Survey Engineer Grade I

S20 and S22

The following should be read and used in conjunction with the information pack 'Competence Assurance & Assessment: Introduction for Experienced Freelance Personnel'.

Evidence Required

Competence appraisal:
- at Survey Engineer Grade I level

Work records:
- copy of one safety related document such as, risk assessment form, toolbox talk sheet or safety briefing which clearly shows that the candidates was involved in the process
- copy of fault report survey sensor calibration results/ check sheets completed by the candidate
- copy of equipment shipping manifest prepared by candidate for transit to or from worksite

Witness testimonies:
- one example of the candidate maintaining a safe working environment for self and others
- one example of candidate's involvement in a survey mobilisation/demobilisation and their ongoing maintenance and fault-finding skills
- one example of the candidate operating survey sensors

Essential knowledge:
- written answers to Survey Engineer Grade I questions

Curriculum Vitae
- Detailing offshore trips, work scope, clients, regions etc.

IMCA Framework Requirements

The competence assurance and assessment framework developed by IMCA (the International Marine Contractors Association) sets out a number of elements for each safety-critical position. The following table shows how competence can be demonstrated against each element.

Code	Demonstration	Covered by
S/S20/000/01 **Safety**	Ability to adhere to offshore safety standards and maintain a safe working environment	CA(a), WT, Q4
	Ability to follow company safety procedures	CA(a), WT, Q5
	Ability to participate in risk assessment process	WTR, Q6
	Ability to recognise hazards in the work place	CA(a), Q2,7
	Demonstrate a knowledge of how to react to safety critical situations and what immediate action can be taken to minimise/eliminate then	CA(a), WT
S/S20/000/02 **Emergency Procedures**	Ability to recognise a potential or actual emergency situation and report it appropriately	WT, CA(a), WT, Q1,4, 5
S/S20/000/03 **Behavioural Factors**	Ability to give and receive handovers at start and end of shift	CA(b), Q6
	Ability to use concise logbooks and records	CA(b)R
	Ability to use concise and unambiguous writing skills and the ability to handle written language effectively	R,CA(b)
	Ability to communicate effectively with marine crew using correct descriptive terms for direction, vessel locations and relevant seamanship terms	CA(b), Q8
S/S20/000/05 **Seamanship**	Demonstrate knowledge of practical seamanship and basic rigging skills	CA(e), Q23
	Demonstrate knowledge of how weather conditions affect ship handling and its impact on the safe handling of survey systems	CA(e), Q3
S/S22/000/06 **Software**	Ability to install computer systems to the offshore worksite	CA(c), (d) WT
	Ability to diagnose software faults and rectify them	CA(c), WTd)
	Demonstrate knowledge of interfacing protocols and limitations	CA(c), WTd)
S/S22/000/07	Ability to install, test and commission survey online and offline systems	CA(d), WT,

Code	Demonstration	Covered by
Survey System Preparation		Q11,12,16,17
	Ability to create waypoints and targets	CA(d)
	Ability to use test and measurement equipment Ability to create survey lines/run lines/sail lines	CA(d), WT
	Ability to prepare survey equipment for transit	R, WT
S/S21/000/07 **Data Acquisition**	Ability to configure system to monitor data quality	WT, CA(h)
	Ability to interface survey sensors	CA(d), WT, Q9CA(h), Q10
	Ability to secure survey systems for sea operations	WT, CA(d), WTh)
	Ability to correctly pack survey systems for safe and cost effective demobilisation	CA(f), WTh)
S/S22/000/08 **Survey Systems Operations**	Ability to operate survey and ancillary equipment	CA(e), WT, Q18,19
	Ability to verify logging and recording system outputs	WT, CA(h)
	Ability to identify high voltage hazards to self and others associated with maintenance and operation of survey equipment	WT, CA(e), WTh), Q12
S/S22/000/09 **Equipment Maintenance**	Ability to perform maintenance of survey systems within constraints imposed by operating environment	CA(c), (d), WT
	Ability to diagnose faults with the survey system and rectify them or report to onshore management for further assistance	CA(f), WT, Q9,10
	Ability to document and label faulty equipment and components	CA(f)
S/S22/000/10 **Administrative Skills**	Ability to complete fault reports	R, Q20
	Demonstrate understanding of calibration requirements and procedures	CA(e)
S/S21/000/08 **Data Management**	Ability to create and maintain clear and concise survey logbook and records	R
S/S21/000/10 **Hydrography/ Oceanography**	Demonstrate knowledge of the effect of tidal and water column parameters on survey sensors	Q18, 20
	Demonstrate knowledge of sound propagation and factors affecting its application to survey observations	Q17
	Ability to complete shipping manifests for survey equipment	RQ19
S/S21/000/11 **Navigation and Positioning**	Ability to power up and configure the navigation system and check data transmission is operational	CA(f)
	Ability to define vessel co-ordinate system and determine 3D offsets for all positioning and ancillary sensors	CA(e)
	Ability to enter offset data into survey system, ensuring sign convention adherence	CA(e)
	Demonstrate understanding of calibration requirements and assist with calibration planning	R, CA(e)
	Ability to perform required survey sensor calibrations	R, CA(e)
	Ability to perform acoustic positioning system calibrations	CA(g), Q13
	Ability to apply calibration corrections to positioning systems ensuring adherence to sign conventions	CA(e)
S/S21/000/12 **Co-ordinate Reference Systems**	Demonstrate knowledge of common datum definitions applicable to the local work area	
	Ability to check that datum transformation parameters have been correctly applied	Q12

Q Question (written answer required) CA Competence Appraisal Form

R Record of work; document or product WT Witness Testimony

Sample Achievement Record

Candidate name: .....

