PART 1.4

Analysis and Findings

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PART 1.4 – ANALYSIS AND FINDINGS

All times local (GMT – ZULU).

OVERVIEW

1.4.1. At approximately 21:35 on 21 January 2020, a Recruit Troop (Tp) from the Commando Training Centre Royal Marines (CTCRM) was involved in an accident whilst disembarking from a Landing Craft Vehicle and Personnel (LCVP) Mk 5B, provided by 47 Commando (Raiding Group) Royal Marines (47 Cdo (RG) RM), during a night beach landing on Tregantle Beach, Cornwall as part of Exercise (Ex) FINAL THRUST. LCVP 0338, accompanied by LCVP 0354, left Weston Mill Jetty, Her Majesty's Naval Base (HMNB) Devonport to sail to Tregantle Beach (a distance of approximately 11 Nautical Miles (NM)).

1.4.2. The LCVPs were each crewed by a coxswain from Boat Tp, 10 Training Squadron (10 Trg Sqn), part of 47 Cdo (RG) RM and three students attending the Landing Craftsman Two (LC2) Course delivered by 10 Trg Sqn. Having arrived at the sea-based final rendezvous point (FRV), approximately 1 NM from the beach, 282 Tp were ordered to remove their Assault Troop Life Jackets (ATLJs). LCVP 0338 touched the seabed at the beach and, once the craft's ramp had been lowered into the water, the troops began to disembark off the port side (left-hand side) of the ramp.

1.4.3. During the disembarkation the depth of water increased from approximately 0.77 m and the last 8 of the 26 individuals to leave the craft found themselves in water above their heads (>1.85 m). Three recruits were recovered from the water to the craft, including Recruit Ethan Jones, who was unconscious and unresponsive. First aid was given on the craft initially by the crew, some members of 282 Tp Training Team (Trg Team), a Royal Navy (RN) Medic and then the South West (SW) Ambulance Service paramedics. Recruit Jones was transferred to the beach and then transported by air to Derriford Hospital, Plymouth where he was subsequently pronounced dead on 24 January 2020.

1.4.4. This part of the report will address the following areas:

a. Analysis of the accident.

b. Analysis of factors using the Safe System of Training (SST) methodology.

c. Analysis of organisational influences.

1.4.5. The Service Inquiry Panel (the Panel) has drawn conclusions and made recommendations throughout the report and a summary of Accident Factors is included at the end of Part 1.4 and a summary of Recommendations is in Part 1.5.

1.4.6. Safety related incidents were recorded on the Navy Lessons and Information Management System (NLIMS) that was developed to record and enable learning from safety (encompassing occupational health) and environmental

incidents across the Navy Command. The Panel[1] accessed NLIMS on 26 March 2020 and found no similar incidents.

METHODOLOGY

Accident Factors

1.4.7. **Accident factors.** Once an accident factor had been determined to have been present it was then assigned to one the following categories:

a. **Causal factor/s.** Causal factors are those factors which, in isolation or in combination with other causal factors and contextual details, led directly to the accident. Therefore, if a causal factor was removed from the accident sequence, the accident would not have occurred.

b. **Contributory factor/s.** Contributory factors are those factors which made the accident more likely to happen. That is, they did not directly cause the accident. Therefore, if a contributory factor was removed from the accident sequence, the accident may still have occurred.

c. **Aggravating factor/s.** Aggravating factors are those factors which made the final outcome of the accident worse. However, aggravating factors do not cause or contribute to the accident. That is, in the absence of the aggravating factor, the accident would still have occurred.

d. **Other factor/s.** Other factors are those factors which, whilst shown to have been present played no part in the accident in question but are noteworthy in that they could contribute to or cause a future accident. Typically, other factors would provide the basis for additional recommendations or observations.

e. **Observations.** Observations are points or issues identified during the investigation that are worthy of note to improve working practices, but which do not relate to the accident being investigated and which could not contribute to or cause future accidents.

Probabilistic Language

1.4.8. The probabilistic terminology detailed below clarifies the terms used in this report to communicate levels of uncertainty within the report. It is based on terms published by the Intergovernmental Panel on Climate Change (IPCC) in their Guidance Note for Consistent Treatment of Uncertainties[2] as well as the Australian Transport Safety Bureau (ATSB) in their paper on Analysis, Causality and Proof in Safety Investigations[3]. Figure 1.4.1 shows a visual representation of the probabilistic language used.

