Abstract
This paper aims the audience to understand the current situation of Non Destructive Testing personnel certification systems in Asia Pacific region and the various industrial acceptances on the type of certification.

Certification system operating in countries such as Australia, China, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Pakistan, Sri Lanka, Myanmar, Outer Mongolia and Vietnam, are briefly discussed. The paper also covers the current situation of the work in progress for the mutual recognition of personnel certification in Non Destructive Testing & their changes affecting the Asia Pacific Region.

Industries such as petrochemical, Oil & Gas, Civil construction are covered including necessary steps & measures taken by the authorities, as well as clients & contractors for the acceptance of personnel certification are also briefly addressed.

The paper also discusses the availability of Personnel Certification Bodies & National accreditation Bodies in Asia Pacific region.

Keywords: NDT, PERSONNEL CERTIFICATION, ASIA PACIFIC, PCB

1. Introduction
The Asian Pacific region is the hub of developmental activities which is likely to increase in the coming decade. With large emphasis by countries such as India, China, Korea, etc. in the field of infrastructure and power, training and certification of personnel has assumed immense significance in this particular region. With a variety of training schemes, all the countries in the region have adopted schemes suitable to their needs to ensure the availability of qualified and certified personnel.
Various Non-Destructive Testing Certification schemes are currently operating in the Asia-Pacific region. The schemes include:

1. ASNT (American Society for Non Destructive Testing) – SNT-TC-1A Scheme – Employer based
2. ASNT (American Society for Non Destructive Testing) – ACCP, Central certification program based on ISO9712(mod)
3. BINDT – (The British Institute of Non Destructive Testing) PCN Scheme through various authorized qualifying bodies based on EN473 & ISO 9712, Accredited to ISO 17024
4. TWI – (The Welding Institute, UK)-CSWIP Scheme delivered through various authorized qualifying bodies based on EN 473 & ISO 9712, Accredited to ISO 17024
5. AINDT – (Australian Institute of Non Destructive Testing) direct by Certification body based on EN473 & ISO 9712, Accredited to ISO 17024
6. ChsNDT – (Chinese Society for Non Destructive Testing) directly by Certification body through various chapters based on EN473 & ISO 9712, Accredited to ISO 17024
7. JSNDI – (The Japanese Society for Non Destructive Inspection) directly by Certification body based on ISO 9712
8. NDTSS – (Non Destructive Testing Society (Singapore)) SGNDT scheme directly by Certification body through ATE based on ISO 9712 & EN 473.
9. ISNT – (Indian Society for Non Destructive Testing), ISNT scheme through various chapters based on ISO 9712.
10. RTCD- RTC Testing & Diagnostics, RTC Scheme through authorized qualifying body based on EN 473 & ISO 9712, Accredited to ISO 17024
11. Other – Include state run /central govt departments controlling the nuclear board of the countries such as Autor in Indonesia, AERB in India, Boiler & Power dept in China run the Certification based on ISO 9712.

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<tr>
<th>Country / Member State</th>
<th>Locally Available Schemes</th>
<th>Standard</th>
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<tr>
<td>AUSTRALIA</td>
<td>1,3,4,5</td>
<td>ISO 9712 /EN473, SNT-TC-1A</td>
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<td>CHINA (PRC)</td>
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<td>INDIA</td>
<td>1,3,4,9,10,11</td>
<td>IS 13805 (Indian Standard) / ISO 9712/EN473, SNT-TC-1A</td>
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The certification schemes are mostly chosen based on the industrial needs & applications. Although SNT-TC-1A certification issued by company/individual Level III’s has been very popular in the Asia-Pacific region, the system is open to abuse. This qualification, therefore, has come under increasing scrutiny by consultants, authorities and third-party accredited organizations. There is now a growing demand for third party accredited certification by end users and the PCN scheme (BINDT) and CS WIP (TWI) have gained in popularity over the last decade.

Although there is a substantial shift towards ISO9712/EN473 third party accredited certification schemes in accordance with ISO17024 in the region, the local national accreditation bodies are not available for delivering accreditation of personnel certification schemes through ISO 17024, Global / Regional MRA is not available for the ISO 17024 personnel certification scheme from the accreditation bodies unlike laboratory (ISO 17025) or Inspection bodies (ISO 17024).

2. Situation in Australia & AINDT’s role in Asia-Pacific region

Australia’s role in harmonisation has always been to support universal recognition of personnel certified in accordance with ISO 9712/ISO 17024, more or less on a universal basis, providing that a person’s qualifications are in accordance with these two standards. It accepts that ISO 9712 specifies the minimum requirements for certification and that for more stringent applications a higher level of competence will be required through endorsements for UT and RT for complex weld configurations, such as node
or nozzle welds. It also recognises that specific requirements are necessary for the emergence of new technologies, including phased array ultrasonic testing (PAUT), digital industrial radiography (DIR) and time of flight diffraction (TOFD).

