WELDING RESEARCH INSTITUTE
BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI 620014
TAMILNADU, INDIA

WRI COURSE BROCHURE

2021 -2022

WELDING RESEARCH INSTITUTE

CONTENTS

TRAINING CALENDAR FOR THE YEAR 2021– 2022

S. No.	Course Title	Course Code	Course Duration	**Course Fee (Rs) excluding GST	Current rate of GST
1.	Welding & Inspection	STC - 451	24.05.2021 – 29.05.2021	21,500.00	18%
2.	Certified Welding Inspector*	CWI - 126	31.05.2021 – 12.06.2021	40,800.00	18%
3.	Welding & Inspection	STC - 452	21.06.2021 – 26.06.2021	21,500.00	18%
4.	Certified Welding Inspector*	CWI - 127	05.07.2021 – 17.07.2021	40,800.00	18%
5.	Welding & Inspection	STC - 453	02.08.2021 – 07.08.2021	21,500.00	18%
6.	Ultrasonic Testing – Level II *	NDT - 145	16.08.2021 – 28.08.2021	42,300.00	18%
7.	Certified Welding Inspector*	CWI - 128	13.09.2021 – 25.09.2021	40,800.00	18%
8.	Welding & Inspection	STC – 454	04.10.2021 – 09.10.2021	21,500.00	18%
9.	Phased Array Ultrasonic Testing (PAUT) Level-II*	NDT – 146	15.10.2021 – 28.10.2021	1,02,700.00	18%
10.	Certified Welding Inspector*	CWI - 129	08.11.2021 – 20.11.2021	40,800.00	18%
11.	Welding & Inspection	STC - 455	22.11.2021 – 27.11.2021	21,500.00	18%
12.	NDT Techniques	NDT – 147	30.11.2021 – 04.12.2021	19,700.00	18%
13.	Certified Welding Inspector*	CWI - 130	06.12.2021 – 18.12.2022	40,800.00	18%
14.	Welding & Inspection	STC – 456	24.01.2022 – 29.01.2022	21,500.00	18%
15.	Radiography Testing Film Interpretation (RTFI) Level II*	NDT – 148	07.02.2022 – 12.02.2022	24,500.00	18%
16.	Certified Welding Inspector*	CWI – 131	14.02.2022 – 26.02.2022	40,800.00	18%
17.	Welding & Inspection	STC – 457	07.03.2022 – 12.03.2022	21,500.00	18%
18.	Certified Welding Inspector*	CWI - 132	21.03.2022 – 02.04.2022	40,800.00	18%

**** Course includes examination.***

NOTE:

- Course Fee per participant; GST extra applicable as per extant Govt. of India Rules on the date of actual payment. Course fee applicable to Indian citizens only. For foreign nationals, kindly contact Programme Officer.
- All Courses are "NON RESIDENTIAL". However, twin-sharing accommodation at BHEL Guest House may be available for course participants on payment to GH authorities, subject to availability.
- **Charges include Lunch and light refreshments in the morning and evening on course days provided at WRI.**

THE PROGRAMME OFFICER
WELDING RESEARCH INSTITUTE
BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014 TAMILNADU, INDIA
Phone No.: +91- 431- 257 7283 / 257 7227
E-mail : wrisow@bhel.in / prveswaran@bhel.in

ABOUT WRI

Welding Research Institute (WRI), Tiruchirappalli was established by the Government of India with assistance from UNDP under the aegis of Bharat Heavy Electricals Limited, Tiruchirappalli. This institute is an "Industry Oriented Research Centre" to promote the application of Welding Technology in Indian industries.

Objectives:

The activities of WRI are focused on developing cutting edge technologies in welding & allied areas through systematic R&D, providing welding technology solutions to all Industries and knowledge dissemination. Recognizing the importance of well-trained manpower in effective implementation of appropriate welding technology, WRI has rightly emphasized on human resource development as one of its major objectives since inception.

