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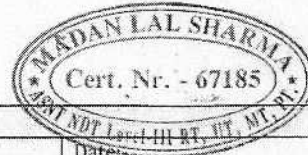
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WRITTEN PRACTICE FOR TRAINING, QUALIFICATION & CERTIFICATION OF NON-DESTRUCTIVE TESTING PERSONNEL	SES-26-743	4

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Revision Status

Revision No.	Effective Date	Description / Summary of Revision
0	10/11/2012	Initial Issue
1	15/2/2013	Revision in Number of Hours
2	20/5/2013	Level III Qualifications Added
3	25/04/2014	Compliance with SNT - TC - 1A, 2011
4	04/05/2015	Clause 5.9 added as per SNT - TC - 1A, 2011
4	04/05/2015	Clause 9.8 added separately for termination as per SNT - TC, 2011
4	04/05/2015	Compliance in No. of training hours as per SNT - TC - 1A, 2011 in clause no. 11
4	04/05/2015	Inclusions of NDT methods applicable to SARA only
4	04/05/2015	Clause 14 amended as per SNT - TC - 1A, 2011 requirements
4	04/05/2015	Clause 16 added as per SARA internal Procedure

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1.0 SCOPE

This procedure sets out the minimum training Qualification and certification requirements of Non-destructive Testing personnel as per ASNT Recommended Practice SNT-TC-1A -2011. The procedure also includes details of how the certification process is controlled by International Reliability Services (referred to as SARA SAE PRIVATE LIMITED or "the Company").

2.0 REFERENCES

2.1 ASNT Recommended Practice No. SNT - TC - 1A -2011 of the American Society of Non - Destructive Testing (ASNT).

2.2 Training Course references include the following;

- ASNT NDT Hand books – 3 rd edition
- ASNT Metals Handbook Volume 11 - Eighth Edition
- ASNT Question & Answer Books (Level I, II & III)
- ASNT Classroom Training Handbooks

2.3 Training courses shall be based on the recommendations of ASNT;

- | | | |
|-----------------------------|---|---------|
| • Radiographic Testing | - | RT-TC-1 |
| • Magnetic Particle Testing | - | MT-TC-2 |
| • Ultrasonic Testing | - | UT-TC-3 |
| • Liquid Penetrant Testing | - | LP-TC-4 |
| • Visual Testing | - | VT-TC-9 |

3.0 METHODS OF NON - DESTRUCTIVE EVALUATION

Qualification & Certification of NDT Personnel in accordance with this procedure shall be applicable to each of the following methods.

- | | |
|-----------------------------|----|
| • Liquid Penetrant Testing | PT |
| • Magnetic Particle Testing | MT |
| • Radiographic Testing | RT |
| • Ultrasonic Testing | UT |
| • Visual Testing | VT |

4.0 LEVELS OF QUALIFICATION

There shall be three (3) levels of Qualification.

- 4.1 **NDT Level I** - Technicians shall have the skill and knowledge to properly perform specific calibrations, specific NDT and evaluations for acceptance and rejection, according to written instructions and to record results. The NDT Level I Technician shall receive the necessary instruction and / or supervision from a certified NDT Level II or NDT Level III Technician. Evaluation for acceptance or rejection purpose and recording of the results shall always be done by a certified Level II & Level III.
- 4.2 **NDT Level II** - Technicians shall be qualified to set up and calibrate equipment, and interpret and evaluate test results in accordance with the applicable codes, standards or specifications, and prepare a written report of the test results. Each Level II Technician shall be familiar with the scope of work and limitations of the NDT method he is certified for. He shall exercise the assigned responsibility for on-the-job training and supervision of "Trainees and Level I Technicians." The level II will be able to prepare written instructions, and organize and report the results of test examination.
- 4.3 **NDT Level III** - Technicians shall be capable and responsible for establishing techniques and procedures, interpreting code standards and specifications and shall designate the particular test method and technique to be used. Where no acceptance criteria are available, the Level III shall assist in establishing the acceptance criteria for the NDT. He shall be qualified to train and examine NDT Level I and II personnel for certification.
- 4.4 **NDT Trainee's** - All NDT personnel shall be considered as trainees until they have satisfied the requirements of Para 11.0 "Minimum Requirements of Training and Experience." A trainee shall work with a certified level II or III individual. A trainee will not independently conduct tests, evaluate, interpret or report test result.

