of Tunnel Kiln before Shipment

a)-d)

UNIDO was kept informed on a regular basis on the progress of manufacturing of Tunnel Kiln. The representative of UNIDO was present during the test in Hungary performed by the end of September 1987. A specialized institute was involved in evaluation of Tunnel Kiln, a short report was submitted on the findings to UNIDO at the same time.

2.04 Spare Parts for Tunnel Kiln, Commissioning and Operation; Special Maintenance Tools, Consumable Materials

a)-d)

TESCO/UVATERV supplied spares for the initial commissioning of Tunnel Kiln as well as a quantity of normal wear and maintenance spare parts sufficient for the first two years of Tunnel Kiln operation. A list of these spares is included in Annex 3 of the present report.

Descriptions, catalogues for spare parts and materials not manufactured by TESCO/UVATERV were handed over to Implementing Agency.

2.05 Packing, Shipping and Insurance of Tunnel Kiln

Actions of TESCO/UVATERV related to packing, shipping

and insurance of Tunnel Kiln were in full accordance with this Clause and Annex D of contract which led to a smooth and successful delivery with the assistance of UNDP/Hanji.

2.06 Visit to Plant Site

TESCO/UVATERV's representatives visited the plant site prior to contacting and ascertained all conditions and information pertaining to the work.

2.07 Contractor Personnel for Erection, Testing and Commissioning of Tunnel Kiln and Local Training

Actions of TESCO/UVATERV were in accordance with stipulations of this Clause.

2.08 Performance Warranty

The Performance Test during 8-11 January, 1989 showed that Tunnel Kiln meets the requirement as set forth in this Clause. Results of Performance Test are attached as Annex 2 to the present report.

2.09 Performance Test of Tunnel Kiln

Performance Test was implemented in conformity with stipulations of this Clause during 8-11 January and showed full success, the Protocole is attached as Annex 1 and 2 to this report.

2.10 Not applicable

2.11 Mechanical Warranty of Tunnel Kiln

Upon the successful Performance Test of Tunnel Kiln the contents of warranty regulations were drawn up and agreed, attached as Annex 3 this report. The warranty period lasts up to October 21st, 1989.

2.12 Modifications to Tunnel Kiln

Minor modifications have been carried out during the installation on the mechanical part of Tunnel Kiln according to special local conditions not affecting the performance of Tunnel Kiln. Major work has been carried out on adjustment of software computer-programme to cope with the fluctuations of the electrical energy supply to ensure reliable operation even under uncertain energy conditions.

2.13 Not applicable

2.14 TESCO/UVATERV provided all the facilities and services required by their personnel for the execution of subject contract.

2.15 TESCO/UVATERV provided such other equipment and spare parts (see Annex 8 of this report) and rendered such other engineering and technical services and personal which are implied by generally accepted professional standards.

2.16 Standard of Work

The project implementation and Performance Test showed that TESCO/UVATERV carried out all their responsibilities on generally accepted professional standards.

2.17 Relationship between the Contractor's Teamleader and the Resident Representative of UNDP in the Project Area

There was a close and continuing relationship maintained between the teamleader and experts of TESCO/UVATERV and UNDP office in Hanoi. Acknowledgement is expressed here for the support rendered by UNDP/Hanoi during the project implementation.

2.18 Debriefing

There was a close and continuing relationship between UNIDO Headquarters in Vienna and TESCO/UVATERV Headquarters in Budapest during the whole period of project implementation.

2.19 Training Aboard

Training of seven Vietnamese took place in November-December 1987 according to the work plan before the commencement of erection of Tunnel Kiln. The experience and practice gained during this period supported the acquiring of the production technology as well as operation of Tunnel Kiln.

2.20 Reports

Reports have been submitted to UNIDO in due number of copies, in English language according to the work plan with minor adjustments related to the practical aspects of the project implementation.

RECOMMENDATIONS

As there is written the Tunnel Kiln is one of the most important factor at the technological producing line, but single is not enough to complete technology aimed of producing good quality of barium ferrite magnets.

Main jobs we have to offer to USER have two sides.

