

THE  
Journal

# ICNDT Journal

The Official  
Journal of the  
**International  
Committee for  
Non-Destructive  
Testing**

Year five – Issue n. 2  
October 2003

*The world Organisation for NDT*

## The most important incoming NDT event

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- Report from 3rd PANNDT
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- Certification in the world: Australia, India, Brazil
- ASME recognition of ISO9712/EN473 Schemes
- ICNDT Directory



## 16<sup>th</sup> WCNDT



16<sup>th</sup> World Conference on  
Non-Destructive Testing  
Montréal, Canada  
August 30 ~ September 3, 2004



### Members of Organizing Committee



Alison Smith



Martin Viens



Dick Struk



Douglas Whitely



Peter Brady



Cindy R. Finley



Jean Bussiere



Sharon Bond



Douglas Marshal

### OBITUARY

#### Bjarne Larsen

It is with great sadness that we report the sudden passing away of Mr Bjarne Larsen, President of the Danish NDT Society and a member of the Board of Directors of the European Federation of NDT.



Bjarne Larsen in his role as President of the European Council for NDT, guided the transition of the organisation into a fully fledged Federation. The new Federation was formally launched during the very successful 7<sup>th</sup> European NDT Conference on Copenhagen in 1998. The success of this conference was due in a large part to the enthusiastic work of Bjarne and his wife Susanne. Bjarne's work was widely acclaimed in the national NDT societies and he was awarded an Honorary Fellowship by the British Institute of NDT. He was also Chairman of the *Insight* European Editorial Advisory Panel.

Since 1998, Bjarne has continued his active support of the EFNDT as a Board Member, and his work on standardisation and accreditation, in parallel with his busy and successful career with Force Institute in Denmark.

Bjarne Larsen, small in stature, and from a small country, was nonetheless a big man in NDT circles. His strong sense of justice and support for the underdog was widely recognised across Europe. He was always willing to contribute and always keen to remind his colleagues to keep close to the industry they seek to serve. He used his sharp sense of humour to good effect in our meetings.

Bjarne will be sorely missed by his wife and family, his friends and the whole international NDT community.

JM Farley  
President EFNDT

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### Call for papers

Abstract Submission Deadline:  
November 15, 2003

### Technique Oriented Sessions

Inspection of Micro-Systems	Walter Arnold
Radiography	Uwe Ewert
Materials Characterization	Robert E. Green
Magnetic Technique Sessions	David Jiles
Signal Processing	Daniel Levesque
High Resolution Ultrasonic Imaging	Roman Maev
Thermography, Thermal techniques	Xavier, Maldague
Laser-ultrasonics	Jean-Pierre Monchalin
In-Process NDT (process control)	Andre Moreau
Certification	Richard V. Murphy
Nuclear and General	Baldev Raj
Guided Waves	Joe Rose
Round table on non-contact ultrasonics	Bruce Tompson
Eddy Currents	Lalita Udpa
Optical Techniques Session	Lian Yang

### THE INTERNATIONAL COMMITTEE FOR NON DESTRUCTIVE TESTING



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WELCOME TO JEJU ISLAND! WELCOME TO ASIA-PACIFIC CONFERENCE FOR NDT



## ICNDT REGIONAL GROUP

## Pan American Committee for NDT

Summary Report from the 3<sup>rd</sup> Pan-American Conference for Nondestructive TestingEXPERT WORKSHOP ON HARMONISATION OF QUALIFICATION AND CERTIFICATION OF NDT PERSONNEL  
Rio de Janeiro 3 June 2003

The workshop was organised by ABENDE – the Brazilian NDT Society – alongside the Pan American NDT Conference – with Mr. Luiz Cesar de Almeida of Petrobras and Joao Conte of ABENDE as Co-Chairmen.

The Workshop commenced with short presentations by each invited participant and was followed by a brainstorming session. Then, the following day, a sub-group of the attendees met to define the priority action items and assigned these to the parties able to pursue them.

## Highlights from individual presentations

- **Wilfried Hueck** – Vice President of DGZfP – explained how his Society's training and certification programmes comply with EN 473 and are recognised under the EFNDT Mutual Recognition Agreement. At Level 3, in response to industry, DGZfP has developed "NDT Master" – a Level 3 programme which exceeds the minimum requirements of the Standard and covers all eleven NDT methods.
- **Dr. Rick Murphy** – Natural Resources Canada (the Canadian Certification Body) and Chairman of ISO TC 135 SC7 – gave an update on the situation in Canada and his organisation's support for the ISO 9712 standard. The process of revision of the

PARTICIPANTS	638
Conference	252
Authors	62
Speakers	22
Participants	168
Exhibitors	386
Visitants	236
Exhibitors	150
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Companies	08
Government Support	01

## Major Meetings:

- Workshop International Harmonization on Training and Qualification of NDT Personnel (see the report)
- Panamerican Committee Meeting
- National Coordinators for Latin America and IAEA Meeting
- General Purpose and Policy Committee of ICNDT (Unconfirmed minutes available on [www.icndt.org](http://www.icndt.org))

standard is underway. Rick commented that it was now proposed to retain the mandatory use of practical examinations at Recertification. A paragraph requiring the Employer to have in place a proper "Written Practice" is proposed. Consideration should be given by ICNDT towards creating a central organisation with responsibility for approval of Certification Bodies.

• **Mike Farley** – President of EFNDT – gave a summary of the actions of the Federation in the field of certification, including the EFNDT MRA (Mutual Recognition Agreement), ECP (the European Certification process) and showed how Standardisation, Accreditation, Mutual Recognition and then ECP would lead to progressively increasing harmonisation. He concluded with his personal 'modern view' of certification, which combines the best of central certification and company certification.

• **John Thompson** – Head of the Certification Division of the British Institute of NDT and Manager of the PCN Scheme – remarked on the progressive harmonisation as standards came together or are combined e.g. EN 45013/ISO 19024; EN 4179/NAS 410. He supported Rick Murphy's ideas regarding an ICNDT scheme to approve Certification Bodies. He also mentioned the

Countries	Participants
BRAZIL	192
ARGENTINA	22
CANADA	08
GERMANY	04
USA	05
UNITED KINGDOM	05
CHILE	04
URUGUAY	03
MEXICO	03
AUSTRIA	01
COLOMBIA	01
SPAIN	01
PHILIPPINE	01
ITALY	01
RUSSIA	01

need to tackle the lack of acceptance of EN473/ISO 9712 by NADCAP.

• **Stephen Black**, Chairman of the Board of ASNT described ASNT's process for developing mutual recognition agreements. He gave particular emphasis to the statistical systems developed in ASNT for measuring and maintaining the degree of difficulty of theory examinations.

• **Vilmar da Silva** of Embraer – the Brazilian aircraft manufacturer gave a thought provoking and very well illustrated presentation on the structure of multi sector training and certification. He pointed out the benefits of identifying the common elements in different sectors or methods and harmonising these.

• **Douglas Marshall** – CINDE Canada and president of the next World Conference shared some of CINDE's experience in training of NDT personnel. Course durations are generally fixed in accordance with the minimum requirements of the ISO 9712 standard, but can be grossly inadequate if the prior know-



ledge and capability (including mathematical aptitude) of the student is below the norm.

• **Giuseppe Nardoni** – Italy and Chairman of ICNDT – commented on the increasingly important role of ICNDT. In his view the acceptance of the standards ISO 9712 and

EN 473 is now assured and attention should be switched to making sure the standard is used correctly – in particular that the employer recognises his responsibilities.

• **Isaac Einav** – NDT Technical officer at the IAEA – described the support given by IAEA to member states who request it. The IAEA has consistently promoted the use of ISO standards, and has contributed by updating the training guidelines (TEC-DOC 628). Experience had shown that the minimum hours requirements were inadequate for the body of knowledge to be fully covered for those students who lack the appropriate technical background.

Notes prepared by Mike Farley  
5th June 2003

## PAN AMERICAN COMMITTEE FOR NDT MINUTES OF RIO DE JANEIRO MEETING

## Intercontinental Hotel, Rio de Janeiro, Brazil

Monday, June 02, 2003 – 1:00 pm to 4:00 pm

## Participants:

Voting Members of the PANNDT Committee: Cesar Belinco – Argentina, Roberto Valera – Bolivia, João Antonio Conte – Brazil, Douglas Withely – Canada, Carlos Ernesto V. – Colombia, Juan Francisco Fortis Roa – Mexico, Silvia Infanzón – Uruguay, Stephen Black – USA

## Guests of the PANNDT Committee:

Alberto Nicolini – Argentina, Hector Espejo – Argentina, José Scopelitti – Argentina, Edson Vasques Moreira – Brazil, José Santaella Redorat Júnior – Brazil, Alfonso Garcia – Mexico

## President of the PANNDT Committee:

Maria Izabel Gebrael – Brazil

## Special Guests of the PANNDT Committee:

Douglas Marshall – ICNDT (Canada)  
Giuseppe Nardoni – President of ICNDT (Italy)

## 1. Call to order

Ms. Gebrael, President of the Committee, welcomed all participants.

