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Final Report

Training Course on

"Optical Fibre Communications"

Komp. Puspiptek-Serpong, Tangerang (Indonesia)
28 October – 1 November 2002

LOCAL ORGANIZERS:

Ministry for Research and Technology (KRT)

RISTEK

and

Research Centre for Physics - Indonesian Institute of Sciences (PPF-LIPI)

PPF-LIPI

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ACKNOWLEDGEMENT

We are very grateful to ICS-UNIDO for financially supporting this training course. Many thanks are also sent to Prof. Gallieno Denardo and Dr. Emilio Vento for encouragement and discussions. We wish to thank PT. Asia Bumi Furukawa, PT. Telkom Indonesia, and PT. Mitra Intimarga for co-sponsoring this training course. Many thanks to PT. Furukawa Supreme Optical Cable and PT. Jembo Cable Company for allowing participants of this training course to visit their factories. We are very grateful to Dr. Taufik Hasan (RisTI Telkom), Dr. Stefano Poli (PT. Pirelli Cables Indonesia), Dr. Ary Syahriar (Photronix Malaysia), Mr. Sontang Hutapea (RisTI Telkom), Ms. Rulianti Darwanto (PT. Indonesia Comnets Plus), Mr. Tomi Budi Waluyo (PPF-LIPI), Mr. Takeshi Hidaka (PT. Furukawa Supreme Optical Cable), Mr. Hilarman (PT. Asia Bumi Furukawa), and Prof. Tjia May On (Dept. of Physics - ITB) for giving lecture in this event. Special thanks are addressed to Mr. Koji Matsumoto (PT. Asiabumi Furukawa) as well as to Prof. Thas Nirmalathas (Australian Photonics CRC), Mr. Luigi Carlo Gastel (PT. Pirelli Cables Indonesia), Mr. Syed Asif Hasnain (UNIDO Representative in Indonesia), the Ambassador of Italy H.E. Mr. Francesco Maria Greco and Mr. Michelle Miele (Embassy of Italy) for their supports to the success of this training course.

SUBCONTRACTOR

Ministry of the Republic Indonesia for Research and Technology (KRT) www.ristek.go.id has some functions such as:

- To formulate government policies on research, science and technology, the application of research and technology products, including their links and usefulness in the realization of national development.
- To coordinate and improve integrating measures in science, research and technology planning and program design under taken by government departments, agencies, universities, and the private sector, including industries, so as to optimize development achievements in numerous fields, in terms of output, cost as well as resource usage.
- To coordinate the operational activities of the following governmental research and technology agencies:
  a) Indonesian Institute of sciences (LIPI)
  b) National Nuclear Energy Agency
  c) Agency for the Assessment and Application of Technology
  d) National Institute of Aeronautics and Space

e) National Coordination Agency for Survey and Mapping

f) National Standardization Agency of Indonesia

g) Nuclear Energy Control Board

- To improve public interest and participation in science and technology.

KRT acts as the coordinator for the Research Centre for Physics – Indonesian Institute of Sciences (PPF-LIPI) that will be the local organizer of this ICS/UNIDO Training Course on Optical Fibre Communications. The PPF – LIPI is one of the research centers under the Deputy of Science and Technology in Indonesian Institute of Sciences. The scope and objective of this center is to conduct activities to support the achievement of the national development goals, by arranging the resources at its disposal for mission oriented research and development activities, especially in physics, in response to the need for an industrialized Indonesia.

THE FINAL PROGRAMME

Theoretical and experimental activities on:

- Active and Passive Components in Optical Fibre Systems
- Quality Systems for Optical Access Networks
- Fibre Lasers, Fibre Amplifiers, Fibre Bragg Gratings, and DWDM Systems
- Communications via Optical Fibres Along Power Lines
- Instrumentation for Optical Fibre Systems
- Optical Fibre Splicing
- Specialty Fibres
- Non Linear Optics and Soliton
- Visit to optical fibre cable companies
- Experiments on using OTDR, fibre splicing, fibre polishing/connectorization, and using OSA

OPENING SESSION

Place : Pusarpedal Auditorium, Kompleks Puspiptek Serpong
Date/Time: October 28, 2002/ 8:00 – 12:30.

- (08:00 – 09:00) Registration
- (09:00 – 09:10) Report by the Chairman of the Local Organizer (Mr. Tomi Budi Waluyo)
- (09:10 – 09:20) Speech by the Head of PPF-LIPI (Dr. Achiar Oemry)

- (09:20 – 09:30) Speech by UNIDO Representative in Indonesia (Mr. Syed Asif Hasnain)
- (09:30 – 09:40) Speech by ICS Area Director (Dr. Emilio Vento)
- (09:40 – 09:50) Speech by the Ambassador of Italy (Mr. Francesco Maria Greco)
- (09:50 – 10:00) Speech and Opening Remarks by the Deputy Minister for Research, Science and Technology Development (Dr. Agus Hartanto)
- (10:00 – 10:30) Break
- (10:30 – 11:15) Keynote Speech I: *"Optical Networks to Meet Telecommunication Challenges in Indonesia"* by **Dr. Taufik Hasan** (DivRisTI Telkom)
- (11:15 – 12:00) Keynote Speech II: *"Experience and Headways of the Pirelli Group in Optic Fiber for Telecommunication"* by **Dr. Stefano Poli** (PT. Pirelli Cables Indonesia)
- (12:00 – 13:00) Lunch

