



**CERTIFICATION SCHEME FOR PERSONNEL**

## **DOCUMENT NO. CSWIP-DIV-9-03**

# **Requirements for Visual Inspectors for Upstream Oil and Gas Production Plant**

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Issued under the authority of the Governing Board for Certification  
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CSWIP is administered by TWI Certification Ltd

## FOREWORD

The Certification Scheme for Personnel (CSWIP) is a comprehensive scheme which provides for the examination and certification of individuals seeking to demonstrate their knowledge and competence in their field of operation. The scope of CSWIP includes, Welding Inspectors, Welding Supervisors, Welding Instructors, Non-destructive testing personnel, plastic welders, and Underwater Inspection Personnel.

CSWIP is managed by the Certification Management Board, which acts as the Governing Board for Certification in keeping with the requirements of the industries served by the scheme. The Certification Management Board, in turn, appoints specialist Management Committees to oversee specific parts of the scheme. All CSWIP Boards and Committees comprise member representatives of relevant industrial and other interests.

## ACCESS TO CERTIFICATION

Access to certification schemes is not improperly restricted. The sole criteria for certification are given in this document (and any subsequent amendments) and no other criteria will be applied. Certification is not conditional on the candidate applying for other services or membership from TWI Certification Ltd, its parent, or any other groups or associations.

### 1. General

#### 1.1 Scope

This document describes the procedures by which personnel may be examined and if successful, certificated in relation to visual inspection of offshore facilities. The scheme is intended to meet the majority of users' requirements to provide industry with an assured minimum standard of proficiency. The specialist user may add specific tests or requirements related to his own needs. The examination procedure is designed to test the candidate's grasp of the inspection methods and techniques, and his/her understanding of the operations he/she performs. The examination procedure involves written and practical tests.

This document covers one grade of activity: this applies to individuals who are involved in visual inspection in relation to upstream oil and gas production plant.

#### 1.2 Job responsibilities

Candidates will be expected to be able to gather information with regards to process pipework situation and condition but will not make any engineering judgement or assessment. They should be capable of maintaining appropriate job records, of preparing written reports and of producing an adequate oral commentary on their work, as and when, required.

#### 1.3 Requirements prior to taking a certification tests

Job responsibilities and experience criteria for examination eligibility are given below.

- a) Authenticated evidence of a minimum of four months relevant experience conducting visual inspections on process pipe-work offshore under appropriate supervision
- b) Authenticated evidence of certification to Level 2 in two NDT methods one of which shall be ultrasonic inspection in accordance with EN 473 or ISO 9712.

In addition to the above candidates must comply with Clause 1.4.

Industrial experience may be acquired prior to or following success in the examination. In the event that the experience is sought following successful examination, the results of the examination shall remain valid for up to two years.

## 1.4 Training

All candidates (with the exception of 'mature candidates' see below) must attend a two week CSWIP approved course of training. Details of this course are available on request.

A mature candidate route offering exemption from one week of the two week course is available for candidates who can demonstrate the following:

- a) Authenticated evidence of twelve month's relevant experience conducting visual inspections on process pipe-work offshore under appropriate supervision

Plus

- b) Authenticated evidence of certification to Level 2 in three relevant NDT methods including ultrasonic inspection in accordance with EN 473 or ISO 9712 or equivalent

Plus

- c) Authenticated evidence of a minimum of two years relevant experience applying the NDT method to which they are certified.

## 1.5 Vision requirements

All candidates must provide evidence of an eye test within 12 months prior to examination showing unaided or corrected near visual acuity in at least one eye, such that the candidate is capable of reading N4.5 Times Roman or Jaegar 1 or equivalent letters (having a height of 1.6mm) type at a distance of not less than 30cm on a standard reading test chart.

Colour vision shall be sufficient that the candidate can distinguish and differentiate contrast between the colours used in the NDT or visual methods concerned.

The evidence must be in the form of a certificate issued by a medically recognised person within the previous 12 months, covering all the above points. Subsequent to certification, tests of visual acuity shall be carried out annually.

## 2. Examination Procedure

### 2.1 Approval procedure

Candidates will be required to satisfy the examiners in all parts of the examination.

#### 2.1.1 Written examination - OVI

The test will include a written examination consisting of:

- a) General theory 30 multiple-choice questions, time allowed 45 minutes
- b) Specific theory 20 multiple choice questions, time allowed 30 minutes.