Australia has also been very supportive of harmonisation of certification schemes in the SEA region and has provided assistance in the form of regional training courses (RTC’s) and in direct assistance to member states.

On a global playing field, Australia has also been active in promoting the universal acceptance of certification schemes that meet the requirements of ISO 9712, EN473 and ANSI: ASNT CP 106, since the core elements of these schemes are essentially the same, with only minor differences.

It is clear that these standards will remain as benchmarks for some years to come and that a universal effort to minimise these differences will lead to a common framework for the recognition of NDT personnel from one region to another.

3. The role of the International Committee for NDT (ICNDT)

ICNDT, consisting of over 60 members, including the world’s most influential countries, plays a strategic role in the coordination of activities of its membership. It’s past two Chairmen, Giuseppe Nardoni (Italy) and Doug Marshall (Canada) have both been strongly advocates for a universally accepted certification scheme for NDT personnel. The present chairman, Mike Farley (UK), has continued this line of thinking and has stressed the importance of unification of national and regional certification schemes in the global marketplace. This has firmly set ICNDT on a course to progress towards this clearly defined objective over the next four years.

Prior to becoming chairman of ICNDT Dr. Farley played a prominent role in the production of an authoritative ICNDT document regarding the harmonisation of third-party accredited NDT personnel certification schemes to ISO 9712, and aligned standards. This document was discussed at a special ICNDT Workshop at the 17WCNDT in Shanghai on 27 October 2008.

After this workshop 33 countries overwhelmingly supported a proposal to establish a joint ISO TC 135/ISO 9712)/CEN TC 138 (EN 473) working group to consider how the two standards, ISO 473 and ISO 9712, could be harmonized. This proposal, from Dr Mike Farley, has gone to Professor Hatano, Chairman of ISO TC 135, who has already indicated the readiness of the Chairman of CEN TC 138 to work with ISO TC 135 and form a joint working group. At the recent meetings in Vienna the outcome was promising that a new ISO 9712 standard will be soon available as global certification standard.
ICNDT also has a NDT Qualification and Certification Committee (WG 1) under the chairmanship of John Thompson (UK). One of its principal objectives is the promotion of international harmonization in compliance with international standards and to promote mutual recognition of certification. The members from Asia Pacific region are China, Japan, Singapore working for the MRA on Certification.

4. Japan’s Role in Asia – Pacific
JSNDI as the past Chair of APNDT led by Dr. Norikazu Ooka held 3 workshops on liaison between the member states to support on training & certification. During the recent meeting in Tokyo, it was discussed to draft a common question bank, to study on support for examination specimens and to train welders to prepare test specimens. The JSNDI qualification and certification is increasingly being used among the Japanese industries. The JIS Z 2305 (ISO9712 MOD) scheme is under discussion for harmonizing with ISO/DIS9712-2011 by establishing ISO9712 Harmonizing Task Group in JSNDI.

5. Situation in South East Asia (Singapore, Malaysia, Indonesia, Thailand)
ASNT, SNT-TC-1A scheme is still a very popular certification & readily available to the market through individual or corporate Level III’s, in terms of cost, it is also the cheapest certification available. PCN (ISO9712/473) are delivered through Authorized Qualifying body such as SETSCO, TWI, Northern Test Centre (Ruane Tati), K2, SGS which is also readily available. TWI is delivering CSWIP certification through its various examination center’s in South East Asia Region.
NDTSS is providing SGNDT certification & MSNT is providing MSNT certification and with the support of industry, particularly PETRONAS, Malaysia will be moving away from SNTC-1A within the next year to a certification scheme based on ISO9712/ISO17024. Indonesia is also in the advanced stages of achieving third party accreditation for its certification scheme to ISO9712/ISO17024.

6. Situation in Mainland China & Hong Kong
Chinese, ChsNDT scheme is fully confirming to ISO 9712/E N 473 schemes and accredited to ISO 17024, with this China reached the requirement of global mutual recognition on NDT Certification. In China other certifications such as SNT-TC-1A & PCN from SGS & TWI are still available through various test centres, Inland domestic certification are widely available in order to meet the local regulatory requirements such as Nuclear, Thermal, Classification etc.
Hong Kong is not in favor of in-house certification since 2005, the HKAS (Hong Kong Accreditation Service) HOKLAS supplementary criteria SC15 requirement to approve an operator is PCN, CSWIP or equivalent scheme accredited to ISO 17024, this made the standard of operators improve considerably & the Approved signatories endorsing the test reports shall be ASNT/ACCP/PCN Level III’s certified independently. Although still minor numbers of in-house qualified operators are in service to the power & utilities sector, the change had brought significant improvement in qualification of NDT personnel.

