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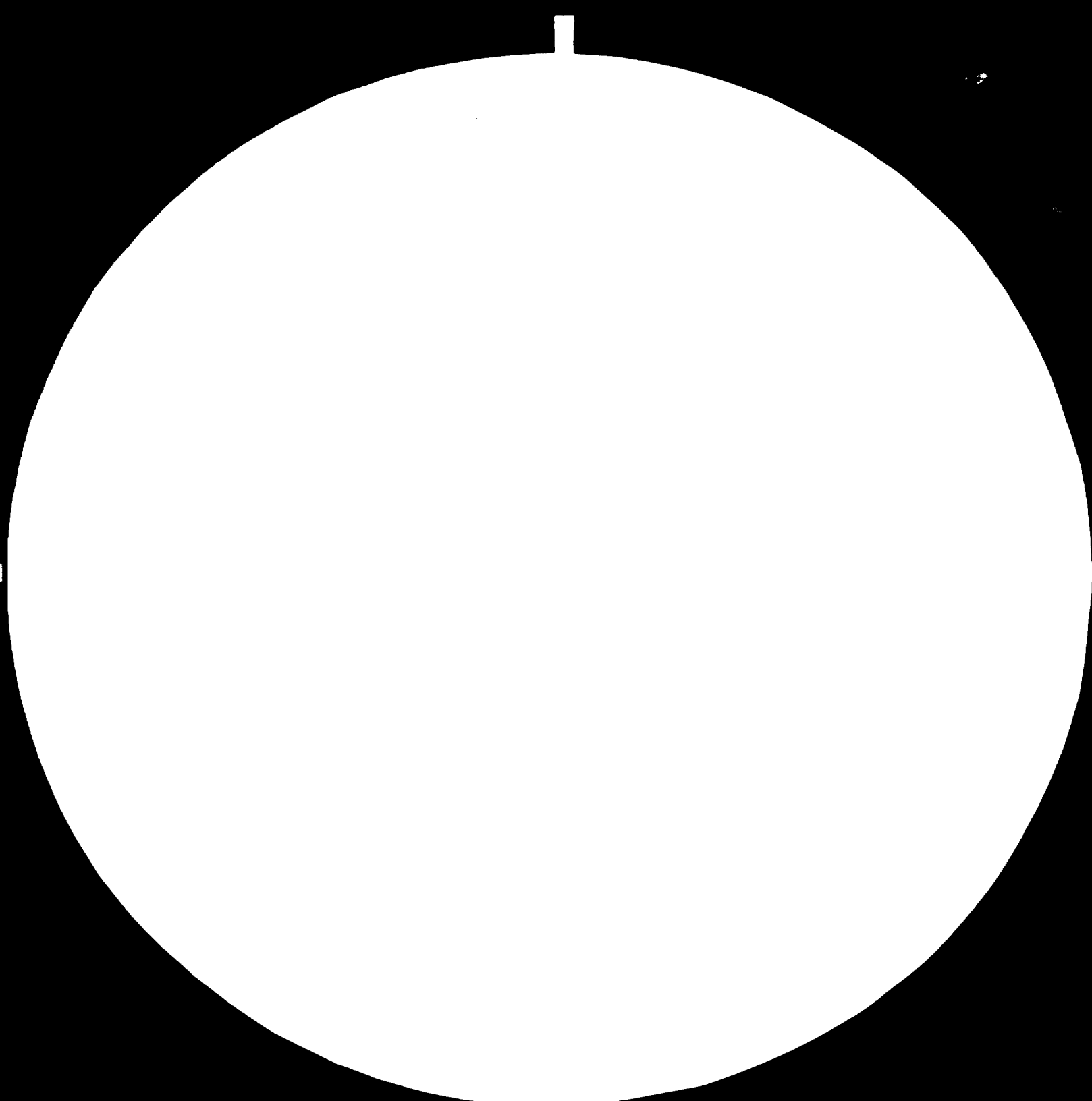

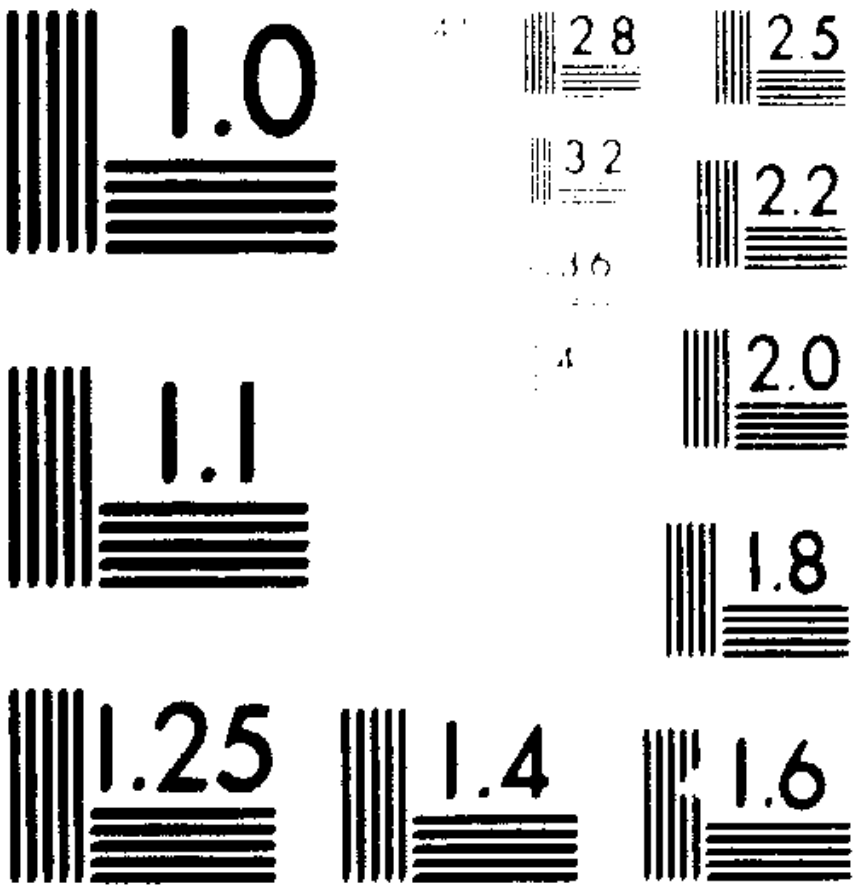

TERMINAL REPORT

DP/GRE/78/001/11-03

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G R E E C E

STRENGTHENING OF THE
HELLENIC ORGANIZATION FOR STANDARDIZATION
E L O T

MISSION ON CERTIFICATION AND QUALITY CONTROL LABORATORIES (PLANNING, LAYOUT, ETC)

TERMINAL REPORT
PREPARED FOR THE GOVERNMENT OF GREECE

B Y

FRANK A. BENTEN
UNIDO EXPERT ON MISSION

11 MARCH 1980

C O N T E N T S

A P P E N D I C E S

1. SUMMARY

1.1 Findings and Recommendations

1. ELOT does not have sufficient resources to commence its Certification Marking activities without an increase in staff. The setting up of the Certification Division is a necessary precursor to any consideration of testing for Certification Marking. The Government is recommended to provide funds to establish this branch of ELOT. It is recommended that ELOT appoints the prospective Head of the Division. See 4.1 and Recommendation R1.
2. A number of independent laboratories exist and ELOT is recommended to use these where available, subject to a number of safeguards. It is also recommended that a National system for registration and accreditation of laboratories be set up. See 4.2 and Recommendations R5 and R11.
3. The ELOT test laboratory could not cope with a much increased flow of work within its present remit of electrical household appliances. Review by ELOT of the future of testing (by ELOT) is recommended, together with appropriate action following review. See 4.3 and Recommendations R6, R7, R8 and R9.
4. Priorities for Certification marking may be affected by the economic climate in Greece, particularly where test facilities do not at present exist. It is recommended that these priorities be reviewed by ELOT and appropriate action taken. See 4.4 and Recommendations R4 and R10.
5. The factory assessments (inspections) which are a necessary complement to the testing of samples are not covered in the project but facilities for these have been investigated. The experience of the Inspection Service of the Public Power Corporation could be drawn on for the benefit of ELOT. See 4.6 and Recommendation R12.
6. There is no established system of Industrial Metrology and Calibration in Greece but some calibration facilities do exist. See 4.5.
7. Arising from consideration of his findings the expert recommends a number of UNIDO inputs all of which are thought to be within the scope of the present project. See Recommendations R2, R3, R6, R9 and R13.