THE SCIENTIFIC SESSION

Monday, October 28th, 2002

- 13:00 - 13:45 Company Presentation by. **Mr. Marhaban Sigalingging** (PT Mitra Intimarga)
- 13:45 - 15:00 Paper Presentation and Group Discussion
- 15:30 - 16:00 Video Presentation: *"R&D Activities at Australian Photonics CRC"* by **Prof. Thas Nirmalathas**

Tuesday, October 29th, 2002

- 08:30 - 10:00 Lecture I: *"Active and Passive Components in Optical Fibre Systems"* by **Dr. Ary Syahriar**, (Photronix Malaysia)
- 10:30 - 12:00 Lecture II: *"CIQS: Quality Systems for Optical Access Networks"* by **Mr. Sontang Hutapea** (DivRisTI Telkom)
- 13:00 - 14:30 Lecture III: *"Fibre Lasers, Fibre Amplifiers, Fibre Bragg Gratings, and DWDM Systems"* by **Dr. Ary Syahriar** (Photronix Malaysia)
- 15:00 - 16:30 Lecture IV: *"Communications via Optical Fibres Along Power Lines"* by. **Ms. Rulianti Darwanto** (PT Indonesia Comnets Plus)

Wednesday, October 30th, 2002

- Company Visit to PT Furukawa Supreme Optical Cable and PT. Jembo Cable Company Tbk.

Thursday, October 31st, 2002

- 08:30 - 10:00 Lecture V: *"Instrumentation for Optical Fibre Systems"* by **Mr. Tomi Budi Waluyo** (PPF - LIPI)
- 10:30 - 12:00 Lecture VI: *" Optical Fibre Splicing"* by **Mr. Hilarman** (PT Asiabumi Furukawa)
- 13:00 - 13:45 Experiment I/Group A; II/B; III/C; IV/D
- 13:45 – 14:30 Experiment I/Group D; II/A; III/B; IV/C
- 15:00 – 15:45 Experiment I/Group C; II/D; III/A; IV/B
- 15:45 – 16:30 Experiment I/Group B; II/C; III/D; IV/A

Note:

Experiment I: Measurement Using OTDR (Optical Time Domain Reflectometer)

Experiment II: Fibre Splicing

Experiment III: Fibre Connectorization

Experiment IV: Measurement Using OSA (Optical Spectrum Analyzer)

Friday,November 1st, 2002

- 08:30 - 09:45 Lecture VII: *"Specialty Fibres"* by **Mr. Takeshi Hidaka** (PT. Supreme Optical Cable)
- 10:15 - 11:30 Lecture VIII: *"Non Linear Optics and Soliton"* by **Prof. Tjia May On** (Dept. of Physics - Institute Technology of Bandung)

Nearly all lecture materials are available in the accompanying CD.

THE COMPANY VISIT

Wednesday, October 30th, 2002

1. 09:00 – 11:30
   PT. FURUKAWA SUPREME OPTICAL CABLE
   Jl. Daan Mogot Km.16, Kalideres, Jakarta Barat

2. 13:30 – 15:30
   PT. JEMBO CABLE COMPANY
   Jl. Pajajaran, Jatiuwung, Tangerang

THE CLOSING SESSION

Friday, November 1st, 2002 (start at 13:30)

- Report by the Chairman of the Local Organizer
- Farewell Speech by the overseas participants
- Speech and Closing Remarks by representative of the Head of PPF - LIPI
- Delivery of Certificates (signed by Dr. Emilio Vento, Dr. Agus Hartanto, and Dr. Achiar Oemry) and CD (contains lecture materials, photos, and participants data) to all participants

FINAL LIST OF PARTICIPANTS

No.	Name	Affiliation	E-mail / Office (o) / Home (h) / Fax (f)
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24	Yusup Kristiono	PT. Jembo Cable Company Tbk Jl. Pajajaran, Jatiuwung, Tangerang	

LIST OF LOCAL ORGANIZER

No.	Name	Duty/Resposibility	Affiliation	Tel./Fax/Email
1	Dr. Agus Hartanto	Program Coordinator/Head of Steering Committee	KRT Jl. M. H. Thamrin No. 8, Jakarta	Telp. 62 21 310 2045 Fax. 62 21 210 2014
2	Dr. Achiar Oemry	Member of Steering Committee	PPF - LIPI Komp. Puspiptek, Serpong, Tangerang 15314	Tel. 62-21-756 0556 Fax. 62-21-756 0554
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4	Dr. Neni Sintawardani	Member of Steering Committee	KRT Jl. M. H. Thamrin No. 8, Jakarta	Telp. 62 21 310 2045 Fax. 62 21 210 2014 sintaw@hotmail.com
5	Tomi Budi Waluyo, M.Eng.Sc.	Chairman of Organizing Committee	PPF – LIPI Puspiptek, Serpong 15314, Tangerang,	Tel. 62-21-756 0556 Fax. 62-21-756 0554 dwitomi@cbn.net.id