First side aimed near future:

- Used equipments have to be rehabilitated, as soon as possible, specially recommended pressing machines, main electric network and last but not least the stand by generator
- Get to be use Tamagawa compact pressing and granulator
- Organize Quality Control System as offered in Know How see chapter fifteen
- Exercise day by day production technology as written in Know How see chapter four

Second side aimed further:

- USER should be completed his usual technological equipments into Know How offered furniture, as vacuum revolving filter, jaw breaker, roller mill etc.
- Change at present active small ball mills and attritors into bigger and better ones, the theory and mode of operation of grinding is written in Know How see chapter nine

- Supervise and complete the automatic control of hydraulic presses, as it is described in Know How see chapter Thirteen

- IF the quantity of production reaches 100 To per year, the technological line should be organized again, and completed with one more Tunnel Kiln, therefor ferritization and sintering will be absolute separated of each other. You should know, that capacity of Tunnel Kiln is more than 100 To per year, but the bigger quantity of products needs one separated line for ferritizing and another one for sintering, as the Vietnamese experts have seen in VIDEOTON, Hungary.

At last TESCO/UVATERV wishes that all his work gave a practical guidance for manufacturing barium ferrite magnets and helped developing electronical industry of Viet Nam.

PERFORMANCE TEST FOR TUNNEL KILN

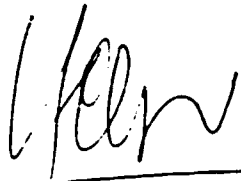
Starting 7 January 1989

Starting fourteen (14) hours 7 January 1989 ,The Kiln will be loaded with bricks until 8 January 9.00 hours . Starting 9.00 hours on 8 January . The Tunnel Kila will be loaded with seven cars build up as follows :

3 stacks of 4 fire boxes : loaded with ferrite rings ,as normally loaded. If not sufficient raw material rings are available ,certain stacks can be filled with already fired products . The factory keeps a log of car number and stacks of products ,to separate the fired and already fired products .

Only certain stacks of agreed fresh products will be measured for magnetic properties .

HANOI , 7 JANUARY 1989



MR. LE VAN CHI
NATIONAL PROJECT DIRECTOR
FERLOVINA



MR. H. KOJONEN
UNIDO



MR. P. HOLZER/MR. P. MARANCSIK
TESCO/UVATERV .

DP/ VIE/80/028

Supply of Tunnel Kiln , spare parts and materials and provision of engineering sciences for the establishment of a Barium ferrite Pilot Plant in the S.R. of VIETNAM .

UNIDO contract no. 86/125 with TESCO/UVATERV , HUNGARY

PROTOCOL OF PERFORMANCE TEST OF THE TUNNEL KILN

carried out according to clause no. 2.09 of the contract and as modified and agreed upon by parties concerned in the premises of FERLOVINA , HANOI, VIETNAM from 8 January to 11 January 1989 .

The results of test analyses of the magnetic parameters are in accordance with clause no. 2.08 of the contract .

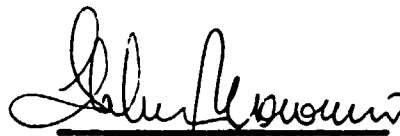
Therefore all parties concerned are herewith signing this protocol and confirming that the ferrite annealing furnace no. FK 003/A supplied by TESCO/UVATERV fulfill all the requirements as stipulated in the contract .

HANOI , the Socialist Republic of VIETNAM

11 January , 1989



UNIDO



TESCO/UVATERV



FERLOVINA

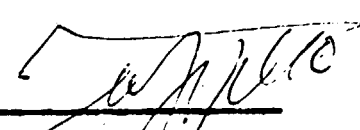
Average magnetic values obtained in performance test of Tunnel Kiln

FK 003/A from 8-12 January 1989 .

	Br	Hc	Hmax
Average both sides	3735	2005	3.18 HGOe/25.35KJ/m ³
Average right side	3752	2000	3.21 HGOe/25.7 KJ/m ³
Average left side	3718	2010	3.14 HGOe/25 KJ/m ³
Average different levels	1R 3856	2058	3.26 HGOe/26.1KJ/m ³
	2R 3608	2108	3.02 HGOe/24.2 KJ/m ³
	3R 3683	1955	3.14 HGOe/25.2 KJ/m ³
	4R3823	1907	3.36 HGOe/25.9KJ/m ³
	1L 3786	2123	3.15 HGOe/25.0 KJ/m ³
	2L 3653	2100	3.04 HGOe/24.3KJ/m ³
	3L 3683	1916	3.12 HGOe/25KJ/m ³
	4L 3750	1900	3.23 HGOe/26.9KJ/m ³

CONCLUSION : Temperature curve and temperature differences over cross section sufficient to produce good Barium Ferrite products .

