SWS INTERNATIONAL COATINGS APPROVAL SCHEME

REQUIREMENTS DOCUMENT

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1. SCHEME MANAGEMENT

The SWS ICAS Requirements Document was jointly developed by the Singapore Welding Society (SWS) and Waugh Technical Services (WTS) of the United Kingdom in 2008. As the scheme is wholly owned by the SWS with effect from 6 September 2010, the Requirements Document has been updated with the changes in the scheme management.

SWS will be the certification body for the scheme entitled Singapore Welding Society International Coatings Approval Scheme (SWS ICAS), responsible for the certification following course delivery and examination by an approved training organization (ATO) according to the Requirements Document. An ICAS ATO may serve as an ICAS training provider as well as an ICAS test centre provided these two entities are independently governed. The personnel for course delivery and examination shall be separate. The examiners may be selected and proposed by the ATO from an approved panel of independent examiners for each examination. The panel of examiners will comprise at least two appropriately qualified and experienced persons who have been assessed by the ICAS Quality Control Committee and authorized by the SWS ICAS Committee. All training providers beginning as Applicant ATO will be subject to an initial audit by the ICAS Quality Control Committee in terms of qualified and experienced course lecturers, training equipment and facilities, course notes and presentation materials, and quality assurance system, and later operating as ATO, to a surveillance audit and a full audit periodically (once in two years) by the same committee.

The ICAS will be guided by the advice and recommendations of the ICAS Coatings Technical & Training Committee (CTTC) from time to time on the suitability of syllabi, their changes with industry requirements and standards, level and content of examination papers, and examination procedures. The advice and recommendations of the CTTC will taken up by the SWS ICAS Committee in policy decision and the ICAS Board of Examiners who will have responsibility for the development and periodic updating of examination papers, the training and validating of examiners, and the scrutiny, review and confirmation of all examination results.

Course notes (1st edition), jointly owned by SWS and WTS are available for approved training providers to use. However, training providers may develop their own course notes and presentation materials which must be approved by the ICAS Quality Control Committee for content and quality before being put to use. ATO will be informed by SWS to review the course notes and presentation materials as and when required in tandem with changes in syllabi, examination revisions and advice or recommendations of the CTTC.

SWS will work towards accreditation as a personnel certification body by the Singapore Accreditation Council (SAC) or other international accreditation body.

2. AIMS AND OBJECTIVES OF THE SCHEME

SWS ICAS approval is designed to qualify Coating inspectors and Coatings industry operatives in the industrial and marine coatings field to a standard which is recognised and accepted by all national and international oil, gas and civil engineering companies throughout the world.

The aims of the approval are:

- To train and then test by examination candidates who can carry out inspection procedures competently, who can keep records in accordance with client requirements, and who can demonstrate a sound theoretical background knowledge of the subject at the various levels.
- To allow client companies to plan future workforce requirements in terms of numbers and levels.
- To standardise the working practices of approved Inspectors and Operatives to a high technical and practical level.

- To provide a seamless progression route from blaster / sprayer through to senior inspector level where required by a company or individual.
- For clients in the oil, gas and civil engineering fields around the world to accept and specify the use of SWS ICAS approval holders on their projects with a knowledge of the approval process and certificates of Coating Inspectors and Operatives who are assessed to the highest levels of knowledge, skills, and awareness of, and adherence to Workplace Safety and Health Legislation and practices.

COATING INSPECTOR LEVELS.

SWS ICAS Coating Inspector Level 1 Inspector, (Junior Inspector)

SWS ICAS Coating Inspector Level 2 Inspector (Supervisory Inspector)

SWS ICAS Coating Inspector Level 3 Inspector (Senior Inspector)

(Levels 1 and 2 are both taught under a combined course)

(Coating Inspector Level 1 shall perform inspection under the supervision of Level 2 or Level 3 until such time as Level 2 approval is attained.)

ADDITIONAL MODULES (Entry requirement: Minimum SWS ICAS Coating Inspector Level 1 holders)

SWS ICAS Pipeline Coatings Inspector

SWS ICAS Corrosion / Coatings Surveyor

SWS ICAS Critical Coatings Inspector

SWS ICAS Fireproofing Coatings Inspector

SWS ICAS Insulation Inspector

COMBINED COURSES

These can be arranged for companies, or candidates, whose areas of work involve Level 1 knowledge and skills, in conjunction with the module for their specialist Coatings area requirements.

Example – Level 1 Coating Inspector + Module of choice. (Examinations for both Level 1 and the selected module are mandatory, immediately following the course)

COATING OPERATIVE LEVELS

SWS ICAS Blaster / Preparation Operative (no entry restriction)

SWS ICAS Painter / Sprayer Operative (no entry restriction)

SWS ICAS Coatings Supervisor (no entry restriction)

CLASS CONTACT HOURS (Other than 5-day delivery formats can be considered upon request)

Inspector Levels 1/2 combined course, and Level 3 course – 40 hours (excluding homework time 10 hours) plus examination time.