6	Dr. Suprapedi	Co-Chairman	PPF – LIPI Puspiptek, Serpong 15314, Tangerang,	Tel. 62-21-756 0556 Fax. 62-21-756 0554
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13	Dr. Titin Kathrina	Master of Ceremony	PPF – LIPI Puspiptek, Serpong 15314, Tangerang,Indonesia	Tel. 62-21-756 0556 Fax. 62-21-756 0554 tikana@p3ft.lipi.go.id
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LIST OF LECTURERS

1) Name : Dr. Taufik Hasan
Position/Affiliation : Head of Research Div. for IT
PT. Telekomunikasi Indonesia Tbk.
DivRisTI
Jl. Gegerkalong Hilir 47
Bandung, INDONESIA
Expertise : Telecommunication Systems

2) Name : Dr. Stefano Poli
Position/Affiliation : President Director/CEO PT. Pirelli Cables Indonesia
PT Pirelli Cables Indonesia
BRI II Building , 15th Fl. Suite 1502
Jl. Jendral Sudirman Kav. 44-46
Jakarta 10210, INDONESIA
Expertise : Optical Fibre Manufacturing

3) Name : Dr. Ary Syahriar
Position/Affiliation : Photronix Malaysia Sdn Bhd
G05, 2300 Century Square
Jalan Usahawan, 63000 Cyberjaya
Selangor, MALAYSIA
Expertise : Photonics Devices

4) Name : Mr. Sontang Hutapea
Position/Affiliation : PT. Telekomunikasi Indonesia Tbk.
DivRisTI
Jl. Gegerkalong Hilir 47
Bandung, INDONESIA
Expertise : Quality Control.

5) Name : Ms. Rulianti Darwanto
Position/Affiliation : PT. Indonesia Comnets Plus
Gedung PLN
Jl. Jend. Gatot Subroto
Jakarta, INDONESIA
Expertise : Communications

6) Name : Mr. Tomi Budi Waluyo
Position/Affiliation : PPF – LIPI
Kompleks PUSPIPTEK
Serpong 15314, INDONESIA
Expertise : Instrumentation

7) Name : Mr. Hilarman
Position/Affiliation : PT Asiabumi Furukawa
Jl. Borobodur 20
Jakarta, INDONESIA
Expertise : Marketing and Field Engineer

8) Name : Mr. Takeshi Hidaka
Position/Affiliation : PT. Furukawa Supreme Optical Cable
Jl. Raya Daan Mogot Km. 16 Kalideres
Jakarta Barat, INDONESIA
Expertise : Optical Fibre Manufacturing

9) Name : Prof. Tjia May On
Position/Affiliation : Dept. of Physics – ITB
Jl. Ganesha 10 Bandung, INDONESIA
Expertise : Photonics Materials

10) Name : Prof. Dr. Thas Nirmalathas
Position/Affiliation : Australian Photonics CRC
Director, Photonics Research Lab.
Victoria VIC 3010, AUSTRALIA.
Expertise : Optical Fibre Communications

OBJECTIVES

This training course introduces the participants to the basic principles and applications optical fibre communications technology through a series of lectures by experts, laboratory experiments, and visit to industries. This will provide the background needed to follow the development of this technology as well as to strengthen understanding and collaboration between the countries participated this training.

ACHIEVEMENT/RESULTS

- Dissemination of knowledge and know-how on optical fibre communications.
- Building a better linkage between universities, R&D institutes, and industries.
- Formation of a class of trained persons in the field of optical fibre communications.

RESUME OF THE QUESTIONAIRE

Subject	Result in %			
	Excellent	Very Good	Good	Fair
The information process was	20	55	25	0
The announcement and pre-course material was	10	38	52	0
I found the scientific programme	10	57	33	0
Applied Lecture/Workshop	10	43	48	0
Use of small working groups	19	43	33	5
Case Studies	10	20	55	15
The time spent by lecturers in class and after class on specific questions/examples	15	55	30	0
Students scientific knowledge was	Balanced=89%		Unbalanced=11%	
Number of days	Just right=76%	Too long=10%	Too short=14%	
Length of working days	Just right=83%	Too long=6%	Too short=11%	
Lecture/Training Rooms	19	38	43	0
Breaks/refreshments	19	38	38	5
Hotel accommodation	15	30	40	15
Meals at the hotel	11	32	42	16
Organizer's response to participants needs	38	29	33	0
Overall programme organization	33	19	48	0
Would you recommend to others from your institution/country to attend a similar activity in the future	Yes = 76%	Maybe = 19%	No = 5%	
Course material	15	50	35	0
Resident lecture presentation	15	30	50	0
International lecture presentation	5	55	40	0
Ability of lecturers to answer specific questions	27	35	38	0

RECOMMENDATION

- It is expected ICS UNIDO also financially support some Indonesian participants (especially who comes from outside Java)

FOLLOW-UP

- Similar training course in 2003 which intensively involved partners such as PT. Telekomunikasi Indonesia, PT Pirelli Cables Indonesia, PT Asiabumi Furukawa, PT

Furukawa Supreme Optical Cable, PT Jembo Cable Company, PT Mitra Intimarga, and the Embassy of Italy

- Regional workshop on "optical sensors" or "lasers in industry" in 2004.
- Regional workshop on "Optical Non Destructive Test" in 2005.