HANOI , 12 JANUARY , 1989


 JAR APPELO

CTA, PROJECT DE/VIE/80/028 .

THE CONTENTS OF WARRANTY REGULATIONS ON TUNNEL KILN .

At the Factory of Science and Manufacture of Magnetic Materials Blanketware
- Hanoi (VIETNAM) .

The representative of Tunnel Kiln Manufactures is :

Mr. PÁL HERNÁDIK : TESCO/UVATERV

The representatives of the Project are :

Mr. LE VAN CHI : Director of the Factory and Director of the
Project

and other assistances .

The two sides come to an agreement of warranty content of Tunnel Kiln as follows :

1/ Tunnel Kiln : SK 003/A made by TESCO/UVATERV (Hungary) and transferred to the project VIE 80/028 for use on 12 January 1969 . a warranty time of 12 months starting on October 21st ,1968 .

2/ TESCO/UVATERV assigned a warranty team consisting of Vietnamese specialists (at present ,they are working in the project VIE80/028) with the following names :

- 1- Mr. TRAN GIUYEN : Mechanic specialist
- 2- Mr. NGUYEN THANH BACH : Mechanic specialist
- 3- Mr. NGO VAN LUONG : Electronic specialist
- 4- Mr. NGO THIE MINH : Electronic specialist .

guided by Mr. TRAN GIUYEN and Mr. NGO VAN LUONG ,taking responsibility of maintenance ,repair and signing in the repairing record in the time of warranty performance of Tunnel Kiln .

These Vietnamese have been trained by TESCO/UVATERV ,having good knowledge of repairing and operating Tunnel Kiln .

TESCO/UVATERV confirms that the above Vietnamese experts in the warranty team are allowed to conduct preventive maintenance ,cleaning and repair .The Vietnamese party is to conduct a log and record all actions taken in English language .Pages of this log should be sent to UNIDO and TESCO/UVATERV in each second month .

Only the people in the warranty team have the right to repair Tunnel Kiln .On using the spareparts and components ,a record should be made and informed to UNIDO and TESCO/UVATERV .If those spareparts and components are used and

the warranty time is not ended, TESCO/UVATERV has responsibility to send in time more parts to replace for the stock .

As regarding the damages parts necessary to be sent to Hungary for repair and replace, TESCO/UVATERV take charge of all expenses for transportation from Vietnam to Hungary and from Hungary to Vietnam through Hungarian Commercial Section in Vietnam .

After the warranty time expires, TESCO/UVATERV will leave at the factory all the remaining spareparts , components and instruments and hand tools except the spare Computer and Monitor .

TESCO/UVATERV and the leader of warranty team have an agreement on a list of varieties and quantities of parts , components and instruments necessary for repair in warranty time . (Annex 1,2)

In the warranty time, TESCO/UVATERV has the right to send their staff, experts to the project to see and to check the operation of Tunnel Kiln and warranty team .etc...the expenses of travelling , hotel accommodation is to be born by TESCO/UVATERV , the project staff will assist TESCO/UVATERV in the work .

5/ For the damages caused by the project staff, TESCO/UVATERV is not responsible for warranty repair . The warranty team , National Project Director and UNIDO representative confirm the damages of this kind and make a record

6/ During the warranty time , in case of any serious damage , TESCO/UVATERV , National project Director and UNIDO's representatives will together evaluate the reasons causing those damages .

The warranty does not apply to any damage caused by :

- a/ Duration of the voltage or lack of energy supply
- b/ lack of preventive maintenance and proper cleaning
- c/ lack of refilling with lubricants
- d/ inadequate repair
- e/ collapse of the carriages's load in the Kiln
- f/ delay in replacing damaged parts
- g/ substantial modification of the Tunnel Kiln .

The parties that causes those damages will have the responsibility .

This content has been discussed and come to be signed by the parties :

TESCO/UVATERV , National Project Director and UNIDO's representatives with a validity within the warranty time .