Limited Qualifications:

- 4.5 **Level II Limited UT:** The same description as a Level II Ultrasonic Testing Technician expect, it will not include angle beam testing (Shear Wave or refracted longitudinal wave) or immersion UT. The limited Level II technician certification shall include contact testing employing straight beam (longitudinal Wave), clad bond integrity UT, and thickness testing.

5.0 EDUCATION TRAINING & EXPERIENCE

- 5.1 All personnel considered for certification in Non-Destructive evaluation shall satisfy the minimum requirements for qualification, training and experience, as per Para 11.0.
- 5.2 The minimum requirements for NDT trainees in all disciplines shall be school graduation or equivalent with demonstrated proficiency or documented technical training.
- 5.3 The minimum requirements for the Level I and II personnel are as per Para 11.0
- 5.4 On-the-job training may be given credit in lieu of actual classroom training hours. This however shall be limited to the extent of 10 hours for each complete continuous engagement period of 12 months subject to a maximum credit of 40 hours.
- 5.5 For Level II certification, the required experience shall consist of work time as Level I. If a person is being qualified directly to level II with no time spent at Level I, the required experience shall consist of the sum of the time required for Level I and II.
- 5.6 Credit for experience may be gained simultaneously in two or more disciplines provided the candidate works at least 25% of the time on each discipline for which experience is being claimed.
- 5.7 Work Experience in months based on a 20 day work month. Work Performed in excess of a 20 day

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work month will be credited to total days required for certification.

5.8 Experience time will be calculated to include set – up time through report completion.

5.9 The Level III will provide an NDE experience log sheet for each applicable individual covering NDT method employed, the date, the amount of time it took to complete the job in hours and project name.

5.10 NDT Level III

- Graduate from a minimum four year college or university curriculum, with a degree in engineering or science, plus one year experience NDT, comparable to a Level II in the applicable NDT method(s). OR
- Completed with passes, two years of engineering or science at a university, college or technical school plus two years NDT experience, comparable to a Level II in the applicable NDT method(s). OR
- Four Years' experience comparable to that of an NDT Level II in the applicable test methods.

6.0 EXAMINATION

6.1 Company ASNT NDT Level III, or an independent ASNT NDT Level III examiner or an ASNT NDT level III belongs to an approved external agency shall conduct and grade all examination for NDT Level I,II and III personnel. The examination process consists three (3) parts. Each candidate must successfully complete all three (3) parts, with a composite grade of 80% and individual exam passes not less than 70%. The parts shall be as follows:

6.2 General Examination - (Level I & II)

6.2.1 General examinations shall be closed book written test, pertaining to the basic principle of the applicable NDT method.

6.2.2 The number of test questions shall be as shown in Paragraph 12.0 of this document for the applicable NDT method.

6.3 Specific Examination - (Level I & II)

6.3.1 Specific examination's shall be a written test, either closed book or open book at the discretion of the NDT Level III examiner. It shall cover the equipment, operating procedure, codes, standards and / or specification that the candidate may encounter during his employment.

6.3.2 The number of test questions shall be as per Paragraph 12.0 of this procedure.

6.4 Practical Examination - (Level I & II)

6.4.1 Each candidate shall demonstrate to the satisfaction of the Level III examiner, familiarity with and operation of the necessary test equipment. The candidate must be able to analyse test results to the level necessary and ensure compliance with the requirements of the applicable code, standard and / or specification.

6.4.2 At least one (1) selected specimen shall be tested for the applicable NDT Technique within the method and results of the test recorded by the candidate attempting to qualify.

6.4.3 The description of the specimen, the test procedure, including at least 10 check points for level I & level II, and the result of the examination shall be recorded. The checkpoints requiring an understanding of test variables and the procedural requirements should be included in practical examination. The candidate should detect all discontinuity and conditions specified by the NDT Level III.

6.5 NDT Level III Examinations

6.5.1 Basic Examination (required only once when more than one test method is being undertaken)

- a) (15) questions relating to the understanding of ASNT-TC-1A document.

- b) (20) questions relating to applicable materials, fabrication & product technology.
- c) (20) questions selected from or similar to the Level II published by ASNT for the applicable NDT methods.

6.5.2 Method Examination (for each method)

- a) (30) questions relating to the fundamentals and principles of NDT, similar to the ASNT Level III questions for each method.
- b) (15) questions relating to the application and establishment of techniques and procedures, similar to the ASNT Level III questions for each method.
- c) (20) questions relating to the interpretation of codes, standards and specifications relating to the test method.

6.5.3 Specific Examination (for each method)

(20) Questions relating to specifications, equipment, techniques and procedures applicable to the test methods employed, in accordance with this written practice.