School of Welding:

The School of Welding (SoW) at WRI was established in 1975 to provide education and training in welding and allied field. The school of welding is conducting three tier training programmes for Engineers, Technicians and Artisans. Apart from comprehensive basic training courses, short term courses on specialized topics are conducted regularly. Further, 'tailor made' courses designed to meet the specific requirements of sponsoring organizations are conducted either at WRI or at customer's premises. Close contact with industry assures that the training is not only relevant to the current needs of the industries but also to prepare them for future developments.

Faculty:

The faculty is drawn from well qualified and experienced research staff in each specialized area of welding. In addition to the Institute's research staff, experts from other organizations are also engaged. The courses are designed such that the trainees could benefit from their rich experience by group discussion and interaction between faculty and participants.

Facilities:

WRI has complete range of conventional and modern welding facilities like laser welding, friction welding, flash butt welding, projection welding, resistance seam welding, plasma spray system, synergic Time and twin MIG welding, AC/DC programmable TIG welding, Hotwire GTAW, Interpulse GTAW, Keyhole plasma welding, multipurpose column & boom type SAW, tandem submerged arc welding, AC/DC variable Square wave SAW, portable spot welding, Orbital welding,

Deep Bore Valve Body welding, Narrow Gap welding technology, etc. It has a metallurgical and mechanical testing laboratory, well equipped with thermal cycle simulator, implant test equipment, SEM, low temperature impact (CVN) testing equipment, fatigue testing equipment, Creep Testing equipment etc. The NDT laboratory is equipped with facilities such as X-ray with Computer Radiography, gamma ray, fluoroscopy, TEM, XRD Stress Analyser, UT and PAUT facilities. The school of welding has 3 class rooms fitted with up-to-date audio visual aids and a full-fledged training workshop.

The Institute's library with more than 13,533 volumes and 28 periodicals on welding and related subjects is accessible to the trainees. A limited hostel facility is available to accommodate welder trainees.

Recognition:

Since inception WRI has so far conducted 80 basic courses, 450 short term courses. 125 Certified Welding Inspector Courses, 274 Special short term courses, 145 NDT courses and Seven International Training Programmes on Welding Technology for customers from India and abroad. A total of about 20000 engineers and supervisors have been trained by WRI till date. Almost every major industry in both public and private sectors has made use of WRI to train their welding personnel. WRI has been recognized as competent authority by Indian Boiler Board to train and certify welders as per IBR.

WRI has conducted 1074 Welding & NDT Courses, so far, benefiting more than 20000 Engineers / Supervisors from private / public sector organisations apart from individuals, throughout the country and abroad.

Under the technical skill development training programme, more than 6000 welders have been trained so far. In addition, tailor-made programmes on topics related to welding & allied areas can be organised at WRI, on mutually agreed terms for any industrial sector.

INFORMATION TO PARTICIPANTS

Location of WRI:

Welding Research Institute is located in the industrial complex of BHEL, Tiruchirappalli, which is 15kms from Tiruchirappalli town on the Trichy – Thanjavur Highway.

How to reach Tiruchirappalli:

Tiruchirappalli (also known as Tiruchy) is about 320 Km. south of Chennai. Number of trains and luxury buses from Chennai Egmore railway station operate throughout the day and night. The travel takes 6 to 7 hours. Tiruchirappalli is also connected by overnight train from Chennai, Bangalore and Kochi. Tiruchy is also connected by air from Chennai and other Asian countries like Singapore, Malaysia and Saudi Arabia.

Conveyance:

Taxi and auto rickshaws nominally charge to reach WRI hostel from Tiruchirappalli junction / bus stand / airport. Regular buses also ply from the C*entral Bus Stand* near the railway junction and *Chattram Bus Stand* near Rock Fort.

Accommodation:

All Courses are "NON RESIDENTIAL" However limited A/C bachelor accommodation (shared) at our Guest House is available for course participants on payment, subject to availability. Internal transport between guest house and WRI will be arranged on course days. It may kindly be noted that all payments pertaining to Guest House boarding & lodging are to be paid to GH authorities directly and not connected with WRI.

