

**Guidance on
Outline Syllabi for ROV-
Related Training Courses**



The International Marine Contractors Association (IMCA) is the international trade association representing offshore, marine and underwater engineering companies.

IMCA promotes improvements in quality, health, safety, environmental and technical standards through the publication of information notes, codes of practice and by other appropriate means.

Members are self-regulating through the adoption of IMCA guidelines as appropriate. They commit to act as responsible members by following relevant guidelines and being willing to be audited against compliance with them by their clients.

There are two core activities that relate to all members:

- ◆ Safety, Environment & Legislation
- ◆ Training, Certification & Personnel Competence

The Association is organised through four distinct divisions, each covering a specific area of members' interests: Diving, Marine, Offshore Survey, Remote Systems & ROV.

There are also four regional sections which facilitate work on issues affecting members in their local geographic area – Americas Deepwater, Asia-Pacific, Europe & Africa and Middle East & India.

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The information contained herein is given for guidance only and endeavours to reflect best industry practice. For the avoidance of doubt no legal liability shall attach to any guidance and/or recommendation and/or statement herein contained.

Guidance on Outline Syllabi for ROV-Related Training Courses

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I Objectives

This document has been produced to set out some proposed outline syllabi covering a number of topics for ROV personnel.

In January 1999, IMCA launched its Competence Assurance & Assessment guidance covering personnel working in safety-critical positions for IMCA members. That guidance has subsequently been updated and expanded. Details of the competence requirements for ROV personnel are contained in document IMCA C 005 Rev. 1 – *Guidance Document & Competence Tables: Remote Systems & ROV Division*. The guidance provides a framework for members to implement competence schemes based on on-the-job assessment and does not set out training requirements. However, it does note that competence is a combination of skills, experience and knowledge. One way of gaining the necessary knowledge for a competence is by attending an appropriate training course.

2 Application

This guidance is applicable to any world-wide geographic area and is in addition to any national regulations, which must be adhered to.

3 ROV Training

In 2000, IMCA published its revised guidance note IMCA R 002 Rev.1 – *Entry Level Requirements and Basic Introductory Course for Remotely Operated Vehicle (ROV) Personnel*. This document set out the basic entry-level requirements for personnel new to the industry with no prior relevant offshore experience. It also set out an ROV familiarisation course. It noted that it was recommended that these new personnel attend an introductory course before the first offshore trip. However, it also noted that it was not a prerequisite for personnel to attend such a course.

In February 2001, IMCA published its updated guidance note IMCA R 005 – *High Voltage Equipment – Safety Procedures for Working on ROVs*. Appendix 1 of that document set out a proposed syllabus for high voltage electricity training. The appendix set out an outline of topics that should be covered in such training, rather than providing detailed information on the contents. A copy of that outline syllabus is reproduced in this document.

4 Outline Syllabi

This document sets out outline syllabi for a number of different courses:

- 1 Training in high voltage electricity (reproduced from IMCA R 005)
 - Part A – High voltage electricity
 - Part B – Electricity in hazardous areas
- 2 Crane operations, lifting and winches
- 3 Rigging and slinging
- 4 Hydraulic systems
- 5 Health, safety and environmental awareness
- 6 Manual handling

Each provides an outline of the topics that should be covered in such training, rather than providing detailed information on the contents. It is envisaged that training establishments and/or ROV contractors might wish to develop courses based on the topics outlined, but tailored to suit the specific personnel/company requirements. The suggested courses are intended to provide an overview of the proposed topics, rather than detailed information.

It should be noted that none of the courses suggested in this document should be considered mandatory or as a prerequisite under IMCA's Competence Assurance & Assessment guidance or schemes based thereon. The outline course syllabi have been developed to aid members in setting up appropriate courses, where they feel that their personnel would benefit from formalised training. It is not intended that personnel need to have attended a formalised training course to demonstrate the appropriate knowledge during a competence assessment.

5 References

IMCA C 005 Rev. 1 – *Competence Assurance & Assessment - Guidance Document & Competence Tables: Remote Systems & ROV Division*

IMCA R 002 Rev. 1 – *Entry Level Requirements and Basic Introductory Course for Remotely Operated Vehicle (ROV) Personnel*

IMCA R 005 – *High Voltage Equipment – Safety Procedures for Working on ROVs*

Training in High Voltage Electricity

Reproduced from IMCA R 005 (February 2001)

Suggested course duration: 2-3 days

Part A – High Voltage Electricity

- i) **Introduction to HV systems**
 - ◆ Definition of high voltage
 - ◆ Reasons for use of HV systems
- ii) **Safety**
 - ◆ Electrical hazards to the human body
 - ◆ Use of electricity in the offshore environment
 - ◆ Use of high voltage systems
 - ◆ Procedures to minimise risk while working on HV systems
 - ◆ Work permits and safe working practices
- iii) **Certification**
 - ◆ Standard labelling/certification
 - ◆ Codes of practice and certificates
- iv) **Description of system components**

Types/uses and operation of:

 - ◆ Ground fault indicators/line insulation monitors
 - ◆ Current and voltage monitoring systems
 - ◆ Isolation devices
 - ◆ Circuit breakers
 - ◆ Residual current devices
 - ◆ Earth leakage circuit breakers
 - ◆ Fuses
 - ◆ Cabling and glanding
 - ◆ Earthing and bonding
 - ◆ Switches
 - ◆ Contactors
 - ◆ Transformers
 - ◆ Insulators
 - ◆ Motors
 - ◆ Connection systems
 - ◆ Junction boxes/enclosures
 - ◆ Slip ring assemblies
- v) **Repair/maintenance**
 - ◆ Use of test equipment
 - ◆ Fault finding techniques
 - ◆ Planned maintenance procedures
- vi) **References**
 - ◆ Legislation, guidance notes, etc.