6.5.4 Waiver of NDT Examinations.

Company may waiver the Level III examinations, if the candidate has a valid ASNT or ACCP Level III certificate in the applicable NDT methods. Candidate with NDT Level III qualification from any other nationally accredited society other than mentioned above, has to follow the format and guidelines described in section 6.5.1, 6.5.2 & 6.5.3.

Company may waive the Level II examinations, if the candidates have a valid PCN/CSWIP/Third party SNT-TC-1A /ISO 9712 Level II & for the marking & training requirement shall follow the valid certificates.

6.6 Vision Examinations.

At time of examination or re - certification, and annually thereafter, a qualified oculist or Optometrist or ASNT NDT level 3 shall carry out the following eye tests;

- a) Natural or corrected near distance acuity, in at least one eye, as determined by the ability to read the Jaeger No. 1 eye chart or equivalent, at a distance of 12" or 30.5 cm on a Standard Jaeger Test Chart.
- b) Colour vision examination to verify their capability of distinguishing colour and differentiating contrast between the colours normally used in the applicable method.
Note: This test shall be at initial certification and then (5) yearly thereafter.
- c) Vision Examination expires on the last day of the month of expiration.

7.0 GRADING OF EXAMINATION

- 7.1 A minimum grade of 70% shall be required for general, specific and practical exams, with a minimum composite grade of 80%. "Composite Grades" are determined by simple averaging.
- 7.2 When examinations are administered by outside agencies and "Pass or Fail" is given, the employer may accept the pass as 80%.

8.0 RE-EXAMINATION

Any candidate, who fails to obtain the required grades, must wait at least thirty (30) days or show documented evidence of having additional training by the Level III before re-examination.

9.0 QUALIFICATION / CERTIFICATION

Certification of all candidates shall be the responsibility of the employer. If third party is used for examination and certification, the certificate issued by third party shall have the details of method, level, Type, technique, Category, material, date of issue and validity to satisfy the requirement of

Para 9.3.

9.1 Candidates who have successfully fulfilled the requirements of this procedure for education, training, experience and examination shall be eligible for Company certification.

9.2 Valid certification from ASNT / C.S.W.I.P. / P.C.N. / AINDT, RTC, DGZfp (German Society), or any equivalent society may be considered for acceptance by the company without further written examinations, if the candidate is assessed by the Managing Director / Quality Manager or Operations Manager or company Level III and found to be suitable and competent for job. Candidate holding third party nationally accredited certificate if fails assessments has to fulfil requirements of this procedure for education, training, experience and examination.

9.3 **Qualification / Certification Records**

9.3.1 All certification records shall be controlled and maintained by company. These original records shall be maintained on file and updated or re-certified as required.

9.3.2 Qualification / Certification records shall include, but not be limited to the following:

- Name of certified individual.
- Level of certification and NDT method.
- Education background and experience of certified individuals.
- Results of NDT training.
- Results of vision examinations.
- NDT examination results.
- Suitable evidence of satisfactory qualifications.
- Details of method, level, Type, technique, Category, and material.
- Composite grades or suitable evidence of grades.
- Dates of certification and/or re-certification.
- Signature of the employers certifying authority and stamp.
- Signature of NDT Level III & Company stamp.

9.4 **NDT Certificates**

9.4.1 All Level I and II personnel who are certified by company shall be issued a certificate for each applicable test method.

9.4.2 The information contained on the certificate shall include details as in the sample certificate.

9.4.3 Upon termination of employment from company the certificate shall be annulled.

9.5 **Renewal of Certification.**

9.5.1 All NDT personnel in the continuous employment of the Company shall be re-examined and re-certified every (5) years.

9.5.2 At the discretion of the Quality Manager or Company Level III, re-certification may be granted without examination for uninterrupted service, provided that the concerned individual has demonstrated satisfactory performance in the methods certified for.

9.5.3 **Interrupted Service**

Personnel who have been terminated and re-hired by the Company within a six (6) month period following termination, may be re certified without re-examination providing they can show documented proof of continuous, satisfactory performance in the applicable NDT methods during their period away from company. This requirement shall also apply to prospective new employees

who have previous work experience. In this case, the concerned individuals shall be required to produce documented evidence of previous certification (if any)

- 9.5.4 New certification, Renewal of certification for uninterrupted service or re-certification for interrupted service with or without examination shall be endorsed by company level III, or Re-certification shall be endorsed by a client approved independent third party ASNT NDT level 3 if any client requirements states in such a way.

