

TPTI APPROVED STANDARDS

Offshore Confined Space

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GLOSSARY

ACOP	Approved Code of Practice
CABA	Compressed Air Breathing Apparatus
CPR	Cardiopulmonary Resuscitation
CSE	Confined Space Entry
DMF	Department of Minerals Fuels
HASAWA	Health & Safety at Work Act
HS&E	Health, safety and environment
IDLH	Immediately Dangerous to Life or Health
LEL	Lower Explosive Limit
LFL	Lower Flammable Limit
MoL	Ministry of Labor
OEL	Occupation Exposure Level
OPITO	Standards & Approvals function of Cogent Sector Services Limited (sets international standards)
OSHA	Occupation Safety & Health Administration
PEL	Permissible Exposure Level
PPE	Personnel Protective Equipment
PPM	Parts per million
SCBA	Self Contained Breathing Apparatus
STEL	Short Term Exposure Limit
UEL	Upper Explosive Limit
UFL	Upper Flammable Limit
TPTI	Technical Petroleum Training Institute
TLV	Threshold Limit Value
TWA	Time Weighted Average

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Offshore Confined Space

INTRODUCTION

This standard was developed by TPTI in conjunction with a workgroup representing the interests of the offshore oil & gas industry in Thailand.

This document introduces and describes the core competence and safety training requirements for personnel who are assigned / employed to carry out confined space entry operations, act as entry permission authorities, as well as those appointed as members of the rescue team.

The core requirements for the certification of personnel to work in / approve entry to confined spaces are those contained in the regulations promulgated by the Thailand Ministry of Labor. These requirements have been taken in to account in the preparation of this course as well as other Thai and other recognized international standards. It explains how competence shall be assessed and certified.

The industry recognizes that a major objective is to prevent incidents occurring and if they do occur, to control them and minimize their effect. It is important therefore to set common standards and to ensure that they are maintained.

The attainment of competency will require personnel to demonstrate both theoretical knowledge and practical skills. Dependent upon the experience of personnel, the following steps in training and assessment must be undertaken:

- a) Basic training and knowledge assessment carried out at a TPTI approved training establishment.
- b) Ongoing development and skills enhancement

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Offshore Confined Space

A.1 Target Group

This program is designed to meet the requirements for the certification of offshore personnel working on rigs, FPSO's, construction barges, diving vessels and other floating assets used in Exploration and Production operations in Thailand.

This Offshore Confined Space Standard contains:

Learning Outcomes
Training Program Content
Statements on:
 Assessment
 Further Training / Assessment

This Standard consists of the following modules:

- Thailand Offshore and Onshore Legislation Relative to Confined Space & Its Hierarchy
- Standards & Definitions
- Types, categories of confined spaces and the various hazards of exposure
- Evaluation of Offshore and Onshore working conditions & preparation of confined spaces for entry
- The correct methods for safe working in confined spaces
- Permit to work system for confined space entry
- Termination of the permit to work for confined space entry
- Personal protective equipment and use of SCBA
- Duties & responsibilities
- Dangers of confined space entry & emergency management
- Basic fire fighting (Offshore and Onshore Environment)
- Provision of assistance & rescue operations (Offshore and Onshore Environment)
- First aid preliminary & secondary assistance (Offshore and Onshore Environment)

A.2 Delegate Prior Achievement

Delegates must have completed TPTI Approved Working at Heights (WAH) prior to taking this course.

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The responsibility for delivering this program rests with TPTI Approved Training Providers

A.3 Learning Outcomes

Following a series of explanations, demonstrations and opportunities to practice, delegates will be assessed as a candidate against the following learning outcomes:

- a) Thai labor law
- b) Petroleum Act and its ministerial regulations / legislation
- c) Confined space regulation
- d) Working at height regulation
- e) PPE regulations

Candidates will Demonstrate Awareness of:-

- a) Relevant legislation under Thai laws and recognized international standards
- b) Confined Space Standards & Definitions

Candidates will Demonstrate Knowledge of:-

- a) Knowledge of what constitutes a confined space and their categories
- b) Hazards of exposure to confined spaces
- c) How to evaluate a confined space and prepare the space for entry
- d) How to work safely with a confined space and mitigate the risks
- e) How to apply a permit to work system, its duration and close out
- f) The various PPE mandatory for confined space entry and its use and maintenance
- g) The duties and responsibilities of all personnel associated with confined space entry
- h) The principle dangers of confined space entry and their mitigating procedures.
- i) The use of basic fire fighting techniques
- j) How to create a rescue plan then perform it.
- k) The provision of primary and secondary first aid

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A.3 Learning Outcomes (continue)

Candidates will Demonstrate the Ability to:-

- a) Identify and prepare a confined space for entry.
- b) Complete the permit to work process and manage it, including close out.
- c) Conduct gas testing procedures
- d) Prepare and use PPE correctly
- e) Enter a confined space correctly and carry out assigned duties in the space,
- f) Manage assigned emergency scenarios
- g) Conduct basic fire fighting in a confined space
- h) Construct a rescue plan then provide rescue in accordance with the plan.
- i) Use rescue equipment to extract an “injured” entrant including vertical recovery.
- j) Provide preliminary and secondary first aid including oxygen (O₂) administration/ventilation

A.4 Training Program

The training program outlined below will assist delegates to meet the stated training outcomes.