[1] Panel Member 2 was granted access to NLIMS in March 2020.
[2] https://pure.mpg.de/rest/items/item_2147184/component/file_2147185/content
[3] https://www.atsb.gov.au/media/27767/ar2007053.pdf

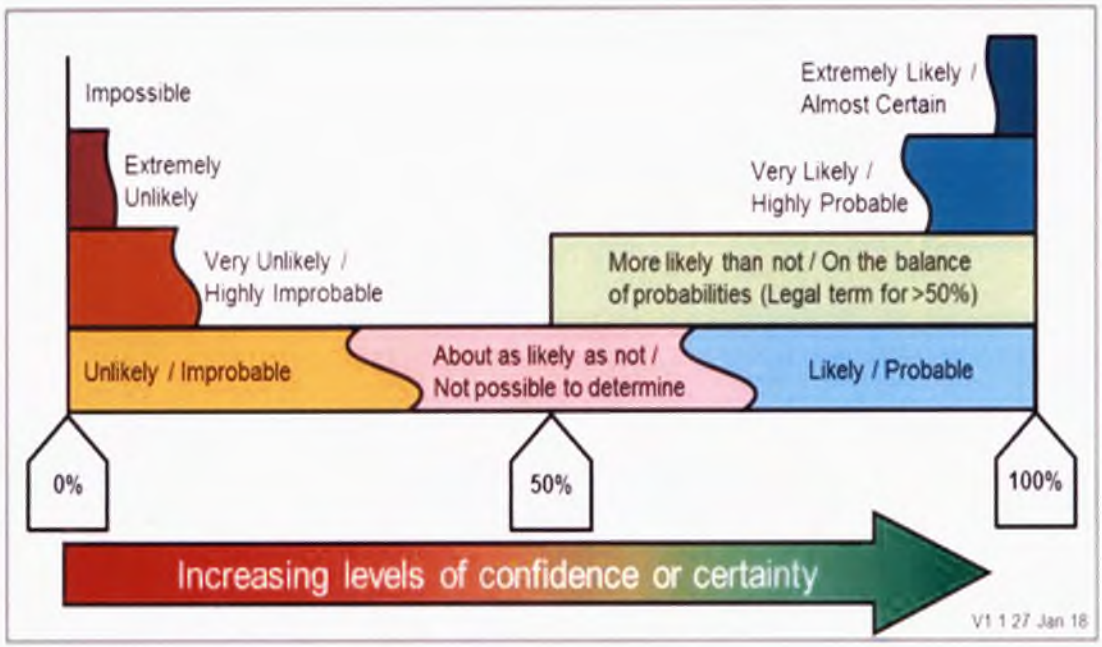

Figure 1.4.1 – Probabilistic Terminology.

Definition of 'Should'

1.4.9. Throughout the report the Panel has made a series of recommendations. The Panel has used the term 'should' within the recommendations using the definition contained within DSA03 Movement and Transport Safety Regulations – Defence Codes of Practice: Exhibit 012

> **'Should'** 'If the advice is followed then this will be considered sufficient to demonstrate compliance with a regulation. However, alternative approaches may be utilised where this produces an outcome as good as required by the regulation.'

Analytical Methodology

1.4.10. The Panel used the Safe System of Training (SST) to analyse the findings of this Service Inquiry. The SST is derived from the Health and Safety Executive Safe System of Work (SSoW) and is based upon four fundamental principles, that training is supported at all times by: Safe Place, Safe Equipment, Safe Persons and Safe Practice. By using this framework, the Panel was able to assess the effectiveness of these four principles and the factors that led to the accident and this report is organised to make findings on Safe Place, Safe Equipment, Safe Persons and Safe Practice in that order. Each 'Safe' element will be defined prior to being discussed. In addition to the SST, the Panel have added a fifth element to the analysis of this report, Organisation. The Panel used this fifth element to assess whether any organisational behaviours influenced the outcome of this accident.