Mr. Edson Vasques, President of ABENDE, in the presence of the honored guests, expressed ABENDE's satisfaction in promoting this gathering.

Ms. Gebrael requested that each participant introduce him/herself.

## 2. Participants

The following voting delegates were present at the meeting:

Cesar Belinco – Argentina, Roberto Valera – Bolivia, João Antonio Conte – Brazil, Douglas Withely – Canada, Carlos Ernesto V. – Colombia, Juan Francisco Fortis Roa – Mexico, Silvia Infanzón – Uruguay, Stephen Black – USA

## 3. Approval of minutes

The minutes of the previous meeting held in Houston – USA on June 19 2001 were read and approved.

We were informed that Mr. Thomas Passek, who represented the PGPC Committee at the ICNDT, had retired from ASNT.

Mr. Douglas Marshall suggested that we should include this subject in the agenda of this meeting.

## 4. Remarks

## 4.1 Announcements

Mr. João Conte read a message he received from

Mr. David Culbertson explaining his absence at the meeting.

Mr. Douglas Marshall reported the information about Mr. Peter Brady and justified his absence at the meeting.

## 4.2 Changes in the Agenda

The agenda for the meeting was submitted for debate.

Mr. Marshall suggested that we should include the awards issue, which was already debated at PGPC meeting of ICNDT.

He said that the American region should appoint one candidate for the awards, which will be granted by the ICNDT.

His motion was accepted.

## 5. Report of the President

Ms. Gebrael submitted her report (attached), and outlined some key issues addressed during her administration. She explained that it might seem little, but the Conference organization was very time consuming.

Mr. Marshall said that the task of organizing large events is one of the main objectives of the President of the Committee, and he congratulated the President of ABENDE and Ms. Gebrael for the excellent organization of this Conference.

The report was approved.

6. Next Conference:  
hosted by Argentina or Mexico

Ms. Gebrael read the minutes of the Houston – USA meeting, provision 5.1, and said that she had understood that Argentina would organize the next Conference, and México would host the one after Argentina.

Mr. Juan Francisco Fortis informed that he went to the United States and discussed with Mr. Culbertson the periodicity of the Pan American Conference.

Mr. Marshall thinks that the Conference should be held every two years, in order to divulge the technology. He said, however, that the Terms of Reference for the Pan American Committee foresees an interval of three to four years between Conferences.

Mr. César Belinco informed that Argentina is preparing to organize the Conference in four years time.

Ms. Gebrael said that the organization of a Conference is an arduous task, and that four years is a reasonable timeframe, since there are other activities to be promoted by the Committee during this time.

Ms. Silvia Infanzón agreed with this information,

and Mr. Garcia Cueto emphasized that the vast majority of international events take place every 4 years.

After a long debate about the subject, it was defined that the 4th Pan American Conference for NDT will be held in Argentina in 2007.

México will host the next Conference in 2011.

Mr. Roberto Valera submitted a motion that Bolivia is interested in hosting the Conference in 2015.

The meetings of the Committee will be held during international or even domestic Conferences. The next meeting of the Pan American Committee will be held in Montreal – Canada, during the World Conference in 2004.

Ms. Silvia Infanzón said that Uruguay is interested in hosting the meeting of the Pan American Committee in 2005, during the National Conference in Uruguay.

Mr. Cesar Belinco made a short presentation of the Argentinean working plan to host the Conference in 2007. Messrs. Nicolini, Scopelitti and Espejo complemented his information. They also showed the Conference logo for 2007, which was handed out for the participants of this Conference.

## 7. New Businesses

## 7.1 Representation of the Pan American Region within the ICNDT

Mr. Marshall submitted the ASNT letter informing the reasons for the temporary suspension of its activities within the ICNDT.

The issue was debated, and the conclusion drawn was that the ASNT should no longer represent the region within the ICNDT.

Ms. Silvia Infanzón submitted a motion for Brazil and Canada to represent the region within the ICNDT. The motion was approved by all present.

## 7.2 Activities of the Pan American Committee

Ms. Gebrael requested that each of the participants present a short summary of the activities in their countries.

## a) Argentina

They are developing activities in new NDT areas and techniques, such as Acoustic Emission and Restoration of Works of Art and Monuments. They also developed a system for the certification of personnel in vibration analyses.

## b) Bolivia

They are working in the organization of the Bolivian Society for NDT.

## c) Brazil

A short summary of the main activities related to courses, events, technical standardization and

qualification and certification of personnel was presented.

## d) Canada

The organization of activities for the coming World Conference for NDT was presented.

## e) Colombia

They informed that there were 62 individuals certified in the country through the ASNT-TC-1A system, and that there was a great interest in the certification through the Brazilian System. They also stressed their efforts for the establishment of the Colombian Society for NDT.

## f) Mexico

The activities developed in the railway field were outlined, and the organization of the next National Conference for NDT, as well as the reactivation of the Mexican Society for NDT.

## g) Uruguay

They were developing NDT courses and other activities in conjunction with local Universities. They were setting up their Board for Qualification and Certification of Personnel.

## 7.3 Funds

The issue of funds for the Committee was submitted for deliberation.

Mr. Espejo reminded everyone that the current responsible for the technical cooperation at IAEA was a Mexican, and that this fact may be of great value for the Agency to support the activities of the Pan American Committee.

## 7.4 Awards

Mr. Marshall read some regulations concerning the granting of awards at the ICNDT.

Mr. Douglas Whiteley said that there were 5 awards that could receive nominations, and that one of these awards should be appointed by the representatives of each region.

Mr. Giuseppe Nardoni, President of the International Committee, expressed his apologies for being late at the meeting as he experienced some problems with the flight. He stressed the importance of regional working groups; he also said that one of the key objectives of the Committees and Associations was to foster the establishment of National Societies for NDT. He also appointed to the importance that the Pan American Committee have its own flag and asked the Committee to look into this matter.

Mr. Stephen Black, ASNT representative, also expressed his apologies for being late at the meeting; he also had problems with the flight. He stressed the ASNT interest in contributing with the countries in the region, especially with the national societies for NDT.

At 4:30 pm, with nothing else to be dealt with, Ms. Gebrael thanked everyone for their presence and adjourned the agenda of the meeting.



# THE POWER OF COMMUNICATION

Nowadays, the use of internet makes easier to run in real time information around the world overcoming political and commercial barriers. However, magazines, journals or more simply newsletters or technical bulletins edited by worldwide NDT Societies are the expression and the soul of each national Society providing also technical support to its members.

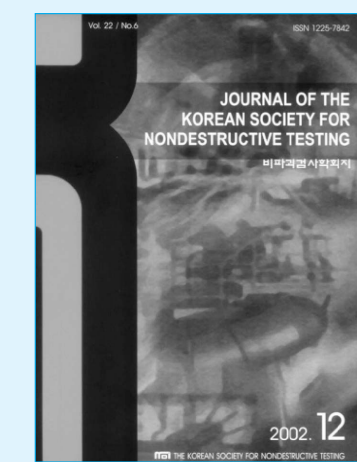
With this page the ICNDT intend to promote dissemination and interchange of publications among ICNDT members with the aim to strenghten liaisons and co-operation in order to achieve an actual global NDT Community