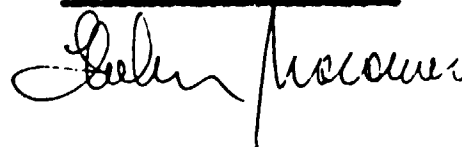
HANOI , 12 January 1999

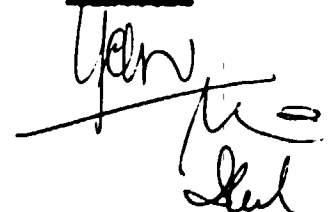
REP. OF UNIDO

REP. OF TESCO/UVATERV

HaPaLe







ANNEX 1

THE LIST OF MECHANICAL COMPONENTS WHICH ARE TRANSFERRED TO VIETNAMESE
WARRANTY TEAM BY HUNGARIAN .

i	N°	i	ITEMS	i	UNIT	i	QUANTITY	i	ADDITION
i	1	i	iElectric welding machine (intergrate)	i	Set	i	01	i	
i	2	i	iMetal cutter	i	Pc.	i	01	i	
i	3	i	iHand drill	i	-	i	01	i	
i	4	i	iBrick cutter	i	-	i	01	i	
i	5	i	iManual Jacked 12 T	i	-	i	01	i	
i	6	i	i Eto	i	-	i	01	i	
i	7	i	i Hammer 2000 (assemble)	i	●	i	01	i	
i	8	i	iHammer 1000	i	-	i	01	i	
i	9	i	i Hammer	i	-	i	03	i	
i	10	i	iPliers	i	-	i	01	i	
i	12	i	i Iron frame	i	-	i	01	i	
i	12	i	i Cable coil (2 phases)	i	-	i	01	i	10 m long
i	13	i	i Diamond cutter	i	-	i	02	i	
i	14	i	i Brick Manual cutter	i	-	i	01	i	
i	15	i	i hand volmeter	i	-	i	01	i	
i	16	i	i Diamond blade of brick cutter	i	Blade	i	02	i	old
i	17	i	i Plastic balance tube	i	set	i	01	i	
i	18	i	i welding roll	i	set	i	02	i	
i	19	i	i 3 phases plug	i	piece.	i	01	i	
i	20	i	i Plastic air tube	i	meter	i	04	i	
i	21	i	i amiang wire	i	meter	i	04	i	
i	22	i	i Glass cotton	i					
i	23	i	i Glass water	i		i		i	
i	24	i	i Paint	i		i		i	
i	25	i	i oil dissolved paper used for wagon	i		i		i	
i	26	i	i Gas welding setting (consist of air connection)	i	set	i	01	i	
i	27	i	i KANTHAL	i	Pc.	i	53	i	
i	28	i	iSUPER KANTHAL	i	-	i	23	i	
i	29	i	i Plastic press air tube	i	meter	i	20	i	Supply later
i	30	i	i Plastic ring	i	Pc.		40	i	Supply later .

12 January ,1989

ANNEX 2

THE LIST OF ELECTRONICS COMPONENTS WHICH ARE TRANSFERRED TO VIETNAMESE
WARRANTY TEAM BY HUNGARY .

N°	ITEMS	UNIT	QUANTITY	ADDITION
1	1 electronic cards	1 Card	1 08	1
2	1 Repairing cards	1 -	1 01	1
3	1 Thyristor TT210A 800VDC	1 Piece	1 02	1
4	1 Thyristor TT75A 800 VDC	1 -	1 02	1
5	1 Thermostat oil	1 Box	1 01	1
6	1 Sincron transformer	1 Piece	1 01	1
7	1(Saracot) Connect board	1 -	1 03	1
8	1 Termo element fuse board	1 -	1 01	1
9	1 Amplifier KICr1	1 -	1 02	1
10	1 Amplifier Pt	1 -	1 01	1
11	1 Thyristor - Transforator	1 -	1 01	1
12	1 Press botton	1 -	1 02	1
13	1 Sticking plaster	1 Coil	1 01	1
14	1 Silicon plastic	1 Tube	1 01	1
15	1 Small relairs	1 Piece	1 02	1
16	1 Relairs plug	1 -	1 01	1
17	1 Electronic socket	1 -	1 01	1
18	1 Electric plug	1 -	1 01	1
19	1 Ventilator	1 -	1 01	1
20	1 Small cross section wire	1 Coil	1 01	1
21	1 Termoelement plastic cover	1 Piece	1 03	1
22	1 Termoelement plastic cover Pt	1 -	1 03	1
23	1 Tin wire	1 Coil	1 02	1
24	1 Volt- meter	1 Pc.	1 01	1
25	1 Soldering ironand transformer	1 -	1 01	1
26	1 Small fuse (glass fuse)	1 -	1 20	1
27	1 Tantan condensator	1 -	1 36	1
28	1 Mechanical keys	1 -	1 07	1
29	1 Flat Mechanical keys	1 -	1 04	1
30	1 KANTHAL A connection cable	1 -	1 06	1
31	1 Screw maker	1 -	1 01	1
32	1 Siren alarm	1 -	1 02	1
33	1 Current transformer	1 -	1 07	1