Hotels:

Participants may make their own arrangements for stay in Tiruchirappalli. A number of good hotels are available around the central bus stand / Railway Junction at reasonable tariff. Participants will have to arrange for their own conveyance, between the place of stay and WRI, if they stay in Hotels.

Course Timings:

WRI functions 6 days a week from 0900 hours to 1730 hours, Sunday being the weekly holiday. The session timing will be from 0900 hours to 1600 hours. Participants are requested to be present at WRI by 0830 hours to complete the registration formalities on the first day.

Climate:

Tiruchirappalli has moderate to hot climate throughout the year. The minimum and maximum temperature range from 25°C to 40°C. Light winter clothing is sufficient during November to January.

Note:

1. Course participants are advised not to bring mobile phones, laptop, camera, memory devices etc. which are not allowed inside WRI campus.
2. All participants are to carry any photo ID like Aadhaar card, Voter ID, PAN card etc.
3. *All security related instructions in vogue from time to time in BHEL, Tiruchirappalli will be applicable to all course participants.*
4. *All pandemic related rules and regulations stipulated by central / state governments, district and BHEL authorities are binding on the course participants*

COURSE ENROLMENT FORM

Course Title	:	
Course Code	:	
Course Duration	:	
Name of Candidate	:	
Designation	:	
Organisation	:	
Qualification	:	
Relevant Experience	:	
Payment Details	:	
Amount (Rs)	:	
Accommodation required*	:	Yes / No
Address for Communication	:	
Phone No / Mobile No.	:	
E-mail	:	
Fax No	:	
Place	:	
Date	:	

Signature of Sponsoring Authority with Seal

* Shared bachelor A/C accommodation will be provided at Guest House on payment subject to availability.

Note:

1. For all our courses, participants are to submit soft copy of the latest passport size colour photograph (with blue background) in JPEG format while applying, to prepare entry pass and certificate.
2. Enrolment form duly filled in shall be sent along with copies of qualification and experience certificates to:
   THE PROGRAMME OFFICER
   WELDING RESEARCH INSTITUTE
   BHARAT HEAVY ELECTRICALS LIMITED
   TIRUCHIRAPPALLI - 620 014
   Phone No. : +91- 431- 257 7283 / 257 7227
   E-mail : wrisow@bhel.in / prveswaran@bhel.in

TERMS AND CONDITIONS

Registration / How to apply?

a) The nomination will be registered on first-come-first-served basis. Last date for registration is one week prior to start of each course subject to availability. To avoid disappointment, send your nomination well in advance. WRI's decision on nominations will be final and binding on the participants.

b) Candidates sponsored by their company shall forward the nominations through competent authority by official letter / E-mail / Fax.

c) Self-sponsored candidates are to send the enrolment form duly filled along with copies of qualification certificate and experience certificate issued by their employer. Course fee to be paid through electronic fund transfer (EFT) as per the bank details appended below:

NAME: BHARAT HEAVY ELECTRICALS LIMITED
BANK: STATE BANK OF INDIA, HEAVY ELECTRICALS, KAILASAPURAM
ACCOUNT NO: 10891588977
IFSC NO. : SBIN0001363

Note: In our endeavour for paperless office, Demand Draft and Cheques are NOT generally accepted. Any payment in CASH is NOT ACCEPTED.

d) Nominations received without course fee will not be entertained. Candidates are requested to confirm the availability of seats before applying / making payment towards course fees.

e) All participants are to submit soft copy of latest passport size colour photograph (with blue background) in JPEG format while applying, to prepare entry pass and certificate as applicable.

