

20 Type Rating – Multi Engine Helicopter

The aim of this flight test is for the applicant to demonstrate competency in the knowledge, skills and attitudes as required in Schedule 5 of the Part 61 MOS for the grant of the type rating – multi engine helicopter (TR MEH).

20.1 Examiner requirements

The following examiner requirements are applicable to the conduct of the TR MEH flight test:

1. The examiner must conduct the TR MEH flight test in accordance with clauses 1 to 3 of Schedule 5 of the Part 61 MOS
2. The examiner must conduct the TR MEH flight test within the operational scope and conditions described in clause 4 of Schedule 5 of the Part 61 MOS
3. The examiner must ensure that the ground component of the flight test is successfully completed before conducting the pre-flight briefing and flight component of the flight test
4. The examiner must not introduce simultaneous, multiple and unrelated simulated emergencies or abnormal events during the flight. Emergencies and abnormal situations relating to aircraft systems, powerplants and the airframe must be limited to those described in the AFM
5. After a simulated failure, the examiner must ensure the aircraft is reconfigured to a normal operating mode before another simulated failure may be introduced, except where the simulated failures are linked. The safety of the aircraft should never be in doubt when simulating emergencies or failures
6. Where credits are available for flight test items, they are valid for 28 days only. After 28 days, the flight test must be conducted in full.

20.2 Plan

20.2.1 Testing methodology

The examiner should apply the flight test methodology described in FEH chapter 3, Adult education and competency-based assessment and FEH chapter 4, Assessment of human factors and non-technical skills.

The flight test should be designed such that all required components can be assessed in a logical sequence. Where one or more mandatory units or elements are unable to be assessed for any reason, the flight test cannot be completed.

The examiner must ensure the applicant is given adequate notice of the intended task to allow for unhurried preparation and planning (simulating a commercial passenger/cargo carrying operation). The applicant should be given the test scenario at least 24 hours before the start of the flight test.

It is recommended that the examiner plans an **airborne** time of approximately:

- 1.5 hour (2.0 in an FSTD) for the general handling and test specific manoeuvres.

The examiner may choose to conduct the flight test in combination with a licence or operational rating flight test if the applicant holds course completion certificates for both. In this case, the time for any flight should not exceed 4 hours.

Use of IFR procedures

To authorise the applicant to pilot the type under the IFR, the examiner must ensure that the flight test is conducted under the IFR (regulation 61.790 of CASR).

20.2.2 TR MEH assessment scope and conditions

The TR MEH flight test must be conducted under the IFR, or by day in VMC under the VFR, as applicable, in a helicopter or an FSTD approved for the purpose, in accordance with subregulations 61.245(1), 61.810(3) of CASR, and the limitation of subregulation 61.245(2) of CASR. The helicopter and FSTD must be of the type covered by the pilot type rating. The helicopter must have operational dual controls, electronic intercom and, if fitted with a wheeled undercarriage, dual control brakes.

The activities and manoeuvres, listed in FEH 20.4.table 31, mirror the TR MEH test form and FTM items. They are a paraphrase of the Part 61 MOS Schedule 5 for the TR MEH flight test.

These activities and manoeuvres, described in clause 3 of Schedule 5 of the Part 61 MOS and the TR MEH test form, must be assessed against a representative sample of the performance criteria applicable to the Element being assessed, taking into account the relevant competency standards prescribed in Schedule 2 of the MOS.

TR MEH flight tolerances and ground reference tolerances are specified in Table 2 of Schedule 8 of the MOS. Sustained deviation outside the applicable flight tolerance is not permitted.

The TR MEH applicant should demonstrate that control of the aircraft or procedure is maintained at all times, that the successful and safe outcome of any manoeuvre is not in doubt and that any corrective action is taken promptly.

Where the aircraft is fitted with an autopilot system, the applicant must demonstrate competency in the system.

In an aircraft, the simulated engine failure should not be conducted at night or in IMC and the examiner should have visual reference at all times during the manoeuvre.