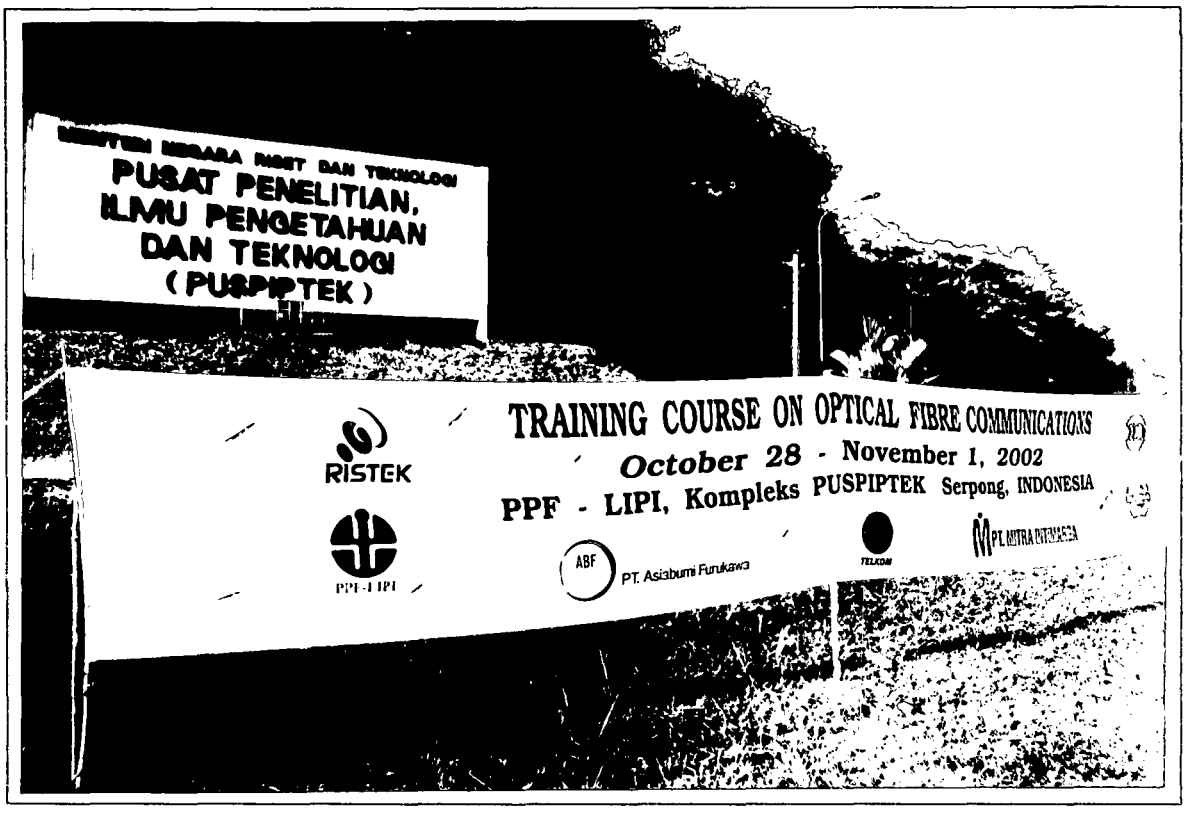
Jakarta, November 20th, 2002

Reported by the Subcontractor

Dr. Agus Hartanto
Deputy Minister for Research, Science, and Technology Development,
OFFICE OF THE MINISTRY OF RESEARCH AND TECHNOLOGY
THE REPUBLIC OF INDONESIA

ANNEXES:

- **Some photographs**
- **Evaluation Form**



Banner of the training course at the PUSPIPTEK gate.

A snapshot of the opening ceremony at the Pusarpedal Auditorium.