NOTE:

- **All the courses conducted at WRI are meant for working professional with prior knowledge about welding and / or inspection, intended only for the purpose of knowledge-sharing and update of industrial growth with respect to Welding, DT & NDT methods.**
- **Course material in the form of book will be provided to all the participants. Course material in any other form, viz., soft copy, Power Point presentation, etc. WILL NOT be provided under any circumstances.**

Cancellation / Postponement and REFUND Policy:

- WRI reserves the right to cancel / postpone any of the scheduled programmes, due to (i) not getting minimum number of participation and (ii) other unforeseen circumstances beyond the control of WRI. However, best efforts will be spared by WRI School of Welding to conduct all the courses as scheduled.

- 100% advance payment on account of course fees is mandatory and shall be paid at least one week prior to scheduled commencement of course. **Charges include Lunch and light refreshments in the morning & evening on course days provided at WRI.**
- In case any of the participants is unable to attend (in full) the course after payment of course fees, due to his/her own reasons and on his / her unwillingness to join the next available course, refund will be made after deduction of GST and other taxes, if any portion of the course fees.
- In case the course is cancelled due to reasons beyond the control of WRI, the registered participants who have made 100% advance payment will be given option and priority to join the next available course and participants who are unwilling to exercise the option will be refunded as per BHEL rules and regulations.
- In all the refund cases, processing by BHEL finance department will take a minimum of three months from the date of claim; refund will be made through electronic transfer and only to registered participant's account number. In no case, Cash / Cheque / Demand Drafts will be issued.
- Claims for refund will be entertained through letter / E-mail along with required documents, viz., copy of first page of bank pass with photo of the account holder and one cancelled cheque leaf and any other documentary proof demanded by BHEL finance department.
- Notwithstanding the above conditions, all refunds for payment against WRI Courses will be bound by BHEL Finance rules and regulations applicable from time to time.

COURSE CERTIFICATE: WRI Course Certificates will be issued at the end of all the courses as per the following procedure subject to completion of attendance and examination formalities as applicable:

(i) "**Certificate of Participation"** for courses without examination - To all the participants with 100% attendance and

(ii) "**Successful Course Completion Certificate"** for courses with examination - To candidates acquiring passing marks, as prescribed against each course as mentioned in relevant pages of this brochure

- Certificates to private candidates from whom 100% advance payment has been received, will be either handed over in person or sent to their postal address.
- Certificates to sponsored candidates will be sent to their sponsoring company on realisation of 100% payment towards courses charges. Requests for certificates by individuals, in case of sponsorship by their employer company, will NOT be entertained.

General:

- All communications regarding the nominations shall be addressed to:

THE PROGRAMME OFFICER
WELDING RESEARCH INSTITUTE
BHARAT HEAVY ELECTRICALS LIMITED
TIRUCHIRAPPALLI - 620 014 TAMILNADU, INDIA
Phone No. : +91- 431- 257 7283 / 257 7227
E-mail : wrisow@bhel.in / prveswaran@bhel.in

WELDING & INSPECTION

STC-451	**24.05.2021 – 29.05.2021**		**STC – 455**	**22.11.2021 – 27.11.2021**
STC-452	**21.06.2021 – 26.06.2021**		**STC – 456**	**24.01.2022 – 29.01.2022**
STC-453	**02.08.2021 – 07.08.2021**		**STC – 457**	**07.03.2022 – 12.03.2022**
STC – 454	**04.10.2021 – 09.10.2021**		**Additional Courses on Demand**	

About the course: This course aims at providing basic information about various welding processes, welding metallurgy and inspection techniques. The theoretical lecture covered will be supplemented with practical demonstration at WRI wherever possible. This course will be useful for the personnel from all fabrication industries including automobile, power plant and ship building.

Eligibility: Candidates should possess a degree in any branch of engineering or equivalent (or) diploma in engineering preferably (and not mandatorily) with minimum 1 year of industrial experience related to fabrication / quality control.