1.2 List of Recommendations

R1 ELOT should establish Certification Division and appoint prospective Head.

R2 UNIDO fellowship should be provided for Head of Certification Division.

R3 UNIDO short term expert on Certification should be appointed.

R4 ELOT should review priorities for Certification Marking.

R5 ELOT should use outside independent test laboratories where available.

R6 ELOT should review ownership and operation of its test laboratory. UNIDO should arrange the supply of equipment within the UNIDO project if appropriate.

R7 ELOT should undertake further investigation into locations for ELOT laboratory.

R8 ELOT test laboratory should not be under the control of the Certification Division.

R9 UNIDO short term expert for on the job training of ELOT laboratory staff should be appointed. UNIDO fellowships should be considered for laboratory staff.

R10 Locations for testing of Central Heating Boilers and Solar Collectors.

R11 National registration and accreditation system for laboratories.

R12 ELOT should consider Inspection (Factory assessment) needs.

R13 UNIDO fellowships should be provided for Inspection staff if appointed by ELOT.

"NB.

This summary is provided for convenience. It should not be taken to contain all the provisions of the Recommendations given in Section 5"

2. INTRODUCTION

2.1 The mission covered by this report has been undertaken within the project DP/GRE/79/001/01/37. The development objective of the project is to further strengthen and develop the Hellenic Organization for Standardization (ELOT), thereby enabling it to elaborate, develop and effectively implement the national policy and system of industrial standardization, quality control and certification marking schemes. The harmonization of these activities with those of other countries of the European Economic Community (EEC) would contribute to establishing and developing the full partnership of Greece in the ELC.

2.2 The project starting date was April 1979 and it has a duration of three years. It provides a range of activities including those concerned with:

1. the legal, organizational and institutional framework for a national certification marking system.
2. the establishment and operation of certification marking schemes for central heating boilers, solar collectors and electrical household appliances.
3. the review and identification of existing testing laboratories in the country.
4. the establishment of testing laboratories.

2.3 The mission was part of one of several short term expert inputs included in the project. The job specification relating to the mission requires the expert to:

1) study the availability, organization, equipment, activities of existing test laboratories in Greece.
2) within the framework of the national certification marking scheme to be established, its priorities and objectives, prepare recommendations about additional testing laboratories required.
3) advise on the planning, layout, location etc. of the additional testing laboratories and facilities.

4) assist in preparing the detailed list of testing and measuring equipment required, with an indication of price and possible sources of supply.

5) assist in training Greek professional staff in the organization and operation of certification and quality control testing laboratories, in the installation and use of testing equipment.

The complete job description forms Appendix 1 to this report.

2.4 The range of objectives, inputs, outputs etc. of the project of which this mission forms part, is fully covered in the project document referenced in 2.1 above. Accordingly, no further elaboration in this report is thought to be necessary.

2.5 This report gives the expert's activities, findings and recommendations for future action, on completion of a mission lasting a period of two months. A list (incomplete) of persons met during the mission is given in Appendix 2.

3. ACTIVITIES

3.1 The expert commenced a two month assignment on 14 January 1980, joining the ELOT project in Athens after briefing at UNIDO Vienna and discussions at UNDP Office, Athens.

3.2 Initially a number of discussions with ELOT personnel took place, relating both to the mission of the expert and those of the experts on earlier missions, Messrs. Frontard (01), Deri (06) and Kapitaniak (04). The mission reports of these experts were studied, together with the project document, and their relationship to the mission covered by this report examined with ELOT personnel.

3.3 It was established that ELOT wished the expert to concentrate in his mission on items 1, 2 and 3 of the job description 03 (see Appendix 1). It was not the wish of ELOT that the mission should cover items 4 and 5 of the job description 03. Furthermore it was not considered necessary in the

long term (i.e, on any return mission), since other experts in specialist testing fields would probably deal with all matters of equipment and training in their particular fields.

3.4 The main activity of the mission has been a series of visits to organizations having test laboratories, to study the equipment available, and to discuss with senior personnel the possibilities for co-operation with ELOT. Apart from organizations having test laboratories, other organizations potentially able to assist,or collaborate with, ELOT on its Quality Mark work, were visited. Details of the organizations visited are given in Appendices 3 and 4.

3.5 Following a request from the Managing Director of ELOT the expert made a study of a range of prospective standards and produced cost estimates for appropriate test equipment. The note arising from this study is reproduced in Appendix 5.

3.6 The expert has had a series of discussions with ELOT personnel and others on a range of topics as indicated below. Some of these discussions resulted in the expert preparing notes and passing over documents as indicated:

1) The implications of Law 372/76 which established ELOT.
2) The current organizational structure of ELOT, its capability to progress with its present resources the Standards Programme and to set up and operate Quality Mark Schemes, with their associated testing and factory assessment (Inspection) services.
3) The establishment of Quality Mark Schemes, in terms of priorities by product categories and in terms of actions needed. The expert's notes arising from these discussions are reproduced in Appendices 6 and 7.
4) Current Standards making activities, also the potential for Quality Mark Schemes (e.g. identification of the product standards in the programme). The expert passed to ELOT documents which are amongst those listed in Appendix 8.
5) The activities of a study group including the Hellenic Industrial Development Bank (HIDB), the Ministry of Industry and Energy and ELOT concern-

ing the use by ELOT of the Quality Control Centre at an Industrial Estate near Salonica. This centre is owned by HIDB and forms part of a development within a UNIDO project of several years standing (see Appendix 3).

6) Other possible locations for ELOT Test facilities.

7) Legal and Industrial Metrology in Greece.

8) Personnel administration in ELOT. The expert obtained and passed over to ELOT documents which are amongst those listed in Appendix 8.

4. FINDINGS

4.1 Organization of ELOT

ELOT has not yet created within its Organization a Department or Division for dealing specifically with Certification Marking.

It has not done so because its resources would not allow this activity to be undertaken without curtailment of its standards making activities.

4.2 Independent Test Laboratories

There are a number of independent test laboratories able to collaborate with ELOT on testing in connection with product standards in the current programme of ELOT.

In particular there is expertise available on chemical analysis, physical testing of metals and non-metals and electrical testing.. Building materials and components are particularly well covered. Appendix 3 gives details of facilities available in each of the laboratories visited.

In many cases test work undertaken is not against a single document but a variety of test requirements from a range of documents, adopted to match the test equipment available at the laboratory. In some cases the ELOT Standard will reflect the equipment available since the laboratory staff participate in the work of ELOT Technical Committees.

Most of the laboratories, although owned by Government or state enterprises, have the right to undertake test work for the private as well as the public sector and in theory therefore there is no bar to undertaking work for ELOT. However, all such laboratories are currently subject to an embargo on the recruiting of staff. Any additional work, requested of them by ELOT, might prove an embarrassment if it were to build up without a corresponding opportunity to increase staff levels. The availability of all the equipment necessary may also be a factor in both the ability and the willingness of a given laboratory to collaborate with ELOT in testing against a particular ELOT Standard. The incentive to undertake such work may be another factor. Another feature found in the laboratories visited is that some are empowered to test and issue certificates through the authority of various Ministerial decrees or decisions.

4.3 ELOT Test Laboratory

4.3.1 Present location

The ELOT test laboratory, covered more fully in Appendix 3, has a limited range of equipment for testing electrical household appliances, principally water heaters which are subject to Law 69/1967. This Law requires all water heaters manufactured in Greece to be type tested by a recognized laboratory and certificated by the Ministry of Industry and Energy. Apart from water heaters tests on cooking ranges are undertaken.

The limited range of equipment could not cope with the testing required when ELOT introduces Quality Marking of electrical household appliances. Additionally, apart from one person well experienced in the testing of Water Heaters and the Head of the laboratory, the other staff are recently recruited and need more training in test techniques than the present test work would seem to offer.