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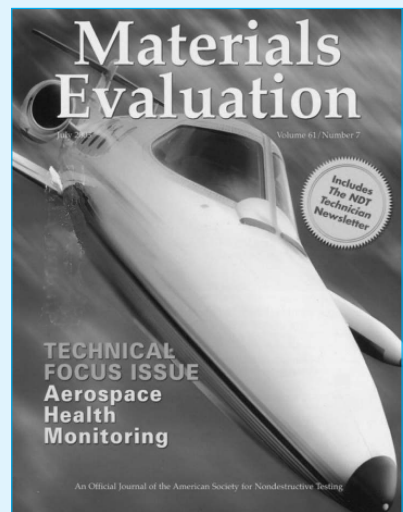
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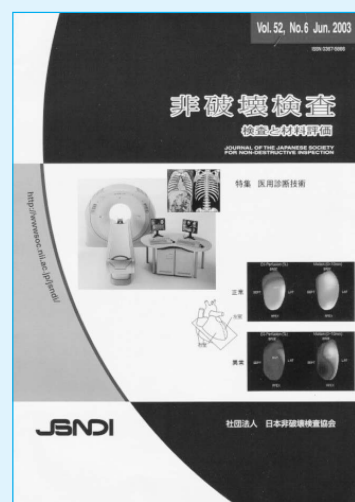
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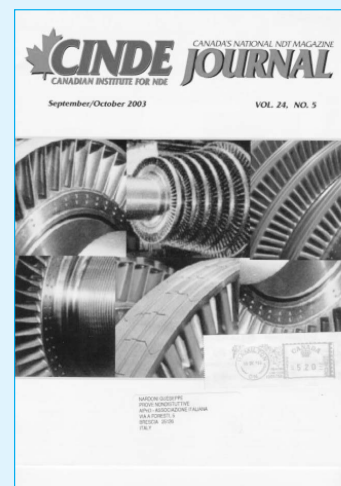
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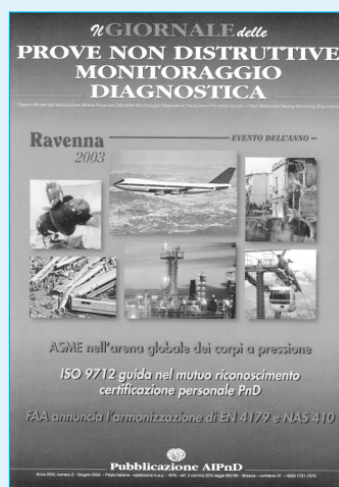
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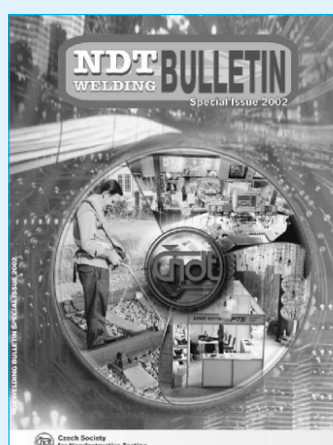
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# ICNDT REGIONAL GROUP Asia-Pacific Committee for NDT

## History on NDT in Asia

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\*Prof. Emeritus, Tokyo Institute of Technology, Tokyo, Japan;  
\*\*Hitachi Construction Machinery Co., Ltd.

\*\*\*Shantou Institute of Ultrasonic Instruments, Shantou, China;

\*\*\*\*Prof. Emeritus, Hanyang University Seoul, Korea;

\*\*\*\*\*San Lien Development Co., Ltd. Taipei, Taiwan;

\*\*\*\*\* Office of Atomic Energy for Peace, Bangkok, Thailand (submitted to 8th APCNDT, December, 1995, Taipei).

As received by Prof Onoe

### ABSTRACT

NDT in Asia were started and broadened in 1970's. Situations of NDT in Asian countries at that time are recollected. Situation and environment of PPCNDT (APCNDT) in Asia at the initial stage are also described. Relation of Japan to Asian countries on NDT are described as well.

### INTRODUCTION

APCNDT was founded in 1976 as PPCNDT and we are quite pleased that APCNDT. In Asia, many countries have established the Society on NDT of their own and vivid activities have been carried out not only in exchanging the information among members but developing the advanced technology and new application on NDT. In this paper, the background, motivation and environment at the time when PPCNDT was founded are described. And also the situations at when the society on NDT was established in Asian countries are recollected and the current topics or activities of the countries now are described as well. In this paper, 4 countries, which are China, Korea, Taiwan and Thailand are specifically referred.

### HISTORY of PPCNDT (APCNDT)

When 7th ICNDT (International Conference on Non-Destructive Testing) was held in Warsaw, Poland in 1973, Dr. Y. Ishii took part in the conference. Participants exceeded more than 1300 and as many as 160 papers were presented in the conference. However, there were few chances to present the paper even accepted by the committee because the participants and papers presented were increased by leaps and bounds. Its phenomenon was desirable but some presenters were not satisfied. So, Dr. Y. Ishii asked the committee members concerned by questionnaire soon after the conference if holding period of ICNDT should change from every three years to every two years. Then members from more than 10 countries were replied, in which the most of them were in favour of Dr. Y. Ishii's opinion, namely holding every two years. But the members from two European countries were against because NDT conference in Europe was intended to be held between ICNDT and it was not economical if held often. After all, ICNDT has been held every three years as ever. Also, in standing committee of 7th ICNDT Dr. Y. Ishii requested that he'd like to hold the 10th ICNDT in Tokyo, Japan in 1982, which happened to be 30th anniversary of JSNDI (Japanese Society for Non-Destructive Inspection). But the request was unfortunately rejected and couldn't be realized. Because candidates for holding ICNDT were so many and on top of that voting power were on European members side due to number of members. There were few members of ICNDT in Asian countries at that time. Therefore, Asian's opinions were not so strong enough accordingly. Dr. Y. Ishii felt that he should keep an eye on not only European countries but Asian countries as well. So, he made up his mind to hold the conference in Asian countries. He consulted with Dr. G. H. Tenney of the United States who was the chairman of international relations committee of ASNT at that time to organize the conference on NDT for Pan-Pacific countries mainly for Asia. He understood and quite agreed with Dr. Y. Ishii's thought. 12 Pan-Pacific countries were called to participate in the conference. Then, 7 countries of the United States, Canada, Australia, Mexico, Korea, Singapore and Japan agreed and had intention to participate. In March, 1976, the meeting for foundation of



Gerold Tenney (right) shakes U.S. President John F. Kennedy's band. Tenney was one of the founder and more enthusiastic man of ICNDT.

Pan-Pacific committee for non-destructive testing (PPCNDT) were held in Tokyo and PPCNDT were founded and started. In the foundation meeting, only Korean members were attended whose representative was Mr. T. Lee of Korean nuclear power industry. Dr. G. H. Tenney and Dr. Y. Ishii were elected as president and vice-president of PPCNDT, respectively. In the meeting, buy-laws of PPCNDT such as the purpose, organization of the committee and activities were proposed, confirmed and approved by the members. The purpose was as follows: the objectives of the PPCNDT are to advance science and engineering related to non-destructive testing in Asian and Pacific coastal countries, to disseminate information, to encourage research, and to organize meetings devoted to mutual understanding among scientific and technical NDT experts.

The secretariat of PPCNDT was first placed at TTI (Technology Transfer Institute) in Tokyo and transferred to JSNDI in 1980. 1st PPCNDT were held in Tokyo in March, 1976 with 250 persons from 5 countries participated. Mr. B. W. Bace of Amoco oil company of the United States was invited as a special lecturer and the conference was held with the seminar on non-

destructive inspection for maintenance services. The conference was successful and made a good start and built the ground of NDT in Pan-Pacific countries. 2nd PPCNDT was held in Seoul, Korea in 1978, 3rd was in Tokyo, Japan in 1980, 4th was in Sydney, Australia in 1983, 5th was in Banqber, Canada in 1987, 6th was in Bleinheim, New Zealand in 1990 and 7th was held in Shanghai, China in 1993. Participants and papers presented for the conference are shown in Table 1. PPCNDT has contributed and helped the Pan-Pacific countries to communicate each other and promote the technology on NDT.

From 2nd PPCNDT in 1978 the president was replaced by Dr. Y. Ishii from Dr. G. H. Tenney. When 3rd PPCNDT was held in Tokyo in 1980, members from China and Taiwan attended together at the conference. Then, Chinese delegation protested against and disappeared from the room during the conference due to the political reasons and become bad mood with high tension. However, Dr. Y. Ishii and other persons concerned made a great efforts to intercede and after all got good relations between them at the welcome party held at night same day. After that event they have been communicated well each other having mutual information exchange. Since 6th conference, a given name of PPCNDT was changed to APCNDT (Asia Pacific Conference on Non-destructive Testing) which was based on the idea of Mr. T. E. Goldfinch of Australia.