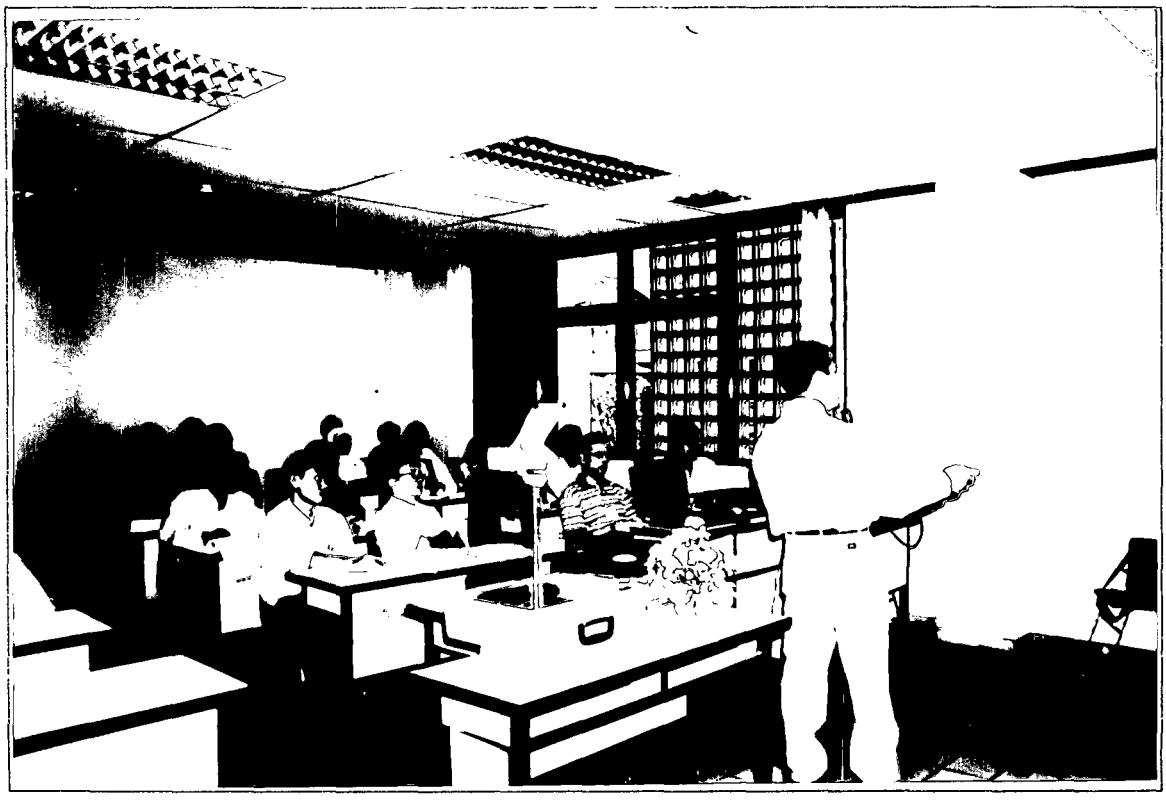
Speech by the Ambassador of Italy H.E. Francesco Maria Greco

Speech by the Deputy Minister of Research, Science, and Technology Development Dr. Agus Hartanto.

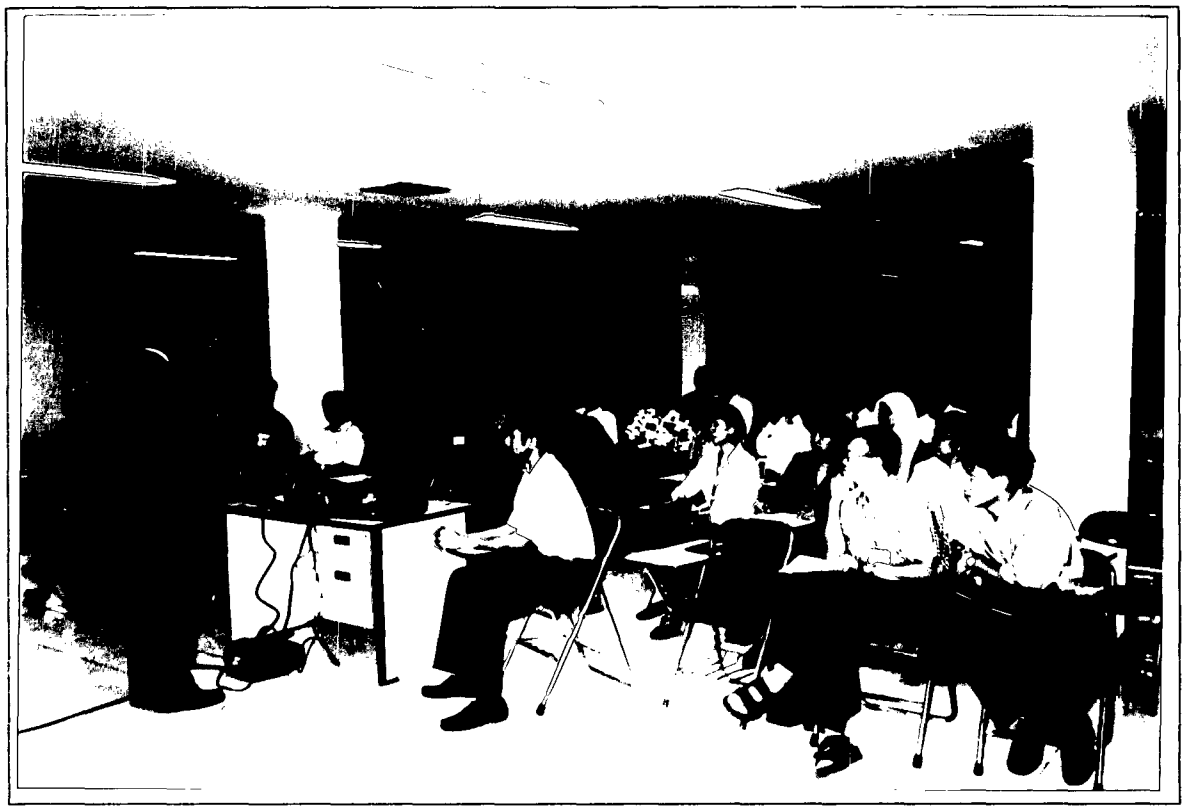
Pose together with the Ambassador of Italy after the opening ceremony.