Additional Module Levels - 21 hours each plus examination time.

Combined course disciplines – 50 hours per course (class contact for Level 1 – 30 hours, and for chosen module, 20 hours) plus homework time 10 hours and examination time.

Operative Levels - 28 hours including assessment time (Four full days continuous) followed by a fifth day for theory examinations, and re-sit examinations for those who fail the initial practical assessments during the course work.

COURSE / EXAMINATION CRITERIA

Candidates who undertake a Level 1/2 course will be eligible to take a Level 1 or Level 1 and 2 examinations, at their or their employers discretion.

Candidates may undertake examinations at their discretion, except those for Combined Courses.

Candidates who can provide evidence of having attended a first or second level course conducted under BGAS, NACE, ICorr or Frosio will qualify to enter for either a Level 1 or level 2 examination as appropriate, at their or their employers discretion. The Level 3 examination can only be taken upon successful completion of an approved SWS ICAS Level 3 course. Levels must be taken in sequence. All Level 3 examination papers marked by an Examiner shall be subjected to double scrutiny or moderation at random by a second Examiner requested by the ICAS BOE before the release of the examination results.

Module and Operative disciplines are based on a single level.

Candidates for Inspector or Module levels may take their relevant examinations following the end of the course or at a later time at their or their companies discretion. All candidates must attend the relevant course level before attempting an examination, except for transition candidates and those exempted as described above.

Candidates for Operative levels will be assessed both theoretically and practically on the fourth day of the course. The approval course and examinations are designed to be carried out on client premises, or any premises meeting the criteria for conducting the courses and examinations. All three operative approval courses / examinations are designed to run concurrently.

EXAMINATION STRUCTURE

Level 1 Inspector,

1 x 40 question MC paper carrying 2.5 marks per correct answer	100 marks possible
Practical examination specified to a maximum of	100 marks possible

Level 2 and 3 Inspector and Modules

1 x 20 question MC paper carrying 1 mark per correct answer	20 marks possible
1 x 16 question Narrative question paper carrying 0 to 5 marks	80 marks possible
Total	100 marks possible

Practical examination specified to a maximum of	100 marks possible
Blaster/ Preparation, Painter / Sprayer Operatives	
1 x 40 question MC paper carrying 2.5 marks per correct answer	100 marks possible
Practical examination specified to a maximum of	100 marks possible
Coating Supervisor, As above plus	
1 x 25 question MC paper carrying 4 marks per correct answer	100 marks possible

EXAMINATION TIME ALLOWANCES

MC 20 question papers – one hour

MC 25 question papers – one hour and fifteen minutes

MC 40 question papers – two hours

16 narrative question papers – three hours

Practical Assessments for Inspector levels – one hour

Practical Assessments for Operatives – seven hours

A small degree of flexibility should be exercised by the examiner as to examination time allowances, but this should not exceed an extra 30 minutes. It is important that the best qualities of the candidate can be ascertained and not necessarily how quickly the examination can be completed. This is particularly important where a candidate is being examined under a second language situation.

ELIGIBILITY FOR CERTIFICATION

Each examination consists of a practical and a theory element, these are standardised at 100 marks for each.

An examination is graded as a pass if both elements attain a minimum of 70 marks out of 100.

If one element is passed and one failed, a re-sit will be offered on the failed element. The re-sit element must be retaken within one year of the original examination date, and the candidate should show evidence of further study. If the re-sit is successful, an overall pass will be awarded. If the re-sit element is failed, the candidate will return to initial examination status for that level.

The certification awarded to successful candidates will consist of a Certificate giving details of the approval gained, and a wallet type ticket which can be used for identification purposes on site and which will give details showing – Approval Body, Candidate Name, Candidate Photograph, Grade of Approval, Date of expiry, Unique Identification Number.

This approval is a personal certification and is the property of the holder regardless of who pays the relevant examination fees.

Prior to an initial examination all candidates must submit the following: Completed examination application and information forms, Vision certificate, Two signed passport size photographs, Fee payable.

REVALIDATION ON EXPIRY OF CERTIFICATION

Certification of SWS ICAS approvals is valid for an initial 5 years. Following that, approved candidates can renew as follows:

5 year renewal without examination - A candidate can renew their expiring approval without examination by following the correct procedure as follows -

- Apply in writing for five year renewal without examination, prior to the expiry date.
- Present an up-to-date copy of CV.
- Present any letters of testimony from clients for project work carried out during the 5 year period.
- Provide a vision certificate not more than one year old.
- Submit expiring approval ticket.
- Pay current revalidation fee.

10 year renewal – It is not possible to renew by application an SWS ICAS approval following 10 years validity. An abridged renewal examination must be taken to check that the candidate is up to date with the latest coatings technology, modern working practices and the latest Health and Safety information.

Candidates will not be notified regarding their expiring approvals. It is the candidates duty to apply for renewal within the time allowed.