The specific theory will be based around the following topics:

- a) Corrosion mechanisms
- b) Painting inspection
- c) Coating inspection
- d) In-service defects
- e) NDT techniques
- f) Weld defects
- g) Inspection of concrete structures
- h) Visual inspection methods
- i) Offshore structures.

### **2.1.2 Practical examination**

All practical examinations will be conducted using samples, photographs and/or video relevant to the visual inspection methods.

The practical examination shall consist of elements designed to adequately assess the competency of the candidate and shall include:

a) General Visual Inspection and dimensional assessment of three samples. The inspection report shall include:

- i) General description of the component
- ii) Internal condition
- iii) Coating condition
- iv) Nominal and minimum thickness

Time allowed 2 hours

b) Close visual assessment of a relevant feature.

A detailed written inspection report supplemented by digital images of all anomalies found in the component and coating shall be produced.

Time allowed 1 hour.

The pass mark for all elements of the examination is 70%.

## **2.2 General Examination Information**

The Offshore Visual Inspector examination consists of two CSWIP examinations, the Offshore Visual Inspection (OVI) examination and the Visual Welding Inspector (Level 1).

In order to be awarded with the CSWIP Offshore Visual Inspector candidates needs to pass both the OVI (general and specific theory papers, and the four practical samples \_ three general and one close visual inspection) and the CSWIP Visual Welding Inspector examination.

Candidates that pass the Visual Welding Inspector Level 1 but fail the OVI examination will be issued with the CSWIP Visual Welding Inspector Level 1 certificate.

Candidates who hold a current valid CSWIP Visual Welding Inspector, Welding Inspector or Senior Welding Inspector qualification will be exempt this part of the examination.

## **2.3 Application for examinations and fees**

Candidates will be required to submit an application form. All the information requested must be on these forms. No applications can be considered confirmed until receipt of correctly completed document. Application forms ask for specific details of experience, training and health and must be signed confirming that these details are correct and supported by such other documents as may be necessary to confirm that the candidate is eligible for examination. No applications can be confirmed until receipt of a correctly completed application form and the full fee.

In the event of a false statement being discovered any certificate awarded as a result of the test will be null and void. A certificate is automatically invalidated if there are any outstanding examination fees in respect of that certificate.

Candidates proved to have cheated, or found to have attempted to remove or found to have removed examination material in a CSWIP examination will not be accepted as a candidate for any CSWIP examination for a minimum period of five years from the date of the examination where cheating, attempting to remove or removal of examination material, was established to have taken place.

Examinations may be taken at any one of a number of Test centres in the UK and overseas. Lists are available on request.

### **3. Certification**

#### **3.1 Results notices**

All candidates will be sent a results notice. This notice will also be sent to the organisation paying the examination fee, if not paid by the candidate.

#### **3.2 Successful candidates**

Two copies of a certificate of proficiency will be issued to the sponsoring organisation or person, i.e. self employed or self sponsored candidates will receive both copies of the certificate.

Duplicate certificates to replace those lost or destroyed will be issued only after extensive enquiries.

#### **3.3 Unsuccessful candidates**

Brief details of the reasons for failure will be given in the results notice sent to the candidate and to the organisation paying the fees.

Candidates who fail to obtain a certificate may attempt one retest on those parts of the examination in which success was not achieved. The retest must be completed within one year of the initial examination, otherwise candidates will have to repeat the completed examination.

The retest may not be taken within 30 days of the previous examination, unless additional approved training is undertaken before taking the retest.

Candidates are strongly advised to arrange some individual refresher training through one of the CSWIP approved training establishments.

Candidates who are unsuccessful in the retest will be required to re-take the full approved course followed by the full examination.

#### **3.4 Period of validity**

Certificates will be valid for five years from the date of completion of the initial test and may be renewed for a further five years on application, provided evidence is produced in accordance with clause 3.5.1.

Certificates are only valid provided:

- a) they are within date
- b) they are on standard cream CSWIP paper bearing the CSWIP logo, black on gold, signed by an officer of CSWIP and embossed with the CSWIP stamp
- c) they have been signed by the individual to whom the certificate is awarded; and
- d) they are accompanied by a valid official CSWIP identity card.

Photocopies are unauthorised by CSWIP and should be used only for internal administration purposes.

#### **3.5 Renewal**

##### **3.5.1 Five year renewal**

In order for the certificate to be renewed after five years, the holder has to demonstrate that he/she has maintained his/her competence by:

- i) \*providing evidence of continuous work activity in visual inspection offshore; and
- ii) providing evidence that the holder has kept up to date in welding technology.