Human Factors (HF) Considerations

1.4.11. A psychologist and an ergonomist from the Institute of Naval Medicine (INM) provided HF specialist support to the SI. This included participation in witness interviews and advice to the Panel throughout the investigation. A separate HF report was produced, which has been considered in the analysis of events.

Services Engaged

1.4.12. The Panel was assisted by the following personnel and agencies:

a. The Defence Accident Investigation Branch (DAIB).

b. The Royal Navy.

c. The Institute of Naval Medicine (part of the Royal Navy).

d. The Corps of Royal Marines (part of the Royal Navy).

e. The Queen's Harbourmaster (Plymouth).

f. The Defence Infrastructure Organisation (DIO).

g. Devon and Cornwall Police (D and C Police).

h. Devon and Cornwall Emergency Response.

i. Her Majesty's Coastguard (Newquay Helicopter).

j. South West Ambulance Service Trust (SWAST).

k. The Health and Safety Executive (HSE).

l. The United Kindom Hydrographic Office (UKHO).

m. The Meteorological Office (Met Office).

n. Defence Equipment and Support (DE&S).

Available Evidence

1.4.13. The Panel had access to the following evidence:

a. The DAIB Triage Report.

b. Evidence released to the SI Panel by D and C Police.

c. Formal written witness statements.

d. Witness statements from Panel interviews conducted with personnel at the scene and others in CTCRM and 47 Cdo (RG) RM.

e. Training documentation from CTCRM and 47 Cdo (RG) RM.

f. Personal Duty Holding Letters of Authority for Comdt CTCRM and CO 47 Cdo (RG) RM.

g. Key Ministry of Defence (MOD), RN and Army documentation.

h. Relevant Standing Orders.

i. Relevant Unit Standard Operating Procedures (SOPs).

j. Training data and Individual Course Reports.

k. LCVP Engineering Data from 47 Cdo (RG) RM.

l. HF Report provided by the Human Factors Group at INM.

m. ATLJ Buoyancy Trial Report provided by the INM.

n. Cold Water Shock (CWS) Report provided by the INM.

o. Beach Reconnaissance Reports for Tregantle Beach from the UK HO.

p. Environmental weather data from the Met Office.

q. Emergency (999) call audio recordings and transcriptions from the SWAST.

r. Log from the Maritime Coastguard Agency helicopter (based at Newquay).

s. Beach reconnaissance analysis provided by 47 Cdo (RG) RM.

t. The DAIB Technical Report on LCVP 0338.

u. The content of the Tactical Aide Memoire orders format of the 282 Tp Comd.

LAW AND POLICY

Health and Safety at Work etc. Act 1974

1.4.14. The primary piece of Health and Safety legislation in the UK was the Health and Safety at Work etc. Act 1974. The Ministry of Defence (MOD) was required to comply with all provisions of this piece of legislation unless a specific exemption was granted by the Secretary of State (SofS). The Act broadly stated that all workers had a general duty to ensure, so far as is reasonably practicable, the health, safety and welfare at work of their employees. It also stated that

Exhibit 112

employees had a responsibility to take reasonable care of their own and other people's health and safety.

1.4.15. The Health and Safety Executive (HSE) was the body responsible for regulating and enforcing Health and Safety legislation. They provided advice and guidance on how to manage Health and Safety in the workplace in their Guidance Leaflet 65 (HSG65). The guidance highlighted the use of a Plan, Do, Check, Act cycle (see Figure 1.4.2).