### Table 1 - Participants and papers presented on PPCNDT

1. Mar.1976: Tokyo, Japan : 15 papers and 250 participants from 5 countries
2. Apr.1978, Seoul, Korea : 27 papers and 250 participants from 8 countries
3. Nov.1980: Tokyo, Japan : 36 papers and 120 participants from 9 countries
4. Nov.1983: Sydney, Australia : 49 papers and 200 participants from 7 countries
5. Apr.1987: Vancouver, Canada : 54 papers and 300 participants from 6 countries
6. Mar.1990: Bienheim, New Zealand : 50 papers and 100 participants from 8 countries
7. Sep.1993: Shanghai, China : 104 papers and 400 participants from 6 countries
8. Dec. 11-14, 1995: Taipei, Taiwan
9. Mar. 23-27, 1998: Anaheim, USA
10. Sep. 17-21, 2001: Brisbane, Australia

## BACKGROUND AND CURRENT TOPICS RELATED WITH NDT IN ASIA

### 1. CHINA

Since NDT technology in China plays an important role in field of economy, national defense and modern science and technology, it has been developed as independent science. In 1976, invited by the chairman of ICNDT, Chinese NDT delegation headed by member of Chinese Academy of Sciences Prof. Tao Hengxian attended the 8th ICNDT conference in France for the first time. In 1979 China was formally accepted as the member of ICNDT in the 9th ICNDT conference in Australia. In 1987 delegation headed by vice chairman of Chinese NDT society Yao Jinzhong attended the 5th PPCNDT in Canada, and formally joined the NDT organization of Asia and Pacific Area.

In order to promote the development of NDT in China, with the leader of general engineer Tao Hengxian, the first largest NDT academic exchange conference in China was held in Shanghai in November, 1978 with 149 delegates of 177 units including 19 industrial systems, Chinese Academy of Sciences, universities and research institutes. The NDT society of China (subordinate to Chinese Mechanic Engineering Society, and briefly called CNDTS in the world) was formally established in the conference. Prof. Ying Chongfu from Acoustic Institute of Chinese Academy of sciences was the chairman of the 1st NDT society. In September, 1993, the society organized the 7th Asian Pacific NDT conference and signed the technical cooperation agreements with NDT societies in German, Russia, Japan, Brazil, Korea and India. There are more and more frequent international exchanges. From 1970's to 1980's, Dr. Y. Ishii and other Japanese experts of NDT visited China to introduce Japanese sophisticated technology on NDT and the newly published books, for example, "Non-destructive Testing Science" authored by Dr. Y. Ishii. They helped Chinese engineers and researchers to know and promote the new technology and application of NDT. In 1981 Dr. Y. Ishii, Dr. N. Niwa and Dr. M. Onoe visited to attend the 2nd CNDTS conference. They also gave lectures and discuss with the Chinese engineers a lot about advanced NDT, which strengthened communication between Chinese NDT Society and JSNDI as well. In 1992, supporting by Dr. Y. Ishii and Dr. K. Imoto, cooperation agreement was signed between the CNDTS and JSNDI.

### 2. KOREA

In 1970's KSME (the Korean Society of Mechanical Engineers) opened the conference of metrology and technical courses for NDI. In other hand, the construction of nuclear power plant led to be recognized NDT in about NDT in industries and academic fields. The people who tried to induce the public opinion late 1970 through meetings and lectures with and from foreign scholars were Dr. J. Cha, vice president of the Korea Atomic Energy Research Institute, Mr. T. Lee, Director of Korea nuclear power Industry and Mr. E. Han, Prof. Hanyang Univ. As the result from that, the KSNT (the Korea Society of Non-Destructive Testing) was organized on April 30, 1980 and Dr. B. Lee was elected as the chairman. Korea nuclear industry had charged of NDT until the 1970's. After KSNT was built, the activities on NDI were controlled by KSNT. Now the KSNT has much improved for

15 years. This society has active in executing the ASNT (the American Society of Non-Destructive Testing) qualification test, holding symposiums and publishing papers etc. But there are not good participation and papers from the experts having practical experiences. That is a problem solved in a short period. 2nd PPCNDT was held in Seoul in 1978, in which more than 250 persons with 27 papers were participated and resulted in a fruitful conference.

### 3. TAIWAN

China steel Co., Ltd. proposed the government, central standardization office, to organize the national NDT society in 1977 to promote NDT technology because NDT became very important in Taiwan industry. The government consigned the industrial research center which was established by National Taiwan University and a certain foundation because it would be advisable to be founded as civilian academic organization. Prof. C. C. Ma, who was responsible for the center, was requested to found the society. Then, he tried to make an effort and the backbone of the organization was built in July, 1978 after the many meetings with a lot of discussions by the national or private companies of power plant, petroleum, shipbuilding, aircraft, machinery and so on. Prof. C. C. Huang and Mr. J. C. Lin of SAN LIEN Development Co., Ltd. positively got in touch with JSNDI and Japanese researchers to exchange the information on NDT. As a result, NDT society of Taiwan was founded in March, 1979 and 1st conference was held in Kaohsiung. Dr. Y. Ishii who was the president of PPCNDT and Dr. Y. Ishibashi who was the chairman of the international committee of JSNDI at that time were invited and made lectures in the conference.

Members when founded were approximately 300. More than 30 persons from Taiwan were took part in the 3rd PPCNDT held in Tokyo in 1980 and became a formal member of PPCNDT.

### 4. THAILAND

NDT was introduced to Thailand in 1969 by International Atomic Energy Agency through the Office of Atomic Energy for Peace (OAEP). At that time Gamma ray and X-ray radiographic testing was the major technique for industrial applications. In 1982, the industrial development started in Thailand and Non-Destructive Testing techniques have since been increasingly important. In 1982, there were various industries using NDT technique as part of their operations, namely airlines, shipyards, oil refineries, constructions and manufacturing of compressed gas containers, automotive tires and large engine blocks. There were seven independent firms offered NDT services. In order to increase the number of qualified NDT personnel for serving of NDT techniques in industries, it was believed that more training course would be essential. In October 1980, under the RCA / UNDP Industrial project, (the Project), OAEP with the cooperation of the Thai Committee on Non-Destructive Testing started national training program in NDT and has been carried on up to now. In 1983, the Thai Society for Non-Destructive Testing (TSNT) was established after the First National NDT Conference on "Role of Non-Destructive Testing" held in Bangkok and under the patronage of "OAEP" and Engineering Institute of Thailand (EIT), and with support of the Project. In the early stages of



Prof. Onoe, ICNDT Honorary Member and active promoter of APCNDT

TSNT'S establishment, training of the NDT personnel in some major techniques for example RT, UT and other NDT technology were undertaken with the support of OAEP and the Project by following the draft ISO 9712 guideline. Since then, various training courses and seminars have been organized, and increasing number of NDT personnel have been trained and qualified. At present TSNT was established as NDT permanent society in Thailand on October 4, 1994. Members of the TSNT comprising NDT practitioners, government officials and persons from associated fields. There are about 100 members.

In 1985, Dr. Y. Ishii, Dr. E. Isono and Dr. Y. Ogura were invited to NDT seminar sponsored by Technological Promotion Association (Thai-Japan). Advanced NDT techniques were introduced and vivid discussions were carried out. This helped build a big bridge between Thailand and Japan in terms of NDT. TSNT has trained NDT personnel to be qualified since 1983. At that time OAEP contacted IAEA expert assistance on NDT level 2. IAEA requested Dr. Ooka, an expert from JSNDI, organizing in level 2 program in Thailand, from 1988-1991. JSNDI has since been TSNT's indirect contact organization in Japan.



Prof. Ishii

### CONCLUSION

History of APCNDT are recollected and background of NDT Society and current situations of NDT in 4 Asian countries are also described. We are so pleased NDT in Asia has been prosperous and advanced and technology has been developed and put into actual use in the related industry, which become important tools for upgrading quality of products. We hope NDT technology will grow rapidly but steadily in the future through APCNDT and amicable relations among Asia countries.



## Training and certification NDT - Indian success story

Baldev Raj, V.A.Chandramouli, K.Balaramamoorthy and B.Venkataraman  
National Certification Board, Indian Society for Non-Destructive Testing



Baldev Raj

Training and certification of personnel is one of the most important and crucial areas that has attracted world wide attraction. It is well recognised that the key to the success of any operation is the availability of qualified personnel. NDT is no exception. In fact, since most of the tests in NDT rely on human interpretation, reliability of NDE test results strongly depends on the quality of the trained personnel. Proper and adequate training of NDT personnel is therefore a must to ensure that the capabilities of the techniques are fully exploited and correct interpretation and hence evaluations are made since they have a significant bearing on the quality and reliability, safety and productivity and long life many a times beyond the design life. Certification schemes are vital to achieve desired and uniform levels of competence and standard of work throughout the country and internationally. Thus, a system or methodology has to be evolved and implemented to objectively evaluate and certify the competence level of NDT personnel.