TRANSITION INTO SWS ICAS

Current holders of Coating Inspector approvals awarded by BGAS / CSWIP, NACE, ICorr or Frosio can transition into SWS ICAS Level 1 or Level 2. This can be undertaken by attending selected topics of Level 1 or Level 1/2 course for at least 8 hours and an abridged examination for the appropriate level or levels.

Level 1 – 40 MC questions and a basic Practical examination.
Level 2 – 20 MC questions and an interview/oral examination.

A candidate can only transition into the equivalent level as that they hold with other bodies.

The transition will be valid for a period of five years from the date of issue, and will then follow the normal route of revalidation for SWS ICAS approvals. Transition is not available for Level 3.

DUTIES AND RESPONSIBILITIES OF COATING INSPECTORS AND OPERATIVES

General - All personnel involved in the preparation of surfaces, application of coatings, intermediate and final inspections, keeping of records, reporting procedures and final signing off of project work should follow good and safe practices and adopt the policy of getting it right first time, this for quality and economic advantage considerations.

Plan for safe working and safe working practices

Follow all Health and safety legislation

Faithfully follow the project specification

Respect all colleagues

Have good and effective channels of communication with others

LEVEL 1 DUTIES

Be able to take and understand verbal and written instructions from a Level 2 or Level 3 Inspector and report back when required

Appreciate the need for inspecting pre prepared surfaces

Appreciate the need for surface preparation to be of the specified standard

Appreciate the need for protective coating systems of the correct type to be used for different surfaces and conditions

Be able to calibrate and use paint inspection instruments correctly, and take accurate readings.

Be able to determine the finished quality of a coating

Report anomalies and paint faults to a more senior inspector

Provide equipment and records for Level 2 and Level 3 inspections

Keep and provide accurate and up to date records of all preparation and painting operations

LEVEL 2 DUTIES

Those for Level 1 plus the following duties:

Liaise with Level 1, and where applicable Level 3 inspectors

Be conversant with the project specification and codes and practices for any particular project

Attend site meetings with other disciplines to ensure smooth running of projects by good teamwork building

Ensure quality assurance, quality control and inspection procedures are coordinated, and that Inspectors carry relevant approvals, and build good teamwork

Ensure all coating practices conform to coating manufacturers recommendations

Carry out visual and investigative inspection to completed coatings projects

Compile all records in readiness for a Level 3 or client inspection

LEVEL 3 DUTIES

Those for Level 1 and Level 2 plus the following duties:

Plan and implement a quality control plan over all coating project preparation and coating procedures

Interpret project drawings and specifications for clarification for colleagues

Take overall charge of safety and planning of site meetings

Supervise the activities of Level 1 and Level 2 inspectors

Check visually that all equipment used on projects is in good working condition, complies with current safety legislation and carries up to date maintenance, safety and calibration certificates

Be in a position to identify major preparation and coating faults, and be able to advise on rectification and future prevention measures

Judge that the overall finish of completed work meets the commercial requirements of the project specification

Be responsible for checking all records for correctness and clarity and ensure they are filed for future reference, including log books and handover notes

Ensure all certificates of completion are attached to the records

Take overall responsibility for all client liaison and communication

Lead the inspection and operative teams with encouragement and respect for all

OPERATIVE LEVELS DUTIES

Take instructions from relevant inspectors

Ensure appropriate work permits are obtained and returned when work is completed

Ensure work permit requirements are complied with

Check all equipment for safety and good working condition

Ensure all working areas are isolated from other activities and the public by barriers and signs

Ensure all pressures and limits of use for all equipment are fully observed

Ensure all appropriate personal protective clothing is worn

Ensure all equipment is properly cleaned and stored safely, following use

Ensure safe working to the benefit of themselves and others

Report all anomalies and work failures to the relevant authority

Maintain good communication between working teams

SYLLABUS FOR LEVEL1 THEORY

CORROSION THEORY

Identification of ferrous and non ferrous metals
Why corrosion occurs in ferrous metals
Detail for the electrolytic cell
Factors which influence the rate of corrosion
Millscale and its effects on steel
The galvanic series
Methods of arresting corrosion
Use of barrier and sacrificial coating systems

SURFACE PREPARATION

Need for surface preparation
Preparation for long and short term systems
Rust grades to SS-05-59-00 (ISO 8501-1)
Blast cleaning grades to SS-05-59-00 (ISO 8501-1)
Wire brushing grades to SS-05-59-00 (ISO 8501-1)

Site and enclosed blast cleaning systems
Needle gunning, Abrasive discs, Grinding, Abrasive paper

Hydro-blasting
Pressure washing
Safety measures required during surface preparation
Removal of surface contamination
Effects of abrasives (expendable, reusable)
Effects of different types of blast nozzle