When the flight test is conducted in an aircraft, the examiner may occupy either a control seat or a suitable observer seat (jump seat). Where the examiner occupies a control seat (as co-pilot), the examiner should be the nominated pilot in command (PIC).

If the examiner is occupying a control seat in a multi-crew operation, they must provide the normal duties of a co-pilot in that role, but only to the extent required by the operator's operations manual.

Where the examiner occupies a jump seat, a suitably qualified pilot should occupy the co-pilot seat and be the nominated PIC.

Where the examiner or a suitably qualified pilot occupies a control seat, the examiner must brief all crew members on the following:

- command/safety of flight responsibilities
- flight test profile and scenario
- role of the 'co-pilot'
- introduction of non-normal sequences
- discontinuation/termination of the flight test
- communication protocols.

When the flight test is conducted in an approved FSTD, the examiner should not speed up or in any other way change the real-time nature of the flight, except when a non-normal sequence has been completed and the simulator returned to its normal operating state. For example, after the engine failure during hover or taxi, the 'aircraft' may be re-positioned to facilitate another take-off without the requirement to taxi to the helipad once again.

Examiners must be cognisant of the general competency requirement of regulation 61.385 of CASR regarding the authority to exercise the privileges of a rating or an activity in an aircraft. For manoeuvres that involve elevated risk (abnormal and emergency flight manoeuvres) when conducting a flight test in an aircraft, the examiner must be competent in the management of all flight test activities including the ability to safely manage potential applicant mishandling. This level of competency should be achieved with a targeted program of examiner training in an aircraft or a simulator where one is available.

20.3 Conduct (ground component)

20.3.1 Initial brief to applicant

In accordance with FEH chapter 3, Adult education and competency-based assessment; the examiner must begin the flight test with a brief to the applicant on the following items:

- flight test context, purpose and content
- assessment procedure
- function of the examiner
- standards against which competency will be assessed
- actions in the event of a failure assessment.

The applicant should be encouraged to ask for clarification should they become uncertain on any of the flight test elements.

20.3.2 Document review

The examiner must confirm that an applicant for the TR MEH satisfies the eligibility requirements to undertake the flight test for the grant of the type rating. To achieve this, the CASR subregulation 61.235(4) certification, training records, logbook, licence and medical certificate must be checked. Ideally, these documents should be presented to the examiner prior to the commencement of the flight test.

Licence – the applicant for the TR MEH must hold a helicopter category PPL, CPL or ATPL.

Aeronautical knowledge examinations – the examiner must review the applicant's theory examination pass records, as conducted by the training provider.

Knowledge deficiency report (KDR) – N/A.

Flight training requirements – the examiner must review the applicant's pilot training records to ensure that the training requirements have been met. Normal evidence should at least be a course completion certificate. To exercise TR privileges in multi-crew operations, the applicant must also have completed an approved course of training in multi-crew cooperation or equivalent (regulation 61.785 of CASR).

Aeronautical experience – N/A.

English language proficiency – N/A.

Eligibility certification – the examiner must ensure that an appropriate person of the training provider has certified in writing that the applicant is eligible to take the flight test.

Medical certificate – for flight tests conducted in an aircraft, the examiner must check that the applicant holds a medical certificate, medical exemption or equivalent allowing them to exercise the privileges of the licence and rating. (Refer to FEH 2.9 table 1 for a summary of medical requirements.)

Security check and fit and proper person requirements – N/A.

If the flight test is a retest following a failed assessment – the examiner must review the applicant's training records for evidence that appropriate remedial training has been successfully carried out with the applicant.

20.3.3 Assessment of knowledge requirements

Questions for the oral knowledge assessment must be in accordance with the knowledge requirements topics listed in clause 2 of Schedule 5 of the Part 61 MOS.

The examiner should use a developed set of scenario-based questions for the listed topics to achieve effective assessment of the applicant's working knowledge and reasoning ability. It should be a structured conversation to a logical conclusion, starting broad and funnelling down, rather than simple

factual recall. (Refer to FEH 3.2.5 to 3.2.7 for appropriate questioning techniques and methods of enquiry.)

