

**Procedure order for Certification of USFD Machines, USFD Operators & Quality Control Supervisors and Approval of Quality Assurance Plan in connection with outsourcing of USFD testing of Rails / Welds by Zonal Railways**

**1. Background:**

- 1.1 In view of increased workload of USFD testing of Rails/Welds, Railway Board through instructions from time to time has permitted limited outsourcing of work. The agency awarded the work approaches RDSO for certification of USFD machines, operators and approval of Quality assurance Program. The provisions have been reviewed by Railway Board. Railway Board vide letter no. Track/21/2004/002/7 dated 26.03.2014 issued instructions on “Review of eligibility criteria and other technical conditions for calling tenders for outsourcing of USFD Testing”. As per these instructions, any agency considering the USFD Work shall be allowed to offer USFD Machines, operators and QAP for verification by RDSO. The list of agency whose system has been examined by RDSO shall be maintained and regularly updated. After verification of machines, operators and QAP by RDSO, any agency can participate in tenders.
- 1.2 ‘IRS Specification for Ultrasonic testing of Rails/ Welds (Provisional), Revised- 2012’ here after referred as Specification and “ Manual for Ultrasonic Testing of Rails & Welds, 2012 ’ herein after referred as Manual shall be reference document. The document with latest correction slip shall be considered while referring to them.
- 1.3 Railway Board has also directed that detailed procedure order will be issued by Track directorate in consultation with M&C directorate of RDSO in view of change in the system of approval of machines, operator and QAP. Accordingly, this detailed procedure order is being issued for information of all zonal railways, agencies considering outsourcing works and other concerned.
- 1.4 Railway Board letter mentions that minimum technical and financial eligibility criteria recommended by Sudhir Chandra committee and circulated vide Railway Board’s letter no. 94/CE-I/CTE/4 dated 17.10.02 should be followed for tenders of USFD outsourcing. If required. Eligibility criteria may be suitably modified to attract better competition. It is also stipulated that to encourage new agencies for work of outsourcing of USFD testing, open tenders upto Rs. 50 Lakh value can be invited without any other technical eligibility criteria like testing of 500Tkm etc., but these agencies should have first got their machines, operators and QAP approved from RDSO before participating in the tender.
- 1.5 As the role of RDSO is limited to approval of machine, operator and QAP, the concerned authority inviting tenders shall be responsible for checking and ensuring that the firm meets the minimum technical and financial eligibility criteria as stipulated. The eligibility criteria are not the part of QAP, as QAP is meant basically to regiment Quality control system. As such, Availability of RDSO approved QAP with firm shall in no way be taken that RDSO has checked and verified eligibility criteria and other details of firm. It is reiterated that assessing the capability of firm, meeting eligibility criteria and other relevant factors will be the sole responsibility of Tendering authority.

**2. Approval of USFD Machines and other equipments:**

- 2.1 The testing system offered by the contractor shall meet the minimum detection levels commensurate with the provision of Para 5 and Para 9 of Indian Railway Standard Specification for Ultrasonic Testing of Rails/Welds (Provisional), Revised-2012.

2.2 The agency considering the verification of system, meeting the requirement by RDSO will approach M&C directorate of RDSO. The agency shall deposit requisite fee for the same in advance as advised by RDSO. The details of already approved machines, calibration blocks shall also be furnished.

2.3 The performance of testing equipment along with data logger shall be verified by Metallurgical & Chemical (M&C) Directorate of RDSO.

(a) The equipment offered by contractor and RDSO approved standard equipment will be calibrated to the same level of sensitivity on simulated flaws in the rail as prescribed in the 'Manual for Ultrasonic Testing of Rail and Welds – Revised, 2006' or latest. The equipment shall also be tested for coverage of the rail section (As per provisions of clause 5.2.1.3/5.2.2.3).

(b) The equipment under test shall exhibit equal or better signals from flaw as compared to the approved standard equipment when tested on rail test piece having simulated flaw as per requirements above.

(c) The equipment under test shall exhibit equal or better coverage of rail/weld sections in detection of flaw as compared to the provisions of clause 5.2.1.3/5.2.2.3 of specification.

(d) The equipment under test shall also exhibit equal or better (up to +10% more vertical height) results as compared to approved standard equipment while testing rail pieces having natural defects of OBS/IMR category.

After verification, the approval certificate with unique number indicating machine make & number, capability of machine etc will be issued by RDSO.

This approval certificate will be valid for four year after which, the machine shall be offered for recertification. The service life is 8 years for USFD Machine. As such, recertification will be done only once in service life of machine.

2.4 The calibration test pieces meant for sensitivity setting of testing equipment should also be certified by M&C Dte. of RDSO before the same is taken to field for sensitivity setting purpose. The certificate of authenticity shall be issued to each calibration test piece and certificate number with RDSO stamp be engraved on the test piece.

### **3.0 Certification of USFD Operators and Quality Control Supervisors:**

3.1 The certification of USFD operators should be done at RDSO in three different categories viz. Rail Testing, Weld Testing and Rail and weld testing both.