PAINT TECHNOLOGY

Functions of binder, pigment and solvent in coatings
Additives in coatings
Types and uses of solvents
Anti corrosion pigments
Laminar pigments
Drying and curing mechanisms
Functions of primers, mid coats and finish coats

COATING MANUFACTURE AND TESTING OF COATINGS

Manufacture of coatings, Direct charge mill, Pre mix mill
Testing used for –
Adhesion
Opacity
Fineness of grind
Drying and curing
Flashpoint
Holidays and Pinholes
Calculations for –
Volume solids %
WFT
DFT, Destructive and non destructive

COATING APPLICATION

Brush
Roller
Spray – Conventional, Airless
Preparation of coatings for use
Influences on drying times
Common problems with application equipment
Safety for coating application

COATING FAULTS

Identification of common coating faults:
In the can
From contaminated surfaces
Due to inadequate preparation
Due to faulty application
Interference by weather
Bleeding
Blistering
Chalking
Cissing
Flocculation
Grinning
Runs and sags

RELEVANT STANDARDS / COLOUR STANDARDS / DATA SHEETS

Relevant BS, ISO, ASTM and IMO standards for the industry
BS 5252:Framework for colour co-ordination for building purposes
BS 4800:Specification for paint colours for building purposes (origin, structure and use)
Coating manufacturers data sheets

HEALTH AND SAFETY LEGISLATION

Permit to work systems
Waste disposal procedures
Accident book requirements
Workplace Safety and Health Act prevailing or applicable in the country of the course
Workplace Safety and Health Regulations prevailing or applicable in the country of the course
Blast cleaning safety documents

INSPECTION DUTIES

Site duties for Level 1 inspectors
Reporting
Documentation
Contractor malpractices

SYLLABUS FOR LEVEL 1 PRACTICAL

Elements from which candidates should demonstrate practical ability and working knowledge

ENVIRONMENTAL TESTING

Whirling Hygrometer
Checks for condition of Hygrometer
Use of Hygrometer for WB and DB readings
DP and RH calculation by – DP calculator or Digital gauge or Slide rule
Metal temperatures by – Magnetic steel thermometer or Digital thermometer
Environmental limits for coating application

IDENTIFICATION AND USE OF ABRASIVES

Identification of Expendable abrasives, Reusable abrasives, Contaminated abrasive
Situations for use of various types
Disposal of spent abrasive
Amplitude control
Effects of incorrect amplitudes

SURFACE PREPARATION

Identify to SS-05-59-00 – Rust grades, Blast cleaning grades, Wire brushing grades
Identify means to remove surface contamination
Recognise limits of various surface replica tapes
Measure Amplitude – Surface profile needle gauge, Dial micrometer and surface replica tape
Rejection of work
Rectification of rejected work

WET FILM THICKNESS MEASUREMENT

Identify – Steel comb gauge, Disposal plastic comb gauge, Eccentric wheel, Suitability for use
Relate to Metric and Imperial readings
Selection of a comb gauge
Readings taken with a comb gauge
Visual inspection of wet films
Rectification of WFT faults
Prevention of WFT faults

DRY FILM THICKNESS MEASUREMENT

Identification of Electronic DFT gauge, Magnetic film thickness gauge
Principles in the use of gauges
Calibration of gauges
Shim thickness requirements
Readings taken with DFT gauges in accordance with ASTM D7091
Sampling method for coating thickness measurement based on IMO Performance Standards for Protective Coatings (PSPC)
Tolerance of readings taken

SYLLABUS FOR LEVEL 2 THEORY

CORROSION THEORY

Mechanism of aqueous corrosion of steel
Electrochemical principles
Forms of corrosion
Corrosion control methods
Factors controlling corrosion rates
Establishing the extent of corrosion

SURFACE PREPARATION

Fundamentals of surface preparation
Selecting methods of preparation
Different methods for preparation of ferrous and non ferrous metals
Weather conditions during surface preparation
Safety aspects during surface preparation
Methods of assessing surface profile
Types and use of etch primers
Testing for surface contamination
Effects of inadequate preparation
Problems with too high/low amplitudes and their rectification

PAINT TECHNOLOGY

Generic types of coating systems and their properties
Constituents of protective coatings and their characteristics
Pigments and their characteristics
Concept of solution, suspension and dispersion
Types of primers and their functions
High performance protective coatings
Water-borne coatings
Oil-based paints
Protective coating for structural steels
Protective coatings for special applications involving various temperature ranges, damp surfaces and non-ferrous substrates
Properties of solvents and their effects on workplace safety and health
Critical pigment volume concentration
Types of polymers and their characteristics
Mixing, curing and drying of protective coatings
Wet and dry film thickness measurements
Methods of coating application
Weather conditions during coating application
Suitability of generic coating systems for industrial environments, hot duty services, damp ferrous surfaces, non ferrous surfaces
Compatibility of solvents and binders

COATING MANUFACTURE AND TESTING OF COATINGS

Protective coating characterization:

- Adhesion tests
- Impact resistance test
- Hardness test
- Abrasion test
- Density testing (One and two pack coatings)