It is recommended the examiner allows 45 to 60 minutes for the knowledge requirements.

20.3.4 Assessment of flight planning

As part of the flight test, the applicant must complete or demonstrate knowledge of (if computer generated):

- flight plan
- fuel plan
- flight notification
- loading system
- take-off and landing data/performance calculation.

When reviewing the applicant's flight preparation documents, the examiner must be satisfied that the applicant is able to validate the data on which the planning decisions and calculations have been made (including, forecast weather, NOTAMs, aircraft data, chart validity).

The examiner must ensure, through considered questioning, that the preparation is solely the work of the applicant and meets the knowledge standards as applicable.

20.4 Conduct (flight component)

20.4.1 Assessment of the applicant's performance

When assessing the competency standards for the activities and manoeuvres in this chapter and on the flight test form, the examiner should consider both the technique used to execute the activity or manoeuvre and that tolerances are maintained within required parameters.

The relevant performance criteria for each element frequently use the terms: technique, smoothness, accuracy, judgement, procedures, knowledge, and flight management.

The following explanations are provided to assist the examiner in assessing the flight component:

- **Technique** – is the method by which a task is performed. There may be more than one acceptable technique and the examiner should be mindful of this in their assessment. Technique should, however, always involve the application of smooth, coordinated and accurate control inputs. Adjusting power, attitude and trim should be in a timely and coordinated fashion whilst following correct procedures
- **Smoothness** – is the ability to skilfully make the appropriate rate of adjustment to power and attitude during a manoeuvre. The applicant should demonstrate smooth flying in all sequences
- **Accuracy** – is the ability to control height, airspeed, heading, balance and trim within the required MOS flight tolerances. Sustained errors outside the MOS flight tolerances in any of these aspects should result in a fail assessment
- **Judgement** – is applicable to all tasks but is of importance with respect to the effect of environmental conditions such as cloud, visibility, wind and turbulence. It may be that on some occasions the flight conditions are such that even though the applicant's technique is sound, the aircraft may deviate outside specified tolerances for short periods. In such cases the assessment of technique, smoothness, accuracy and judgment should be the determining factors
- **Procedures** – the applicant should demonstrate awareness and practical application of nominated standard operating procedures and checklist discipline throughout the flight test. In many circumstances, the adherence to SOP's may be the reason a committed error has been corrected in a timely manner

- **Knowledge** – during the flight test the applicant's underpinning knowledge may be further tested. For example, during the management of an aircraft system failure, it may become apparent that there is a lack of knowledge of that system
- **Flight management** – the applicant should demonstrate satisfactory proficiency in aircraft and flight management systems, situational awareness, threat and error management and decision-making during the flight. The examiner should assess adherence to either company SOPs, training provider SOPs or the helicopter manufacturer's AFM, for example, operator specific or manufacturer, as nominated by the applicant.

Assessment should be based on the technique used by the applicant to satisfy compliance with SOPs and not just the ability to perform the task within specified numerical tolerances.

Applicants should not be given a second opportunity to demonstrate a manoeuvre unless, in the opinion of the examiner, the circumstances causing failure of the first attempt were outside the control of the applicant in the test environment or the applicant recognised the error and self-managed corrective actions. This should be considered when the examiner is observing an error or errors which may have the potential to become safety critical, providing the applicant is demonstrating non-technical skills and threat and error management appropriately before the examiner is required to intervene.

20.4.2 Pre-flight briefing

In accordance with FEH chapter 3, Adult education and competency-based assessment; the examiner must brief the applicant on:

- the scenario applied to the test environment (e.g. passenger carrying commercial operation/simulation of passengers)
- pilot in command, including traffic separation roles and responsibilities
- transfer of control
- flight tolerances and ground references
- simulating emergencies, methods and calls
- clarification of crew responsibilities in the event of actual emergencies
- procedures for simulating IMC
- multiple flights and the assessment of competencies (if applicable).

The applicant should be encouraged to ask for clarification should they be uncertain about any of the briefed items.

