



Australian Government

RIICTC402 Supervise tunnel boring machine operations

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with RII Resources and Infrastructure Industry Training Package Version 6.0.

Application

This unit describes the skills and knowledge required to supervise tunnel boring machine (TBM) operations in civil construction, including implementing job plans and managing, overseeing and reporting on the execution of TBM operations.

It applies to those working in supervisory or technical specialist roles. They generally perform tasks involving a broad range of varied activities most of which are complex and non-routine and are responsible for the quantity and quality of the output of others.

Licensing, legislative and certification requirements that apply to this unit can vary between states, territories, and industry sectors. Users must check requirements with relevant body before applying the unit.

Pre-requisite Unit

RIICTC306 Conduct tunnel boring machine operations

Unit Sector

Civil construction

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare to supervise TBM operations	1.1 Obtain, interpret and confirm work instructions 1.2 Access, interpret and apply documentation required to supervise TBM operations and confirm work activity is compliant 1.3 Prepare and implement a job plan that meets task requirements in consultation with team members 1.4 Confirm required resources are available for work activity 1.5 Monitor environmental risks and hazards and address

	non-compliance as required 1.6 Check and confirm all team members and own self meet personal protective equipment requirements 1.7 Identify plant, tools and equipment required for tasks, and check for faults and confirm condition meets job requirements 1.8 Identify steps required to respond to emergencies and confirm team members are briefed on procedures
2. Prepare team members for TBM operations	2.1 Identify team member training requirements and implement training plans within scope of own role 2.2 Communicate and clarify instructions with team members and other involved personnel according to job requirements 2.3 Set out tasks required to complete work activity according to job requirements
3. Oversee TBM operations	3.1 Monitor TBM operations according to job requirements 3.2 Implement adjustments to work processes and job plan as required and confirm required outcomes are achieved 3.3 Oversee maintenance of plant, equipment and tools and confirm maintenance is recorded as required 3.4 Oversee technical troubleshoots as required 3.5 Communicate and coordinate with tunnel manager on decision-making required for TBM operations 3.6 Check and confirm ring-built quality according to job requirements 3.7 Monitor and adjust TBM operations to meet production requirements
4. Report on TBM operations	4.1 Complete and submit reports according to site requirements 4.2 Recommend required changes to confirm task execution meets job requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance but not explicit in the performance criteria.

Skill	Description
Oral communication	Presents workplace procedures and technical instructions to a group using sector-specific vocabulary
Writing	Writes job plans, organisational procedures and specifications considering available resources and time frames

Unit Mapping Information

New unit

Links

Companion Volume Implementation Guide is found on VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=88a61002-9a21-4386-aaf8-69c76e675272>

Assessment Requirements for RIICTC402 Supervise tunnel boring machine operations

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Performance Evidence

The candidate must demonstrate the ability to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including evidence of the ability to:

- supervise tunnel boring machine (TBM) operations on at least three occasions, including:
 - completing at least 500 metres of overall tunnelling operation without delays from required time frame
 - completing at least 500 metres of overall tunnelling operation with a maximum of five ring builds that do not meet quality requirements
 - supervising and overseeing at least three cutterhead intervention sessions
 - completing at least 1,000 metres of tunnelling operations without an injury incident that requires reporting.

During the above, the candidate must:

- locate and apply required documentation, policies and procedures and confirm work activity is compliant
- implement the requirements, procedures and techniques to supervise TBM operations, including:
 - calculating quantities of TBM supporting consumables usage for executing tasks
 - interpreting required documentation, including:
 - engineering drawings
 - geological data
 - permits to bore approved by a tunnel manager
 - TBM operating parameters
 - identifying and analysing rock profile characteristics
 - identifying potential issues and providing solutions during operations that meet job requirements
 - establishing tunnel flood and fire protection systems
 - providing advice to team members required to improve tunnel ring build quality

- determining key positions of the tunnel rings manually and without the use of supporting surveying tools
- confirming materials and consumables quality meets tunnel construction requirements
- work with others to supervise TBM operations in a way that meets required outcomes, including:
 - providing instruction and supervision using communication techniques and equipment
 - monitoring movements and hazards and identifying and communicating changes to work environment
 - preparing for and conducting briefings, toolbox and site meetings
 - maintaining records and reporting systems, including preparing and presenting job reports
 - managing team members in a shift and confirming requirements are in place allow team members to carry out work activity.