Paint film permeability
Paint film flexibility
Viscosity measurement of newtonian and non-newtonian fluids
Artificial weathering tests for marine, high humidity, industrial and agricultural environments

MAINTENANCE PAINTING

Selection of coating systems
Compatibility between coating systems
Use of tie coats
Identification and removal of surface contamination
Repairs to damaged areas exposing the substrate
Repairs to damaged areas not exposing the substrate
Intermediate inspections for the design life of coating systems

CALCULATIONS

Theoretical spreading rate (m^2/l)
Theoretical cost (m^2)
Theoretical paint consumption (l)
Paint consumption with loss Loss factor, 30% = 0.7
20% = 0.8
10% = 0.9
Density of a one pack paint
Density of a two pack paint when mixed

COATING FAULTS

Recognition, detection, remedy and prevention for:
Bittiness
Blooming
Dry spray
Fading
Flash or spot rusting
Orange peel
Holidays
Pinholes

PAINT COLOURS

Paint colour idenfication based on BS 4800 and RAL 841-GL Colour System
Methods of colour identification

WORKING PRACTICES

Client/contractor relations
Contractor malpractices
Role of quality controls and quality assurance inspection personnel
Duties of Level II coating inspector
Site layout
Visual inspection
Dealing with difficult and awkward areas
Maintenance and operation of plant and equipment

SYLLABUS FOR LEVEL 2 PRACTICAL

The practical examination for level 2 consists of an interview based on twenty five verbal questions based on the following areas –

Readings and faults with a whirling hygrometer

Corrosion theory

Hydroblasting and pressure washing

Degreasing surfaces

Blast cleaned surfaces out of specification limits

Abrasives and their characteristics

Rust grades

Various pre-cleaning methods

Basic ingredients of coatings, and drying and curing of coatings

Details for maintenance painting

Coating faults, and remedies

Paint manufacture in relation to pigments

Use of a banana gauge

Use of surface profile gauges

Coating test procedures

Duties of Level 2 inspectors

Action taken for unsafe practices

Coating application

Description of coating systems suitable for various conditions and temperatures

SYLLABUS FOR LEVEL 3 THEORY

SAFETY REQUIREMENTS OFFSHORE

Statutory document SI 1019
Other statutory legislation
Medical requirements
Safety survival training
Offshore induction training
Escape routes
Permit to work systems
Vessel entry permits
Over the side working
Scaffolding
Breathing apparatus
Electrical grounding

INSPECTION AND REPORTING PROCEDURES

Quality assurance and QC procedures
Risk assessments
Emergency decision making
Client / Senior inspector relations
Factors which govern drying and curing rates
Monitoring of drying and curing rates
Contamination of surfaces
Encapsulated areas and masking out
Anomalies / Coatings applied out of sequence
Communication – log book, handover notes

OFFSHORE WORKING PRACTICES

Inspection of contractors plant and equipment
Contractor malpractices
Local environmental problems
Problems with access to working areas
Operational working restrictions
Restricted timescales
Storage of materials
Housekeeping

SPECIALISED COATING SYSTEMS

Fireproof coatings – Flame spread classification, Fire ratings, Fireproof coating systems
Selection of suitable fireproof coating and thickness
Coating systems suitable for – Topsides, Atmospheric zone, Splash zone, Submerged zone, Deck coatings, Helideck markings and colours, Escape route identification, Elevated temperatures, Potable water tanks, galvanised surfaces
Insulation - Acoustic and Thermal.

PAINT FILM TESTING

Preparation of test panels – Dry grit blasted, Wet grit blasted, Hand / Mechanically cleaned, Wet salt contaminated panels
Performance testing for – Topside, Atmospheric, Splash and Submerged zones systems.

SYLLABUS FOR LEVEL 3 PRACTICAL

Elements from which candidates should demonstrate practical ability and knowledge

IDENTIFICATION OF SPECIALIST COATING SYSTEMS AND THEIR CHARACTERISTICS

Acrylic urethane finish
Coal tar epoxy
Coats containing MIO
Deck coatings
Epoxy high build coatings
Fireproof coatings
Glass flake epoxy
Reflective coatings
Tank lining coatings
Zinc silicate heat resistant primer

IDENTIFICATION OF PROBLEMS WHEN WORKING

Access to working areas
Elevated safety factors
High wind
Salt spray
Tidal changes
Marine salt deposits
UV light
Rapid change in weather conditions

COLOUR SCHEDULES

BS 5252	Framework for colour co-ordination for building purposes
BS 4800	Specification for paint colours for building purposes
BS 381C	Specification for colours for identification, coding and special purposes
BS 5499-2	Graphic symbols and signs. Safety signs, including fire safety signs. Signs with a Specific meaning
BS 1710	Specification for identification of pipelines and services

SYLLABUS FOR BLAST CLEANING / PREPARATION OPERATIVE, PAINTER SPRAYER OPERATIVE, COATING SUPERVISOR

THEORY

CORROSION THEORY

Why corrosion occurs in carbon steel, Process of corrosion, Millscale, Galvanic series, Methods of arresting corrosion.