The certificate will not be renewed without further test if a substantiated complaint is notified by the Governing Board during the period of its validity. Further instruction and retest may then be required.

Renewal must take place not later than 21 days after the date of expiry. It is the certificate holder's responsibility to ensure that renewal takes place at the appropriate time. Only under extreme circumstances will certificates be renewed up to a maximum of six calendar months from the date of expiry shown on the certificate and late renewal will be subject to a special fee.

### **3.5.2 Ten year renewal**

Certificates are renewed beyond ten years from the initial examination (or from a previous ten year renewal) by the holder successfully completing a renewal examination prior to the expiry of the certificate in addition to the renewal procedure given in 3.5.1 Requests for the appropriate documentation should be sent to TWI Certification Ltd.

The ten year examination will consist of the practical part of the initial examination.

One retest, within six months of the 10 year renewal examination will be allowed.

Candidates who fail at the 10 year retest point will have to take the full course and full initial examination again to regain the qualification.

## **3.6 Complaints and appeals**

Any 'party' which considers itself to have reasonable grounds for questioning the competency of a CSWIP qualified person may petition the Certification Management Board for withdrawal of that person's certificate. Such a petition must be accompanied by all relevant facts and if, in the opinion of the Committee, a prima facie case has been presented, a full investigation of the circumstances under dispute will be initiated. If the petition is substantiated to the satisfaction of the Board, the person's certificate will be withdrawn and a further test will be required.

Appeals against failure to be certified or against non-renewal of a certificate may be made by the person concerned or the employer upon application in writing to the Certification Management Board.

## **4. RECORDS**

Records of all successful and unsuccessful candidates are maintained. These records are accessible to the Certification Management Board or its nominees at all reasonable times.

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\* As a guide, 'reasonable continuity' in any given five year period means that absences from work for which the certificate was granted should not exceed one year in one or several periods.

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**CERTIFICATION SCHEME FOR PERSONNEL**

# **Visual Inspectors for Upstream Oil and Gas Production Plant**

**APPENDICES TO DOCUMENT CSWIP-DIV-9-03**

Appendix 1: Examination Syllabus



## **APPENDIX 1: EXAMINATION SYLLABUS**

Any aspects of the syllabus may be included in the written, oral and practical examination.

The level of knowledge required by the candidates varies according to the topic. To ensure comprehension by all parties the following terms have been selected to demonstrate an increasing level of knowledge.

### **DEFINITIONS**

#### **OUTLINE KNOWLEDGE:**

The candidate must be familiar with the subject in outline terms. He/She should know that the topic exists and what it is applied to. In the context of inspection methods/techniques the candidate would be expected to know “what it is, what it does” but would not be expected to know the finer points of application of the technique.

#### **KNOWLEDGE:**

The candidate must have a working knowledge of the subject and be able to apply it.

#### **DETAILED KNOWLEDGE:**

The candidate must have a depth of knowledge sufficient to enable him/her to exercise judgement.

## GENERAL

### 1. INTRODUCTION

The candidate will demonstrate **OUTLINE KNOWLEDGE** in the following general areas:

- The need for inspection in relation to the safety and integrity of offshore structures.
- Basic terminology of steel structures, concrete structures, superstructures risers and process pipeline facilities.
- Basic knowledge of offshore production including pipework terminology and onshore refining, petrochemical and processing pipework terminology.
- Outline modes of failure and deterioration experienced on the above assets including risers and pipelines.
- Appreciation of the roles and responsibilities of others - Offshore Installation Managers (OIM), Offshore Inspection Engineers (OIE), Inspection Coordinators and Verification Bodies.
- The importance of control documentation, accurate records and good communications.
- Concrete terminology.

### 2. VISUAL INSPECTION

#### **KNOWLEDGE OF:**

- Cleaning for the purpose of general inspection standards only (wire brush).
- Potential hazards associated with deposits, scales and coatings and their removal.
- Standards of surface finish.
- Basic weld terminology.
- Clamp, guide, support and steelwork terminology.

#### **DETAILED KNOWLEDGE OF:**

- Types of external visual defects and their likely locations on structures, risers and process pipework and utility plant
- Dimensional checking, methods of estimation, direct and indirect measurement and principles employed in engineering practice.
- Use of measurement tools (pit gauges, profile gauges, callipers).
- The importance of written procedures in determining the level of inspection required.
- The application of customer inspection, reporting and anomaly criteria.