9.6 Level III Certification

- 9.6.1 Company shall appoint by issuance of a letter of appointment from the management, the NDT Level III who shall fulfil the requirements listed below:

- 9.6.2 Level III certification shall satisfy at least one of the following requirements:

- a) Complete, with a passing grade, a Level III General examination and Specific examination conducted by an independent ASNT, certified NDT Level III and Company Level III practical examination for each of the applicable disciplines.
- b) Complete, with a passing grade, company Level III General, Specific and Practical examination for each of the applicable disciplines.
- c) Have valid and concurrent certification to Level III certification, endorsed by a recognised body of NDT (Such as ASNT or equivalent) and documented evidence of relevant work experience.

9.7 Technical Performance Evaluation:

- a) NDE personnel may be re – examined at any time, have their certification extended or revoked at the discretion of Quality Manager and/or certifying NDT Level III.
- b) A technical Performance evaluation to the requirements of practical examination, will be performed every five (5) year as a minimum.

9.8 Termination:

- a) The employee certification shall be deemed revoked when employment with the company terminates.
- b) Level I and II technicians whose certification has been terminated, may be recertified to their former NDE Level based on examination, as described in Section 6.0, provided all the following conditions are met to the satisfaction of the Quality Manager and NDE Level III:
 - i) The employee has proof of prior certification(s)
 - ii) The employee was working in the capacity to which he was certified within the last six (6) months of termination
 - iii) The employee is being recertified within six (6) months of termination.
 - iv) Prior to being examined for recertification, employees not meeting the above requirements should receive additional training as deemed appropriate by the NDT Level III.

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10.0 SUB-CONTRACTORS

- 10.1 NDT Sub-contractors may be used by the Company as deemed necessary and approved by Management & Client.
- 10.2 Sub-contractors shall be required to submit their qualification procedures including the company's written practice for control and administration of NDT personnel and Level III documentation for approval.

11.0 MINIMUM REQUIREMENT OF TRAINING AND EXPERIENCE

Examination Method	Level	Training Hours	Minimum Hours Experience in Method	Total Experience in NDT
Ultrasonic Testing	I	40	210	400
Ultrasonic Testing	II	40	630	1200
Radiographic Testing	I	40	210	400
Radiographic Testing	II	40	630	1200
Liquid Penetrant Testing	I	4	70	130
Liquid Penetrant Testing	II	8	140	270
Magnetic Particle Testing	I	12	70	130
Magnetic Particle Testing	II	8	210	400
Visual Testing	I	8	70	130
Visual Testing	II	16	140	270

11.1 Limited Certification

Method	Level I	Level II
Ultrasonic Testing (Limited Level II)	--	40
Total Work Time Experience (Months)per level for all of the above	--	630 Hours

12.0 MINIMUM EXAMINATION QUESTION REQUIREMENTS

- 12.1 The NDT Level III shall approve all questions used in Company examination

12.2 NDT Level I & II - Theory

NDT Test Methods	Number of Questions			
	General		Specific	
	Level I	Level II	Level I	Level II
Liquid Penetrant	40	40	20	20
Magnetic Particle	40	40	20	20
Radiography	40	40	20	20
Ultrasonic	40	40	20	20
Ultrasonic Limited	--	30	--	15
Visual testing	40	40	20	20

13.0 MINIMUM QUALIFICATION'S

The minimum qualification of NDT Personnel within the Company shall be at least NDT Level I in accordance with SNT - TC - 1A, qualified by an ASNT Level III personnel or Level II certified from an equivalent independent certification bodies like PCN, AINDT, RTC and ASNT.

14.0 APPOINTED ASNT Level III CONSULTANT'S

The company management as required in support of personal certification shall appoint ASNT NDT Level III Consultant. All relevant documentation shall be maintained on file for reference.

The responsible employer manager is responsible for verifying that the Level III is responsible and in charge of training, testing, documenting, and certification of all Trainees, Level I and Level II technicians. The responsible employer manager will sign the letter of certification and the certificate along with the Level III's signature, to include the date of certification and expiration date.

15.0 RESPONSIBILITY FOR TRAINING RECORDS AND CERTIFICATION

The Quality Manager or designated person shall be responsible for maintaining records of training & certification to ensure that re-certification of operators are performed prior to the five (5) years duration. All training and experience received shall be documented on a regular basis.

16.0 TRACEABILITY OF CERTIFICATIONS & NDT PERSONNEL:

SARA shall maintain NDT employee roster and issue Individual Inspection Stamps to technician for each NDT Method. Issuance of stamp shall be in compliance of Procedure no. Sara/QA/Doc/231 Rev 0