The laboratory is housed on an upper floor of a building with no handling facilities and therefore not convenient for the receipt and handling of a large flow of appliances of various sizes. The building is also subject to a planning blight, being zoned for development of schools. Its future is thus precarious.

The need therefore is to relocate the laboratory to a building with ground floor space and suitable access, and to equip it adequately with test equipment.

The extent of the increased facilities of both space and equipment will depend on decisions concerning the future direct testing activities of ELOT.

4.3.2 Relocation possibilities

The present location of the ELOT test laboratory is unsuitable for a number of reasons e.g. space and accessibility. There are a number of possibilities for relocation which have been examined, albeit not in any great depth. The possibilities for relocation are:

1) A site in or near Athens - possibly combined with the rest of ELOT or adjacent to the PPC site.
2) A site in Corinth - on undeveloped land.
3) A site in Salonica - in conjunction with the Quality Control Centre.
4) A site in Patras - near to the University where a building exists.

Establishment of test facilities owned and operated in one or more of these locations is feasible and depends largely on a number of decisions which need to be made by ELOT. Two significant decisions will relate to:

1) Priorities for Certification and hence testing. This will confirm the need or otherwise to set up test facilities not at present available (See 4.4)
2) The extent of testing work which will be undertaken directly by ELOT.

4.4 Test Laboratories not at present available

4.4.1 There are two priorities expressed by ELOT for which test facilities are not presently available in a form suitable for ELOT testing. These are for the testing of:

1) Central Heating Boilers - In this case it may be possible to set up facilities at the Technical University of Athens in the Department which deals with steam raising and related technology. The professor in charge of the Department has expressed willingness to collaborate

with ELOT in such work and claims he could set up a laboratory for testing within a short time span. There has been no detailed investigation by the expert in view of the fact that a specialist expert has reported (Kapitaniak). It is assumed, subject to further investigation by the specialist expert, that for the initial stages of any ELOT testing these facilities would be adequate.

2) Solar Collectors - For the testing of these an offer has been made by Patras University (Physics II Department), to undertake this work, subject to the test equipment being provided by ELOT. The University has been visited and the prospects for this collaboration discussed with the professor who would lead the team undertaking the test work. The knowledge of test techniques exists and also the interest to undertake routine testing in parallel with research work on Solar energy being currently undertaken. Although the proposal for test equipment needs has been given to ELOT there has been no attempt by the expert to evaluate this since the project includes a specialist expert on this subject whose mission has not started. The proposed test site has been examined and appears suitable, subject to investigation by the specialist expert.

4.4.2 Apart from the priorities expressed by ELOT there are in its programme Standards for which either the Quality Mark could be applied or a testing service offered but for which no independent test facilities have been identified during the mission. These are:

1) Tungsten filament electric lamps - The testing/certification of these may be of interest since their performance can have a bearing on energy conservation.

Although testing can not be undertaken at present some facilities are being obtained by the Testing and Research Centre of the Public Power Corporation, in connection with their needs for testing of street lighting fittings. These facilities are expected to be available during the second half of 1980 and could possibly meet any needs for ELOT testing.

2) PVC flexible cords and cables - PVC flexible cords are used extensively on household appliances and interest in the CENELEC "HAR" Scheme has been expressed. Since there are no independent test facilities at present available, extension of the ELOT test laboratory facilities into this field might be appropriate.

3) Safety of Toys - The ELOT Standards are adopted from CEN and are codes of practice not specifications. If any certification service were to be offered by ELOT it would seem appropriate that the test work be in the direct control of ELOT and hence undertaken by its own laboratory suitably equipped.

4) Fire extinguishers.

5) Flokati rugs.

6) Batteries and Primary Cells.

7) Wiring accessories.

8) Sodium vapour lamps.

9) High pressure mercury vapour lamps.

10) Lamp ballasts.

In the event of a proposal for testing/certification of any of the products listed in 4) to 10) inclusive, special facilities would probably be needed either in the ELOT laboratory or one of the independent laboratories referred to in Appendix 3. The availability or otherwise of test facilities is likely to be the most significant factor affecting the timing of the introduction of a testing or cerfication scheme.

4.5 Metrology and Calibration Services

Although some legal metrology exists in Greece for retail weighing machines, petrol pumps etc, there is no single centre holding Primary Standards of length, mass etc and no established system of Industrial Metrology. The lack of a system creates potential problems for any Certification Scheme since the necessary calibration of measuring instruments and test equipment and traceability to primary standards is rendered difficult if not impossible. For many of the measurements likely to be encountered in ELOT Standards, cali-

bration facilities do exist at the Calibration Centre of the Hellenic Air force (see Appendix 4) and fortunately these facilities are available on request to private organizations. Some of the Standards in the Calibration Centre are in imperial rather than metric units but the calibration of electrical measuring instruments which would be required by for example the ELOT electrical laboratory, would not be a problem.

A calibration service for tension and compression testing machines exists at the Research Centre of Public Works but traceability to primary standards is uncertain.

4.6 Inspection Services

Although not specifically required to by the job specification, the expert has enquired into the availability of Inspection Services. It was found that the Public Power Corporation (PPC) has a long established Inspectorate, charged with ensuring that all purchases made by PPC are in accordance with its specifications. (More detail is given in Appendix 4).

Included in this activity is the assessment of the capability of suppliers to continuously manufacture to given standards.

Whilst not a third party activity, it follows a similar pattern to that which will be needed by ELOT as part of its third party certification schemes. Clearly the long experience of the PPC Inspectorate could be of great assistance to ELOT. The possibilities for collaboration are, either to assist with the training of an ELOT Inspectorate, or to undertake Factory assessments on behalf of ELOT.

No other similar Inspection Services have been identified and investigated although it is understood that a less well established one exists in the Public Telecommunications Service (OTE).

5. RECOMMENDATIONS

R1 ELOT should strengthen and develop by setting up a Division for Certification activities. Initially this should be small, dealing with both administrative and technical services and with provision for growth as demand increases.

A person with calibre and potential to control the Division should be appointed, having no other duties within ELOT but the establishment and operation of the Certification System. Dilution of effort with other responsibilities would not afford the proper opportunity to establish an activity which will be crucial to the acceptance and authority of ELOT in the future.

The person appointed should have a broadly based technological background, being professionally qualified and with administrative knowledge and experience. He or she must also have the imagination and energy to develop the system to meet the future needs of the country.

Adoption of this Recommendation would imply the need for financial input from Government since ELOT could not expect to finance the activity from the earnings of certification schemes, at least in the early years of the system.

Any diversion of resources from the Standards making activities of ELOT into the Certification activity would further hamper its efforts to keep up with the demands placed on it. Greece's accession to the EEC will increase rather than reduce these demands.

R2 When the ELOT Certification Branch is established the person selected as the prospective head should be given a UNIDO fellowship for two or three months. Such a fellowship would be to study the operation of Certification marking in selected West European Countries e.g. France, Federal Republic of Germany, United Kingdom. There is provision for this in the UNIDO project.

R3 When the ELOT Certification System is launched a short term UNIDO expert should assist the country staff in dealing with the practical application of the established rules for the Hellenic Quality Mark. The period of the

mission should be between 2 and 6 months. There is provision for this in the UNIDO project.

R4 In the light of the economic climate in Greece ELOT should review the expressed priorities for Certification marking. Two of the priorities, ie Central Heating Boilers and Solar Collectors, involve considerable capital investment for test facilities and hence may need to be deferred. This of course has to be considered in the context of Greece's accession to the EEC and the obligations thereby imposed.

R5 Where there are laboratories existing in a field of activity of interest to ELOT, these should be used if suitable arrangements for collaboration can be made. In particular, the senior management must be keen to do the work. The implications of the adoption of this Recommendation are as follows:

1. The Certification Division of ELOT is set up and able to monitor the activities of the chosen test laboratory.
2. Since it is not necessarily the case that all equipment for a particular ELOT Standard will be available there may be need for funds to be provided to obtain more equipment.
3. A proper agreement between ELOT and the test laboratory must be drawn up. See appendix 9 for guide lines.