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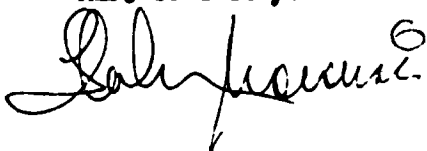
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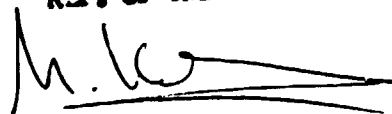
1	34	1 Fuse 400 A	1 Pc.	1 03	1
1	35	1 Fuse 160A	1 -	1 06	1
1	36	1 Fuse 63 A	1 -	1 06	1
1	37	1 Plug fuse	1 -	1 05	1
1	38	1 Start switch	1 -	1 01	1
1	39	1 Big cross section wire	1 meter	1 80	1
1	40	1 Small cross section wire	1 -	1 150	1
1	41	1 Plastic tube	1 Pc.	1 05	1
	42	1 Electrolytic condenser 2200-1000F	1 -	1 25	1
	43	1 Electrolytic condenser 470F	1 -	1 18	1
	44	1 Paper condenser	1 -	1 40	1
	45	1 Resistor	1 -	1 80	1
	46	1 Potentiometer	1 -	1 05	1
	47	1 Thermocouple -Bimetal	1 -	1 04	1
	48	1 Coil antiparasit	1 -	1 01	1
	49	1 Integral circuit	1 -	1 25	1
	50	1 Power transistor	1 -	1 05	1
	51	1 Integral circuit 725	1 -	1 02	1
	52	1 Transistor	1 -	1 17	1
	53	1 Fuse plug	1 -	1 03	1
	54	1 Diode	1 -	1 48	1
	55	1 Rectifier	1 -	1 01	1
	56	1 Nut and screw	1 kg	1 02	1
	57	1 Temperature NiCrNi	1 -	1 02	1
	58	1 Temperature PtRhPt	1 -	1 01	1
	59	1 Repairing instrument box	1 -	1 01	1
	60	1 Contactor	1 -	1 01	1
	61	1 Intermediate contactor	1 -	1 01	1
	62	1 Computer	1 Pc.	1 01	1
	63	1 Monitor	1 -	1 01	1

HANOI, 12 January 1989.

REP. OF VIETNAM



REP. OF CAMBODIA



REP. OF THE FACTORY




1456/11
Fokas
12/16

FROM : PROJECT VIE/80/028
MAGNETIC MATERIALS
HANOI-VIETNAM

TO : TESCO/UVATERV - CONSULTING ENGINEERING COMPANY
ROSEBERG hp utca 21., H-1054
BUDAPEST - HUNGARY

Re ; Contract No. 86/125 - Tunnel Kiln 03/3

Holozet
12.26

Dear Sirs ,

Refer to " the contents of warranty tireregulation on Tunnel Kiln " signed 12 Jan. 1989 , please be informed the Tunnel Kiln worked from 26 Jan. 1989 to 31 March 1989 as follows :

- The Tunnel Kiln has been working normally
- Mechanic :/ The Tunnel Kiln has been filled up with lubricants and replaced the plastic ring TOM KISEL 155-05.769 953.0
- */ The entrance 's push-in piston of the Tunnel Kiln is dry of oil because it is too far from the lubricant box . we propose one more lubricant box should be supplied by TESCO/UVATERV .
- Electricity :/ n 21 March 1989 , in zone 1:04 , there's none temperatur indicator due to the cables are burnt together . This problem has been solved ,
- */ On 29 March 1989 : one Super Kanthal was damaged at the point of contact . One new Super Kanthal has been installed .
- */ One ventilator is wrong , the other two ventilators make much noise and we are unable to repair here because cabinets are welded shut please advise .