Last date for Registration: One week prior to start of the course, subject to availability

Course contents:

- Arc Welding Power sources
- SMAW Process - Equipment, Techniques & Electrodes Classification
- SAW Process - Principle, Equipment, Techniques, Consumable and Applications
- GMAW and FCAW Processes - Principle, Equipment, Techniques, Consumables and Applications
- GTAW Process - Principle, Equipment, Techniques, Consumables and Applications
- Welding metallurgy - Weldability of steels
- Heat treatment of weldments
- Weld Joint Design & Welding symbols
- Welding procedure specification as per ASME Sec IX
- Mechanical and Metallurgical testing of welds
- Weld discontinuities, types, causes and remedies
- Visual inspection
- Penetrant test & Magnetic Particle test
- Radiographic Testing Principles & Techniques
- Ultrasonic Testing Principles & Techniques
- Demonstration of welding processes, Destructive & Non Destructive Testing methods.

Examination: There is no examination for this course and participants will be issued with Certificate of Participation.

CERTIFIED WELDING INSPECTOR

CWI – 126	**31.05.2021 – 12.06.2021**		**CWI – 130**	**06.12.2021 – 18.12.2022**
CWI – 127	**05.07.2021 – 17.07.2021**		**CWI – 131**	**14.02.2022 – 26.02.2022**
CWI – 128	**13.09.2021 – 25.09.2021**		**CWI – 132**	**21.03.2022 – 02.04.2022**
CWI – 129	**08.11.2021 – 20.11.2021**		**Additional courses on Demand**	

About the course: The course covers nearly all aspects in welding and inspection with specific focus on International Codes of construction. The course will enable the participants to carry out inspection of weld in the fabrication of pressure vessels, structural and piping and is well recognised by the industries all over the world. More than 4000 inspectors have already benefited by this course and are occupying key positions in different industries all over the world.

Eligibility: Candidates should possess a degree in any branch of engineering or equivalent (or) a diploma in engineering. Candidates should mandatorily possess a minimum one year's industrial experience related to fabrication / construction / quality control.

Last date for Registration: One week prior to start of the course subject to availability.

Course Contents:

- Introduction to Welding
- Welding Power Sources
- Basic Metallurgy
- Welding Metallurgy & Weldability of Steels (CS, LAS & SS)
- Shielded Metal Arc Welding Process and electrodes classification
- Submerged Arc Welding Process Principle, Techniques and Applications
- GTAW Process Principle, Techniques and Applications
- GMAW and FCAW Processes Principle, Techniques and Applications
- Weld joint design, type of joints and welding symbols
- Residual stresses and distortion control
- Heat treatment of weldments
- Visual inspection
- Penetrant testing and magnetic particle testing
- Radiographic testing principle & techniques
- Ultrasonic testing principle & techniques

- Welding Procedure Specification, Procedure Qualification Record as per ASME.
- Fabrication aspects of structural steels as per AWS D1.1
- Fabrication aspects of pressure vessels as per ASME code
- Line pipe welding and testing as per API 1104
- Welders qualification as per ASME and IBR requirements
- Weld discontinuities types, causes and remedies.
- Occupational Health & Safety in welding
- Demonstration of welding processes and Destructive & Non Destructive Testing methods.

Examination: At the end of the training programme, the participants are required to appear for the end-course examination consisting of theory as well as practical parts. The theory exam consists of Part A – Objective type and Part B – descriptive type questions. In the Part C (practical), the candidate will also be assessed visual inspection of Weldments. Candidates should score a minimum of 50% marks in aggregate for a pass in the examination.

Validity: The CWI certificate initially issued by WRI is valid for a period of 5 years from the date of passing the end-course examination. Candidates can get their certificates renewed any time before the expiry of their certificates by following the prescribed procedures in vogue at the time of their application for revalidation and by making the prescribed payment.

Re-examination: Participants who could not aggregate 50% marks in the initial examination will be permitted to appear for re-examination within one year of undergoing the course by appearing in the end-course examination of the subsequent CWI course(s) by making payment of prescribed re-examination charges. Participants who could not clear the re-examination within one year need to undergo CWI course once again for certification.

Note: Candidates not sponsored but appearing as private candidate shall produce the copy of certificate in proof of work experience.