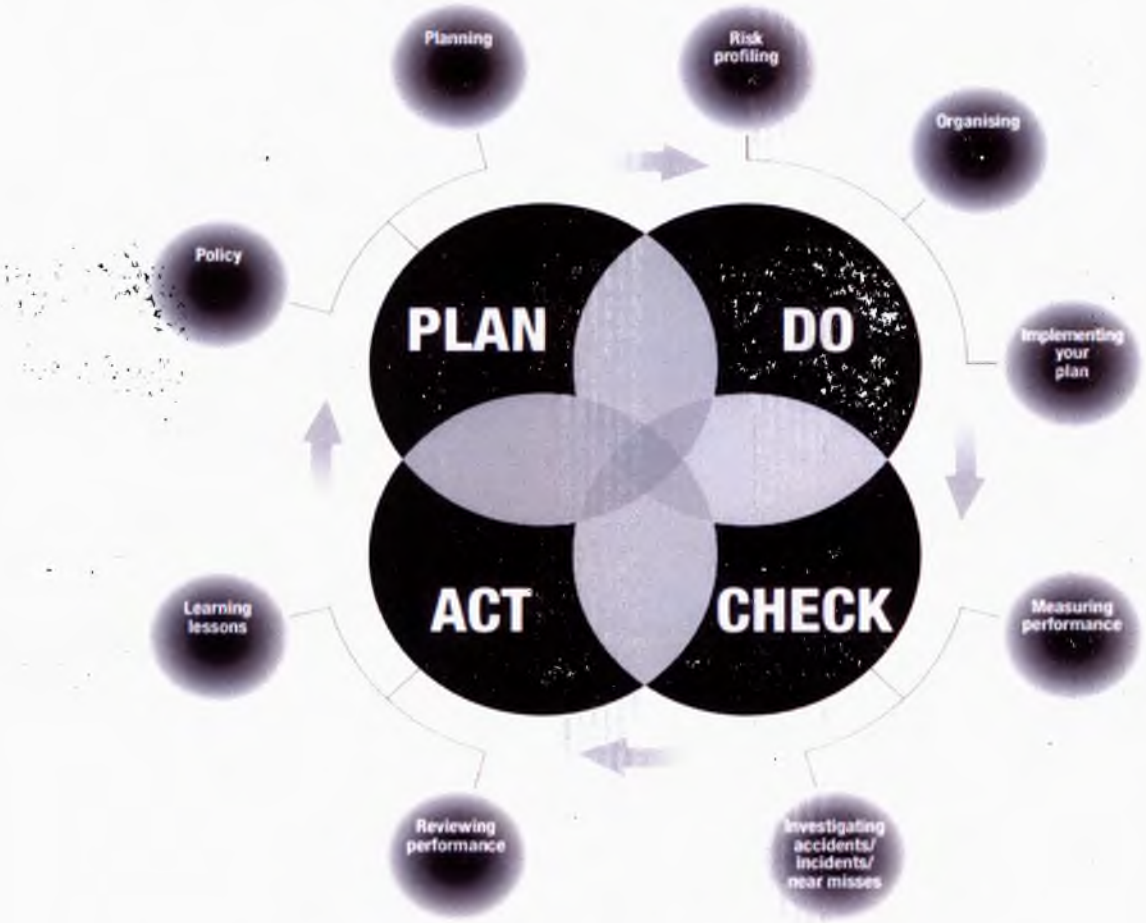

Figure 1.4.2 – HSE Plan, Do, Check, Act cycle.

Defence Safety Authority (DSA) Policy

1.4.16. **DSA01.1.** The DSA was the Defence Authority for Health, Safety and Environmental Protection (HSEP). One of the DSA's responsibilities was the regulation and enforcement of internal HSEP regulations, known as Defence regulations, within Defence. DSA01.1 Defence Policy for HSEP highlighted the Secretary of State's Policy Statement for HSEP and described: Exhibit 012

a. The HSEP legislative framework that applied to Defence and how this was addressed by Defence policy.

b. The responsibilities for the management of HSEP across Defence.

c. The requirements and arrangements for managing HSEP risk in Defence.

d. The requirements for checking and reporting HSEP performance.

e. The requirements for ensuring competence and providing information, training and instruction.

f. The arrangements for regulation, assurance and enforcement of HSEP in Defence activities.

1.4.17. **DSA01.2.** DSA01.2 (Implementation of Defence Policy for HSEP) defined the specific legal and policy requirements and individual Defence Regulators detailed acceptable means of compliance and offered further guidance material as appropriate. Exhibit 013

Publications

Joint Service Publications (JSPs) 822 – Defence Direction and Guidance for Training and Education

1.4.18. JSP 822 was the authoritative policy that directed and guided Defence training and education. The Defence Systems Approach to Training (DSAT) was the system that had to be used by those who were involved in the analysis, design, delivery, assurance, management and governance of Defence training and education. JSP 822 was divided into two parts: Part 1 detailed the mandated policy that had to be followed whilst Part 2 contained the guidance material to assist in compliance with Part 1. Exhibit 014 Pt1, Pt2

1.4.19. JSP 822 stated that DSAT was designed to generate a Training System that allowed trainers to deliver appropriate, effective, efficient, accountable, safe and risk-focussed training to trainees. When new or modified equipment, technology, tactics, techniques or procedures were developed, or when new or amended policy or legislation was brought in, the requirement for new or modified training had to be examined. Where training was required, DSAT provided a tool to deliver training that met the needs of the Training Requirements Authority (TRA) as well as the DSAT Quality Management Standard (QMS) mandated by Defence and consisted of four elements: Analysis, Design, Delivery and Assurance.