Knowledge Evidence

The candidate must be able to demonstrate knowledge to complete the tasks outlined in the elements, performance criteria and foundation skills of this unit, including knowledge of:

- policies, procedures and documentation required to supervise TBM operations, including those relating to:
 - environmental protection, including atmospheric monitoring
 - hazard and risk management
 - incident and emergency response
 - materials quality and delivery requirements and procedures
 - organisational, client and site operational requirements
 - project quality requirements
 - reporting and recording requirements
 - set out requirements and procedures
 - waste management
 - training requirements for team members
 - job plans and instructions
 - communication techniques and equipment
 - work health and safety
- types, operational phases, characteristics and limitations of TBM and equipment required to operate TBM
- principles and techniques for effective supervision of TBM operations, including:
 - TBM operational roles and responsibilities
 - techniques for creating and monitoring safe and stable tunnelling environments
 - TBM works planning and operations sequencing techniques
 - TBM monitoring techniques
 - basic construction craft works, including:

- carpentering works
- hot works
- piping installation
- techniques for interpreting and applying:
 - TBM controls
 - permits to bore
 - engineering drawings
- types and characteristics of tunnels required for TBM operations, including:
 - soil and rock types and characteristics
 - implications of soil and rock types for TBM operations
- civil construction terminology required for conducting tunnel construction
- principles and techniques for leading, mentoring and coordinating teams.

Assessment Conditions

Mandatory conditions for assessment of this unit are stipulated below. The assessment must:

- include access to:
 - personal protective equipment
 - TBM
 - equipment required to supervise TBM operations
- be conducted in a safe environment; and,
- be assessed in the context of this sector's work environment; and,
- be assessed in compliance with relevant legislation/regulation and using policies, procedures and processes directly related to the industry sector for which it is being assessed; and,
- confirm consistent performance can be applied in a range of relevant workplace circumstances.

Where personal safety or environmental damage are limiting factors, assessment may occur in a simulated work environment* provided it is realistic and sufficiently rigorous to cover all aspects of this sector's workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills.

• Assessor requirements

Assessors must be able to clearly demonstrate current and relevant industry knowledge and experience to satisfy the mandatory regulatory standards as set out in the Standards for Registered Training Organisations 2015/Australian Quality Training Framework mandatory requirements for assessors current at the time of assessment and any relevant licensing and certification requirements. This includes:

- vocational competencies at least to the level being delivered and assessed
- current industry skills directly relevant to the training and assessment being provided
- current knowledge and skills in vocational training and learning that informs their training and assessment
- formal relevant qualifications in training and assessment

- having knowledge of and/or experience using the latest techniques and processes
- possessing the required level of RII training product knowledge
- having an understanding and knowledge of legislation and regulations relevant to the industry and to employment and workplaces
- demonstrating the performance evidence, and knowledge evidence outlined in this unit of competency, and
- the minimum years of current** work experience after competency has been obtained as specified below in an industry sector relevant to the outcomes of the unit.

It is also acceptable for the appropriately qualified assessor to work with an industry expert to conduct assessment together and for the industry expert to be involved in the assessment judgement. The industry expert must have current industry skills directly relevant to the training and assessment being provided. This means the industry subject matter expert must demonstrate skills and knowledge from the minimum years of current work experience after competency has been obtained as specified below, including time spent in roles related to the unit being assessed:

Industry sector	AQF indicator level***	Required assessor or industry subject matter expert experience
Drilling, Metalliferous Mining, Coal Mining, Extractive (Quarrying) and Civil Infrastructure	1	1 year
	2	2 years
Drilling, Coal Mining, Extractive (Quarrying), Metalliferous Mining and Civil Infrastructure	3-6	3 years
Other sectors	Where this unit is being assessed outside of the resources and infrastructure sectors assessor and/or industry subject matter expert experience should be in-line with industry standards for the sector in which it is being assessed and where no industry standard is specified should comply with any relevant regulation.	

*Guidance on simulated environments has been stipulated in the Companion Volume Implementation Guide located on VETNet.

**Assessors can demonstrate current work experience through employment within industry in a role relevant to the outcomes of the unit; or, for external assessors this can be demonstrated through exposure to industry by conducting a minimum number of site assessments as determined by the relevant industry sector, across various locations.

*** While a unit of competency does not have an AQF level, where a unit is being delivered outside of a qualification the first numeric character in the unit code should be considered as the AQF indicator level for assessment purposes.

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