PRECAUTIONS DURING OPERATIONS

Precautions when blast cleaning and using hand and power tool equipment, Precautions when airless spraying, Identification of hazardous areas, Health and safety legislation.

PLANNING OF WORK

Disturbance and dangers to the public, Access to working areas, The need for warning signs tapes and barriers, Suitability of equipment and processes, Availability of suitable equipment and PPE, Consideration of difficult working conditions, The need for work permits, Safe removal of waste materials.

SURFACE PREPARATION

Degreasing and cleaning of surfaces, Blast cleaning standards, Wire brushing standards, Equipment for site blast cleaning including safety features, Nozzle types, Abrasive and human factors, Enclosed blast cleaning, Wet blast cleaning.

APPLICATION OF COATINGS

Application of coatings by brush, roller, conventional spray, airless spray and electrostatic spray, Comparison of each in terms of quality and cost effectiveness.

COATINGS

Basic constituents of coatings, Additives.

WET FILM THICKNESS

Use of eccentric wheel and wet film combs for taking WFT readings.

DRY FILM THICKNESS

Use of non destructive, destructive, test panels and calculation for establishing DFT readings.

CONTRACTOR MALPRACTICES / COATING FAULTS

Intended and unintended malpractices, Coating faults, cause, cure, prevention.

GLOSSARY OF PAINT TERMS

Common terms used in the coatings industry.

SYLLABUS FOR BLAST CLEANING / PREPARATION OPERATIVE, PAINTER / SPRAYER OPERATIVE, COATINGS SUPERVISOR

PRACTICAL

SAFETY FACTORS ADOPTED AND THE IMPLEMENTATION OF EFFICIENT PRACTICES IN THE WORKPLACE

Plan and organise working teams for various practical activities, Demonstrate ability to accept responsibility within a team situation, Carry out work safely for the benefit of themselves and others, Fully record working activities, Safely dispose of waste materials, Clean, check and store equipment and materials properly following use.

SELECTION, ERECTION, DISMANTLING AND STORAGE OF WORKING PLATFORMS

Possess a working safety knowledge of timber ladders, steps, trestles, lightweight staging and metal tower scaffolding for industrial use, Inspect chosen scaffold for defects before assembling, Erect scaffold as a team in a safe manner, Scaffold dismantled and safely stored, Mount and dismount scaffold in a safe manner. Wear appropriate PPE.

PREPARATION OF WORKING AREAS FOR SITE AND WORKSHOP

Show knowledge of site drawings and coating specifications, Identify items to be protected and masked out, Demonstrate knowledge for the use of warning signs, warning tapes, barriers and hazardous area signs, Apply masking correctly, remove masking from surface without damage, dispose of safely.

PREPARATION OF SURFACES BY HAND AND MECHANICAL MEANS

Possess a working knowledge of specifications for preparation, Demonstrate practical knowledge of various types of preparation on coated and non coated ferrous and non ferrous substrates, Carry out safety checks to preparation equipment, Prepare work to set standards, Work safely using appropriate PPE, Provide a safe working environment for others on site and the public, Store equipment safely following use.

PRODUCTION OF SURFACE FINISHES BY BRUSH, ROLLER AND AIRLESS SPRAY

Show a working knowledge of health and safety regulations in relation to WSH 2006 (or other national workplace safety and health regulations) and relate these to volatile coatings, Demonstrate a working knowledge of different types of generic coatings, Show knowledge of different coatings being required for different climatic conditions and substrates, Recognise suitable methods of coating application according to the size and shape of an area, Mix one and two pack coatings correctly, Apply coatings to a given standard by various methods of application, Determine WFT and DFT thicknesses of coatings, State the use of a stripe coat and a tie coat, Identify drying and curing times, Wash out and store all coating equipment properly, Store all coating materials to manufacturers instructions and health and safety regulations.

Note – The theory elements will be based in the classroom, the practical elements will be based on site or in a purpose built coating examination centre.

TRAINING CENTRE REQUIREMENTS

An ATO can be an organisation that has been audited and approved as an ATO by the SWS ICAS Qualification Committee. The audit requirements include but are not limited to one or more qualified and experienced course lecturers, adequate training equipment and facilities, approved course notes and presentation materials, and quality assurance system. The ATO will be subjected to an initial audit to be followed by a surveillance audit and a full audit once in two years.

The ATO shall use only examiners from the panel of examiners authorized by SWS ICAS Committee.

The term training centre can mean an approved ATO's own premises, or other premises or locations that may be used for conducting courses and examinations. Wherever situated, an approved training centre should meet minimum standards of comfort, have minimum quantities of equipment for candidate use during the course, and have an effective communication system.