We're looking forwards to having your reply as soon as possible .
Thank you for your cooperation .

Best regards .

Yours truly,

31 March 1989

Copied to : UNL D - VIENNA

NGO VAN LUONG
ON BEHALF OF WARRANTY TEAM

ANNEX 5. STATE OF THE ART OF THE FERRITE TECHNOLOGY IN THE INDUSTRY

12/11/00/203

1. MILLING : in operation , reasonable status
2. MILLING : in operation , able to work in producing (M)max// 30%
3. MILLING : in operation , able to produce materials with (M)max//30%
Capacity of both types of mills is small and long milling times are required .

Improvement in method and milling times are proposed and in testing status.

4. MILLING : is operational , but will start soon . It has large capacity if used .

5. MILLING : are inadequate and dangerous , method is in operation , improvements are proposed .

6. MILLING : 2 100 F , 1 100 F .

7. Presses are not designed for volume type of pressing . They are expensive hard operated . Bad die construction . Bad magnetizing/demagnetizing system . Inadequate vacuum system .

8. Presses are able to produce a limited number of product of good magnetic value (M)max// 30% with an usable, but not international acceptable physical and mechanical quality .

9. Dies make small hard press for arbitrary products and test samples maximum product size 10 mm diameter . Able to produce products of (M)max//30% in small quantities .

10. Dies used for dry pressing of soft ferrite and hard ferrite very slow action .

11. Dies are exhibited with 12 100 F and 12 100 F machines for producing granulate .

12. Dies are now and able to operate . Capacity for 12 100 F is sufficient . Capacity of 12 100 F and 12 100 F are very small .

13. Dies is operational . Able to produce ferrite products of (M)max//30%

Improvements have been implemented and some other have been proposed .
14. Dies ; is in operation , able to grind ferrite products to a tolerance of app. 0.1 mm . Method is slow (one side at a time) . Magnetic table is a disadvantage for it makes products somewhat magnetic so that it is not well possible to align products sufficiently . Motor governing automatic feed is being required .

15. Dies ; are slow and tolerance

16. Dies ; most are out of order for lack of I.C heating elements.

12/11/00/203

S. P. P. P.
S. P. P. P. (cont.)

21.03.1989.

2.1 0417

United Nations
Industrial Development Organization
Metallurgical Industries Section
V i e n n a

To the kind attention of Mr. Noguera de Silva

Dear Sirs,

Re: Ferrite pilot plant in Hanoi, Viet Nam, DP/VIE/80/028

May we kindly remind you that TESCO/CVATERV laid considerable effort in the course of project implementation to render assistance towards the rehabilitation of the existing machinery available in the plant. We submitted our proposal in June 1988. The decision not to request TESCO/CVATERV's involvement in this activity was declared during the performance test of the tunnel kiln.

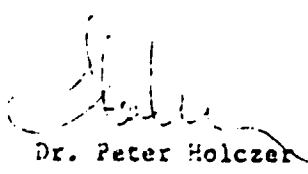
Anyhow we made efforts in the past so that we can react immediately upon such a request therefore we collected numerous spare parts and consumables. These parts are rather difficult to obtain because the subject machinery was manufactured long ago. We make a proposal to offer you the spare parts and consumables according to the attached list. Will you please confirm your interest not later than May 15th, 1989., otherwise we shall sell these items for other manufacturers. The price of the full list items is 6140 USD.

Enclosure

C.C. to Mr.M.Kohonen

Yours faithfully,


Béla Dékány


Dr. Peter Holczek

Annex 7.

United Nations
Industrial Development Organization
VIENNA

March 21st, 1969

2/24/69

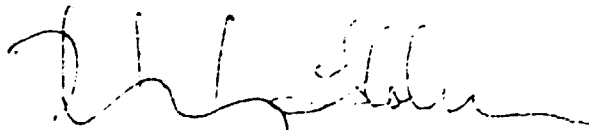
To the kind attention of Mr. N. Zohovene, Contracts Officer Contracts
Section

Dear Sirs,

Re: Ferrite pilot plant in Hanoi, Viet Nam , EP/VIE/20/328

With reference to our talks in Hanoi in January 1969 in the course of the performance test we hand over to you herewith enclosed 1 pc of Commodore printer type HPS 1250 (identification no: 4016152) as requested by the Vietnamese counterpart and as promised by TESCO/UVATERV.