1.4.20. Course documentation, specifically the Learning Specification (LSPEC), Assessment Specification (ASPEC) and Assessment Strategy (AStrat), was the trainer's crucial link to the DSAT process. It provided the authority to deliver standardised training and formed the basis for the production of course programmes, lesson plans and assessments (see Table 1.4.1).

DSAT Management of the Training System JSP 822	
Documentation	**Description**
Training Objective (TO)	TOs ensured that the training activity had a definite focus linked to a Defence need. They helped to ensure that the associated trainers, support staff and trainees, had a clear understanding of what the trainees were required to learn, and able to do at the end of the learning event.
Instructional Specification (ISPEC)	ISPECs were used to identify learning outcomes and were linked to specific Key Learning Points (KLPs).
Learning Specification (LSPEC)	LSPECs contained the information the trainer needs to deliver training, including the structure and sequence of training. The main purpose of the LSPEC was to control what was taught and how it was taught. The trainer should have taught all of the KLPs as specified in the LSPEC.
Assessment Strategy (AStrat)	AStrat articulated the summative and formative the 'how', 'when' and 'in what manner', training was to be assessed, which generated an ASPEC which contained the detail.
Assessment Specification (ASPEC)	ASPECs gave guidance on the assessment of enabling objective(s), ASPECs generated lessons or event plans and assessments suitable to the training environment.

Table 1.4.1 – DSAT Management of the Training System JSP 822.

1.4.21. JSP 822 defined methods of training delivery as Collective Training and Individual Training. Collective Training was that training which was delivered to improve a Team's ability and function as a cohesive entity. Individual Training was delivered to individuals to improve their knowledge, skills and attitudes. JSP 822 mandated that trainers were to comply with the Defence Trainer Competency Framework (DTCF). This framework detailed the qualifications that had to be held by trainers and instructors at the differing levels of delivery within Defence. Additionally, JSP 822 mandated that training delivery should be properly programmed, planned and that training deficiencies should be managed appropriately. Management of the training system and assurance is shown at Figure 1.4.3.

