Organizational Practice of NDT in Service Inspection Companies

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Demands on NDT

The statements of NDT have to be reliable and resilient!

Comprehensive knowledge of influencing factors on accuracy and reliability
Description of Influences

**Modular Reliability Model**

Organisational Context

Intrinsic Capability

Application Parameters

Physics

Human Factors

Optimized Diagnostic System

IC

AP

HF

e.g. Environment

e.g. experienced or inexperienced inspectors

Source:
Müller et al: Progress in Evaluating the Reliability of NDE Systems – Paradigm Shift
Berlin, 2009
Starting point

Organizational Context not sufficient evaluated

- Introduced in to the model following a study, which showed an influence of the “organization” on the reliability of NDT

- Lack of further evaluations:
  - What does “organization” mean?
  - Which influences exist?
External Frame of NDT

- Safety Culture
- Regulatory Requirements
- Technical Rules
- Social / Ethical Culture
- Market / Financial Frame
Practice?
→ Survey
Survey among NDT companies

Idea: focus on service inspection companies
• Offer many inspection methods
• Work in different industrial areas
• Inspect wide range of components

Presumption about their characteristics:
• Good organizational structure
• Comprehensive Quality Management System
• Personnel highly qualified
• Reliable results required by customer
Survey in January 2014

Sample:
- 206 members in member group “D” of DGZfP
- Consultants, dealer, foreign entities, freelancers, and companies with specialized services excluded
- 94 general NDT service providers

Approach:
- Invitation per phone, CEOs or management only
- Web-based questionnaire
- Anonymous answering due to critical questions
- 47 complete responses
Questionnaire

1. Company size, structure, customer groups
2. Qualification and work conditions of personnel
3. Involved parties in preparation and execution of Non-destructive Tests
4. Test results: evaluation and reporting

Total 44 Questions
Some results of the survey
Distribution of working fields

- Chemical and Petrochemical Industries: 24%
- Aerospace: Production and Maintenance: 4%
- Shipbuilding/Automotive/Railway: 6%
- Power Generation and Transmission: 20%
- Machinery and Equipment Manufacturing: 25%
- Production of Boilers and Pressure Vessels: 20%
Main way of quality management
Operator qualification as offered and requested
Role of ISO 9712 training in the view of the management
Role of ISO 9712 Recertification in the view of the management

- The costs are not honored by our customers: 29%
- They are problematically, since specialized operators have to demonstrate more general skills: 11%
- They are of less importance, since operators show their competency on their daily work: 14%
- They are essential to demonstrate independently the competency of the operators to our customers: 28%
- They refresh the knowledge of the operators: 18%
Where do you seldom acquire jobs despite your offer of qualified personnel?
Do the operators have to work under pressure of time?
Does it happen, that the customer wishes to modify the inspection result?

(lower test requirements, report without stating repairs...)
Summary of Questionnaire

- Quality management system diverse
- Personnel qualification not always fitting
- Experience time in some areas difficult
- Recertification better than thought
- Pressure by time and customer
Organization of Work
Evaluation of the Survey

• Customer often not informed about NDT- needs:
  - missing technical data and history of component

• Level 2 personnel is of most importance regarding quality and reliability:
  Preparation, Execution, Evaluation, Reporting

• Influence of external factors proofed

• New internal factors identified
Internal Organizational Frame

- Business Process:
  - content, scope, extent
  - schedule
  - compensation

- Information Process:
  - aim, method, rules
  - schedule
  - responsibilities
  - work environment
  - reporting

- Delivery Process:
  - preparation
  - resources
  - work place
  - deviation handling
  - customer relation
Final Result
Recommendations

- Influence of procedures for preparation and performance on the NDT-reliability
- Dependence and quantification of internal and external factors
- Greater awareness for the ethical rules: add to inspection contracts as well
- ISO 9712: Training and Experience?
Thank You!

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