In order to make efficient use of time and ensure effective learning, the three phases of explanation, demonstration and practice should be integrated wherever practicable. To facilitate the most effective learning, the practical part will always succeed the theoretical part of the training.

Full use should be made of visual/audio-visual aids and course handout materials.

Practical exercises should be designed and delivered solely to meet these standards and must not place on delegates any physical or mental demands other than those required to meet the standard.

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A.4 Training Program (continue)

1. Hierarchy of legislation.

Give an overview of:

- a) Hierarchy of legislation
- b) Thai labor and social welfare law
- c) Petroleum Act and its ministerial regulations / legislation
- d) Standard of administration and management of occupational safety, health and work environment in confined space.
- e) OSHA confined space regulation
- f) Confined space regulation
- g) Working at height regulation
- h) PPE regulations

2. Standards & Definitions

Give an overview of:

- a) The definition of a confined space
- b) The interpretation of confined space entry

Give a detailed explanation of:

- a) The terms TLV, OEL, PEL, TWA
- b) The terms STEL, IDLH
- c) The terms LEL, LFL
- d) The terms UEL, UFL
- e) The definition of flammable gas
- f) The definition of combustible gas
- g) A flash point
- h) Ignition temperature
- i) Auto ignition temperature
- j) Chemical reaction
- k) Toxic gas
- l) Units use to measure gases e.g. PPM, Percentage, mg/m³

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A.4 Training Program (continue)

3. Types & Categories of Confined Space & Their Hazards

Give an overview of:

- a) The types and categories of confined spaces
- b) The different configurations of confined spaces

Give a detailed explanation of:

- a) The definition of a hazard as it is applied to confined spaces
- b) The definition of risk as it is applied to confined spaces
- c) What constitutes a hazardous atmosphere or potential hazardous atmosphere (atmospheric hazards)

Provide a detailed discussion on:

- a) Control measures to manage hazards and risks
- b) Hazards associated when working in a confined space. (physical hazards)

4. Evaluation of Working Conditions & Confined Space Entry Preparation

Give an overview of:

- a) The behavior of gases
- b) Properties of common gases in the confined space area
- c) Atmospheric testing
- d) Inert gas
- e) Types of gas detectors

Give a detailed explanation of:

- a) Limitations of gas detectors
- b) Ventilation techniques
- c) Planning and prevention of dangers from working in confined space

Provide a detailed discussion on:

- a) Identifying of unsafe conditions in confined space
- b) Identifying of unsafe acts in confined space
- c) Gas testing technique

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A.4 Training Program (continue)

5. Safe Working Practices In Confined Spaces

Give an overview of:

- a) Safe systems of work
- b) Hierarchy of controls

Provide a detailed discussion on:

- a) Job safety analysis development, use and limitations
- b) Task risk assessment development, use and limitations
- c) Work pack development, use and limitations
- d) Tool box talks
- e) Communications

6. Permit To Work System

Give a detailed explanation of:

- a) Purpose of a permit to work system for confined spaces
- b) Types of permit to work and their hierarchy
- c) Issuance of a permit to work
- d) Acceptance of a permit to work
- e) Supporting documents for a permit to work
- f) Validity of a permit to work
- g) Sections that must be covered in any permit to work

7. Termination of the permit to work

Give a detailed explanation of:

- a) Confined space close out
- b) Termination of a permit to work

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A.4 Training Program (continue)

8. Personal Protective equipment

Give an overview:

- a) Selection of appropriate personal protective equipment
- b) PPE required when working in the confined space
- c) Proper use of PPE
- d) Maintenance of PPE
- e) Limitations of PPE

Give a detailed explanation & demonstration of:

- a) Donning of self contain breathing apparatus
- b) Donning safety harness
- c) Airline breathing apparatus
- d) Distress signal units
- e) Personal detectors

9. Duties & Responsibilities

Give an overview of the duties & responsibilities of:

- a) Managers
- b) Field leader
- c) Entry Supervisors
- d) Attendant
- e) Authorized Entrants
- f) Rescue team members

10. Emergency Response Dangers & Methods of Avoidance

Give an overview of:

- a) Gas alarms
- b) Dangers of rescue without respiratory equipments
- c) Manual handling when evacuating the casualty from the confined space
- d) Visibility restrictions
- e) Toxic gas emergencies
- f) Flammable gas dangers
- g) Raising the alarm