### History of Training and Certification in India

The importance of personnel qualification for NDT personnel had been realized by NDT professionals in India way back in the 60's itself. Familiarisation talks and lectures on NDT were arranged in different organizations and at various places. With the formation of a Professional Body on NDT - The NDT Society of India in 1972, the training programs were pursued in a systematic manner. Participants from various industries and organizations were invited and structured courses on specific NDT methods were conducted with practical demonstration. Keeping in view the pace of industrialization and increased application of NDT, particularly in nuclear, defence, aerospace, petrochemical and heavy industries, Indian Society for Non-Destructive Testing (ISNT) in late 70's constituted a panel of selected professionals for formulating a certification scheme. Comments on the draft scheme were invited from user departments around the country and the refined certification scheme, based on the then state-of-art expertise base, was adopted in 1982. With this as foundation, ISNT started conducting Level-I and Level-II certification examinations in the conventional NDT methods with active involvement of different ISNT chapters.

During this time, International Atomic Energy Agency (IAEA), realizing the important role of training and certification especially in critical areas such as nuclear industry, developed its training guidelines and syllabi for the conventional NDT techniques. This syllabi outlined in the IAEA TecDoc 628 "Training Guidelines in Non-Destructive Testing" took into account the work done by ICNDT as well. Based on this syllabi, a number of Level - II and Level - III programs were conducted by IAEA through the RCA in close collaboration with the national NDT body. In India, Level - III programs were conducted in ultrasonic testing and radiography and a number of personnel from Atomic Energy and public sector organizations such as BHEL participated. To create harmonisation among the various countries and also ensure the same within a country IAEA also brought out a series of training guides in the techniques of RT, UT, PT and MT. It also conducted special programs such as "Train the Trainers" to educate the faculty on the art of training. With the rapid increase in the adoption of several NDT methods and techniques in several industries and also due to the greater insistence on quality by the customers and regulatory bodies, the need for recognition and harmonization of training and certification of NDT personnel was being felt by the industry and regulatory bodies. With this in view, the Bureau of Indian Standards (BIS) took up the task of formulating an Indian Standard on this subject and in line with prevailing international standards. BIS rightly recognized the need and importance of ensuring the quality of trained and certified personnel and took up the issue in its MTD Sectional Committee (SMDC 21). ISNT took an active part in the deliberations and finally the Standard IS-13805 was printed and released in 1993. Meanwhile ISNT was recognized as National Sponsoring Organisation and India as an Accredited Examination Centre by the American Society for Nondestructive Testing (ASNT) for conducting ASNT-Level-III Examination. Starting from 1986, so far eleven examinations have been conducted till last year in India and about 400 personnel from India, Gulf region, Singapore, Ceylon, Malaysia and Bangladesh have benefited by this interaction and got ASNT Level III certification.

While formulating the Indian standard on Training and certification of NDT personnel along with BIS, ISNT in parallel constituted the National Certification Committee in early 90's to start work on various procedures necessary to meet the requirements proposed in the draft standard. Later when the standard IS 13805 was released, the certification committee was renamed and broadened as National Certification Board (NCB) in 1997.

### Present scenario

The National Certification Board of Indian Society for Non Destructive Testing has been entrusted with the task of training and certification of NDT personnel in the country since 1997. The membership of NCB has been carefully drawn with members from public, private sector organisations, third party inspection agencies, ministry, regulatory bodies, professional bodies, research and educational organisations, etc. The organizational structure of NCB is given in Table - I below. Some of the major responsibilities of NCB as outlined in IS 13805, include:

- Initiating, maintaining and promoting the national certification scheme as per ISO 13805
- Administering the procedures and operation for certification in accordance with the standard
- Prescribing a code of ethics which shall apply to certificate holders
- Accrediting training agencies in NDT methods
- Keep all appropriate records and issue the certificates and other written testimonies
- Interact with recognised international bodies for mutual recognition of certification and international harmonisation.

### Significant achievements of NCB- National Harmonisation Quality Manual

The first priority of NCB has been the harmonisation of training and certification programs at the national level. India being a vast country with distinct and varying educational curricula and experience levels, this was the most daunting task for NCB. As with any NDT inspection, the first step was to formulate a procedure and a flow chart detailing the implementation route. This was done by NCB by formulating its quality manual in line with the requirements of ISO 9000 (keeping in view international harmonisation requirements) to streamline the various activities and procedures. Guidelines were provided on how to conduct the Level - I, II and III courses. The responsibilities of the Chapters/organizations conducting the courses, examiners and the NCB were clearly identified and defined. The methodology for accreditation of organisations to conduct training and certification programs and the code of conduct for the examiners were prescribed. The Quality manual also described the Quality policy and the Quality objectives of NCB. All the Chapters of ISNT and the bodies conducting training and certification programs in NDT were provided with copies of this manual for compliance.

### Course Notes

One of the main stumbling blocks in national harmonisation was the variation in the curricula and the methods of teaching. Such variations would result in personnel with different levels of understanding. The curricula part was taken care by the formulation of the Indian Standard on Training and Certification IS 13805 which provided in detail, the topics to be covered and the practical to be arranged. IS 13805 exceeded ISO 9712 in general.

The teaching part was taken care of by the preparation of Courses notes for Level - I and Level - II in various techniques. **This was a major and second important achievement of NCB.** Keeping in mind the educational background of the candidates, the language used in the course notes is very simple with lot of illustrations so that the candidates can grasp the subject quite easily. Emphasis has been placed more on the practical aspects of the technique. NCB is now taking steps to have standard teaching aids based on power point presentations and video presentations so that the teaching methodologies can also be harmonized.

### Harmonisation of Examination

To harmonise the examinations being conducted at different places in India, a question bank is being developed. For uniformity of assessment in practicals, sets of standard blocks with calibrated defects have been obtained from internationally reputed firms such as Sonaspection International, UK. Development of a library of well characterised specimens with natural defects in castings, welds and forgings is a continuing action of NCB. The examiners for all the Level - I and II exams are chosen from the list of examiners accredited by NCB.

The Level - I and Level - II training and certification programs come under the purview of the Chapters with NCB assuming a supervisory role, Level - III examinations is the direct responsibility of NCB. More than 10,000 personnel have been certified till date by the Chapters. NCB today caters to the trained manpower needs of the core and strategic industries such as the Atomic Energy, Defence, Space, manufacturing and fabrication industries. It has also catered to the specific needs of the industries through the organization of specialized employer specific training and certification programs. A number of requests have also been received by NCB for conducting training and certification programs in the gulf region and in Bangla Desh.

NCB has also successfully conducted 5 ISNT level - III exams. The highlight of the Level - III examination is that these were also conducted in specific sectors such as welds, castings and forgings. Apart from the general paper and the specific paper, there was also a paper on procedure writing. Candidates who had come directly for the Level - III exam had to undergo a practical exam equivalent to Level - II standard.

Till the advent of international harmonisation, to cater to the needs of the candidates requiring certification of international bodies, NCB also conducts ASNT level - III certification once in a year with the active support of ASNT. There are over 4000 ASNT Level III personnel world wide. NCB has helped about 400 candidates from India and other regions around to qualify as ASNT Level - III. Table - I gives the status of NDT certificate holders in India. ( see the page 6 for table )

### International harmonisation

Many a developing and developed countries have their own training and certification program. While some such programs (such as ASNT, PCN, etc.) are well structured and established, many are in various stages of evolution. However, a unanimous opinion that has been expressed by the developed and developing nations is the need for world harmonisation and international recognition of NDT personnel. Towards this end, the International Committee on NDT (ICNDT) has initiated a number of preparatory steps.

### ICNDT Efforts

It was realised in the late 1970s itself by ICNDT that harmonisation of qualification and certification of personnel in NDT is desirable to simplify World Trade and to avoid the unnecessary and costly duplication involved if NDT technicians need to obtain many different approvals from different countries and schemes had been realised. ICNDT also realised that it is not possible to develop a universal scheme to satisfy all countries since they have different customs, laws and practices, but harmonisation on technical requirements including theoretical knowledge through common syllabus, practical skills and by specifying job responsibilities identical assessment procedures can be achieved. Towards this end, during the 9<sup>th</sup> World Conference held in Melbourne in 1979 ICNDT appointed a working group which was entrusted with the task of unifying the plethora of schemes adopted by different countries and bring out a basic document. The first basic document ICNT WH 15-85 "Basic Requirements for National Personnel Qualification and Certification Schemes" was thus prepared by this Working Group on Harmonization of Training and Qualification of NDT-Personnel and was adopted by ICNDT in November 3, 1985 during the 11<sup>th</sup> World Conference on NDT at Las Vegas. The document provided an outline of the basic requirements for national personnel qualification and certification schemes. It was based on the centrally administered examination approach rather than the Employer based approach. Individual employers can, if required, add "job specific" theoretical and practical examinations to satisfy their own special needs or those of their customers. The document also envisaged that most countries will develop representative National Bodies to control their National schemes and that such bodies will be responsible for ensuring that schemes meet National needs. These national bodies would in turn promote the national and international recognition of their national schemes.