ULTRASONIC TESTING LEVEL – II

(IN ACCORDANCE WITH SNT-TC-1A)

NDT – 145	16.08.2021 – 28.08.2021

About the course: The course is designed to provide the participants, a better understanding of theory and applications of ultrasonic testing and to qualify them as ultrasonic testing Level II. Successful candidate will be able to calibrate the equipment, perform the test, interpret and evaluate the result as per the applicable codes and standards. Training, examination and certification will be based on WRI's written practice which is aligned with the requirements of SNT-TC-1A of American Society for Non Destructive Testing (ASNT).

Qualification: Degree / Diploma in Engineering (or) Degree in Science

Experience: Minimum of one year in Ultrasonic Testing (Mandatory) - to be certified by the employer.

Vision Requirement: Normal or corrected Near Vision of Jaeger (J2) and no colour blindness (Checked using Ishihara Chart).

Last date for Registration: One week prior to start of the course (subject to availability)

Course contents:

- Properties of sound and wave propagation
- UT – Equipment and probe
- Calibration and reference blocks
- DAC and its significance
- Ultrasonic testing techniques
- Testing of raw materials
- Ultrasonic testing of welds
- Ultrasonic testing of castings
- Interpretation of UT signals and variables affecting the test results
- Ultrasonic testing Practical and quiz

Examination and validity: At the end of training programme, the participants are required to take up examination in General (Theory), specific and practical as recommended by SNT-TC-1A of ASNT. Candidate has to obtain a minimum of 70% in each examination and an aggregate of 80% to get certified as UT level

II. The successful candidates will be awarded a certificate based on which the employer can certify the individual as UT level II. This certificate is valid for 5 years from the date of certification. The certificate has to be renewed before expiry with one-month prior notice. The candidates who wish to renew their certificate in the year 2016 can appear for this examination with one-month prior notice.

Note: 1. A letter should be addressed to the programme officer requesting WRI to train the candidate as per ASNT-SNT-TC-1A. A copy of the proof of educational qualification, employer certificate in respect of UT experience and a vision certificate as per vision requirement given above by a registered medical practitioner should be submitted at the time of registration.

2. Participants are requested to bring scientific calculator for the programme.

PHASED ARRAY ULTRASONIC TESTING LEVEL II

(IN ACCORDANCE WITH SNT-TC-IA)

NDT – 146	15.10.2021 – 28.10.2021

About the course: This course is designed to provide the participants, a better understanding about theory and application of phased array ultrasonic testing, to train them and qualify them as phased array ultrasonic testing Level II in accordance with ASNT SNT TC IA. Successful candidate will be able to set up, calibrate the equipment, perform the test, interpret and evaluate the results as per applicable procedure or codes and standards. The candidate will be trained to organize, perform and report the testing results using phased array ultrasonic testing technique.

Qualification: Diploma or Degree with physics and maths as a part of their curriculum.

Experience requirements: Minimum work experience (Hands on) of 6 months as Level II in Ultrasonic testing is a mandatory requirement to appear for examination and certification. Candidate shall have thorough understanding and experience in conventional ultrasonic testing.

Vision requirements: Candidate shall have Normal or corrected near vision of Jaeger (J2) or equivalent and shall not have colour blindness.

Last date of registration: One week prior to the commencement of the course (subject to availability). Registration will be made on first come first serve basis.

Course content:

- Basic concepts and theory of PAUT
- Equipment, probes, wedges, encoder and scanner
- Developing a scanning technique using software
- Focal law generation (on board and external), single and multiple group,
- Digitization principles
- Testing techniques and various display used in PAU T
- Equipment Calibration and standardization of set up
- Data acquisition and analysis
- Report generation
- Written instruction, Procedure, Codes and standard requirements (ASME Section V, ASTM E 2700 etc.)
- Basics of Zone discrimination concepts for automated UT in pipeline inspection

Examination: At the end of the training program, the participants are required to undergo examination which consist of specific and practical examination. Candidate has to obtain a minimum of 70% in each examination and an aggregate of 80% to get certified as PAU T level II.