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A.4 Training Program (continue)

11. Basic Fire Fighting

Give an overview of:

- a) Condition of fire
- b) Classification of fire
- c) Fire spread

Give a detailed explanation of:

- a) Methods of extinguishing a fire
- b) Main types of fire extinguishers
- c) Fire prevention
- d) Fire readiness
- e) Selection of fire fighting equipment
- f) Use of fire extinguishers

12. Rescue Operations

Give a detailed explanation of:

- a) Development of a rescue plan
- b) Rescue without entering the confined space
- c) Appointing rescue personnel
- d) Appropriate rescue equipment
- e) Basic rope handling techniques
- f) Mechanical advantage
- g) Method of searching for a casualty in a zero visibility situation
- h) Vertical recovery using tripods and ropes
- i) Horizontal recovery
- j) Lowering the casualty from height using ropes and technical equipment
- k) Use of appropriate stretchers for confined space rescue

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A.4 Training Program (continue)

13. Preliminary & Secondary First Aid Techniques

Give an explanation of:

- a) Basic life support

Give a demonstration of:

- a) Use of a resuscitator
- b) Administering O₂
- c) Trauma bandaging
- d) Immobilization of the casualty
- e) Head to toe checks
- f) Correct method of handling the casualty
- g) Transportation of the casualty

A.5 Duration of Training

The optimum 'contact time' for this training and assessment is seen as 28 hours.

It is suggested that a ratio of 60% 40% theory/practical is appropriate.

- The total contact time per day shall not exceed 8 hours
- The total training day shall not exceed 10 hours

The total training day includes

- Contact time
- Coffee & meal breaks
- Travel time between training sites where applicable

Assessments, both written and practical, will be conducted after the training program is finished.

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A.6 Assessment

Assessments will be conducted by TPTI approved training providers.

Delegates attending this training and assessment program (referred to as candidates during assessment) will be given a series of explanations and demonstrations which will identify what they are expected to know and do. This will be followed by practical exercises that will allow delegates to demonstrate their skills, knowledge and understanding of Confined Space Entry and Rescue techniques.

Assessment of the candidates' performance will be against the stated learning outcomes and will involve both written and practical assessments. Candidates who achieve a rating of 70% or higher on the written assessment and a 'Pass' on the practical assessment, will be issued a TPTI certificate.

If they achieve lower than 70% or fail the practical assessment, further time and opportunity for coaching will be given to candidates to enable them to reach the standard leading to the award of a certificate. However, the time available for this during a program is limited and it should be recognized there may be occasions where other arrangements need to be made.

If they achieve lower than 70% or fail the practical assessment, the candidate must retest the failed portion of the assessment within eight weeks. The candidate will be allowed two attempts at the retest within the eight week period, if required.

If all attempts described above fail, then the candidate must re-take the Offshore Confined Space course.

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A.7 Further Training / Assessment

It is recommended that the theoretical and practical elements of this training should be assessed at three year intervals.

An Assessment, both written and practical, will be conducted at the TPTI Approved Training Centers.

Note that the candidates must hold a valid “Offshore Confined Space” certificate in order to qualify for reassessment.

If they achieve lower than 70% or fail the practical assessment, the candidate must retest the failed portion of the assessment within eight weeks. The candidate will be allowed two attempts at the retest within the eight week period, if required.

If all attempts at recertification described above fail, then the candidate must resit the full Confined Space course.

The recommended duration of this training and assessment session should be not less than 8 hours contact time with a ratio of 10%:90% theory and practical.

This Further training and assessment will be conducted at TPTI Approved Training Centers.

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RESOURCES

In order that a competence program may be delivered successfully it is essential that the correct people are present to support the program and that the appropriate facilities and equipment are in place.

Qualifications for the delivery of the training

Prior to applying for TPTI accreditation, the training provider must be accredited by the Labor and Social Welfare Department for delivery of confined space training.

B.1 Staff

Instructional staff will be required to carry out training and assessors will be required to judge candidate's competence. It is important that the staff involved have the appropriate qualifications and experience.

a) Trainers will:

- Be registered with the Labor and Social Welfare Department as a confined space entry trainer
- Have offshore experience.
- Be trained and qualified in instructional/lecture techniques and/or have proven instructing/teaching experience.
 - a) Have training and experience in confined space operations including training from recognized providers and on the job experience.
 - b) Be included in an ongoing staff training program which enables them to maintain and update skills and knowledge.
 - c) Be able to clearly communicate in the English language
 - d) Have knowledge of applicable Thai and International Standards and Regulations applicable to Confined Space Entry

b) Assessors must be:

- a) Be registered with the Labor and Social Welfare Department as a confined space entry trainer
 - b) Discipline experts trained and qualified in assessment techniques
 - c) Knowledgeable of the areas being assessed
- c) All staff must have the appropriate competences to conduct/assist the element of training being conducted.
- d) All Training staff will be trained in the causes and consequences stress/anxiety, coping skills and how to manage delegates who are suffering from anxiety.