Keynote Speech by Dr. Taufik Hasan (Head of Div. RisTI P.T. Telkom).

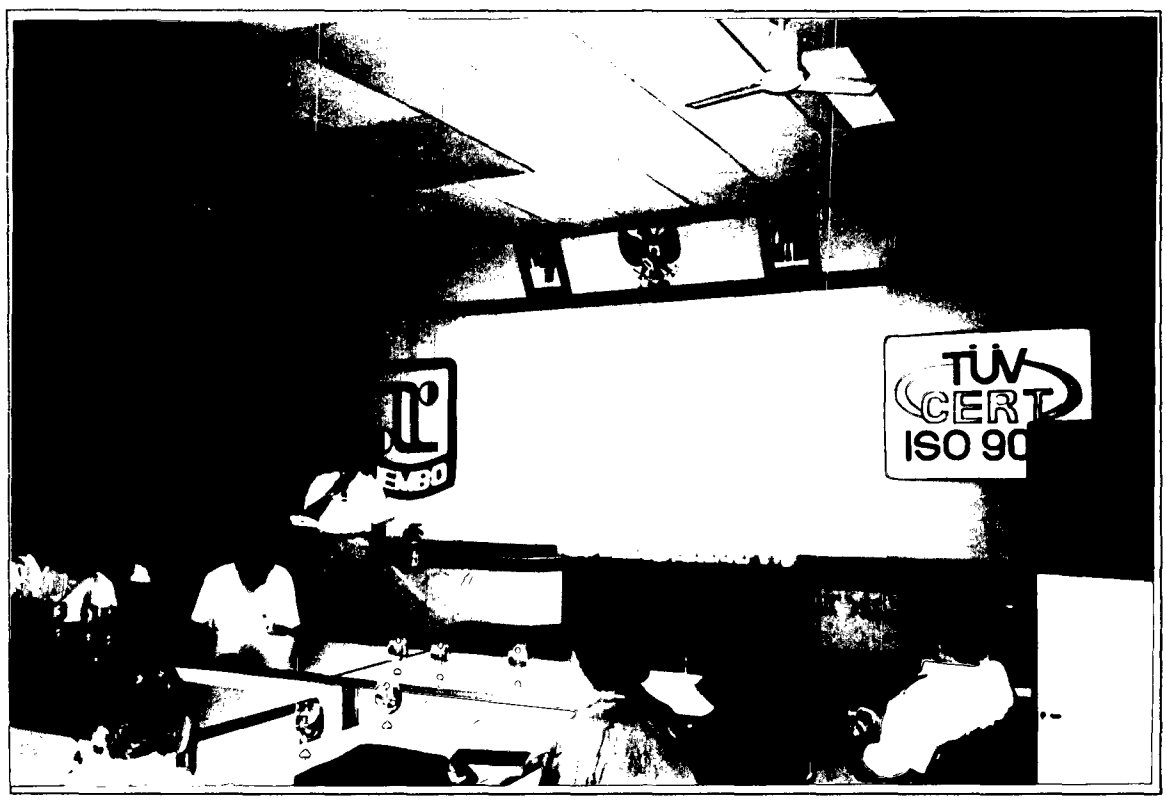
In the classroom: Lecture by Mr. Sontang Hutapea.



In the classroom: Lecture by Dr. Ary Syahriar.



At PT Furukawa Supreme Optical Cable.



At PT Jembo Cable Company Tbk.

Lecture and demo on optical fibre preparation.

Experiment on using OSA (optical spectrum analyzer).

Experiment on fibre splicing.

EVALUATION

A.1. How did you obtain information about this workshop/course ?

- From COMSAT / ICS
- Email from organizer
- Internet
- From LIPI (Ms. Tuti)
- From leaflet or brochure
- From my institution (Indonesia University)
- From ICS-UNIDO and organizer
- From member of LIPI Fizik
- From Dr. Tan (Physics Dept. University Brunei Darussalam)
- Through private communication with member in LIPI Fizik
- From University

A.2. The information process was ...

Excellent	20 %	
Very Good	55 %	
Good	25 %	
Fair	00 %	

A.3. The announcement and pre-course material was ... (Describe the content of the workshop/course :)

Excellent	10 %	
Very Good	38 %	
Good	52 %	
Fair	00 %	

- Lectures, group discussion, factory visit, experiment
- Five days course contents: registration, opening ceremony, different invited lectures, paper presentations, company visit, experimental period & closing ceremony.

A.4. I found the scientific programme ...

Excellent	10 %	
Very Good	57 %	
Good	33 %	
Fair	00 %	

A.4.1. Applied Lecture/Workshop ...