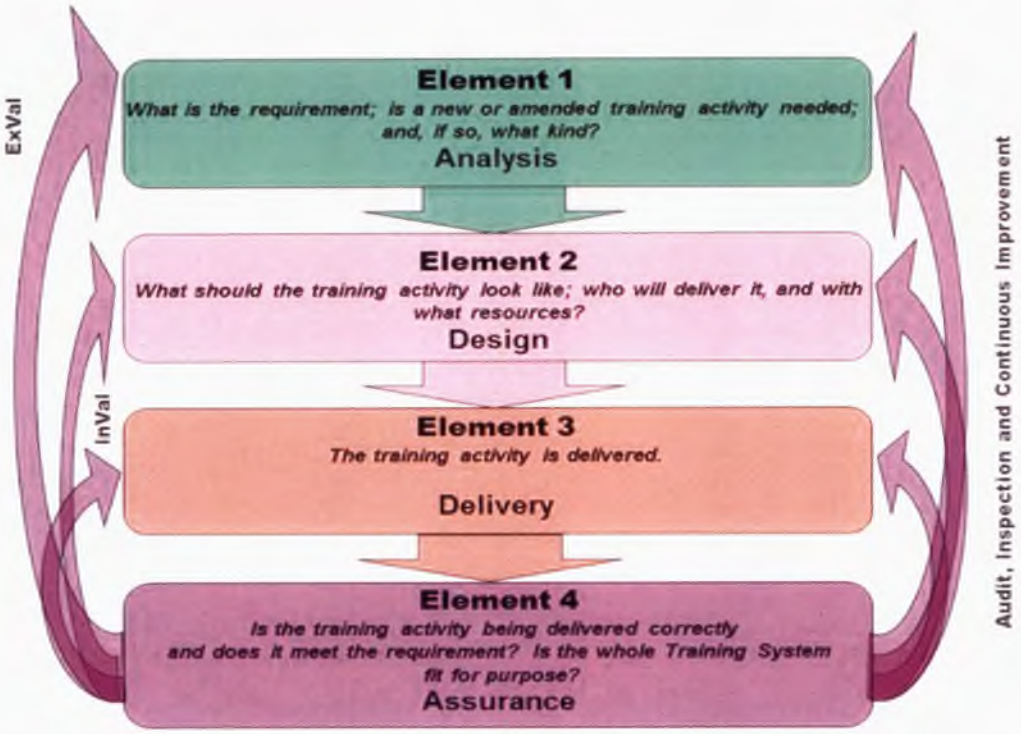

Figure 1.4.3 – Management of the Training System and Assurance.

1.4.22. JSP 822 mandated that assurance activity was conducted for all training activity. Mandated assurance comprised of an Evaluation Strategy including Internal and External Validation, 1st Party Audit and Inspection (A and I)[4], 2nd Party A and I[5] and 3rd Party A and I[6]. It also mandated that the DSAT process should be iterative and that the assurance activity should take place regularly and as part of all elements. Two key assurance activities were Internal Validation and External Validation. Other assurance activity that assured the whole of the Training System was also required.

JSP 375 – Management of Health and Safety in Defence

1.4.23. JSP 375 was the lead MOD Departmental publication for health and safety. This was the corporate publication that provided rules and guidance to Defence in meeting its health and safety obligations. It comprised two parts: Part 1 was the directive that had to be followed in accordance with Statute or Policy mandated by Defence for the management of health and safety. Part 2 provided guidance on specific areas of health and safety in accordance with the policy stated in Part 1. It provided policy-compliant business practices which were to be considered best practice in the absence of any contradicting instruction. Exhibit 015

[4] 1st Party A and I activities were conducted for internal purposes to assure the Commanding Officer that the training activities conducted were being undertaken in accordance with the DSAT QMS elements of JSP 822 and that any improvements identified were implemented (conducted for phase 1,2 and 3 training).
[5] 2nd Party A and I was conducted by an external body but still within Defence. 2nd Party A and I provided higher level assurance to stakeholders that Training Providers were complying with the DSAT QMS (conducted for phase 1,2 and 3 training).
[6] 3rd Party A and I was only conducted for phase 1 and 2 training and was often conducted by the Office for Standards in Education.

JSP 418 – Management of Environmental Protection in Defence

1.4.24. JSP 418 was aligned with JSP 375 and was the corporate publication that provided guidance to the MOD in meeting its Environmental Protection Policy and Regulatory obligations. JSP 418 consisted of two parts and aligned with the structure of JSP 375. The Panel reviewed the requirements of JSP 418 and the activities that were being conducted at the time of the accident. Exhibit 016

Book of Reference digital 10 (BRd10) – Navy Command Safety and Environmental Management System

1.4.25. BRd10 described the Navy Command's Safety and Environmental Management System (SEMS), which was the enduring HSEP system and how to meet this requirement by directing: how Navy Command ensured it complied with legislation, regulation and policy; how to assure good practice, compliance and continuous improvement; and operate beyond minimum compliance to exploit HSEP resilience as a direct enabler to naval capability. The Safety and Environmental Management Plan (SEMP) regarding Commandant General Royal Marines' (CGRM) activity (Chapter 22) had not been issued at the time of the accident. Exhibit 017

1.4.26. BRd10 described a hierarchy of Accountable Persons (APs) who were charged with ensuring that effective HSEP related plans, orders and processes existed within their area of responsibility. Critically, those arrangements must have carefully matched HSEP requirements to specific operating or operational conditions so that there was a good fit between what should have been done and what was done in the workplace every day.