Part B – Electricity in Hazardous Areas

i) Introduction

- ◆ Hazardous area classification

ii) Safety

As in A) ii) plus:

- ◆ Intrinsic safety principles and apparatus
- ◆ Portable electrical equipment

iii) Certification/Labelling

iv) Environment

- ◆ Flammable gases and vapours
- ◆ Hazardous area classification

v) Description of Components

- ◆ Methods of Ex and EExe Protection e.g. Exd, Exe, Exn, Exs, etc.
- ◆ Flameproof enclosures
- ◆ Glanding of cables in hazardous areas
- ◆ Pressurised apparatus and systems (Exp)

vi) Repair/maintenance

- ◆ Planned maintenance schedules
- ◆ Flameproof inspection and maintenance

vii) References

- ◆ Electrotechnical construction standards and codes of practice
- ◆ Legislation, guidelines, etc.

Training on Crane Operations, Lifting and Winches

Suggested course duration: 2 days

- i) General information covering**
 - ◆ Major types of lifting equipment
 - ◆ Means of slinging
 - ◆ Recertification
 - ◆ Visual awareness of defects
 - ◆ Weather limitations

- ii) Cranes and 'A' frames**
 - ◆ Installation
 - ◆ Use of/operations/safety
 - ◆ Inspection
 - ◆ Function of testing
 - ◆ Load certification
 - ◆ Maintenance/repair
 - ◆ Lift wire inspection/maintenance/replacement

- iii) Umbilical winch**
 - ◆ Types (lifting winch)
 - ◆ Installation
 - ◆ Use of/operations/safety
 - ◆ Inspection (winch and umbilical)
 - ◆ Function testing
 - ◆ Load testing (armoured umbilicals)
 - ◆ Umbilical types (armoured/aramid)
 - ◆ Maintenance/repair (winch and umbilical)
 - ◆ Umbilical retermination
 - ◆ Umbilical handling
 - ◆ Umbilical inspection/maintenance/replacement

- iv) Tether management systems**
 - ◆ Use of/operations/safety

Introductory Training on Rigging and Slings

Suggested course duration: 2 days

- i) Introduction**
 - ◆ Rigging operations and procedures

- ii) Identification and use of equipment**
 - ◆ Lifting equipment selection
 - ◆ Examination and testing
 - Marking lifting equipment
 - Safe working load
 - ◆ Types of equipment and inspection
 - Typical fittings
 - Shackles
 - Webbing slings

- iii) Correct use of slings and lifting equipment**
 - ◆ Assessment of loads
 - Factors of safety
 - Safe working load
 - Sling angles
 - ◆ Organising lifting operations
 - Attaching, securing and detaching loads
 - Deck awareness
 - Crane signals

Training on Hydraulic Systems

Suggested course duration: 2-3 days

- i) **Introduction to hydraulics**
 - ◆ Definition of principles of pressure
 - ◆ Definition of principles of flow
 - ◆ Hydraulic symbols
 - ◆ Reasons for use of hydraulic systems
- ii) **Safety**
 - ◆ Hydraulic systems hazards to the human body
 - ◆ Use of hydraulic systems/fluids in the offshore environment
 - ◆ Use of high pressure hydraulic systems
 - ◆ Procedures to minimise risk while working on hydraulic systems
 - ◆ Safe working practices
- iii) **Certification**
 - ◆ Standard labelling/certification
 - ◆ Codes of practice and certificates
- iv) **Description of system components – types/use and operation of:**
 - ◆ Hydraulic fluids
 - ◆ Hydraulic pumps
 - ◆ Actuators, rams, rotators
 - ◆ Hydraulic motors
 - ◆ Intensifier systems
 - ◆ Manifold systems
 - ◆ Compensation systems
 - ◆ Measurement control (temperature, pressure, etc.)
 - ◆ Directional valves
 - ◆ Flow control valves
 - ◆ Cartridge valves
 - ◆ Solenoid valves
 - ◆ Servo valves
 - ◆ Hydraulic slip rings
 - ◆ Piping, connector and sealing systems
 - ◆ Accumulators
 - ◆ 'Hot Stab' systems
 - ◆ Tooling systems and applications
- v) **Associated electrical circuitry**
 - ◆ High voltage AC
 - ◆ Low voltage DC
- vi) **Repair/maintenance**
 - ◆ Use of test equipment
 - ◆ Basic fault finding techniques
 - ◆ Basic circuit diagram representation
- vii) **References**
 - ◆ Legislation, guidance notes, etc.

Overview Training on Health, Safety and Environmental Awareness

Suggested course duration: ½ day

- i) Safety/risk management**
 - ◆ Hazards and risks
 - ◆ Risk assessment
 - ◆ Individual responsibilities
 - Management of change
 - Manual handling hazards and precautions
 - Slips, trips and falls
 - Tool inspection before use
 - Housekeeping

- ii) Health and safety**
 - ◆ Hazardous substances
 - ◆ Preventing and controlling exposure
 - ◆ Use of PPE and control measures
 - ◆ Monitoring exposure at the workplace

- iii) Environmental awareness**
 - ◆ Pollution prevention
 - ◆ Waste management

- iv) Relevant legislation**
 - ◆ Coastal state/flag state
 - ◆ Appropriate codes of practice
 - ◆ MARPOL

Training in Manual Handling

Suggested course duration: 2-3 hours

- i) **What is manual handling?**
 - ◆ Causes and types of manual handling injuries
 - ◆ Human spine and loads
 - ◆ Back and leverage

- ii) **Safe lifting techniques**
 - ◆ Economic risk assessment – need to consider:
 - the load
 - the individual(s)
 - the task
 - the environment
 - ◆ Documentation
 - ◆ Good handling techniques