Going a step further, ICNDT also adopted the document "ICNT WH 23-85 Model Agreement on the Mutual Recognition of Qualification and Certification Schemes for NDT Personnel" on November 7, 1985. This document provided the basis for mutual recognition by which two national bodies who have found that their training systems and qualifying examinations are based on the same principles. ICNDT also decided to forward the documents to ISO TC 135/SC7 for their consideration. ISO referred to these documents in the course of preparation of ISO 9712.

### Present Status and Indian Effort

It was during the ICNDT meeting on December 11, 1996 during the 14<sup>th</sup> WCNDT at New Delhi, India that Dr. Baldev Raj was chosen as the Chairman of the Policy and General Purposes Committee (PGPC) of ICNDT and a task group was formed specifically to look into International NDT Certification Scheme and recognition of existing schemes with Dr. Mike Farley (task leader), Dr. Morio Onoe, Dr. Mike Turnbow and Dr. Aufricht as the members. During the PGPC meeting at Copenhagen which was held along with the 7<sup>th</sup> European Conference on NDT in May 1998 under the Chairmanship of Dr. Baldev Raj of India, international harmonisation formed the major agenda point. It is now agreed upon by ICNDT unanimously that ISO 9712 must be the basis for harmonisation. Once a NDT society is accredited under ISO 9712 it should be able to have the support of other NDT societies when they seek recognition. The ultimate goal is the formation of an International Accreditation Forum which would accredit the national body once it complies with all the requirements.

India has played a key role in the efforts of the international community for international harmonisation. A strong Indian delegation led by Dr. Baldev Raj participated in the ISO 9712 seminar held during the 15<sup>th</sup> World Conference on NDT. During this seminar, the steps taken by National Certification Board for national harmonisation was outlined. Dr. Baldev Raj also emphasised that India has already taken the necessary steps such as revision of existing Indian standard IS 13805 according to ISO 9712 (2000) so that India would be in time for international harmonisation. The course notes and quality manual were circulated among the international community and drew appreciation from all around. Many countries from the gulf and Asian region have requested India to conduct training and certification programs in their country.

### Harmonisation through Regional Groups

Having achieved the first step in the international harmonisation that is - the identification of the common international standard (ISO 9712) on which the national standards can be based the next logical step is the mutual recognition of the individual certification schemes. While globally this can be achieved in a single step the logistics would make it difficult to implement. The better and pragmatic step and a realistic solution towards this is the identification of an accreditation agency and proceeding regionally. It is here that the regional groups can play a significant role.

The regional bodies can interact effectively amongst themselves, mutually identify the strength and weaknesses of their certification schemes and thus arrive at a common platform so that harmonisation based on the international ISO 9712 among the region is ensured. Such a step would also take into account the needs and priorities of each of the countries. Once this is achieved in the individual regions, integration at the global level becomes easier. Hence, it is necessary for ICNDT to consider activating the regional groups and formulating the guidelines for such regional harmonisation.

The IAEA meeting on Mutual recognition of various certification schemes, held in Dhaka, Bangladesh during Aug. 27-29, 2001 is a landmark meeting in this regard. Attended by Dr. Baldev Raj, President ISNT and Coordinator of the RCA program of IAEA from India, President of ICNDT Dr. G.Nardoni and many other ICNDT members from developing and developed countries, the objective of the meeting was to formulate the action plan and recommendations to achieve mutual recognition. Since, India has a good success story with respect to national harmonisation and is playing a vital role in the efforts of ICNDT for international harmonisation, it played a key role in the formulation of the guidelines and recommendations which are reproduced below in a nutshell:

1. IAEA to approve the Draft Agreement for Mutual Recognition formulated at the Dhaka Meeting and distribute it to all National NDT Coordinators of RCA member states as a reference guide for National Certification Bodies seeking recognition.
  2. IAEA to recognise the IAEA/RCA Working Group formed at the Dhaka Meeting for mutual recognition of various certification schemes in Asia-Pacific Region of RCA.
  3. IAEA/RCA to organize a consultant meeting, as early as possible, for the members of the IAEA/RCA Working Group to prepare a model quality manual for implementing the requirements of ISO 9712 and EN45013.
  4. IAEA to support the National Societies, and their nominated Certification Bodies, on specific request with regional experts in order to build competence of the member countries of IAEA/RCA to gain accreditation in accordance with EN45013 from their nationally recognized accreditation bodies.
  5. IAEA and ICNDT to prepare an agreement for administration and technical support toward the mutual recognition of the worldwide certification schemes already in progress.
- With greater impetus to international harmonisation ICNDT should consider activating the regional groups and formulating / developing the guidelines for such regional harmonisation.

### VISION OF NCB

Apart from the various efforts of NCB for national and international harmonisation, NCB has formulated its vision for the next ten years. This being an era of information technology, web based education has been a reality. NCB has planned for a full fledged web based program so that the certification tests (theory) can be taken by a candidate any where in the country and the practical exam in the nearest accredited centre.

Apart from the conventional NDT techniques, a number of other areas such as coating thickness measurement, thickness gaging, corrosion determination etc need attention. NCB plans to interact with the professional bodies with expertise in these areas and spread the knowledge to the entire region.

NCB also proposes to work in close coordination with the national and international standards organization to develop in a fast manner standards for the advanced NDE techniques. It also proposes to have regional round robin programs in collaboration with International Organisations such as IAEA to evaluate and benchmark the status of certified personnel and also emphasise the importance of calibration of NDE equipments.

### CONCLUSION

The main mission of Training and Certification programs, of any national or international body is to provide a measure of NDT personnel competency that is reliable, valid and cost-effective. With the rapid advances in the field of engineering, technology and material science, the science and technology of nondestructive testing and evaluation is also expanding with newer and better methods/techniques. It is therefore needless to emphasize that training and certification activity would require continuous improvement and upgradation commensurate with industrial, national and global needs and should also keep pace with the state-of-the-art technology of NDT & NDE.

The mission of NCB is three fold:

- 1) To provide training, standards, and services for qualification and certification of NDT personnel in tune with the national and international needs.
- 2) Strive for collaborations with various other international professional bodies and societies so that NDT professionals in India and the Asian region can have the benefit of keeping themselves updated and professionally qualified and
- 3) Join hands with ICNDT and the international community in ushering in international harmonisation on the basis of ISO 9712.

While NCB has recognized and will always address itself to these issues, the greatest challenge is to not only respond but also deliver what is essential in a timely manner.



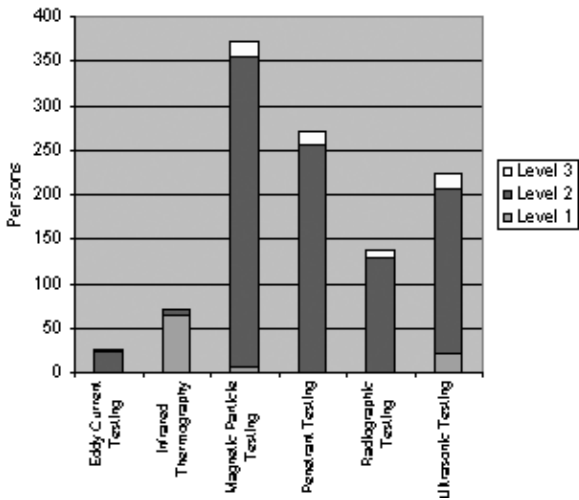
# CERTIFICATION IN THE WORLD

## Certification in Australia

CERTIFIED PERSONS BY METHOD

Method	Level 1	Level 2	Level 3	TOTAL
Eddy Current Testing		23	2	25
Infrared Thermography	64	6		70
Magnetic Particle Testing	7	348	16	371
Penetrant Testing	1	255	14	270
Radiographic Testing	1	127	9	137
Ultrasonic Testing	21	186	16	223
<b>TOTALS</b>	<b>94</b>	<b>945</b>	<b>57</b>	<b>1096</b>

Certified Persons by Method



Australia has a long history of 3<sup>rd</sup>-party NDT certification. The Australian Institute for NDT (AINDT) first introduced a certification program in 1971. The original scheme covered two levels of certification, known as Technician and Technologist. With the development of the original ISO9712, a Standards Australia committee developed an Australian Standard for certification of NDT personnel, based on the then draft ISO document. In fact this standard, AS3998-1992 was published a few months before the publication of ISO9712-1992. Australia has participated in an active manner in the development of ISO9712-1999 and in the subsequent revision of that document. Australian Standard AS3998 has been revised to conform 100% with ISO9712:1999 and has been published as AS3998-2002/ISO9712:1999.