Yours faithfully



Béla Dékány dr. Péter Holczer

L I S T

of appliances and tools provided for the erection of the tunnel kiln and donated to FERLOVINA as a contribution to facilitate maintenance in the framework of UNIDO project no. DP/VIE/60/028.

Item	Denomination	Quantity	Price in USD
1.	Sawing machine for sawing ceramic and bricks	1 pc	1.200
2.	Diamond cutting disc	2 pcs	1.900
3.	Arc welding machine - complete set	1 pc	960
4.	Hand boring machine	1 pc	150
5.	Hand grinding machine	1 pc	340
6.	Oxy-acetylen welding equip. with cutting appliance	1 set	550
7.	Trading sets	2 sets	120
8.	Grip plyers. universal plyers screw spanner wice / 120mm /		120
9.	Miscellaneous		200
Total:			6.110 USD =====

Hanoi January 9th 1969

Mr P. ~~Hoeser~~ / Mr. P. Narancsik
TESCO / UVATERV

S U M M A R Y

of contributions rendered by the Contractor to the Implementing Agency free of charge in the framework of UNIDO contract no.

86/125.

1./ Survey of the existing machinery was carried out in April 1987 by four Hungarian experts in a period of stay of two weeks each:

- salary	2 months	x	3.000 USD	=	6.000 USD
- DSA	60 mandays	x	65 USD	=	3.900 USD
- air tick.	4 tickets	x	1.800 USD	=	7.200 USD
					<u>17.100 USD</u>

Contractor's proposal for the rehabilitation was submitted to UNIDO in May 1987.

2./ Preparation of the proposal and quotation for the rehabilitation of the existing machinery

- home office work	2 m/m	x	1.000 USD	=	2.000 USD
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3./ Provisions of instructions and descriptions in die manufacturing

- home office work	2 m/m	x	1.000 USD	=	2.000 USD
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4./ Provision of guidance and detailed documentation of slurry containers/mixers to the technological line

9.000 USD

5./ Laboratory testings of the raw materials in February-March and May-June 1987

3.000 USD

6./ Pilot production on the basis of the Vietnamese raw material received in May 1988 with stopping the production line in Hungary for two days duration

14.000 USD

7./ Provision of one set diamond grinding segment with recipients

2.500 USD

8./ Provision of appliances and tools according to the attached list

6.110 USD

9./ Provision of electrical parts and components according to the attached list

5.000 USD

Grand total: 26.710 USD

Hanoi January 9th 1989

TESCO / UVATERV

LIST

of spare parts handed over by the Contractor to the Implementing Agency in relation to Annex H. of UNIDO contract no. 66/125.

- Controlled rectifier bridge	500 A	500 V	1 pc
- Controlled rectifier bridge	100 A	500 V	1 pc
- Synchro-transformer			1 pc
- Rectifier driver / separator units			4 pcs
- Thermocell / P + Rh + Pt /			1 pc
- Thermocell / NiCr - Ni /			1 pc
- Thermostat amplifier for P + Rh - Pt thermocell			1 pc
- Thermostat amplifier for NiCr-Ni thermocell			1 pc
- Input acceptor card			1 pc
- Digitizer card			1 pc
- Output card			1 pc
- Input-output control card			1 pc
- EPRON battery			1 pc
- Supply unit			1 pc
- FESTO oil. order no 207 672 OFSW-1			1 liter
- EL-5-6 electric limit switch FESTO			1 set
- LFM-1/4-S-B spare filters FESTO / insertion pcs only/			5 pcs
- FSW-220 magnet coils. FESTO			2 pcs
- JP-4-1/4 pulse valves FESTO			2 pcs
- VL-4-1/4 pneumatic valves FESTO			1 pc
- VL-3-1/4 pneumatic valves FESTO			1 pc
- VLO-3-1/3 pneumatic valves FESTO			1 pc
- R-3-1/4 ball-valve or valves FESTO			7 pcs
- RK-3-1/8 short-effect signal valves FESTO			pc
- R-4-1/4 ball-valve or valves FESTO			pc
- Full set of gaskets for dia 10 cylinders 04903 750 07 Mecman			2 sets
- Full set of gaskets for the dia 160 cylinders 04903 755 03 Mecman			2 sets
- Full set of gaskets for dia 63 cylinders 04903 751 04 Mecman			2 sets

The above items were handed over at the end of June.