Documents to be submitted for registration:

- Application for course enrolment
- Copy of proof of educational qualification
- Employer certificate fulfilling the experience requirements in ultrasonic testing
- A letter addressing to the program officer requesting WRI to train the candidate as per ASNT-SNT-TC-IA.
- Medical certificate as a proof for vision requirements, which has to be certified by a medical practitioner

Note:

- WRI deserves the right to disqualify the participants from certification program when the participant is found to have colour blindness.
- Participants are requested to bring a scientific calculator for their use during the programme.

NDT TECHNIQUES

NDT – 147	30.11.2021 – 04.12.2021

About the Course: The course is designed to provide an overall view of NDE and to acquaint the participants about the various aspects and techniques used in commonly applied NDE. The principle, advantages, limitations and applications of each technique will be highlighted. It is highly useful for quality professionals, designers and manufacturing personnel.

Eligibility: Degree in science or engineering or diploma in engineering will be preferable.

Last Date for Registration: One week prior to start of the courses subject to availability.

Course Contents:

- Visual inspection
- Penetrant testing and magnetic particles testing principles, techniques and applications
- Radiographic testing principle and techniques
- Conventional Ultrasonic testing principle and techniques
- Introduction to advanced Ultrasonic testing PAUT & TOFD
- Advanced NDT Techniques like Acoustic emission testing, Eddy current testing (ECT), Thermography, Neutron radiography, Guided wave testing and Leak testing
- Visual defect identification lab
- PT, MT, RT & UT – Demonstration

Examination: There is no examination for this course and participants will be issued with Certificate of Participation.

RADIOGRAPHIC TESTING FILM INTERPRETATION (RTFI) Level II

(IN ACCORDANCE WITH SNT-TC-1A)

NDT – 148	07.02.2022 – 12.02.2022

About the course: The course is designed to provide the participant an understanding of the basic theory of radiographic testing and the concepts of radiographic film interpretation. The participant will be able to obtain an insight into the important aspects to be considered during interpretation. Personnel involved in the quality functions and manufacturing operations will find the course useful.

Qualification: Degree in Science or Degree / Diploma in engineering.

Experience: Minimum of 2 months in Radiographic Testing (mandatory) - to be certified by employer.

Vision Requirement: Corrected or uncorrected near vision of Jaeger J2 required and no colour blindness (Checked using Ishihara Chart).

Last date for Registration: One week prior to start of the course subject to availability.

Course Contents:

- Radiographic principles
- Radiographic sources
- Radiographic techniques
- Film processing & Radiographic image quality
- Interpretation of radiographs
- Radiographic film interpretation - practical.

Examination and Validity: At the end of training programme, the participants are required to take up examination in General (Theory), specific and practical as recommended by SNT-TC-1A of ASNT. Candidate has to obtain a minimum of 70% in each examination and an aggregate of 80% to get certified as RTFI level II. The successful candidates will be awarded a certificate based on which the employer can certify the individual as RTFI level II.

Note: 1. A letter should be addressed to the programme officer requesting WRI to train the candidate as per ASNT-SNT-TC-1A. A copy of the proof of educational qualification, employer certificate in respect of RT experience and a vision certificate as per vision requirement given above by a registered medical practitioner should be submitted at the time of registration.

WELDERS TRAINING AND QUALIFICATION

(ASME, BS, DIN, IBR, EN287, IS & ISO)

I. Welders training and qualification:

WRI offers practical training to welders for a variety of job requirements. The practical training is tailored to the specific needs of the individual welder under the close supervision of experienced instructors. Besides practical training, necessary theoretical inputs are also given.

The training workshop is equipped with facilities for SMAW, GMAW, GTAW and SAW processes. It also has the facility of **Simulator Based Welding Training** to assess welder skill sets. Welding techniques and skills are taught for plates, pipes and tubes in various positions. Welders are trained in variety of materials like carbon steels, low alloy steels, stainless steels and non-ferrous materials. Materials and consumables for training in common grades are provided by WRI. More specialised materials have to be provided by the sponsoring company.