3.2 The agency considering the certification of USFD operators will approach M&C directorate of RDSO for the same. The requisite charges and slot available for training and certification will be advised. It will be responsibility of agency to depute only the properly qualified personal possessing the qualification as per Para 7 of 'IRS Specification for Ultrasonic testing of Rails/ Welds (Provisional), Revised- 2012'.

3.3 After checking the capability & qualification, the provisional competency certificate will be issued by RDSO, valid for six months.

3.4 For regular competency certification in through pedestrian USFD testing of rail and weld, the operator shall have an experience of satisfactory performance in 'through pedestrian USFD testing' of 100 track Kms (200 rail Kms). For regular competency certification in USFD testing of welds by hand probing, the operator shall have an experience of ultrasonic testing of 100 no. of rail weld joints satisfactorily. The certification to this effect shall be from the officer – in – charge

of the section ( Asstt. Engineer or higher), where the operator has performed testing. The testing certificate along with relevant testing reports shall be produced by the contractor while applying for regular competency certificate for the operator. The regular competency certificate shall be valid for three years.

- 3.5 The agency shall also have a proper quality control supervisor having minimum academic qualification of Bachelor in Science or equivalent with Physics as one of the subject or Diploma/Degree in Engineering from any national/international institute/University. He shall possess the requisite qualification in NDT testing as per Para 7 of specification. After verification, the certificate in this regard will be issued.
- 3.6 The certification of USFD operators and supervisors will be valid only for the firm, which is offered them for certification by RDSO. The unique numbered competency certificate will be issued containing following:
- (a) Particulars of Operator/ supervisor
  - (b) Qualification
  - (c) Competency in Rail testing/ Weld Testing
  - (d) Competency to work machines
  - (e) Agency for which competency is valid
  - (f) Validity of competency certificate
- 3.7 Performance of USFD operators will be reviewed by Zonal Railways at regular interval during currency of contract. Similar system of review of quality supervisors shall also be followed by Zonal Railways. Based on assessed performance by zonal railways and other relevant inputs, the performance of the operators shall be critically reviewed by RDSO at the time of validation of competency certificate. It will be responsibility of agency to furnish the contract wise performance report of operators/ supervisors as assessed by concerned zonal railway at the time of requesting for revalidation of competency certificate. No request will be considered without detailed performance report.

#### **4.0 Quality Assurance Program (QAP):**

- 4.1 The QAP for Ultrasonic testing of Rails/ Welds shall necessarily have following contents:
- i) Covering page clearly bringing out
    - (a) Whether the QAP is for Ultrasonic testing of Rails/ Welds (by pedestrian testing) OR Weld testing (by Hand probing) OR Both
    - (b) Number of USFD machines, operators and number of teams for each type of testing
    - (c) Self assessed capacity of agency to undertake the quantum of work
  - ii) Index page giving Contents of QAP
  - iii) Brief details about agency covering infrastructural facilities, capability, Details of address along with contact numbers for Office & Training Centre etc.
  - iv) Details of ISO certification of firms
  - v) Organization chart emphasizing Quality Control set up
  - vi) Qualification of key personnel and officials deployed for Quality control

- vii) List of USFD Machines available, which are approved by RDSO separately for Rail testing, weld testing( Hand probing) and Flash Butt Weld testing giving following details:  
  
Make & Model of USFD Machine, Unique SN of machines assigned by Manufacturer, Code assigned by contractor, Year of Manufacture, Approval certificate details issued by RDSO, Validity of approval of Machine.  
( Copies of Approval certificates issued by RDSO shall be attached.)
- viii) List of Standard test piece, calibration Block etc. containing S.No., approval Certificate no. with date & Validity  
(Copies of Approval certificate issued by RDSO shall be attached)
- ix) List of USFD operators separately for Rail testing (by pedestrian testing) , Weld testing (by hand probing) , Flash Butt Weld testing with following details :  
  
Name, Father's name, Date of birth, Qualification, Details of Medical certificate with category, competency Certificate no. with Date, Machines for which competent to work, Date when competency certificate was originally issued, Years of experience, Validity of approval of competency certificate.  
(Copies of Approval certificate issued by RDSO shall be attached)
- x) List of quality control supervisor with following details  
  
Name, Father's name, Date of birth, Qualification, Details of Medical certificate with category, competency Certificate no. with Date, Date when competency certificate was originally issued, Years of experience, Validity of approval of competency certificate  
(Copies of Approval certificate issued by RDSO shall be attached)
- xi) Availability of required reference documents viz. Manual and Specification with proof of purchase.
- xii) Self assessed capacity by firm for undertaking USFD work along with the calculations.
- xiii) Quality control regime adhered by firm giving frequency of performance review of USFD operators, Training needs, Check on calibration of machines & equipments etc.
- xiv) Formats for performance review of USFD operators
- xv) Formats for Calibration check by USFD operators and quality supervisors
- xvi) Other Relevant information.

Each page shall have following information on the header & footer :

On the header : Name of the document i.e. QAP for ....., Rev. ....., Effective from .....

On the footer : Prepared by ....., Approved by ....., Page .... of ....