Australia is a large continent with a dispersed population. Over 90% of Australia's population lives in coastal cities and towns. Compared with Europe and America, we have a relatively small population. This is reflected in our certifications, with around 1100 certifications to the AS3998/ISO9712 standard.

Training is undertaken by public (technical colleges) and private providers in most states by face-to-face, as well as distance learning, computer and internet based training. AINDT provides examinations at examination centres located in all states. These examinations are conducted twice per year (July and December) as well as on-demand subject to certain conditions.

All examination questions are held on a national database so that all examination papers are unique. Practical examination certified test specimens are held at a central repository and are distributed so that different specimens are provided to each examination centre for each series of examinations.

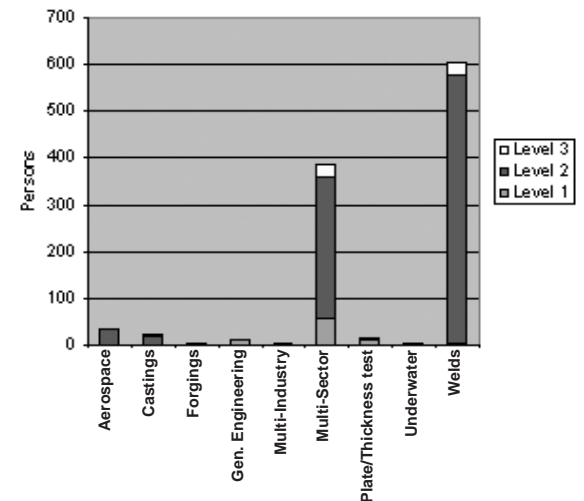
The AINDT certification Scheme has been accredited to EN45013/ISO9712 by the national accrediting body JAS-ANZ.

The Scheme is managed by a Certification Board of 12 persons representing users and providers of NDT services, as well as industry and training bodies and the National Association of Testing Authorities (NATA). The Board is supported by an Applications Committee and a Panel of Examiners.

CERTIFIED PERSONS BY SECTOR

Sector	Level 1	Level 2	Level 3	Total
Aerospace	1	35		36
Castings		21	1	22
Forgings	2	3		5
General Engineering	12			12
Multi-Industry	5			5
Multi-Sector	58	302	28	388
Plate/Thickness Test	11	6		17
Underwater	1	4		5
Welds	4	574	28	606
<b>TOTALS</b>	<b>94</b>	<b>945</b>	<b>57</b>	<b>1096</b>

CERTIFIED PERSONS BY SECTOR



## Certification in India

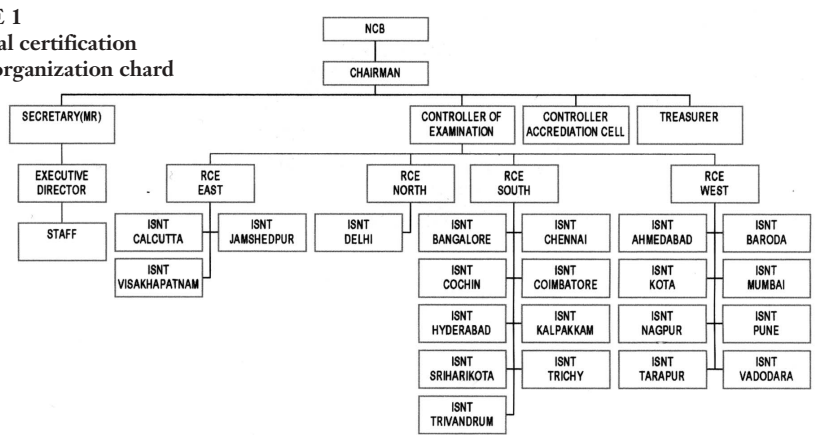
Status of NDT Certificate Holders In India

Level – III personnel qualified in India (ASNT, ISNT and IAEA)	~ 500
Level – II personnel qualified in India	~ 10,000
Level – I personnel qualified in India	~ 6,000

Technique wise distribution of Level – III (ASNT, ISNT and IAEA)

No.	Technique	Level – III
1.	UT	286
2.	RT	277
3.	MT	225
4.	PT	155
5.	ET	29
6.	VT	45
7.	LT	21
8.	NRT	1
9.	AET	2

TABLE 1  
National certification board organization chart



## Certification in Brazil

The **National System** was started in 1980 with the Technical Commission on Qualification and Certification of NDT Personnel. In 1987 was formed the **Certification Council** with 15 Representatives from different Brazilian industrial sectors: Oil & Gas, Chemical & Petrochemical, Power Generation, Castings, Forgings, Welds and Tubes.

**The Certification Bureau** includes: Certification Bureau Manager, NDT Level 3 Experts, Coordinators from the Industrial Sectors as the following: Aerospace, Automotive, Chemical & Petrochemical, Power Generation, Underwater Inspection, Iron, Castings and Forgings. The above industrial sectors are also represented in the **Industrial Sectors Committees**.

### Examination Centers

We have three recognized centers:  
 – PETROBRAS / SEQUI, São José dos Campos / SP (PT, MT, RT, UT, VT, ET)  
 – SENAI / CETEC-SOLDA, Rio de Janeiro / RJ (PT, MT, UT)  
 – SABESP, São Paulo / SP (LT)

PETROBRAS – SEQUI was recognized as an examination center of the National System in 1992. Some results of 22 year of operation are 28.300 Examinations, 10.113 Candidates of 680 Companies



### Standards of the National System

- NA-001 (ABENDE Standard on Qualification and Certification of NDT Personnel)
- DC-001 (ABENDE S Standard on Qualification and Certification of NDT Personnel - Procedure)

### National Qualification System

Maintenance of certification: every 12 months to certify satisfactory vision and effective rendering of professional services

### Recertification:

After 60 months of valid certification, it can be renewed for another period by a simplified examination.

### NDT Methods in the National System

Visual Testing, Penetrant Testing, Magnetic Testing, Ultrasonic Testing, X and Gamma Ray, Eddy Current, Leak Testing, Acoustic Emission, Underwater Inspection

### Numbers of the National System

Levels/Methods	1	2	3
PT	4	1047	15
MT	0	380	16
UT	319	262	13
RT	107	110	12
ET	0	4	2
VT	0	167	1
LT	31	28	28
<b>TOTAL</b>	<b>461</b>	<b>1998</b>	<b>87</b>

ABENDE is accredited certifying body by INMETRO in order to certify personnel, according to NIE-DINQP-014 Standard (in compliance with EN 45013), in conformance to ISO 9712 Standard

INMETRO is the Brazilian Institute of Metrology, Standardization and Industrial Quality.

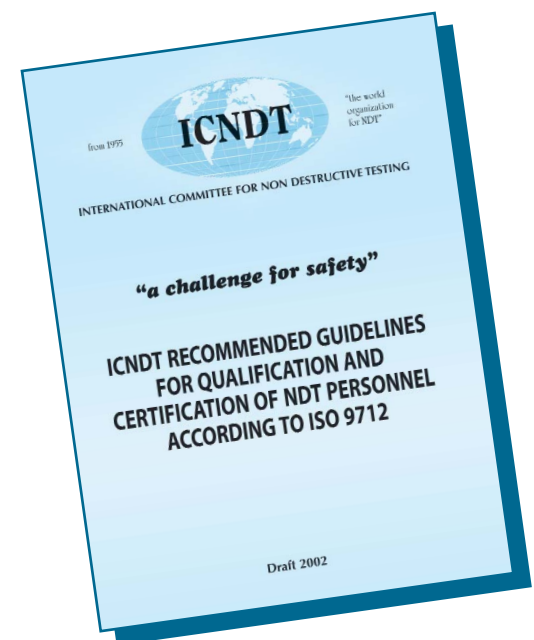
ØAutarchy of the Federal Government under the MDIC (Ministry of Development, Industry and Foreign Trade)

- ØExecutive Authority
- Ø Management Contract
- Ø Gold Award in 2000

### INMETRO ACTIVITIES

- Scientific and Industrial Metrology
- Legal Metrology
- Quality (Conformity Assessment, Technical Regulation)
- Accreditation
- Technological Information
- Education for Quality

INMETRO is formally recognized by: IAF (International Accreditation Forum), ILAC (International Laboratory Accreditation Cooperation), EA (European Cooperation for Accreditation), APLAC (Asia and Pacific Laboratory Accreditation Cooperation), BIPM (Bureau International des Poids et Mesures)





# ASME recognise ISO 9712/EN 473 Certification Schemes

## ASME Comments on the EC 2002 Report on United States Barriers to Trade and Investment January 16, 2003

There are a number of points raised regarding the issue of certification of NDE personnel performing examination to the requirements of the ASME Boiler and Pressure Vessel Code that require clarification.