20.4.3 Assessment of activities and manoeuvres

An examiner must comply with the requirements and take into account the recommendations described below when planning and conducting the **TR MEH** flight test. Where there are no specific recommendations, 'NSR' is listed in the table against the unit or element.

Table 31. Assessment of activities and manoeuvres - TR MEH

Phase of flight	Requirements	Recommendations
Pre-flight	(a) Perform pre-flight actions and procedures	An applicant may apply operator specific fuel policies for carriage over and above the minimum legal statutory fuel requirements.
	(b) Perform pre-flight inspection	In-transit (aircraft turnaround) pre-flight cockpit preparation is acceptable for the purposes of the pre-flight inspection.
Ground operations, take-off, departure and climb	(a) Complete all relevant checks and procedures	NSR

Phase of flight	Requirements	Recommendations
	(b) Lift-off and hover helicopter	The examiner should assess these items during the normal operation of the helicopter in the departure phase.
	(c) Taxi aircraft	
	(d) Air transit helicopter	
	(e)(i) Plan, brief and conduct take-off and departure procedures	
	(e)(ii) Conduct instrument departure – published if available or ATC cleared if available	For IFR operations only. Simulated IMC must not be introduced before the take-off minima. A Class G overhead departure procedure may be flown if a SID or ATC departure is not available.
	(f) Conduct maximum performance take-off	NSR
	(g) Conduct climbs and climbing turns – must include any 2 of maximum rate, maximum angle or cruise climb	The examiner should pose scenarios to achieve the observation of a climb at best angle to achieve obstacle clearance or at best rate during departure and climb phase.
En route cruise	(a) Maintain straight and level and turn aircraft	NSR
	(b) Use instrument navigation systems	If the flight test is conducted under the IFR, the instrument flight assessment should consist of a segment with at least the IAP2 elements conducted under the IFR. The flight should include a sector to an aerodrome (other than the departure aerodrome) serviced by a published instrument approach which the helicopter is equipped to use.
Test specific activities and manoeuvres	(a) Hover helicopter in crosswind and tailwind and perform turns around any 1 of the rotor mast, nose or tail	The examiner is required to assess headwind/crosswind/tailwind hover and ground taxi unless the applicant's training records certify dual or solo competence in those wind conditions. In this case the examiner must indicate competency by marking the items on the flight test form with 'TR'.
	(b) Perform sideways and backwards flight	NSR
	(c) Conduct steep level turns of at least 45° bank	Recommend a turn through at least 180 degrees is assessed.
	(d) Perform full panel instrument flying	NSR
	(e) Full panel instrument flying, recover from at least 2 unusual attitudes	In an aircraft, the unusual attitude recoveries should be conducted by day in VMC and the examiner should have visual reference at all times during the manoeuvre.
	(f) Land on and lift-off from sloping ground	It is not a requirement to demonstrate maximum slope landing limitations.
	(g) Execute limited power take-off, approach and landing	All engines operating

Phase of flight	Requirements	Recommendations
	(h) Manage engine failure - at least 1 from take-off, cruise flight, approach and landing	The applicant shall attain optimum helicopter performance following failure of an engine. At least one from a take-off, cruise flight or approach configuration; and must include an OEI landing. In an aircraft the simulated engine failure should not be conducted at night or in IMC and the examiner should have visual reference at all times during the manoeuvre.
	(i) Manage engine failure during hover or taxi	NSR
	(j) Manage a control or tail rotor malfunction in flight and at the hover	NSR
	(k) Manage a system malfunction – at least 1 from engine fire, electrical failure, hydraulic system, airframe fuel system or engine governor system	NSR
Descent and arrival	(a) Conduct descents and descending turns	NSR
	(b)(i) Plan and conduct arrival and circuit joining procedures	NSR
	(b)(ii)(A) Perform a descent or published arrival procedure to an aerodrome	For IFR operations only. The descent may be a normal descent to MSA/LSALT or a DGA.
	(b)(ii)(B) 2D, conduct approach	For IFR operations only.
	(b)(ii)(C) Conduct missed approach	For IFR operations only.
Circuit, approach and landing	(a) Conduct normal circuit pattern, approach and landing	These items should be assessed during the normal operation of the helicopter during the circuit phase.
	(b) Approach to the hover	
	(c) Air transit helicopter	
	(d) Perform a go-around procedure	The examiner may need to introduce a reason to conduct the go-around procedure.
	(e) Perform after-landing actions and procedures	NSR
Shut down and post-flight	(a) Park, shut down, secure aircraft and complete post-flight administration	NSR
General requirements	(a) Maintain effective lookout	In most flight tests, the assessment of emergency and non-normal events will provide sufficient evidence of the NTS competencies. The examiner should provide,
	(b) Maintain situational awareness	

