

## Proficiency Testing in Nondestructive Testing (NDT)

Amry Amin Abas  
Dr Mohamad Pauzi Ismail  
Suhairy Sani  
  
NDT Group,  
Industrial Technology Division

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## Proficiency Testing

- evaluation of participant performance against pre-established criteria by means of interlaboratory comparisons
- ISO/IEC 17043 : 2010 Conformity assessment -- General requirements for proficiency testing

## Types of PT

- includes, but is not limited to:
- a) quantitative scheme — where the objective is to quantify one or more measurands of the proficiency test item;
- b) qualitative scheme — where the objective is to identify or describe one or more characteristics of the proficiency test item;
- c) sequential scheme — where one or more proficiency test items are distributed sequentially for testing or measurement and returned to the proficiency testing provider at intervals;
- d) simultaneous scheme — where proficiency test items are distributed for concurrent testing or measurement within a defined time period;
- e) single occasion exercise — where proficiency test items are provided on a single occasion;
- f) continuous scheme — where proficiency test items are provided at regular intervals;
- g) sampling — where samples are taken for subsequent analysis; and
- h) data transformation and interpretation — where sets of data or other information are furnished and the information is processed to provide an interpretation (or other outcome).

## Requirements of PT

### Technical Requirements

- Personnel
- Equipment, Accommodation, and Environment
- Design
- Preparation of Materials
- Choice of Methods
- Operation of Program
- Data Analysis
- Reports
- Communications
- Confidentiality

### Management Requirements

- Organization
- Management System
- Document Control
- Review of Requests, Tenders, Contracts
- Subcontracting Services
- Purchasing services and supplies
- Service to the customer
- Complaints
- Control of nonconforming activities
- Improvement
- Corrective Actions

## Purpose of interlaboratory comparison

- Evaluation of performance
- Identification of problems to initiate actions for improvements
- Establishment of effectiveness and comparability of test
- Provision of additional confidence to client
- Identification of interlaboratory differences
- Education of participating laboratories

## Purpose of interlaboratory comparison

- Validation of uncertainty claims
- Evaluation of the performance characteristics of a method
- Assignment of values to reference materials and suitability
- Support of statements of the equivalence of National Metrology Institutes

## Methodology

- Scope of test : Ultrasonic Testing Thickness Measurement (UTTM)
- PT test items (carbon steel):
  - > 1 pipe with 2 inches diameter (2 test points)
  - > 1 pipe with 4 inches diameter (4 test points)
  - > 1 pipe with 11 inches diameter (11 test points)
  - > 1 welded plate (7 test points)



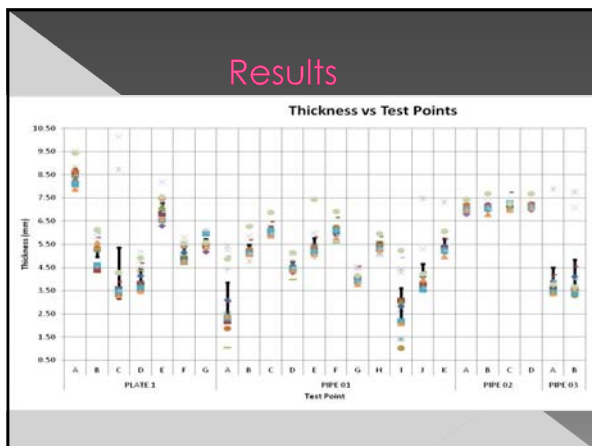
## PT in action



## Design

- Procedure is provided to participants
- Participants shall have valid Level II certificate (ISO9712)
- 6 organisations participated
- 16 participants
- Specimens were brought to the respective organisations

## Results



## Results

- Consistent outliers indicates potential problem
- Organisations that are not accredited to ISO17020/17025 are the main outliers
- Average uncertainty is 0.33mm

## Conclusion

- Proficiency Test is useful in determining the uncertainty of UTM
- The results gives an overview of the current problem of UTM
- Further study needs to determine the factors that affect the reliability of measurement

Thank you