1.4.27. The overarching aim of BRd10 was to underpin the 1st Sea Lord's safety pledge[7], environmental protection statement and safety vision: the delivery of an operationally successful, full-spectrum naval capability without unnecessary harm to people, equipment or the environment. It applied to all areas of Navy Command. It did not dispense with the need to comply with the law, Queen's Regulations or HSEP regulation and policy issued by the DSA (see Figure 1.4.4).

[7] 'As First Sea Lord, I am committed to my moral and legal responsibility to provide a working environment that is safe to train and operate within.' Maritime Safety Strategy 2018-2020 – 'Safe to Fight'

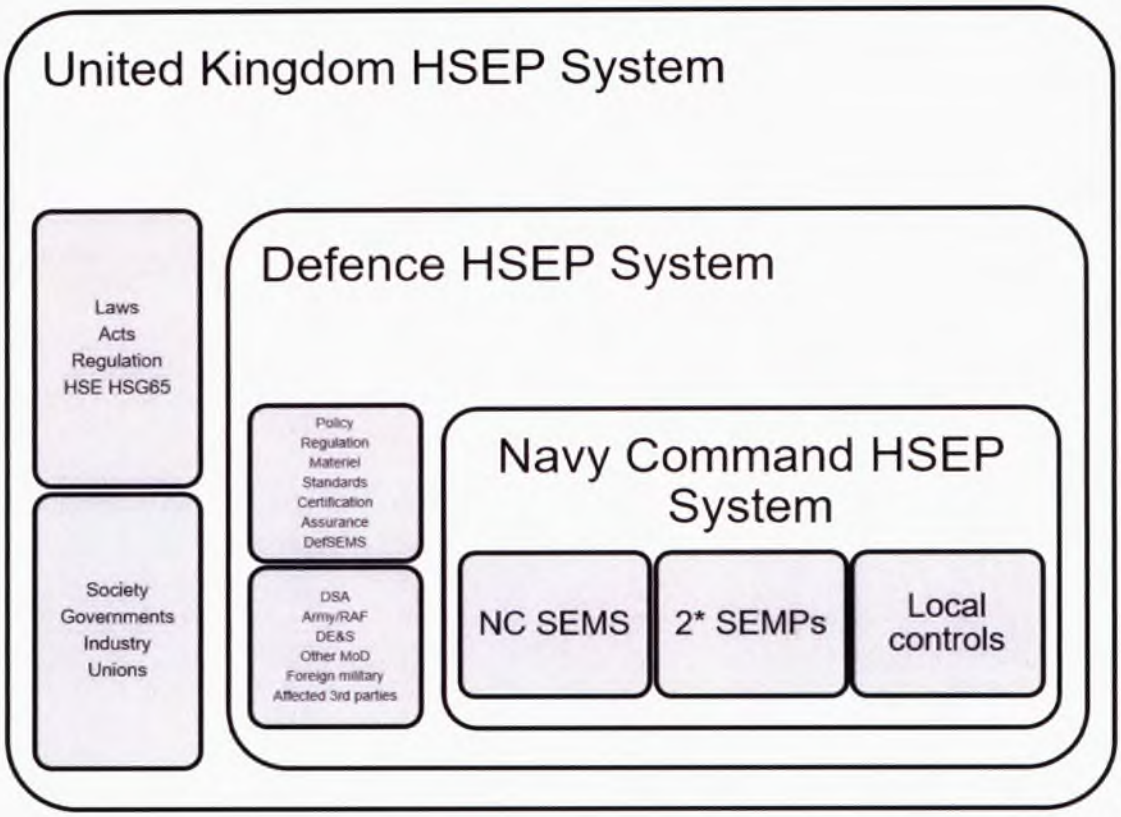

Figure 1.4.4 – United Kingdom HSEP System from a Navy Perspective[8].