Phase of flight	Requirements	Recommendations
	(c) Assess situations and make decisions	where possible, applicable operational environment scenarios to support these events.
	(d) Set priorities and manage tasks	The examiner should request a copy of company SOPs to ensure familiarity with standard briefs, work-cycles and procedural techniques.
	(e) Maintain effective communications and interpersonal relationships	
	(f) Recognise and manage threats	
	(g) Recognise and manage errors	
	(h) Recognise and manage undesired aircraft state	
	(i) Use correct radio procedures	Communication and radio procedures relevant to the airspace within which the test is conducted.
	(j) Manage relevant aircraft systems	The applicant should demonstrate a sound working knowledge of the helicopter's automation system, including use of the Flight Management Computer System (FMCS), the Autopilot Flight Director System (AFDS) and the Mode Control Panel (MCP) (or however these systems are described).
	(k) Manage fuel system and monitor fuel plan and usage	NSR

20.4.4 Failure assessment

The failure to perform a manoeuvre or procedure may be broken into 2 levels depending on the safety implications during the flight test. Both levels result in a fail assessment.

Safety-critical items

The highest level, being safety critical, is where the control of the aircraft is such that the safe outcome of the manoeuvre or procedure is in doubt and the examiner has to take control (physically or by direction).

Examples of safety-critical failure items include, **but are not limited to:**

- failure to complete checklist items mandated by the AFM
- failure to correctly prepare the aircraft for flight
- failure to comply with ATC clearances and airspace requirements
- failure to operate the aircraft within the limitations of the AFM
- failure to maintain required flight visibility and cloud separation during a visual segment
- failure to maintain required terrain clearance
- failure to comply with minimum descent altitudes
- failure to maintain minimum traffic separation standards
- failure to comply with the hand-over/take-over technique (not applicable to single pilot authorisations)
- failure to safely and consistently apply the elements of NTS1 and NTS2.

If the error is safety critical and the examiner needs to take control or intervene, the flight test must be terminated immediately. Some credits may be given for test items already assessed that are not associated with or relevant to the safety-critical event.

Non safety-critical items

The second level is where the control of the aircraft is such that the safe outcome of the manoeuvre or procedure is certain, but the flight tolerances have been exceeded or the technique is unsatisfactory. Under these circumstances the flight test may be continued, and credits given for successfully completed test items.

The examiner has the discretion to enable the applicant to demonstrate NTS2 TEM to avoid the situation where the error becomes safety critical.

Credits are only valid for one retest.

20.5 Complete (post flight)

20.5.1 Debriefings

The examiner must debrief the applicant and the training provider as soon as practicable after the conclusion of the flight component.

In the event of a fail assessment, in addition to the verbal debriefing, the examiner should ensure sufficient detail is entered into the applicant's training records to allow the training provider to construct a remedial training program. CASR 61.385 implications should also be discussed with the applicant.

20.5.2 Flight test administration

At the conclusion of the flight test, the examiner must:

- within 14 days after the day of the test, complete the flight test report and provide a copy of the report to the applicant, training provider and CASA
- within 14 days after the day of the test, complete the flight test management system notification requirements.

All items on the test form must be marked to indicate the assessment, with either ✓ (pass), X (fail), N (not tested) or TR (training records).

Licence entries made by the examiner (if applicable) must be in accordance with the Flight Crew Licensing Manual.