R6 ELOT should review its intentions regarding the ownership and operation of test facilities. Is it to continue to own and to expand such facilities or will it rely on test work undertaken in other laboratories?
If it is to continue and to expand then this expansion should be initially in the field in which it is engaged at present i.e. electrical household appliances.
As the UNIDO project includes equipment supply, the appropriate lists should be drawn up and the equipment provided.
Whatever decision is made regarding test facilities owned by ELOT the priority of testing and certification of electrical household appliances should be retained in view of the EEC Low Voltage Directive which will eventually need to be applied in Greece.

R7 If a decision is made that test facilities will continue to be owned and operated by ELOT, there should be further investigation into the various possibilities for location of these facilities.

The Quality Control Centre in Salonica has the advantage that the building already exists and there is some equipment already installed. Although conceived for a different purpose, ie, local quality control services and training, it may be that the needs have changed since the original concept. Operation by or for ELOT would not necessarily mean that any local services needed could not be fulfilled since the test laboratory could operate on a "jobbing" basis as well as for certification mark testing. Availability of the test laboratory for these two functions could lead to better utilization of the facilities. The Quality Control Centre should therefore be included in any investigation of locations.

Patras has the advantage of being closer to the headquarters of ELOT than Salonica. It is claimed that there are suitable technician level people available in the area. The building adjacent to the proposed site for the solar collector test facility may be suitable for conversion to a test laboratory and should be included in any investigation of locations.

R8 Any ELOT test laboratory should be accountable to the general management of ELOT and not under the control of the Certification Division. Its relationship with the Certification Division should be similar to that of any other test laboratory (See R5). It should be subject to the same reporting rules although clearly, being in the same organization, the two branches would have close contacts.

R9 If ELOT decides to continue and to expand its testing facilities then a short term expert on training should assist with "on the job" training in the ELOT test laboratory. This expert should be experienced in the field of testing of interest to ELOT, assumed to be electrical household appliances. There is provision for this in the UNIDO project. Additionally UNIDO fellowships for selected ELOT personnel should be considered.

R10 When it is decided to undertake Certification Marking of Central Heating Boilers and Solar Collectors it is recommended that the test work be undertaken by the Technical University of Athens and by the University of Patras respectively. (This recommendation is made subject to confirmation by the experts in these two fields).

R11 Since there is no system for the registration and/or accreditation of laboratories it is recommended that such a system be set up by the Government. Advantages would be:

1) A clear understanding within the country of the nature and scope of test facilities available, both public and private.
2) Overlap of equipment in different laboratories, particularly those of Government, would be clearly seen and hence it should be possible to reduce expenditure on unnecessary duplication of equipment.
3) Uniform criteria for accreditation would be established to the benefit of the country, both for internal purposes and for obtaining recognition abroad of any test work undertaken in the registered laboratories.

The control of such a system should be undertaken by an Inter-Ministerial committee representing those Ministers which either have, or have need for, such laboratory services. Since ELOT would find value in such a system, it could as part of its Certification Mark Division activities provide the Secretariat and related services. At a later stage Industrial Metrology might form part of the system.

R12 When the Certification System is launched there will be need for Inspection services for Factory Assessments. ELOT should consider its needs in this respect and decide whether it will set up an Inspection Service or seek to obtain the co-operation of an outside service such as that of the Public Power Corporation. Rules for Factory Assessments will have to be established.

R13 If an ELOT Inspection Service is set up, selected personnel should be considered for UNIDO fellowships to study factory assessment procedures in Western Europe, e.g. France, Federal Republic of Germany, United Kingdom. It is believed that the UNIDO project will allow for such fellowships.

6. ACKNOWLEDGEMENTS

The expert has been received cordially in all his contacts during the period of his mission. This applies particularly to ELOT personnel. The willingness of contacts to explain their activities and to deal with questions raised by the expert has greatly facilitated his investigations. It is with thanks that this assistance is acknowledged.

Special mention must be made of the help given by Mr. Damianos Agapalides of ELOT who has been a constant companion on the series of visits made during the mission. His kindness and hospitality have been much appreciated. Mrs. Christina Karydakis is also thanked for the way she dealt with various office requests and for typing this report.

UNIDO

The consultant will be attached to the National Organization for Standardization (NOS) under the Ministry of Industry and Technology, and working in close cooperation with other relevant Government ministries and departments, institutions, organizations and industrial enterprises, will be expected to:

1. study the availability, organization, equipment, activities of existing testing laboratories in Greece

2. within the framework of the national certification making scheme to be established, its priorities and objectives, prepare recommendations about additional testing laboratories required

3. advise on the planning, layout, location etc. of the additional testing laboratories and facilities

APPENDIX 1

UNITED NATIONS DEVELOPMENT PROGRAMME

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

PROJECT IN GREECE

JOB DESCRIPTION
DP/GRE/[illegible]/001/11-02

POST TITLE	Consultant in certification and quality control laboratories (planning - layout - organization - equipment)
DURATION	Two months (with possibility of return missions)
DATE REQUIRED	May 1979
DUTY STATION	Athens, with travel in the country
PURPOSE OF PROJECT	To assist the Government in strengthening and developing the national standardization and certification marking schemes

4. assist in preparing the detailed list of a testing and measuring equipment required, with an indication of price and possible sources of supply

5. assist in training local professional staff in the organization and operation of certification and quality control testing laboratories, in the installation and use of the testing equipment.

The consultant will also be expected to prepare a final report covering the findings of his mission and his recommendations to the Government on further action to be taken.

QUALIFICATIONS

University degree in engineering, technology or applied physical sciences. Extensive experience in the planning, organization and operation of testing laboratories with particular reference to quality control testing for certification purposes. Full knowledge about the various types of testing and measuring laboratory equipment required and available on the market. Good knowledge about the organization and operation of such laboratories in the FED countries required.

LANGUAGE

English or French with good working knowledge of English.

BACKGROUND INFORMATION

1. Since the end of the Second World War the economic development policy of Greece has aimed primarily at aligning the national standard of living of the level of the industrialized countries of Western Europe. This programme has been largely successful since the income per capita which was equivalent to 35% of the average figure for these countries in 1955, was raised to 53% in 1977.

During this period the Government encouraged foreign investments in Greece together with the importation of the relevant technologies, in order to provide Greek industry with better opportunities for commercialization of its products abroad.

2. One of the top priorities of the Government of Greece lies in the conservation of energy, as well as in the search for alternative sources of energy. According to a report published in 1977 by the National Energy Council, the average annual rate of increase of energy consumption was 10,6% for 1963 - 1972 and about 5,5% for 1973-1976. In 1976 the demand was satisfied by 25,5% solid fuels, 70,5% liquid fuels and 3,6% hydropower. Industry accounts for 43,4% of energy consumption, transportation for 21,6% and residential and other uses for 34,8%.

3. Within the framework of the above principles and policies of the Government of Greece, the Hellenic Organization for Standardization (ELOT) was established in 1975 by the Law No. 372/1976, as a non-profit institution, under the supervision of the state exercised by the Minister of Industry. The establishment of the National Council of Standardization which would form part of the procedure for organizing and operating ELOT, was announced in 1977.

4. To further develop and strengthen these activities, the need for assistance in the following fields was expressed by the Hellenic Organization for Standardization (ELOT):

- legal framework for certification procedures
- setting-up and equipment of a laboratory for testing of central heating equipment, heating appliances and solar energy collectors
- setting up and equipment of a laboratory for basic electrical equipment

- feasibility, creation and operation of a system for supervising compound constructions (factories, building constructions, etc.).

5. In addition to the above considerations about energy conservation, the activation of ELOT in the fields of standardization, quality control and quality certification schemes will provide a major contribution to improving the quality, reliability and safety of Greek products, materials and equipment intended for local consumption as well as for export. This contribution should also be seen in the light of Greece's full partnership in the European Economic Community (EEC) and ELOT would play a crucial role in bringing about the harmonization of the Greek national standards, quality control and quality certification schemes with those of such EEC bodies as CEN, CENELEC, [illegible] and the CB Scheme. ELOT would also represent Greece in the international activities in standardization, quality control and certification marking.

RS/tz - 20-11-1978

APPENDIX 2

PERSONS MET ON MISSION

1. UNDP

Mr. Nicholas COUSSIDES,	National Programme Officer, UNDP.