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RESOURCES

B.2 Trainer/Delegate Ratio

- a) It is recommended that the maximum number of delegates attending this program is 16.
- b) The following ratios indicate the maximum number of delegates to be supervised by one Instructor at any one time during each activity.

Theory	1:16
Practical Exercises	1:8
Confined space entry	1:4

B.3 Facilities

It is important to make sure that facilities as listed below are available.

Administration arrangements appropriate for enrolment and certification of delegates and all aspects of the delivery of training in accordance with this standard.

Theory training area(s) so designed to enable each delegate view, to hear and participate fully in the subject matter being taught.

Practical training equipment and facilities so designed to enable each delegate, to practice the following:

- a) Confined Space entry techniques, not less than 3 meters in height
- b) Gas testing (Multifunction gas detector required), selective 3 categories from H₂S, CO₂, O₂, CO
- c) Rescue techniques including vertical rescue, multi-level need (not less than 3 meters in height each level)
- d) Basic fire fighting techniques in confined spaces
- e) First & secondary first aid including O₂ administration & CPR

All facilities must be maintained and where appropriate, inspected and tested in accordance with current standards/legislation and manufacturers recommendations.

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RESOURCES

B.4 Equipment

- a) Different types of equipment may be required and it is important to make sure that is both available and fit for purpose
- Confined space entry facility
 - Fire fighting equipment (extinguishers)
 - Gas testing equipment
 - Tripods for vertical rescue
 - Horizontal rescue equipment
 - Suitable stretchers
 - Breathing apparatus – SCBA and CABA
 - CPR manikins
 - Working at Height structures, equipment and rescue equipment
 - Full range of PPE applicable to confined space entry & rescue

All equipment must be maintained, and where appropriate, inspected and tested in accordance with current standards/legislation, guidance and manufacturers recommendations.

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GENERAL GUIDANCE & REQUIREMENTS

B.5 Certification & Recording

A TPTI Certificate will be issued to all candidates assessed as meeting the stated outcomes, detailing that they are competent to proceed to the workplace for company specific training where applicable. Delegates details will also be registered in the TPTI Central Register, The issue of a certificate indicates that the delegate has achieved a level of competence to enable him/her to proceed to the workplace for further training and development. Following satisfactory assessment the training provider delivering the training will issue every candidate a certificate. The certificate remains valid and certifies the persons for all confined space (Combined worker and supervisor) operations under the direction of the labour and social welfare authority.

Each individual attending any TPTI approved program must be registered with the Central Register (CR) operated by TPTI.

Training Establishments are responsible for the following:

- a) The issuing of certificates direct to the delegate completing the program and to the sponsoring company (when required). Each certificate must indicate that the delegate has been assessed against the agreed training outcomes and must contain the following:

- Establishment name
- Full TPTI course title stating that it is TPTI approved
- TPTI course identification code
- Delegate's name
- Course dates
- Expiry date (will be the day before the course completion date)
- Unique Certificate Number
- Establishment Signatory

- b) Each individual attending any TPTI approved program must be registered with the Central Register (CR) operated by TPTI. Registration must be made by training establishments to TPTI on a daily basis.
- c) All Joining Instructions contain information, which indicate certain aspects of the course are of a physical nature. The responsibility for the individual completing the course without any adverse effects to their present state of health lies with the delegate and/or company sponsoring the delegate.

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GENERAL GUIDANCE & REQUIREMENTS

B.5 Certification & Recording (cont'd)

- d) Prior to each course commencing, delegates must sign a declaration indicating they have read and understood a written statement regarding the physical nature of the program and the need for delegates to be in good health. Instructional staff should also read out a statement indicating this at the time.
- e) Where doubt exists regarding the medical fitness of any delegate, the training establishment should ask the delegate or their employer to seek the advice of a medical examiner.
- f) A Medical officer, familiar with the nature and extent of the training is "on call".
- g) Risk assessment of all training areas and provision of all appropriate safety equipment.
- h) Written statements of organization for all sessions, which clearly define responsibilities and relationships for all staff either directly or indirectly involved.
- i) All training and supporting activities are carried out in accordance with current legislation and safe working practices.

B.6 Medical and Health Requirements

Offshore Confined Space contains physically demanding and stressful elements. All personnel who participate in such training should be medically fit and capable of participating fully.

Training Establishments are required to ensure that prior to participating in practical exercises the delegate must possess a valid, current medical certificate from the hospital, clinic, or clinical agents registered under Thai government,

It is recommended that this information is given to delegates along with pre-course joining instructions

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Guidance and advice on this standard is available by contacting:

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