Excellent	10 %	
Very Good	43 %	
Good	48 %	
Fair	00 %	

A.4.2. Use of small working groups ...

Excellent	19 %	
Very Good	43 %	
Good	33 %	
Fair	05 %	

A.4.3. Case Studies ...

Excellent	10 %	
Very Good	20 %	
Good	55 %	
Fair	15 %	

A.4.4. The time spent by lecturers in class and after class on specific questions/examples ...

Excellent	15 %	
Very Good	55 %	
Good	30 %	
Fair	00 %	

A.5. Students scientific knowledge was ...

Balanced	89 %	
Unbalanced	11 %	

B.1. Number of days ...

Just right	76 %	
Too long	10 %	
Too Short	14 %	

B.2. Length of working days ...

Just right	83 %	
Too long	06 %	
Too Short	11 %	

C.1. Lecture/Training Rooms ...

Excellent	19 %	
Very Good	38 %	
Good	43 %	
Fair	00 %	

C.2. Breaks/refreshments ...

Excellent	19 %	
Very Good	38 %	
Good	38 %	
Fair	05 %	

C.3. Hotel accommodation ...

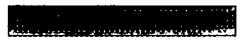
Excellent	15 %	
Very Good	30 %	
Good	40 %	
Fair	15 %	

C.4. Meals at the hotel ...(if "Fair" please explain why :)

Excellent	11 %	
Very Good	32 %	
Good	42 %	
Fair	16 %	

- Able to purchase dinner at Guest House
- No television and no phone
- Far away from the main city, nothing to be done after the class
  below standard rooms

D. Organizer's response to participants needs ...

Excellent	38 %	
Very Good	29 %	
Good	33 %	
Fair	00 %	

E. Overall programme organization ...

Excellent	33 %	
Very Good	19 %	
Good	48 %	
Fair	00 %	

F. Would you recommend to others from your institution/country to attend a similar activity in the future ...

Yes	76 %	
Maybe	19 %	
No	05 %	

F.1. Which part of the activity did you find most useful ?

- Experimental Labs plus the site visit.
- Company visit.
- Lectures.
- Lecture I, Lecture III, Lecture V, Experiment, lecture VII.
- All of the parts.
- Lecture from the industries and labolatory.
- Experiment.
- Hidaka presentation.
- Practice/Experiments.
- All.
- Making practice about fiber optics stuff.
- Lecture notes and industry visit.
- Company visit.
- Company visit and experiments.
- Lectures and visits.
- Company visit.
- Lab activity and a few presentation about fibre optic development in several countries, presentation about telecommunication system that use optical fibre include trend of market and technology in telecommunication system.
- Lecture I, lecture III, Experiment.
- All.
- Company visit to PT. Furukawa Supreme Optical Cable and PT. Jembo Cable in found to be the most useful part of the activity.

F.2. Which part of the activity do you think should be expanded ?

- Experimental Labs.
- Lab. work.
- Lecture.
- Lecture I, II, V and experiment.
- Lecture from Furukawa.
- Lecture fron industries and from other institutions contain the latest technology and researchs achivements related to the topic.
- Experiment and Company visit.
- Laboratory activities.
- Add the time of practice/experiments.
- None.
- Practice: Splicing, fusing and something like these.
- Workshop.
- Experiment.
- Worskhop.
- Lecture and workshop/laboratory practicals.
- Experiment, because I am the participant by doing.
- I think the subject is not only in theoritical but should expand for the implementation. These activities should be a gateway between theory and the implementation phase or gateway between scientiest and engineer.
- Experiment.

- In my opinion, the experimental part seems to be expanded. Should be included the Coupler vs Gain measurement part.

F.3. Which part of the activity do you think should be droped ?

- None.
- Lecture II, IV, Keynote speech.
- Nothing.
- None.
- The speech and any activities that just sit and not doing anything.
- There is no part should be droped, but there were so many teoritical presentation and less of case study.
- None.
- There is no balance between theory and practical case study.
- Keynote Speech.
- I think no part of the activity should be dropped. All parts of this activity are very much essential.

F.4. Any other suggestions for future improvements to the programme ?

- During workshop days it is good to have full day for site seeing around Jakarta to have an image about Indonesia.
- More qualified lecturer such as Dr. Ary Syahriar.
- To add more lecturer expecially from specialist from abroad.
- All of paper must be copied in CD.
- Hopefully that the financial not only for participants from other countries, but also for Indonesian Government employee which is not supported from their institutions.
- make some groups for discussion.
- Presentation/training material (printed material) should be given before the presentation was attended.
- Choose the lecture rooms in silent.
- None.
- It should be any advanced training for shaping the experting to an individual by more enough days to learn and study.
- Advance the lecturer and experiment.
- Try to expand the experiment activity. Perhaps participants can learn by doing also.
- Give a lot of time to foreign countries for the begenning of the programme eg. 2 or 3 months (problem od visas).
- More advenced lectures. A summary of lecture prior to thestart of workshop would be helpful.
- All the lecturers are from optoelectronic people, there is no one from system people.
- In my suggestion more invited lecturer in this field should be arrange for future improvements to the programme.