2. ELOT

Prof. John A. TEGOPOULOS,	National Technical University of Athens. President of ELOT.
Mr. Alexander MORAITAKIS,	Managing Director.
Mr. Evangelos VARDAKAS,	Deputy Managing Director, Planning and Development Division.
Mr. Dim.KOUTSOMITOPOULOS,	Finance and Administration Division.
Mr. Vassilis PHILOPOULOS,	Technical Division.
Mr. Alekos PAVLOPOULOS,	Legal Adviser.
Mr. Cosmas IONAS,	Chief, Electrotechnical Laboratory.
Mr. Costas SPARTINOS,	Engineer, Planning and Development Division.
Mr. Christos MITSARIS,	Economist, Planning and Development Division.
Mr. Damianos AGAPALIDES,	Chemist, Planning and Development Division.
Mr. John MARASLIS,	Architect, Technical Division.
Mr. Apostolos KARAKOSTAS,	Electronics Engineer, Electrotechnical Laboratory.
Ms. N. VAGHIA-HANDAKA,	Chemical Engineer, Technical Division.
Ms. Irini FRANGOPOULOU,	Mechanical Electrical Engineer, Technical Division.
Mr. Sotiris PRIFTIS,	Electronics Engineer, Technical Division.
Ms. Christina KARYDAKIS,	Secretary of Direction.

3. MINISTRY OF INDUSTRY AND ENERGY

Mr. John CATSOULIS,	Director General MIE.
Mr. Dimitris POLITIS,	Chief, Standardization Division MIE.

4. RESEARCH CENTRE OF PUBLIC WORKS

Mr. E. EFSTATHIADIS,	Director of Centre.
Mr. G. LEKKAS,	Director of Construction Material Division.
Mr. CHRISTOULAS,	Director of Soil Mechanics Division.
Mr. CHRISTODOULATOS,	Director of Specifications and Coordination Division.
Mr. KAKRIDIS,	Director of Bituminous Material Division.

5. INSTITUTE FOR AGRICULTURAL ENGINEERING

Mr. Stephanos ARCHOS,	Director.
Mr. John SOUVATZIS,	Electrical and Mechanical Engineer.
Mr. Takis POTHOS,	Mechanical Engineer.
Mr. Andreas RIGAS,	Mechanical Engineer.
Mr. John KYRIAKOPOULOS,	Electrical and Mechanical Engineer.

6. TESTING AND RESEARCH CENTRE - PUBLIC POWER CORPORATION

Mr. Phedon VENTOURATOS,	Manager of Centre.
Mr. Moses MOSCHOVITCH,	Head of High Power Testing and General Electrical Section
Mr. Th. LIATIS,	Head of Materials Testing Section.
Mr. Alex. ECONOMIDES,	Head of High Voltage Testing Section.
Ms. Annussa VENIERI,	Engineer General Electronical Section.

7. GENERAL STATE CHEMICAL LABORATORY - MINISTRY OF FINANCE

Dr. Dennis MARKETOS,	Head of Division of Environmental Pollution Control.
Dr. Elli VAYONI,	Head of Division of Raw Materials and Industrial Product

8. INSPECTION SERVICE OF PUBLIC POWER CORPORATION

Mr. S. FOTIADIS,	Head of Service.
Mr. C. LAIOS,	Head of Greece Inspection Section.
Mr. J. GEROSIDERIS,	Inspector.

9. NATIONAL TECHNICAL UNIVERSITY OF ATHENS

Prof. John A. TEGOPOULOS,	Chair of Electrical Machines (President of ELOT).
Prof. N. PAPAGEORGIOU,	Chair of Steamraising and Thermal Installations.

10. CALIBRATION CENTRE - HELLENIC AIR FORCE

Lt. Col. A. TOUBAS,	Commander.
Captain N. SPYROPOULOS.	
Captain DRAKOULAKIS.	

11. UNIVERSITY OF PATRAS

Prof. Rigas RIGOPOULOS,	Chair of Physics II.
Dr. P. IOANNOULIS.	
Mr. TRIPANAGNOSTOPOULOS.	

12. INDUSTRIAL ESTATE OF SALONICA - HELLENIC INDUSTRIAL DEVELOPMENT BANK

Mr. Elias ANTONIADIS,	Resident Manager.
Mr. Simeon KERAMOGLOU,	Chemical Engineer.
Mr. Man. CHADZIDAKIS,	Mechanical Engineer.
Mr. Otto JOHN,	UNIDO Expert.

13. UNIVERSITY OF SALONICA

Dr. PETRIDES,	Department of Power Electronics.
Dr. E. TZEKAKIS,	Department of Acoustics.
Dr. G. PAPANICOLAOU,	Department of Electro-Acoustics.

APPENDIX 3

ORGANIZATIONS VISITED HAVING TEST LABORATORIES

1. ELOT Test Laboratory

Head of Laboratory Mr. C. Ionas.

1.1 This laboratory formerly belonged to the Hellenic Electrotechnical Association (EHE) and was taken over by ELOT in 1978, together with the other activities of EHE.

It was set up by EHE in 1965 for the purpose of testing in connection with EHE Quality Mark Scheme on household electrical appliances (both performance and safety).

The main work undertaken has been on storage water heaters, cooking ranges and small heating appliances such as grills, toasters and fan heaters.

Storage water heaters are subject to a Law which requires that they are type tested by a recognised laboratory and certificated by the Ministry of Industry and Energy (MIE). The EHE test laboratory was recognised by the MIE for this purpose.

In 1977 the laboratory received recognition by the International Commission on Rules for the Approval of Electrical Equipment (CEE) as a test house for water heaters and cookers under the CEE Certification Body (CB) Scheme.

1.2 There is a limited range of test equipment for undertaking the tests on household electrical appliances required by the Law 69/1967 and by CEE publications. The area of the space available is some 250 sq. meters situated on an upper floor of a building in the centre of Athens.

Only one set of electrical measuring instruments is available, thus limiting the possibilities for simultaneous testing of several appliances.

1.3 Since only one set of measuring instruments is available there are no facilities for checking calibration of these inside the laboratory. There is also no systematic arrangement for calibration by an outside service.

2. Research Centre of Public Works - Athens

Director Mr Efst. Efstathiadis

2.1 This Centre has been in existence for many years and has as its main purpose the provision of a testing and research service to the Ministry of Works. This is normally in connection with Public Works and Roadworks contracts. It is allowed however to undertake private work for contractors and others on a fee charging basis.

In addition to the Centre there are a number of regional laboratories which undertake the routine tests associated with Public Works and Roadworks contracts.

Staff of the Centre number about 300 of whom some 30 are professionally qualified. They are assisted by Technician Engineers and Technicians.

2.2 The facilities for testing which exist at the Centre include:

a) Tension, Compression, Bending and impact testing of Building Materials and components, both concrete and metal (300 kg to 500 Tonnes).

b) Chemical and physical testing of building materials, water etc. (including thermal conductivity measurements on insulation materials).

c) Environmental Conditioning and Testing of Building materials and components (Including weatherometers with Xenon and Carbon arcs and facility to introduce corrosive atmospheres).

d) Physical testing of Plastics components such as PVC pipes.

e) Optical testing of Paints, Reflective Materials etc.

f) Sound insulation and noise testing (Mobile laboratory).

2.3 Calibration facilities are available for tension and compression test machines ranging from 300 kg to 500 tonnes. A calibration service is provided to other laboratories, both public and private, on request. As part of this service certificates of calibration are given.

Calibration facilities also exist for pressure gauges.

2.4 There is scope for co-operation with ELOT on testing for Quality Mark Schemes for Building and Construction materials against projects currentl.

.../...

in the ELOT Standards programme since most if not all the equipment likely to be required exists in the Centre.

Since the Centre may undertake test work for outside organizations the administrative path to collaboration is facilitated.

3. Institute for Agricultural Engineering - Athens

Director Mr. Stephanos Archos.

3.1 The Institute has been in existence for over thirty years and has as its main function research in all fields of agricultural engineering, being a branch of the Ministry of Agriculture. Its activities include the type testing of materials, components and equipment used in agriculture, ranging from tractors to PVC pipes. These type tests are undertaken at the request of manufacturers of the products concerned.

Staff of the Institute number 70 of whom 10 are professional engineers.