- 4.2 Period of validity of the QAP will be Three (3) Years. After this period, it shall be renewed based on machines available with firms, operators qualified, performance of operators and other relevant factors.

4.3 In order to avoid multiplicity of QAP of a particular firm, only one QAP shall be approved to a firm for all type of testing viz. Rail testing, Weld testing by hand probing, Flash Butt Weld testing.

**5.0 Approval of Quality Assurance Plan (QAP):**

5.1 The agency possessing the requisite USFD machines and manpower, duly certified by RDSO, shall submit the QAP for Ultrasonic testing of Rails/ Welds containing requisite information in four copies to Track Design Dte of RDSO along with requisite charges.

5.2 After initial scrutiny by Track Design Dte. about adequacy of information and being found prima-facie in order, the three copies will be forwarded to M&C directorate for scrutiny. In case it is considered that information provided is not complete, the discrepancies will be advised to Firm with copy to M&C directorate.

5.3 The QAP forwarded by Track design directorate will be examined by M&C directorate as per requirements of specifications Para 7.5. The M&C directorate will certify the machines & equipments as per Para 6.0 and operators/ quality supervisors as per Para 7.0 of specification. The discrepancies observed shall be communicated by M&C Dte. to the agency directly under intimation to Track Design Dte. The agency shall submit the clarification to M&C Dte. under intimation to Track Design Dte.

5.4 If QAP is found in conformance to Para 6, 7 & 7.5 of specifications, M&C Dte. shall certify the QAP with comments “ QAP is verified and found in conformance to Para 6, 7 & 7.5 of IRS Specification for Ultrasonic testing of Rails/ Welds (Provisional), Revised- 2012” . The certificates of machines and USFD operators will also be enclosed with the QAP. The so certified copies of QAP (retaining one copy for their record) will be forwarded to track design directorate for issue of the QAP to the agency. The one copy of QAP so verified with Unique RDSO number will be issued to agency by the Track Design Dte.

5.5 The details of approved QAP will be maintained in Track Design Directorate and will be uploaded at RDSO Website. The position will be updated every six months in January and July. The following Details will be uploaded:

S.N.	Name and address of firm	Firm's QAP No.	Type of testing viz. Rail/ Weld/ FBW	No. of Machines	No. of operators	Self assessed capacity of firm	Approved QAP No.	Validity of Approval of QAP	Remarks

5.6 In case, the agency wants to induct additional machines of already approved specifications/ category, same can be done after approval of Zonal Railway. Such changes shall be advised to Track Design Dte and M&C Dte. of RDSO for record.

5.7 Any changes in details of QC head, Type of testing i.e. Rail/ Weld testing (by Pedestrian testing) / Weld testing (by Hand probing), machines of different category, shall call for revision of QAP for which agency shall apply to RDSO giving the details of changes made.

## **6.0 General Items to be ensured by Zonal Railways:**

- 6.1 The certification of machine/ system is done by RDSO initially. Regular check as required as per specification shall be ensured by Zonal Railways. Any deterioration in performance shall be advised to RDSO (M&C Directorate and copy to Track directorate).
- 6.2 The certification of operators/ quality supervisors is done by M&C directorate. Performance review at regular interval shall be done as per specification/ Railway Board instructions. Any adverse performance shall be brought to notice of RDSO (M&C directorate and copy to track directorate) immediately.
- 6.3 Zonal Railways shall test check the capability of the operator and ultrasonic test system from time to time. These test checks can be carried out in accordance with specification.
- 6.4 The operator shall possess original copy of the valid Competency Certificate issued by RDSO while performing testing of rails/welds in the field and produce the same to railway officials when demanded. Zonal Railways shall put in place a mechanism to maintain day to day records of operators employed by the contractor along with equipment used (Sr. No. of machine etc.).
- 6.5 The approval of QAP by RDSO does not certify the agency's eligibility for meeting required norms. The zonal railway shall ensure the compliance about firm's capability, eligibility criteria and other requirements as per extant instructions.

## **7. Other details:**

- 7.1 The firm's while approaching RDSO for approval/ re-approval of QAP shall furnish the details of USFD testing work done by them earlier against approved QAP along with performance certificate issued by concerned contracting authority. The request will not be considered unless the details are furnished.
- 7.2 Similarly, Firms while approaching RDSO for Re-certification of USFD Operators shall give the complete performance report issued by Concerned Zonal Railway where operator has worked during currency of earlier approval. The request will not be considered unless the details are furnished.
- 7.3 On the basis of advise/ complaint raised by railway, RDSO shall critically review/ check the QAP of agency.
- 7.4 The testing charges for certification of machines/ equipments, operators and approval of QAP will be worked out by M&C Directorate and advised.
- 7.5 All payments shall be made in advance through RTGS.
- 7.6 M&C Directorate of RDSO shall act as third party to investigate whether the defect was detectable at the time of USFD testing or not. The decision of RDSO shall be final and binding on both the parties and this decision is not arbitrable.

**This Procedure order will be applicable w.e.f. 15.10.2014.**