F.5. Do you think that the topics/tools you studied during the course could be used by industries in you country? If so, how? If not, why not?

- May be tools for splicing and testing of fibre optics are useful for most companies special whom working in the field of comm. and most of university have thier own LAN network.
- Sure, way not.
- Yes, the topic is a very important for today communication.
- Integrate the research institution, cores university and industries.
- I think not, because industries in Indonesia only contain a samll part of technology achivements.
- Yes, because right now the industries in my country (Indonesia) began to adopted the new technology of fibre optic.
- Yes, It is very important to choose/to determine the technology and designing network by considering many parameters that we got in this training.
- Yes, useful for the country.
- It could be used if it is takes enough days to learn and study.
- Yes, through public lectures and workshop for department which uses optical fibre as communication media.
- yes, we should explain to industries everything about optical fibre. What benefit if they use it.

- Yes.
- Yes, Have gained better insight into industrial application of optical fibre communication. The networking is most valuable.
- So, how to implementation be effective.
- No. All the topics only theory. can you imagine how to make researches in Indonesia and developed it for telecommunication system ? In Indonesia, people only make money not a formula.
- The topics/tools studied durung this course may be used by industries in my country, but will be helpful for other researcher or students in my country (India).

F.6. Can you suggest any programme and future activities which ICS could pursue in order to help with the technological and scientific advancement of your country ?

- Moblie communication, Communication networks and e-government.
- Training or workshop on photonics technology.
- Recent topics in high technology.
- Giving a support to do researches in our country.
- For my country, please make some discussion groups for doing research technology that usefull to Indonesian public.
- Please invite fibre optic application terminal equipment vendor to give presentation about FO application technology, so we will get complete information from physical layer to application layer.
- Optical networking.
- The participant/student should be practice not only in laboratory but also in field such as attending or following any project which doing the material trained.
- Programme in information communication technology.
- Wireless technology.
- Non-conventional energy for 3rd world countries and the management of energy resources.
- I think it will get better if not only imagine what all lectures talk. we need tools.
- The activity on"Fabrication of some special types of optical fibres", which ICS could pursue in order to help with the technological and scientific advancement of my country (India).

F.7. Do you think you have benefited from participation in this course/workshop? If so, how? and your Institution ?

- Yes, I start understanding the way of producing fibre optic cables and the new ideas how to increase the performance of fibre comm.
- Yes, acquiring new knowledge.
- To distribute of information to other person in my institution.
- Yes, new information from participants and hopefully new lirik in the future.
- Yes, in this course I can have knowledge about some technologies of fibre optic.
- Yes, the lab activity and experiences are very important, and we got the business and technology description from other country.
- Of course, to add knowledge about fibre optic.
- Will use FO for optical networking.
- Yes, many knowlwdge we've got and many friends, so we will have open thought to the science specially about fibre and communication optics.
- Yes, through lectures notes and workshop.
- Because I am from industry. I think that this course can help me to solve problems that we have on our company.
- Yes.
- Yes, The contacts and networking will be useful in the future.
- So, because my institution is industry and the theory and practice in labs have benefit in my job.
- We can expand our business with pilot project from another country.
- I am very much benefited from participating in this course/workshop. Company visit and experimental part helped me very much to gather knowledge and this knowledge will be transfered to other students of our institute in this field.

F.8. How do you intend to disseminate the information you have acquired during the activity once back in your own country ?

- It gives me new experience for monitoring the fibre cable network we have, to be more achive to write the right specification once we want to buy fibre optic.
- I will use the material and knowledge that I have aquired to teach students at my country.
- To develop it.
- By giving a lecture to my students.
- By sharing knowledge, or give presentation to our college.
- Will use for LAN and WAN.
- By way of lectures and the internet.
- Giving the info.
- Yes, teaching and training.
- We have an activity called knowledge sharing in our company. We have to share these knowledge.
- After coming back. I will submit a report about this course to the head of my institution and head ISTAD.CSIR, India to disseminate this information that I have acquired.

G.1. Course material ...

Excellent	15 %	
Very Good	50 %	
Good	35 %	
Fair	00 %	

G.2. Resident lecture presentation ...

Excellent	15 %	
Very Good	30 %	
Good	50 %	
Fair	00 %	

G.3. International lecture presentation ...

Excellent	05 %	
Very Good	55 %	
Good	40 %	
Fair	00 %	

G.4. Ability of lecturers to answer specific questions ...

Excellent	27 %	
Very Good	35 %	
Good	38 %	
Fair	00 %	

Any comments :

- Changing the place of accomodations, have special days for site seeing.
- If there will be any programme, please inform us.
- I hope for the next course, all participants have place in the best house. All paper must be copied for participants.
- All course material, specially hard copy of lectures presentation should be had by participants during course.
- Material should be given before course.
- Please contact us is any course again.
- More invited lecturer in different specific field of optical fibre may be arrange. If possible, visit to optical fibre production plant should be arrange. Experimental part regarding hours measurement process and making fusion coupler, writing of fibre Bragg-grating may be included. Should invited more overseas participants from other different countries. I hope the organizer will be always in contact with me in the future.