3.2 The facilities for testing include:

a) Pump test rigs (weir and orifice methods for flow measurement).

b) Dynamometers for electric motor and engine testing - various sizes.

c) Chemical and physical testing of materials and components

- plastics and steel pipes
- soils, metals and fuels

(including Thermal Conductivity of insulating materials, vicat tests on plastics, compression and tension testing).

d) A good range of measuring instruments - measurements include. Watts, volts, amps, air velocity, pressure, load and mass.

3.3 Calibration facilities for working level instruments exist through the holding of a set of instruments of sub-standard grade, which are not used for working purposes.

3.4 Administrative scope for co-operation with ELOT exists since the Institute undertakes test work for outside organizations. The test facilities would be suitable for some of the Building Materials projects currently in the Standards programme of ELOT.

4. Testing and Research Centre of the Public Power Corporation - Athens

Manager Dr. Phedon G. Ventouratos.

4.1 The Centre has been established since 1976. It is largely concerned with testing in connection with materials and equipment supplied to the Public Power Corporation (PPC). In addition test work is undertaken for manufacturers and others on a fee charging basis.

Staff of the Centre number 50 of whom 8 are professionally qualified.

4.2 The facilities for testing which exist at the Centre include:

a) Tension, compression and impact testing of metal components.

b) Humidity conditioning - programmable cycles in chambers.

c) Chemical analysis - rapid methods.

d) High voltage testing including mobile laboratory.

e) General electrical testing including tracking index tests (ASTM), properties of insulating materials (schering bridge).

f) Variable voltage and current supplies with the range 0-1000 volts and 0-1000 Amps with limit of 5 kilowatts.

g) Vibration tests on components.

A high power laboratory is being constructed with a short circuit capacity of 400 MVA. It is expected that this will be in operation by the end of 1980. Additionally there is an intention to purchase a sphere photometer and a goniometer photometer for tests on street lighting luminaires This should be available by the second half of 1980.

4.3 Calibration facilities exist for the tension and compression test machines but not for the electrical measuring instruments.

Calibration facilities for these are said to exist at the PPC Meter Calibration laboratory and the Research Centre also plan to have their own sub-standard instruments in the future.

4.4 The scope for collaboration with ELOT exists in terms of the availability of certain test equipment. Additionally, since the Centre can undertake work for outside organizations, the administrative scope is facilitated.

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A possible problem is the embargo on staff recruitment placed on all Government Departments and State Industries.

5. General Chemical State Laboratory - Athens

Dr. Dennis G. Marketos - Head of Division of Environmental Pollution Control.

Dr. Elli Vayoni - Head of Division of Raw Materials and Industrial Products.

5.1 This laboratory operates under a Law of 1929 and as its name implies, undertakes Chemical (and related) testing of a wide range of materials which are subject to Greek statutes. These include foodstuffs, industrial chemicals, pharmaceuticals, fuels and other hydro-carbons. The main Laboratory is in a building near the centre of Athens, built in 1961. In addition there are branch laboratories throughout Greece, including a large branch in Piraeus. Total staff of the service number 320 who are professionally qualified, mostly chemists, with supporting clerical staff. There are no technicians employed since the Law does not permit this.

The Law allows the laboratory to undertake private work on request as well as that for the public sector.

5.2 Many testing facilities exist but those most likely to be of interest to ELOT in its Quality Mark Work, are in the Division of Raw Materials and Industrial Products. Its work includes tests on, textiles, leather, plastics, rubber and paper. In particular facilities exist for:

a) Tensile strength and elongation - all materials.
b) Impact testing.
c) Tear testing.
d) Permeability testing - air and water.
e) Fade testing (Xenon).
f) Washing test.
g) Metals analysis.
h) Humidity Conditioning (test room is also air conditioned).
i) Folding, bursting, tear and smoothness testing of paper.
j) Thread count and torsion testing of textiles.
k) Water proofing tests on leather.

Other Divisions have a range of equipment for rapid chemical analysis, mass spectrophotometry, atomic absorption spectrometry and gas chromatography.

5.3 Calibration facilities exist in the Division of Raw Materials etc. for the checking of the tensile strength test machines.

5.4 Scope exists for collaboration with ELOT both administratively and in terms of the availability of test equipment which might be referred to in ELOT Standards. However the demand for test work by Government Departments is high and it is possible that any work for ELOT could not be dealt with expeditiously, this being essential to a successful Quality Mark Scheme.

6. Quality Control Centre - Industrial Estate - Salonica

Mr Antoniadis - Resident Site Manager.

6.1 The Quality Control Centre has been constructed as part of an Industrial Estate some 20 km outside Salonica.

This Industrial Estate is within a UNIDO project (DP/GRE/69/526) where the counterpart organization is the Hellenic Industrial Development Bank (HIDB).

When conceived the Quality Control Centre was intended to provide a Service to small (and large) industries being set up on the Industrial Estate. It was to have various workshops intended for training purposes as well as having a quality control (test and metrology) section and a chemical laboratory. Equipment has now been provided and installed but there had not been any use made of the equipment at the time of the visit. It was not possible to ascertain whether the workshop equipment and any other test equipment was to be provided and installed.

The Centre has some 600 sq. m. of covered space on a single level and it is understood that there is scope for the addition of another storey to the building. The building is divided into a number of areas separated by solid (structural?) walls. Each area has doorways giving access from a common open corridor and to the perimeter of the building. If the dividing

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walls are structural these limit the flexibility of the building should it be used for other purposes than that originally intended.

6.2 The quality control section and the chemical laboratory occupy some 100 sq. m. and 70 sq. m. respectively. The quality control section has been divided into two equal areas, one for precision measurements, the other for tests. Equipment in the quality control section includes the following:

1. Universal tension and compression testing machine 60 tons.
2. Universal tension and compression testing machine 2.5 tons.
3. Pendulum Impact testing machine 35 kg.
4. Universal Hardness tester 1 - 250 kg.
5. Industrial Radiographic unit.
6. Proving rings for tension and compression 3 to 50 tons.
7. Miscellaneous rubber, plastics and leather physical test apparatus.
8. Range of micrometers external and internal.
9. Range of vernier calipers and height gauges.
10. Optical dividing head.
11. Projectorscope.
12. Granite surface tables and plate.
13. Universal Comparator with inductive gauging heads.
14. Slip gauges - metric grade 1 accuracy.
15. Range of straight edges, vee blocks, sine bars angle plates necessary to facilitate precision measurements.
16. Accessories for the above mentioned equipment.

The chemical laboratory is equipped with a range of apparatus for chemical analyses of various kinds including tests on water and effluents including flue gases.

6.3 The range of precision measuring equipment in the quality control section makes possible the calibration of such items as micrometers, vernier gauges and dial gauges, used both within the Quality Control Centre and by outside Organizations.

The tension and compression testing machines in the Quality Control Centre can be calibrated with the proving rings provided. No doubt these could be used to offer a calibration service for the testing machines of outside organizations.

6.4 Scope for the use of the Quality Control Centre by ELOT depends on the outcome of the work of the study group to which reference is made in Section 3.6 of this report. The equipment at present available in the Quality Control Centre is to be found in other laboratories nearer to Athens. Hence any use of the Quality Control Centre would be related to a decision by ELOT to expand direct testing facilities into areas not adequately covered at present.

APPENDIX 4

OTHER ORGANIZATIONS VISITED

1. Hellenic Air Force Calibration Centre - Athens

Commander - Lt. Col. A. Toubas Hellenic Air Force.

1.1 The main activity of this Centre is to undertake calibration of all test and measuring instruments and equipment used by the armed forces of Greece. In addition to calibration work the Centre also undertakes the repair of test and measuring equipment.

The facilities for calibration are available to public services (eg. telecommunications service) and also to private organizations on request. Such work is undertaken on a fee charging basis.

1.2 Test and measurement facilities exist in each of three sections, electronics, dimensional and optical and electromechanical.

The electronics section is the most extensive dealing with a wide variety of equipment from wavemeters to oscilloscopes and voltages from d.c. to microwave frequencies. Many high grade standards are available including resistance, inductance, capacitance, voltage, time (caesium).

The dimensional/optical section has standards for mass (imperial) high grade gauge blocks (imperial) and comparator equipment both optical and electronic. Metric standards are being obtained.

The electromechanical section deals with flow of liquids, pressure and vacuum, temperature and calibration of load cells. Again high grade standards are available.