#### 2.1 Welding Inspection

- Welding processes; materials and edge preparations
- Standard terminology for weld defects
- Identification of visual weld defects and appreciation of likely weld defect locations

The CSWIP 3.0 Visual Welding Inspector examination meets the minimum requirements for the welding inspection criteria.

## **2.2 Specific knowledge of:**

### **2.2.1 Piping**

- Leaks
- Gouges
- Pipework coating/painting deterioration (Re. scale No.)
- Corrosion of support points under clamps (Re. scale No)
- Piping clashes/piping misalignment/restricted movement
- Visibly vibrating
- Loose supports causing metal wear
- Build up of salt deposits on stainless steel and Duplex pipework
- Dissimilar metal corrosion
- Bolt insulation kits fitted

### **2.2.2 Insulation**

- Missing jacketing/insulation
- Ends of insulation runs not sealed off
- Sealing deterioration
- Banding (broken or missing)
- Bulging
- Heat tracing
- Bestobells missing or damaged

### **2.2.3 Spring supports**

- Spring supports set within limits
- Bottomed-out spring
- Stop pins removed

### **2.2.4 Supports**

- Missing supports
- Sliding shoes off supports
- Hanger distortion or breakage
- Loose brackets
- Mechanical damage slide plates/rollers
- Support corrosion

### **2.2.5 Flanges and bolts**

- Missing bolts
- Visibly loose bolts
- Corroded nuts/bolts (Re scale No)
- Corroded flanges (Re scale No)
- Deformed flanges
- Gasket fitted.

### **2.2.6 In-line valves**

- Leaks from the valve and trim
- Corrosion of body/trim and springs (Re scale No)

### **2.2.7 Temporary Repairs**

- Is the temporary repair leaking
- Mechanical damage.

### 3. RECORDING METHODS:

#### **KNOWLEDGE OF:**

- Pipework component identification code systems
- Requirements for care in use and deployment of photographic and video equipment
- Digital photographic equipment, charging batteries and equipment maintenance.
- Importance of size references, idents and record keeping.
- Completion of inspection datasheets (calibration, description, location, dimensions, sketches, date, name, signatures, etc.)

#### **DETAILED KNOWLEDGE OF:**

- Pipe-work component identification code systems
- Engineering drawing conventions, piping isometrics and P & IDs
- Methods of setting up identification markers and size references.
- Optimum lighting in photography and video. Awareness of shadow and backlighting. Use of establishing, stand-off and close-up.

### 4. CORROSION

#### **OUTLINE KNOWLEDGE OF:**

- General principles of corrosion and corrosion protection by protective coatings
- Awareness of corrosion rates in the offshore/petrochem/refining environment.

#### **KNOWLEDGE OF:**

- Typical instances and causes of corrosion sites on structure, risers and process pipework
- Appreciation of the criticality of corrosion on structure, risers and process pipework
- Corrosion mechanisms
- Corrosion under insulation
- Classification/type of corrosion
- Pipe supports
- Flanges

#### **DETAILED KNOWLEDGE OF:**

- Corrosion reporting requirements: (Anomaly criteria, category of corrosion, extent, depth, recording options).

### 5. COATINGS

#### **OUTLINE KNOWLEDGE OF:**

- The purposes of coatings (anti corrosion, fire protection, blast protection, identification, insulation, high visibility, non-slip)
- Methods of coating application and repair, multi-layer coating systems
- Surface preparation requirements for coatings application.

#### **KNOWLEDGE OF:**

- Types of coating (cladding, Thermal Sprayed Aluminium, enamel, epoxy, bituminous, elastomeric, cementitious, intumescent, retrofit mechanical) and their modes of deterioration and failure in-service
- Typical coating problems and their recognition
- Sites of typical coating problems.

***DETAILED KNOWLEDGE OF:***

- Coating and coating defect terminology.
- Visual inspection and reporting of coating condition.

**6. REPORTING AND REPORT WRITING**

***DETAILED KNOWLEDGE OF:***

- Principles of report writing
- The function of data sheets, logs, videos, photographs and recording media.
- Importance of standard terminology, need for accuracy, simplicity, consistency, clarity and methodical approach.
- Necessity of fluent verbal description during recorded inspection activities.
- Necessity of post-inspection written reports
- Necessity of recognition and reporting of anomalies
- Quality control procedures relating to inspection.