Hanoi, January 11th 1969

TESCO / UVATERV

S U M M A R Y

of transfer of know-how and technology in the frame work of UNIDO contract no. 26/125.

The transfer of the know-how of the contractor has been carried out in three phases:

- 1./ During the training programme - according to Clause 2.10. of the contract - the know-how of the complete hard barium-ferrite production / wet technology / was acquired by seven Vietnamese trainees selected by the Implementing Agency in November-December 1987. The trainees studied the above technology theoretically and practically / see the First Interim Performance Report of the Contractor/.
- 2./ On-the-job training was carried out by the following Hungarian experts / in brackets see duration of their stay in Hanoi /:
 - Mr. Károly Zsarnoczay 07.July - 24 August 1988
 - Mr. Károly Hornyák 12.August - 19 August 1988
 - Mr. László Szeles 12 August - 24 August 1988
 Instructions and guidance on the adaptation of the Contractor's know-how was provided.
- 3./ A brief description and supply of data of the know-how adaptable to the local conditions was handed over by the Contractor's team to the Implementing Agency in August 1988.

Financial aspects of the transfer of the know-how are as follows:

a/ On-the-job training			
Salary:	2.3 m/m x	3.000 USD	= 6.900 USD
DSA :	70 m/day x	65 USD	= 4.550 USD
air-ticket:	3 ticket x	1.800 USD	= 5.400 USD
			<u>16.850 USD</u>
b/ home office work already performed for the preparation of the written know-how			
7 manmonths	x	1.000 USD	= 7.000 USD

Total: 23.850 USD

Hanoi January 9th, 1989

TESCO / UVATERV

S U M M A R Y

of man-days spent by the experts and mounters of TESCO/UVATERV
in the project area related to UNIDO project no. DP/VIE/EO/028

Name	Position	Period	Total m/d
Mr. Miklós Tóth	Exp. pilot plant planning and op.	11Jan - 22Jan	12
		2Mar - 30Apr	60
		23May - 2Jul	40
		12Sep - 27Oct	46
Mr. Pál Tabányi	Exp. pilot plant planning and op.	27Apr - 5Jun	38
Mr. Endre Viskárty	Exp. pilot plant planning and op.	24Jun - 17Sep	86
Mr. Béla Katkics	Exp. pilot plant op. and maint	23Oct - 8Jan	77
Mr Tibor Biró	Exp. pilot plant op. and maint	26Dec - 8Jan	14
Mr Károly Zsarnoczay	Exp. ferrite techn	7Jul - 24Aug	49
Mr. Károly Hornyák	Exp. ferrite techn	12Aug - 19Aug	8
Mr. László Szeles	Exp. meas. and magn. appl.	12Aug - 24Aug	13
Mr. László Huszár	Exp. in op. and maint.	4May - 21May	18
		11Jun - 31Jul	51
		5Sep - 23Oct	49
Mr. Ferenc Lengyel	Exp. in op. and maint	4May - 28Jun	55
		10Oct - 23Oct	14
Mr Béla Balatoni	Exp. in op.maint	10Oct - 23Oct	14
Mr György Restály	Installation of the tunnel kiln operation start- up commissioning and maintenance	11Jan - 22Jan	12
Mr. Zoltán Mészáros		11Jan - 27Oct	87 /total/
Mr. Pál Zahorecz		14Mar - 30Apr	48
Mr. Mihály Iványi		14Mar - 30Apr	48
Mr Gábor Hobor		14Mar - 30Apr	48
Mr János Karasz		7Apr - 21May	45
Mr József Berta		7Apr - 21May	45
Mr. László Ravasz		7Apr - 21May	45
Mr László Dombi		4May - 4Jun	32
Grand total:			<u>1,062 m/d</u>

Hanoi January 9th 1989