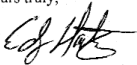
The first is "While the ISO standard ISO 9712 on this matter has been supported by the American National Standards Institute (ANSI), the standard is not recognized in the context of the American Society of Mechanical Engineers code on pressure vessels". While not specifically referenced in the ASME Code, if a Manufacturer chooses to certify NDE personnel performing ASME Code examinations using ISO 9712 he may do so as long as this is established in his written practice.

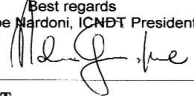
This leads to another point in which it was stated "In practice this means that NDT personnel in Europe need to be double-certified: once for ISO 9712/EN 473 and once again for ASME-NDT". This is not necessarily the case. **If a Manufacturer prepares his written practice for ASME Code related examinations in such a way to establish ISO 9712/EN 473 as his method of certification then there would be no need for double-certification.**

Another point concerns the examinations themselves. It was stated "The only substantial difference is that whereas in the ISO/EN case the test is performed by a competent third party, ASME requires the test to be performed in an ASME-proprietary fashion". There are no ASME-proprietary tests for NDE personnel. Nor does the ASME Code establish requirements for the administration of NDE personnel training, examination or certification. It is the Manufacturer's written practice that establishes the control and administration of these aspects of the qualification of NDE personnel.

The report also makes reference to a request regarding ISO 9712: "Apart from asking ANSI to ensure that the ISO 9712 is properly implemented in the US Pressure vessels code, the European federation of non-destructive testing (EFNDT) submitted to ASME in October 1999 a code case (i.e. detailed wording of the proposal) to amend the corresponding section of the ASME code. Regretfully, no progress has been made since".

The request from the EFNDT received the full attention of the ASME Subcommittee on Nondestructive Examination. Based on the recommendation of this Subcommittee, a revision to Article 1 of Section V of the ASME Boiler and Pressure Vessel Code was approved to allow any national or international central certification programs be used for the certification of NDE personnel. The newly revised paragraph T-120 (f) will read as follows.

<p>* Codes and Standards</p> <p>1-212-591-8500 FAX 1-212-591-8501 www.asme.org</p>		<p>ASME International</p> <p>Three Park Avenue New York, NY 10016-5990 U.S.A.</p>	
<p>July 7, 2003</p>			
<p>To:</p>		<p>Mr. Giuseppe Nardoni, I &amp; T International Mr. R. Roche, President, EFNDT Mr. Bjarne Larsen, Vice President, EFNDT Mr. John Thompson, Manager, Certification Services Division, BINDT Dr. Reinhard Maab, European Boilermaker's Association Mr. Helmut Salomon, European Boilermaker's Association</p>	
<p>Subject:</p>		<p>Revision to BPVC Section SC V Regarding NDE Personnel Qualifications</p>	
<p>Gentlemen,</p>			
<p>This letter is to advise that, in response to international interest in NDE requirements for qualification of personnel, the attached revision to ASME BPVC Section V, Article 1, paragraph T-120 was approved and published in the 2003 Addenda. In particular, I direct your attention to T-120(e) and (f), which provide for alternatives to be used by the manufacturer to fulfill the examination requirements of the documents listed in T-120(e).</p>			
<p>Yours truly,</p>			
<p></p>			
<p>Ed Maradiaga Secretary SC V Subcommittee on Nondestructive Examination Phone: 1-212-591-8056 Fax: 1-212-591-8501 Email: <a href="mailto:MaradiagaE@asme.org">MaradiagaE@asme.org</a></p>			
<p>Att:</p>		<p>BPVC Section V, Article 1, Paragraph T-120</p>	
<p>Cc (w/att):</p>		<p>Jon Batey, Chair, SC V Bruce Kovacs, Vice-Chair, SC V Richard McGuire, Chair, SG Personnel Qualifications, SC V</p>	
<p>The American Society of Mechanical Engineers</p>			

<p>ICNDT</p> <p>"the World organization for NDT"</p>	
<p>INTERNATIONAL COMMITTEE FOR NON-DESTRUCTIVE TESTING</p>	
<p>Brescia, September 12 2003</p>	
<p>ASME International Three Park Avenue NEW YORK, NY 10016-5990 - USA</p>	
<p>To the SC V Subcommittee on Nondestructive Examination Att. Ed Maradiaga - Secretary</p>	
<p>Att.: Jon Batey, Chair, SC V Bruce Kovacs, Vice-Chair, SC V Richard McGuire, Chair, SG Personnel Qualifications, SC V</p>	
<p>Ref: Your letter, July 7 2003</p>	
<p>Subject: ASME Section V Edition July 2003 Qualification and Certification of NDT Personnel for ASME - Code Work</p>	
<p>With great pleasure We have received your letter anticipating the acceptance by ASME of National and International Scheme based on third party examination as ACCP, ISO 9712/EN 473.</p>	
<p>This decision give support to the efforts of ISO, ICNDT and other Organisation to promote more reliable certification scheme. The investment made all over the world by Industry, for achieving this new qualification have found its best recognition and moral benefit.</p>	
<p>All we are working to achieve a more safety world; ASME through its Code has given a great impulse in stimulating the advancement of NDT technologies, in requiring deeper knowledge, asking for more professional skill.</p>	
<p>Thanks for being with us in this global campaign for improving the grade of integrity. In the name of ICNDT we express to ASME our best compliments for this well done work for the entire NDT Community.</p>	
<p>Best regards Giuseppe Nardoni, ICNDT President</p> <p></p>	
<p>ICNDT G. Nardoni President Via A. Foresti, 5 - 25127 BRESCIA (Italy) Tel. +39-030-3739173 - Fax +39-030-3739176 - personal phone: +39-348-2280470 E-mail: <a href="mailto:ainpd@mail.protos.it">ainpd@mail.protos.it</a> - home page: <a href="http://www.ainpd.it">http://www.ainpd.it</a></p>	

## Ravenna 2003, Italy

### International Panel on Personnel Certification



(r-l) D.E.Bray ( ASME), R. Murphy ( ISO TC135 Chairman), G.Nardoni (ICNDT Chairman), V. Krstelj ( Croatian Society President), B.B.Djordjevic ( Hopkins University) and A. Broz ( FAA)

## ARTICLE 1 - GENERAL REQUIREMENTS

### A03 T-120 GENERAL

(a) Subsection A describes the methods of nondestructive examination to be used if referenced by other Code Sections or referencing documents.

(b) Subsection B lists Standards covering nondestructive examination methods which have been accepted as standards. These standards are nonmandatory unless specifically referenced in whole or in part in Subsection A or as indicated in other Code Sections or referencing document.

(c) Any reference to a paragraph of any Article in Subsection A of this Section includes all of the applicable rules in the paragraph.<sup>1</sup> In every case, reference to a paragraph includes all the subparagraphs and subdivisions under that paragraph.

(d) Reference to a standard contained in Subsection B is mandatory only to the extent specified.<sup>2</sup>

(e) For those documents that directly reference this Article for the qualification of NDE personnel, the qualification shall be in accordance with their employer's written practice which must be in accordance with one of the following documents:

(1) SNT-TC-1A<sup>3</sup>, Personnel Qualification and Certification in Nondestructive Testing; or

(2) ANSI/ASNT CP-189<sup>3</sup>, ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel

(f) National or international central certification programs, such as the ASNT Central Certification Program (ACCP), may be alternatively used to fulfill the examination requirements of the documents listed in T-120(e) as specified in the employer's written practice.

<sup>1</sup> For example, reference to T-270 includes all the rules contained in T-271 through T-277.3.

<sup>2</sup> For example, T-233 requires that Image Quality Indicators be manufactured and identified in accordance with the requirements or alternatives allowed in SE-747 or SE-1025, and Appendices, as appropriate for the style of IQI to be used. These are the only parts of either SE-747 or SE-1025 that are mandatory in Article 2.

<sup>3</sup> SNT-TC-1A (2001 Edition), "Personnel Qualification and Certification in Nondestructive Testing;" and ANSI/ASNT CP-189 (2001 Edition), "ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel;" published by the American Society for Nondestructive Testing, 1711 Arlington Lane, P.O. Box 28518, Columbus, Ohio 43228-0518.

<sup>4</sup> In this Code Section, "Code User" is any organization conducting nondestructive examinations to the requirements of this Section. A03

# ICNDT DIRECTORY TO DATE

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