7. Situation in India

India has a huge number of NDT personnel certified to SNT-TC-1A & every year, ASNT Level III examinations are conducted twice a year. India also has more of the public sector and strategic sector employees qualified in accordance with the IS 13805 – a Scheme based on ISO 9712. With the recent available Authorized Qualifying Body from BINDT & RTC the ISO 9712/EN 473 schemes are readily available as both are accredited to UKAS. The clients opt to choose third party certification scheme in lieu of SNT-TC-1A scheme.

However the Radiographic Testing using isotopic sources is fully controlled by AERB (Atomic Energy Regulatory Board) & all the operators & Safety personnel’s need to go through a detailed training & certification program available through AERB test centers country wide which exceeds the training requirement of ISO 9712 with stringent minimum entry academic qualification requirement puts one of the highest national standard. Apart from the above training and certification activities in India, started in the late 80’s assumed significance in 1993 with the development of the first Indian standard IS 13805 by the Statutory Body - Bureau of Indian Standard (BIS). BIS clearly defined the need for a certification Board to be formed. It also authorized ISNT to form this Body to initiate the activities in the field of training and certification. The National Certification Board (NCB) which has now been for more than about 15 years has qualified more than 25000 personnel in accordance with the IS 13805 which is in line with the requirements of ISO 9712.

ISNT, through NCB conducts Level I, II and Level III T&C programs in 10 NDT methods. While NCB ISNT has not been accredited to ISO 17024, the certification program is well structured, based on a quality manual. ISNT has also developed a series of course books and a question bank which contains more than 3000 questions in the various methods. The qualification schemes from ISNT & AERB are not accredited to ISO 17024, accreditation plans are under progress and ISNT is approaching the experts in the Asian Pacific region who have active liaison with ICNDT WG-1 for this accreditation.

8. Situation in Korea
Korea has the largest number of ASNT certified personnel’s in the Asian region, the independent ASNT Level III examination is available in the country & SNT-TC-1A schemes are widely popular certification from the country. The Korean Society for Non-Destructive Testing is actively pursuing certification to ISO9712/ISO17024 and it is expected that this transition will be completed by 2015.

9. Accreditation bodies in Asia Pacific Region
The following bodies are the only providers of accreditation to ISO 17024 in the Asia Pacific Region.

Australia – Joint Australia New Zealand National Accreditation (JAS/ANZ)
China – China National Accreditation Board (CNAB)

10. Barriers in achieving Harmonization to ISO 17024.
ISO 17024, although simple on face value is in fact quite complex. Certain key requirements, such as compliance, validation, evaluation and surveillance are extremely important and demand of a structured quality management system to have a considerable degree of cross-reference to records, documentation and other information. The result is a relatively complex, multi-layered system that covers completely the activities of the certification body, including its administration, structure, finances, staffing, development and maintenance of the scheme, etc. Ultimately the examination process has to be clearly documented and include everything from handling of applications, generation of examination papers, conduct of examinations, marking of papers, issue of certification and rights of appeal, all of which have to be included in the QMS.

Several of the member states of the IAEA project do not have the expertise or resources to develop a QMS that meets ISO 17024. For its part, IAEA ran a Regional Training Course (RTC) in Bali in April 2008 to give participants a clearer understanding of the principles involved in the preparation of a QMS. This Regional training course was successful but some of the less-developed countries still need continued assistance to ensure that they have a QMS in place that would lead to its acceptance by an IAF third-party accredited organisation.

IAF accreditation is also difficult to achieve for most of the member countries as discussed earlier do not have accreditation scheme to ISO 17024. This situation is not unique, since member countries of other regional groupings, EFNDT for instance, also have a similar problem. The cost of third-party accreditation is often quite high and is a disincentive for some certification bodies. Although preferable to get third-party accreditation through an IAF member it is noted that this is not mandatory for either ISO 9712/ ISO 17024. It could be argued, therefore, that there is sufficient scope for accreditation of certification bodies to be done by a peer organisation such as
ICNDT. WG1, as part of its charter, will be looking at the possibility of accrediting certification bodies within the framework of ICNDT.

Another barrier to harmonisation is the culture of the respective countries that are part of the IAEA project and, presumably, would not be uncommon in other regional groupings around the world. The most difficult problem is the reluctance of some of the National Certification Bodies (NCB’s) to relinquish control of their certification bodies by allowing greater representation by other key-stake holders that have a vital interest in the qualification and certification process. In a few countries in the SE Asia region, specific organisations have a dominant role over the NCB in its decision making process. In such situations it will be necessary for the NCB to be structured in such a way so that it gives confidence in its competence, impartiality and the integrity of its decision making processes, and to make itself more independent of parochial interests.