1.3 Scope for direct collaboration with ELOT is through the calibration of instruments used by ELOT in its own laboratory. In addition, for the necessary calibration of test and measuring instruments used by ELOT Quality Mark licensees, the service would be most useful.

2. Inspection Service of the Public Power Corporation (PPC)

Head of Service - Mr. S. Fotiadis

2.1 The Inspection Service of the PPC has been operating for 30 years and hence has a long tradition of Inspection control of materials and equipment purchased by PPC. The range is wide, from complete power stations to uniforms and footwear. The service covers not only suppliers in Greece but anywhere in the world.

2.2 The Service is divided into three sections and has an Inspection staff of 30, all of whom are qualified engineers. The sections are:

1. Inspection section for suppliers in Greece.
2. Inspection section for suppliers outside Greece.
3. Quality Control Section.

The last named section is the youngest, being some 15 years old. It is concerned primarily with the capability assessment of new (and existing) suppliers. It also investigates new methods of inspection and test, in particular non-destructive testing. It is this section which is nearest in scope to ELOT's future needs. The other two sections are more concerned with stage and final inspection of the products being supplied.
The sections are not watertight and Inspection staff will be allotted to tasks in any of the three depending on need and economy considerations.

2.3 Full reports of all investigations are kept and these are used to brief new Inspection staff, or those checking a particular product for the first time. On the capability assessments all aspects of the factory are checked, staff as well as manufacturing, inspection, test and quality control facilities.

2.4 The service is cost conscious, keeping a close check on the cost of Inspection compared with the total cost of the material and products purchased. At present the cost of Inspection is between 0.25% and 0.5% of the overall cost of supplies to PPC.

2.5 Specifications used by PPC for their purchases are reviewed by a Standardization Committee before being accepted for use. Most specifications for

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distribution equipment are based on IEC and VDE Specifications.

2.6 Cooperation with ELOT was discussed and a willingness to be of assistance was expressed by the Head of the Service. This might be in training an Inspection Service of ELOT if one is created. Mention was made of co-operation with the Inspectorate of the Public Telecommunications Service (OTE).

3. National Technical University of Athens

3.1 Professor John Tegopoulos who has the Chair of Electrical Machines (and is President of the Board of ELOT) was visited in his laboratory in the Technical University.

A short tour of the laboratory was made to see the equipment available. This includes a range of dynamometers for load testing of motors from 25 kw down to very low fractional horsepower.

Professor Tegopoulos expressed interest in assisting ELOT in testing in his laboratory, being prepared to set aside part of it to undertake any such work systematically.

3.2 An opportunity was taken to visit the workshops of the Mechanical Engineering Department, where students are trained in the use of machine tools and other metal working techniques. The facilities are used to manufacture items for use in the Technical University.

3.3 Professor N. Papageorgiou who has the Chair of Steam Raising and Thermal Installations was visited on the same occasion as the other two visits. Professor Papageorgiou had been visited by the specialist expert Mr. Kapitaniak and had expressed interest in undertaking the test work for ELOT on Central Heating Boilers. There are no specific facilities available at present but the Professor indicated that he would be able to arrange test equipment to deal with boilers up to 100,000 Kcal within a short time of a request from ELOT.

No investigation of equipment available was made in view of the fact that a specialist expert is included in the project.

4. University of Patras

Professor Rigas Rigopoulos - Chair of Physics II

The Physics II Department of the University is involved in research on a sophisticated system for the utilization of solar energy. It is co-operating with three other Departments in the University, Chemical Technology, Mechanical Engineering and Thermal Physics.

Professor Rigopoulos has made a proposal to ELOT to undertake the testing of simple solar collectors. This proposal includes a paper giving cost details for the necessary test frames and measuring equipment. A site belonging to the Univesity is available and some preparation of the site has been undertaken in anticipation that the test work will be given to the Department. This site was examined and seemed suitable for the work.

In addition to the equipment proposal made by Professor Rigopoulos, there is another, much more elaborate, proposal made by a German company Dornier, for the supply of a range of test equipment.

There has been no detailed discussion on the nature and suitability of the equipment in view of the fact that the project provides for a specialist expert on solar collectors. The impression gained during the visit was one of competence and energy in the team which is led by Professor Rigopoulos.

5. University of Salonica

5.1 At the time of the visit to the Quality Control Centre in Salonica (See Appendix 3) an opportunity was taken to visit two laboratories in the University of Salonica.

5.1 Dr. Petrides - Department of Power Electronics.

The laboratory of this Department is set up in temporary accomodation pending the completion of a new building in some two years time. The laboratory is equipped for student experiments and research on the use of semi-conductor devices for power (e.g. motor speed control) applications.

Potential for use in connection with ELOT testing needs seems limited so far as the present Standards programme is concerned.

5.2 Dr. Tsekakis - Acoustics/Architecture Department.

Dr. Papanicolaou - Electro-Acoustics Department.

The electro-acoustics laboratory is well equipped with a range of Bruel and Kjaer and other high grade equipment. It too is housed in temporary accommodation pending the completion of a laboratory in a new building. No reverberation room or other acoustic room is available but the laboratory is able to undertake limited sound insulation tests on building materials using a comparative method. Such rooms will be a feature of the new laboratory.

Potential for use in connection with ELOT testing is limited at least until the new laboratory is constructed.

APPENDIX 5

TESTING FACILITIES FOR ELOT

1. Electrical Safety and Performance Testing of Household Appliances

1.1 The ELOT Standards programme for 1980 covers Standards for a range of Heating and Cooking Appliances. The cost of basic equipment for the testing of these appliances is estimated to be: 1.900.000 drachmas

1.2 Since this is a basic list, a large flow of test work could not be undertaken without unreasonably long waiting times occurring. Accordingly a forward plan for increasing the facilities should be made, to be implemented when the demand for testing rises. Allow for this another sum of: 750.000 drachmas

1.3 It is assumed that the present equipment of the ELOT Test Laboratory, suitably augmented, would be used exlusively for the testing of Water Boilers in accordance with the present regulations until an ELOT Standard recognized by the Government is prepared. Allow for the increase of test equipment to provide quicker "turn round" time: 300.000 drachmas

NOTES:

1. The cost estimates do not include:
   a. Oxygen Bomb (limited requirement - available in another laboratory).
   b. Radio Interference Suppression measuring equipment.
   c. Test equipment for components (other than basic tests on thermostats). Such components might include: flexible cords, switches, capacitors, transformers, sockets, appliance connectors and plugs.
   d. Air conditioning (i.e. temperature control) of the test rooms.
   e. Facilities for constructing "built in" enclosures.

   The cost of providing test equipment to cover b) and c) above could be at least equal to that for the testing of appliances (i.e. 1.900.000 drachmas).

2. Forward planning to cover the range of proposed Standards on Motor Operated Appliances is advisable.

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2. Testing of PVC Flexible Cords (Small sizes for Household Appliances)

2.1 The cost of basic equipment for the testing of PVC flexible cords is estimated to be: 1.100.000 drachmas

2.2 Such a basic list could not cope with a large flow of test work without long waiting times occurring. Allowing for a forward plan, to be implemented when demand for testing increases, would need provision of an estimated: 250.000 drachmas

NOTES:

1. Much of the equipment would be of use for larger sizes of PVC flexible cords and PVC cables.
2. The cost includes the provision of a tensile test machine. Whilst suitable machines are available in other laboratories, the provision of a machine in the ELOT Laboratory would greatly facilitate the work in other fields e.g. Toys and textiles.
3. If rubber cords and cables were to be covered then a further cost would be involved, perhaps one quarter to half the initial costs (i.e. 275.000 - 550.000 drachmas).

3. Safety Testing of Toys

The estimated cost of basic equipment to undertake the testing of toys to ELOT STANDARDS ELOT EN 71-1 and ELOT EN 71-2 is: 540.000 drachmas

NOTES:

1. It is assumed that a tensile test machine will be available (e.g. for flexible cords).
2. Since the Standards are not product specifications but more codes of practice a Quality Mark Scheme is not likely to be appropriate. However a testing service with Reports only might be provided by ELOT.