COMMUNICATION

Brochures or literature showing proposed course and examination dates at the various levels -
Address, telephone no, fax no, email address.
Contact person
Course enrolment and information forms
Examination application forms

CLASSROOM FACILITIES

Course notes and handouts as applicable
U shape layout with sufficient space for candidate comfort
Chairs with fabric seats
Head table and chair for lecturer use
Separate table for instruments
Selection as required from –
Video player
CD player
OHP
Flip chart with pens
Whiteboard / Blackboard

Candidate notepaper with pen and pencil
Water available all day
Tea / Coffee facilities for break times
Lunch or access to lunch facilities (Halal food where appropriate)
Toilet and hand washing facilities

EXAMINATIONS

Two rooms to be available
Room 1 for Theory examinations under invigilation
Room 2 for practical examinations conducted on a one to one basis

TRAINING / EXAMINATION EQUIPMENT REQUIREMENTS

WEATHER CONDITIONS

Magnetic steel thermometer
Whirling hygrometer
Dew point calculator
DP and RH calculation tables
Digital thermometer
Digital DP meter

ABRASIVE SAMPLES
Iron or steel shot / grit mix to 75% shot and 25% grit
Garnet
Copper slag
Crushed glass
Contaminated abrasive

PREPARATION OF SUBSTRATES
Swedish standard SS- 05- 59- 00
Rust grade samples, A, B, C, D
Blast cleaning grade samples, SA 1, SA 2, SA 2.5, SA 3
Wire brushing grade samples ST2, ST3
Surface profile needle gauge, scale 0.002mm
Dial micrometer, scale 0.002mm
Surface replica tape, grades coarse and X coarse
Rubbing tool for use on tape
Blast cleaned calibration plate (specified to 30min and 75max microns profile)

WET FILM THICKNESS
Full set of steel WFT combs
Plastic disposable combs
Eccentric wheel

DRY FILM THICKNESS
Electronic DFT gauge with calibration set (Elcometer (345 Dual model)
Magnetic film thickness gauge (Elcometer 111 or 211)
Set of shims for calibration
Dry blasted steel sample plates for calibration (30 to 75µm)
Dry film thickness sample plates for measurement (2 in number)

DENSITY AND VISCOSITY

Ford flow cup number 4
Density cup

PAINT FAULTS IDENTIFICATION

Samples showing –
Bleeding
Bittiness
Chalking
Cissing
Grinning
Runs and sagging
These can be photographs

IDENTIFICATION OF COATING SYSTEMS FOR LEVEL 3 ONLY

Those identified on page 14 of this document.

ANCILLIARY ITEMS

Holiday detection unit (can be photograph)
Pinhole detector unit (can be photograph)
Pull off dolly tester (can be photograph)
Coating manufacturers data sheets
Daily report sheets
BS 4800

A full set of equipment should be available for practice on the course at the ratio of one set for up to 12 course members, and two sets for up to 24 course members.

Note 1 – No wet paint films will be used either on the course or in the examination. If a real holiday detector is used, it must be disabled from being switched on.

Note 2 – The equipment used for the examinations must be the same as that used for training on the course.

EXAMINER / INVIGILATOR DUTIES

EXAMINER DUTIES

Advise invigilator of their duties
Carry out and grade the practical examinations
Mark and grade the written examination papers
Return all paperwork to SWS for ratification
Dismiss candidates if caught cheating and file report (no exceptions)

Interpret wording of any questions if required

Note – It is usual that an examiner conducts 5 examinations per day

INVIGILATOR DUTIES

An invigilator will be locally appointed and take instructions from the appointed examiner. Their duties will be to -
Read the examination rules.
Check candidate identity.
Ensure candidate paperwork is complete.
Ensure mobile phones are handed in.
Observe time limits for completion of written papers:
- Level 1, MC paper 40 questions – two hours
- Levels 2, 3 and Modules MC paper 20 questions – one hour
- Levels 2, 3 and Modules Narrative paper 16 questions – three hours
- Operative levels, MC paper 40 questions – two hours
- Operative, Coating Supervisor extra MC paper 25 questions – One hour fifteen minutes

Collect completed papers and make secure.
Observe fair play during the written examination.
Report any cheating to the examiner (With evidence if possible).

EXAMINATION RULES

Only a black or blue pen may be used for written answers (no pencil).

No scrap paper may be used (use blank side of question paper if needed).
No correction fluid to be used (cross out and rewrite if necessary).
Mobile phones must be switched off and handed to the invigilator.
A calculator may be used but not one with an electronic memory.
No communication with other candidates during the examination.
No breaks to be taken during the course of writing an examination paper.

COMPLAINTS / APPEAL PROCEDURES

Any candidate believing they have been given a wrong result, or who have a complaint against the way their examination was conducted must lodge a written complaint / appeal to SWS within three months of the date of their examination result. They must state their reasons for the complaint / appeal whereupon their papers will be reviewed by SWS and a member of the CTTC. The result of this review will be made known to the complainant within two months of being received.