The welder training is organized right through the year at WRI. The duration of the training depends on the initial skill level of the welder, his ability to acquire higher skills, the actual job requirements like material, process, position etc. After the training the welder can be qualified as per the requirements of various codes like ASME, IBR, and ISO 9606 etc. Such qualification in the presence of any testing authority specified by the customer is also possible.

To help the Indian industries to equip themselves with highly skilled welding personnel, WRI has been continuously conducting skill development program for ITI Welder passed candidate as well as School drop outs under funding from Department of Science and Technology (DST) GOI, Tamilnadu Adithiravidar Housing and Development Corporation Limited (TAHDCO), Regional Directorate of Municipal Administration (RDMA) and Tamil Nadu Skill Development Corporation (TNSDC) Government of Tamilnadu. Around 1500 welders have been trained under the above schemes and they are well placed in industries in India and abroad.

To finalise the course content, considerable interaction with customer is necessary on materials, process, code, qualification requirements etc. The duration, course fee and testing charges will vary depending on these factors.

For further information, please contact:

Telephone : +91-431- 257 7283 / 257 7227 / 257 7433
E-mail : wrisow@bhel.in / prveswaran@bhel.in
Fax : +91-431-2520773
Website : www.wriindia.com

II. Standard training and qualification programme:

The school of welding offers standard training programmes for welders as indicated in Table – 1. The welders joining these courses should essentially have an ITI certificate and also should also have an experience of minimum 3 to 5 years. Moreover, experienced welders having no specific qualification can also attend the programme given in the Table - 1.

TABLE -1

Course	Job and Material	Process	Code	Position	Minimum period	
					Training (in weeks)	Training & Qualification (In Weeks)
1.	Carbon, low alloy steel Plates	SMAW	IBR ASME	Vertical, Horizontal & Down hand(D.H)	04	05
2.	Carbon Steel & Pipe & tube (Inclusive of CS Plates)	GTAW & SMAW	IBR ASME	All Position	05	08
3.	Alloy steel Pipe & tube (Inclusive of AS Plates)	GTAW & SMAW	IBR	All Position	08	10
4.	Stainless Steel Sheets, Pipes& Tubes	GTAW & SMAW	-	D.H., Horizontal& Vertical	04	-
5.	Carbon, low alloy steel Sheets & plates	GMAW	ASME	D.H., Horizontal& Vertical	04	05
6.	Aluminium Sheets & Plates	GMAW	-	D.H., Horizontal& Vertical	04	-
7.	Carbon, low alloy Steel Sheets & Plates	SAW	IBR ASME	D.H.	02	03

III. Organisation based training programme:

Orientation course in particular processes, materials, job and positions are also arranged at the School of Welding for specified durations. These courses are fully tailor - made to the needs of sponsoring organisations or individuals.

IV. Training Charges:

The charges for training can be obtained from The Programme officer. Qualification tests to agencies like IBR, LRIS and others will involve additional charges, as applicable.

V. Lodging and boarding:

Boarding and Lodging arrangements at guest house can be provided on request and on additional charges, subject to availability.

VI. Transport to WRI:

The Welding Research institute is situated in BHEL, Tiruchirappalli complex. Transport will be provided for commuting to WRI for all the participants residing in guest house for the course duration.

TABLE – 2

Process	Material	Training charges * / Week / Welder
SMAW	Carbon Steel	Contact Programme officer for fee details
	Allow Steel	
	Nickel Based Alloys **	
GTAW	Carbon Steel	
	Allow Steel	
	Stainless Steel **	
	Aluminium **	
	Nickel Based Alloys**	
Solid wire CO_2 and FCAW	Carbon Steel	
	Allow Steel	
	Aluminium **	
GMAW	Aluminium & other non – ferrous material **	

* GST to be paid extra as per GOI rule

** Customer to supply materials & consumables as free issue to WRI on indicated quantities and dimensions.

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