4. Building and Construction Materials.

4.1 Thermal Insulation

- Wood Wool Slabs
- Expanded Polystyrene
- Glass fibre blankets

4.2 Asbestos Cement Products

- Sheets, flat and corrugated
- Pipes, joints and fittings - above and below ground
- Pressure pipes.

4.3 Paving slabs.

.../

4.4 Bricks

4.5 PVC Pipes and fittings.

It seems likely that initially at least Quality Marking could be supported by testing at other laboratories which are available (e.g. Research Centre of Public Works). Thus the only equipment which might need to be provided is simple checking devices for use by inspectors when visiting factories e.g. pressure gauges, squares, thickness gauges.

Suggest an allowance of: 50.000 drachmas

5. Central Heating Boile

Insufficient information available at present on which to base an estimate of cost. However facilities are said to be available at the Technical University of Athens, hence initial cost may be minimal. Build up of test work may change the situation and a forward plan for increased facilities could be produced.

6. Solar Energy Collectors

Insufficient information at present available to enable an estimate of cost to be provided.

7. Miscellaneous

Other possiblities not taken into account in this study are:

a. Tungsten Filament Lamps.
b. Edison Screw Lampholders.
c. Discharge Lamps (HPMV and Sodium).
d. Ballasts for Discharge Lamps

Costs of equipment for this group of items are likely to be considerably higher than the cost of basic equipment for household heating and cooking appliances.

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8 Capital Equipment - Test Equipment	Vouchers
8.1 Household Heating and Cooking Appliances (basic equipment)	1.000.000
8.2 Household Heating and Cooking Appliances (supplementary list)	750.000
8.3 Water Boilers Testing (supplementary list)	300.000
8.4 Flexible cords (basic equipment)	1.100.000
8.5 Flexible cords (supplementary list)	250.000
8.6 Safety Testing of Toys (basic equipment)	540.000
8.7 Building and Construction Material (Inspectors kit)	50.000
8.8 Central Heating Boilers	--
8.9 Solar Energy Collectors	--
8.10 Miscellaneous items	--
	4.8[illegible].000

9. Buildings and Services

Essential to the provision of equipment for testing is the provision of adequate buildings and related services. Insufficient information is available at present to provide cost estimates. However, for the range of test facilities which might be obtained by ELOT and detailed in Sections 1 to 3 above an area of three to four times the area of the present ELOT Test Laboratory would be needed. There should be scope for growth, both in test areas and associated storage and handling space.

FAR/ELOT/31
12 February 1980.

APPENDIX 6

ELOT QUALITY MARK SCHEMES - TENTATIVE PRIORITIES (from discussion with ELOT personnel).

1. Short term

1.1 Central Heating Boilers.

1.2 Solar Collectors.

1.3 Household Electrical Appliances

i) Cooking and heating Appliances.

ii) Motor Operated Appliances.

2. Medium Term

2.1 Toys (safety).

2.2 Pipes and tubes

i) Plastics

ii) Steel

iii) Copper

2.3 Asbestos Cement Products.

3. Long Term

3.1 Construction Materials

i) Bricks

ii) Cement

iii) Plaster and lime

3.2 Carpets and other textile floor coverings.

3.3 Personal safety products.

3.4 Lamps - tungsten filament.

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ANNEX 2

AIDE MEMOIRE

ELOT AND QUALITY MARKING

Actions

1. Establish Hellenic Quality Mark (Frontard Recommendation 3).
2. Provide and confirm Quality Mark Rules (Frontard Recommendation 4).
3. Set up Certification Board of ELOT.
4. Set up Certification Division of ELOT.
5. Decide on Quality Mark Schemes to be introduced
   - systematic?
   - ad hoc according to the request of industry?
   - mixture of both?
6. Discuss and promote with selected sectors of Industry
   - provide for simultaneous announcement to avoid unfair commercial advantage.
7. Decide on any priority action on Standards needed in respect of 5.
8. Decide whether, as an interim or long standing measure, existing laboratories in the country (or in selected cases, in other countries) are to be used.
9. Decide location and initial size of ELOT laboratories.
10. Decide target date for first Quality Mark Scheme.
11. Provide staff, Administrative, Testing, Inspection to enable target date to be met.
12. Provide equipment and building to enable target date to be met.
13. Provide forward plan to deal with growth of Quality Mark Schemes. (Reinforcement of 11 & 12)
14. Train staff in the various functions associated with the Quality Mark Schemes - Administration, Testing, Inspection.

Note: This list is not claimed to be exhaustive.

FAR/ELOT/32

12 February 1980

APPENDIX 8

LIST OF DOCUMENTS PASSED TO ELOT

1. SOLAR ENERGY

1.1 Draft British Standard Code of Practice (BS 5918:1979)
"Solar Heating Systems for domestic hot water".

1.2 Article from Chartered Mechanical Engineer (UK) December 1979
"Constructing an outdoor solar collector test facility".

1.3 Draft DIN Standard - DIN 4757 Part 3 February 1979
"Solar heating Systems; Solar Collectors, definitions requirements, tests" (In English).

1.4 Israel Standard - SI 609 May 1966
"Solar Water Heaters: Test Methods" (In English).

1.5 Issue No 4 of "HELIOS" - University of Cardiff (UK).

2. PERSONNEL ADMINISTRATION

2.1 British Standards Institution - Booklet
"Terms and Conditions of Service - July 1977"

2.2 British Standards Institution - Notes on salary policy.

2.3 British Standards Institution - Notes on performance appraisal system.

3. MISCELLANEOUS BRITISH STANDARDS INSTITUTION DOCUMENTS

3.1 "System for the registration of firms of assessed capability".

3.2 "System for the registration of Test Houses of assessed capability".

3.3 "An Introduction to the BSI Certification Marking Schemes".

3.4 "Regulations governing the use of the Certification Trade Marks of the Institution (Form 313)".

3.5 "Regulations governing the use of the Safety Certification Trade Mark of the Institution (Form 402 /1/)".

3.6 "Scheme of Supervision and Control (Form 312)".

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3.7 Notes on BSI film.

3.8 B.S. Sectional lists SL 16 - Building.

3.9 BS 3456: Part 3: Section 3.9 1979

"Stationary instantaneous water heaters".

APPENDIX 9

ELOT AND OUTSIDE TEST LABORATORIES - GUIDE LINES

1. Ideally test work should be placed only with registered test laboratories (assuming Recommendation R11 of this report is adopted). In the absence of registered laboratories ELOT Certification Division should establish criteria similar to those in Part Three of the BSI Publication "System for the Registration of Test Houses of Assessed Capability", a copy which has been left with ELOT.
2. When an outside laboratory is being considered by ELOT (e.g. for a new Quality Mark Scheme), the Certification Division should be satisfied that all the equipment required by the Standard is available in the laboratory. One way is to send to the laboratory a questionnaire and copies of the appropriate Standard(s). This to be followed by a visit by ELOT personnel.
3. The laboratory should be made aware that it should not use a test method not called up in the Standard, even if it believes it to be equivalent, without the knowledge and specific consent of ELOT.
   (This is a most important provision of any agreements between ELOT and test laboratories since the use of alternative test methods, e.g. because the appropriate equipment is not available, could invalidate any test report intended for Quality Mark purposes).
4. The test laboratory should be made aware that test work for Quality Mark purposes is commissioned by ELOT Certification Division and not by the manufacturer. Accordingly any test failures or other results should be reported only to ELOT Certification Division.
5. The test laboratory should be aware of the requirement to maintain the confidentiality of any work undertaken on behalf of ELOT.
6. ELOT Certification Division should establish the format of the report it requires and ensure that the outside test laboratory follows this format.
7. The agreements should contain provisions for the receipt, holding and disposal of the test samples by the laboratory. (Usually the samples will

remain the property of the manufacturer and disposal arrangements will be agreed with him. In no circumstances should there be any disposal to the staff of laboratories or ELOT).

8. ELOT Certification Division should be the point of contact between the manufacturer and the test laboratory. Any direct contacts between the test laboratory and the manufacturer should be only with the knowledge and consent of the ELOT Certification Division. It follows that the agreement should require the test laboratory to notify ELOT of any contact made with it by the manufacturer.

9. ELOT Certification Division should make arrangements to regularly monitor the progress of any test work placed with outside laboratories.