IMPARTIALITY RULES

A person may be approved and validated as both a lecturer and examiner, but shall not act as both lecturer and examiner for any single course.

Examiners shall not conduct examinations for employees of their own company or group of companies or organisations.

TRAINING AND VALIDATION FOR SWS ICAS APPROVED LECTURERS AND EXAMINERS

RATIONALE

To provide a training scheme through which potential Lecturers and Examiners can be approved to successfully carry out their duties under the SWS ICAS scheme, this to meet high standards of delivery and client expectations

To empower suitably pre qualified individuals to carry out the teaching and examination processes as required by the SWS ICAS scheme.

To develop procedures which will standardise the delivery of syllabus / course material and examination processes, thus ensuring equal opportunity for successful outcomes throughout the world.

For Lecturers and Examiners to undergo seamless updating of new syllabus / course and examination material as it occurs, due to technical advances, updating of Workplace Safety and Health legislation, and recommendations and advices from the ICAS Coatings Technical & Training Committee (CTTC).

GENERAL STATEMENT

Different criteria must be employed for the training and validation of Lecturers and Examiners as their role is diverse.

Any assessment used to verify a potential Lecturer or Examiner will not be based only on formal examination but will also rely on respect for their already pre established qualifications and experience. This together with practical training, peer encouragement and discussion.

A candidate may be approved to both Lecturer and Examiner status, but whose work will fall directly under the impartiality rules laid down in the SWS ICAS Requirements Document.

An audit system under the ICAS Qualification Committee will be in place in order to continuously monitor quality aspects at the point of delivery, and for paperwork administration of both Lecturers and Examiners.

The main SWS ICAS Committee with the recommendations of the ICAS Qualification Committee has sole arbitration as to the suitability of a person to carry out the duties of Lecturer and Examiner and, at their discretion may withdraw validation at any time. SWS reserves the rights of appointment and/or authorization of an examiner to the panel of examiners for any particular examination at any place.

Organisations can nominate individuals to be considered for Lecturer and Examiner status based on their qualifications and experience. This also applies to self nominated individuals.

Training and assessment required will initially be carried out by SWS.

LECTURER TRAINING AND VALIDATION

BACKGROUND

All coating subject specialists may not necessarily be able to become teachers as teaching itself can be partly a gift but is mostly a competence achieved by training, together with deep subject knowledge, confidence, and the ability to communicate and interact clearly with students. Practical experience of the subject is essential in order to make reply to student questions with clarity and correctness.

TRAINING & VALIDATION

Due to diverse geographical locations more than one proposed Lecturer can attend training at one time, excepting for the third element which must be carried out on a one-to-one basis, and this for assessment purposes.

Validation for all levels and modules must be undertaken separately under three elements

Element 1: Prospective Lecturer to be thoroughly familiar with course material (that is not self developed in particular) and knowledgeable in depth and scope with the subjects in a specific module

Element 2: Prospective Lecturer to make course teaching materials available to SWS for audit purposes.

Element 3: Prospective Lecturer to teach course alone with SWS in attendance to monitor and evaluate performance.

The ICAS Qualification Committee will recommend whether or not the proposed Lecturer is ready to conduct training courses meeting SWS ICAS requirements.

EXAMINER TRAINING AND VALIDATION

BACKGROUND

Examiners are proposed by the ATO for endorsement by the main SWS ICAS Committee at the recommendations of (i) the ICAS Qualification Committee (for actual performance of the proposed Examiners) and (ii) the ICAS Board of Examiners (for peer assessment of the proposed Examiners). They will already be well qualified, and can demonstrate valid site experience. The training should recognise the strengths already held by the proposed Examiners and should pay respect to those strengths, whilst

at the same time preparing the proposed Examiners for conducting examinations meeting SWS ICAS requirements.

TRAINING & VALIDATION

Practical examinations – The ICAS Qualification Committee will observe the practical examinations being carried out without comment, but will make observation notes. The marks awarded by the trainee Examiner will then be discussed and advice given as necessary to guide the proposed examiner towards a standardised approach. The trainee examiner must note that test samples used in training must not be used in examination except in special circumstances.

Theory examinations – The ICAS Qualification Committee will not be present at the examinations but will join the proposed Examiner for the marking procedure. The proposed Examiner will mark the papers in accordance with the marking scheme (both MC and narrative) under the scrutiny of the ICAS Qualification Committee. The MC papers will be marked twice to ensure correctness, and the Narrative paper marked according to the marks allocated for the questions.

Following this, the ICAS Qualification Committee will recommend whether or not the proposed Examiner is ready to take up the duties, or whether or not the process needs to be repeated, or whether further unspecified training needs to take place before the proposed Examiner attains the required standard.

Proposed Lecturers and Examiners may undergo training for their roles during the time they are working towards attaining SWS ICAS Level 3 qualification.

END OF DOCUMENT