At the outset Australia’s certification scheme already conformed to ISO 9712/ISO 17024 which provided a sound platform for other countries to follow. Sri Lanka, another country with a small industrial sector, has shown considerable resourcefulness in not only establishing a NCB but also in developing a quality management system that meets ISO 17024. In showing that it can be done through will and perseverance it is expected that Sri Lanka will be among the first of the countries to achieve its time frame for certification in 2009.

China has already reached its objective in 2009 when it first announced at the 17WCNDT in Shanghai in 2008 that it had achieved a translation of ISO 9712 into the Chinese language and then followed this up with accreditation through its national accreditation body to ISO 17024 in 2009. This, as expected, provided a significant boost to harmonisation in the region with one of the world’s leading economic powers embracing the concept of harmonisation to ISO 17024.

Pakistan has also made great advances in developing a QMS that fully meets ISO 17024 and is in the process of developing a NCB that meets the requirements of this standard. It does not have a national accreditation body to accredit the NCB quality management system but has put in the basic infrastructure that will enable it to comply with these requirements. It should comply with the MOU by 2012.

The Philippines is one country that has made great advances in the establishment of a national certification scheme and the Philippines Society of NDT has been sanctioned by the government to become the National
Certification Body. ISO 9712:2006 also has been given government approval through the Dept. of Trade and Industry and will be adopted as the standard for certification of NDT personnel in the country. The Philippines Society is now working to get third-party accreditation through the Accreditation Office of the Dept. of Trade and Industry for its certification process.

Indonesia are also progressing quickly towards harmonisation of its certification scheme to ISO 9712/ISO 17024. Its NCB was established in 2009 and work on a quality management system commenced in 2008 with an estimated completion date by 2010. Working with strong government support Indonesia will meet its deadline of 2012 and complete the process of harmonisation. Its close neighbor, Singapore, Non Destructive Testing Society, has a certification system that covers SNT TC1A, PCN and ISO 9712 through various AQB’s. It still lacks a NCB at the moment but with a QMS already in place it should easily comply with the requirements for aligned standards to ISO 9712 by 2012. The challenge for Singapore is to set up a NCB and then align its certification process to the stated objectives of the IAEA/RCA memorandum of understanding.

Malaysia has an economy with a “high tech” dependency and is prominent in the oil and gas industry and other industries with a need for well-trained and qualified NDT personnel. Malaysia has excellent facilities for the training of NDT technicians and through the Malaysian Government’s Department of Skills Development is implementing a national program for certification of NDT personnel. Arrangements are already in place to implement a QMS that meets ISO 17024 and this should be operational by the end of 2009. Malaysia is well on track to achieve harmonisation by the end of 2010.

Bangladesh is another of the countries with a low resource base in terms of the needs of industry. It does take seriously the training and certification of its NDT personnel and meets the general requirements of ISO 9712: 1999. With over 750 personnel trained to L I and L II across all five methods it is conscious of the potential development of oil and gas resources in the Bay of Bengal and the changes that this will bring to a mainly agricultural country. Again, there is considerable will in Bangladesh in achieving the stated objectives in the MOU. Already it has formed a NCB and has started on the essential elements of a quality management system. It will need continuing assistance in the development of its QMS and in the procurement of suitable test pieces and NDT equipment to become full self-efficient.

Japan, largely, has been a silent partner in the IAEA/RCA project but recently has shown a growing interest in harmonisation of certification schemes in the region. With Professor Hatano, as Chairman of ISO Committee TC 135, it does have a stake in the outcome of certification, not only in SE Asia, but
also in a wider context throughout the world. With Japan as a supporter of ISO 9712/ISO 17024 the region has a powerful ally in the strengthening of relationships between developed and developing nations SE Asia.

12. Conclusions

There is a groundswell of opinion that is leading to the universal alignment of the three most important standards that cover certification of NDT personnel – ISO 9712/EN 473/ANSI ASNT CP106.

It is expected that considerable progress towards harmonisation will take place by 2012 with the possibility that this will become a reality by 2016.

The harmonisation of personnel certification schemes in the SE Asia region will substantially meet its objectives by 2012 with all countries achieving recognition through the MRA signed in Auckland in 2006.

There will be no great shift in the world in the adoption of one certification system only. Each regional grouping is likely to retain present standards such as ISO 9712/EN 473/ANSI ASNT CP106 as the basis for certification in those regions.

What will change, is that these standards will be similar in their requirements, and that any small differences will not give cause, or due reason, for the non-recognition of qualifications by personnel who are certified in accordance with these standards.

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