First assessor name: .....

	Assessment Decision	Approval of Internal Verifier/ Competence Focal Point
Safety		
Emergency Procedures		
Behavioural Factors		
Seamanship		
Software		
Survey System Preparation		
Survey System Operations		
Equipment Maintenance		
Administrative Skills		

Comments:

First assessor signature: ..... Date: .....

Verifier signature: ..... Date: .....

Sample Competence Appraisal

The appraiser must have observed the appraisee completing the task before completing the relevant section. Where necessary a number of different appraisers may be used to complete the form fully.

Appraisee name: .....

Task	**Feedback to Appraisee**	**Appraiser** *(Print name, sign and date)*
a) Demonstrate safety and emergency awareness, familiarisation with worksite and ability to identify hazards. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		
b) Maintain effective teamwork and communication. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		
c) Install and maintain computer systems and technical software packages, diagnose faults and rectify. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		
d) Install, interface and maintain survey sensors. Understand calibration techniques and offset requirements. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		
e) Operate ancillary survey equipment, including safe launch and recovery of sensors and rigging skills. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		
f) Complete maintenance logs, fault reports, correctly label faulty equipment and prepare for transit. Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐		

Projects **Indicate which Projects you have participated in during the last 12 months. Specify Project Workscope**		
Projects Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐	N.B. Feedback should be based on projects ticked above	
Hardware/Software **Indicate which Hardware/Software you have used during the last 12 months**		
Hardware/Software Performance is exceptional ☐ Performance is competent and dependable ☐ Additional skills or experience required ☐	N.B. Feedback should be based on software / hardware detailedabove	

Appraisee comments:

Appraisee signature: ..... Date: .....

Essential Knowledge – Sample Questionnaire

1 What is the definition of 'near miss' incident?

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2 List the most important hazards encountered when working offshore and the benefits of toolbox talks.

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3 What is the difference between sea, swell and current and explain their effect on the deployed ROV/towed vehicle bearing in mind the safe working limits for the launch of ROV/towed system?

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4 For your worksite describe in detail how any safety incidents are reported.

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5 What is the difference between sea, swell and current and explain their effect on the deployed towed survey sensor bearing in mind the safe working limits for the launch of towed survey sensors?

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6 For your worksite describe in detail how any safety incidents are reported.

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7 Where can you find the company emergency procedure documents for your worksite?

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8 What is the TRA (task risk assessment) process and how does it apply to typical tasks carried out in your work environment?

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9 Explain the hazards of working on masts and the various ways of working safely at heights.

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10 Explain the importance of good communications.

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11 If one or more of the sensors fails to be read by the navigation system how would you go about assessing where the problem lay and what are the most common reasons for data not reaching the navigation system in a readable format?

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12 What could be the effect on the number of satellites received when working alongside a platform or rig and what could be the outcome if the vessel was using DGPS as a reference for its DP system?

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13 List any mobilisation operations that may require the use of a permit to work system or direct permission from bridge crew or vessel master. List any additional PPE that would be required in this instance.

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14 When installing navigational antennae and cabling, what are the main hazards to avoid to ensure there is no future damage to the cable, that the antennae are able to receive the strongest signal and that there is no danger to personnel?

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15 What are the advantages of having tidy and clearly labelled cabling between sensors and the relevant operating systems?

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16 What is the difference between EHF and MF acoustic systems and explain in what circumstances you would use either one?

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17 What would be the outcome of using or interrogating a beacon code that is being used by another vessel, in the same area, for DP purposes?

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18 What is the effect of a faulty antenna earth connection on the HF diff signal?

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19 What would be the indications that the USBL system was not calibrated and describe methods of determining which currently applied correction may be wrong?

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20 When installing radio transmitting equipment such as telemetry, VHF radios, etc., explain why it is essential that the antenna system is connected before applying power.

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21 List three important criteria to be observed when choosing a suitable location for charging transponders.

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22 What effect would the height of the towed fish have on the records in respect of range and determining the height of features?

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23 Describe the effects of varying vessel speed on the behaviour of the towfish

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24 How should you approach a major problem in terms of reporting the fault, finding technical information, seeking additional help and reporting to supervisors and clients?

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25 In order to preserve the integrity of subsea cables, what should be avoided when routing/handling subsea cables?

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26 Why can dismantling transponders which have failed during operations be very dangerous?

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27 What type of knot would you use to temporarily join two pieces of rope together?

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