BRd6600 – Royal Marines Landing Craft and Small Craft Operations Vol 1

1.4.28. BRd6600 was the foundation for Landing Craft operations and established a set of Standard Operating Procedures (SOPs) for units and detachments. It set out the definitions, general operating instructions, policy and safety information for the Landing Craft Specialisation and importantly, for this inquiry, the operating procedures for the LCVP Mk5B. Exhibit 002

BR7943 – LCVP Mk5 (Batch 2) Principal Vessel Publication

1.4.29. BR7943 was the Principal Vessel Publication for the LCVP Mk5B and set out the technical data for the craft. Exhibit 021

Pamphlet 21 – Close Combat – Ranges Pamphlet 21 Training Regulations for Armoured Fighting Vehicles, Infantry Weapon Systems and Pyrotechnics (PAM 21)

1.4.30. PAM 21 covered the planning, conduct and supervision of training with Infantry Weapon System (Inf WS), Armoured Fighting Vehicle (AFV) and pyrotechnics. The application of the regulations was mandatory; they were Exhibit 018

[8] Extracted from Brd10 Nov 2018 V1.

approved best practice, enabling realistic and demanding training whilst ensuring that risks are reduced to As Low As Reasonably Practicable[9] (ALARP).

1.4.31. PAM 21 was structured to follow the progression of training associated with Inf WS and AFV. It explained the SST, rules for awarding qualifications to plan, conduct and supervise all live and blank firing with Inf WS and AFV.

Army Code 71717 (AC 71717 (Jun 17)) – Close Combat Survivability Fieldcraft, Battle Lessons and Exercises

1.4.32. AC 71717 explained the criteria required to teach infantry tactics and fieldcraft. Skill at Arms (SAA) Instructors were taught how to deliver lessons on a qualifying course and had an understanding of those basic instructional techniques required to deliver SAA training. However, it was rare that a squad of soldiers would all have the same learning style and therefore essential that the instructor had the skills and experience to be able to adapt his instructional methods to cater for the needs of those being trained. The guiding principle was that all subject matter must be delivered regardless of the level of experience and/or previous knowledge of the student. There was latitude in the methods which can be employed by the instructor to deliver this matter, but ultimately the lesson must deliver and practice the students on the detail contained within the lesson in accordance with the LSPEC for that lesson. Instructors were not permitted to omit detail or adapt drills to save time. Instructors should have always consulted the chain of command (CoC) if there is any doubt as to what was required. Exhibit 019

Army Code 71850 Apr 17 – Operational Shooting Policy (OSP)

1.4.33. The purpose of the OSP was to detail a progressive regime of shoots designed to introduce novice firers to shooting, to build their confidence and skills for likely operational tasks. It also provided means to assess whether minimum standards were being achieved in order to allow the individual firer and the CoC to take appropriate action. Exhibit 020

1.4.34. The OSP stated that exercising troops were to be sufficiently trained to cope with the demands of the exercise. They were to be trained and tested to ensure competency on all weapons and pyrotechnics they would use during such training. Training was to be carried out by an appropriately qualified instructor and was to be recorded in order to ensure that progression of training was achieved. Exhibit 020

[9] ALARP – 'As Low As Reasonably Practicable – Reasonably practicable involves weighing a risk against the trouble, time and money needed to control it. When these are judged to exceed any further control of the risk, then ALARP has been achieved' ACSO 3216.
'Reasonably practicable' is a narrower term than 'physically possible' ... a computation must be made by the owner in which the quantum of risk is placed on one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money, time or trouble) is placed in the other, and that, if it be shown that there is a gross disproportion between them – the risk being insignificant in relation to the sacrifice – the defendants discharge the onus on them.' Court of Appeal (Edwards v. National Coal Board, 1949).

ORGANISATION

Duty of Care

1.4.35. Duty of Care (DoC) was a common law legal concept, that formed part of the tort of Negligence. The DoC required individuals to ensure that they and others did not suffer any unnecessary and foreseeable harm. The duty existed in many relationships, and in particular between an employer and employee, and from one employee to another. In addition to the common law DoC, in respect of health and safety legislation, statute also provided additional 'duties' that were owed by specific individuals (eg the employer, a person who had control over premises, or the employee themselves). The Health and Safety at Work etc. Act 1974 specified 'General Duties' for, amongst others, the employer and the employee in order to ensure, so far as is reasonably practicable, the health, safety and welfare of employees and anyone else affected by the activity or who had access to those premises. More commonly, ALARP was used instead of 'so far as is reasonably practicable' and the HSE considered that the two terms meant essentially the same thing and, at their core, was the concept of 'reasonably practicable'. Exhibit 013

1.4.36. More was expected of commanders who directed and supervised activity to manage the risks that they created and/or were confronted by. This was done by understanding the risks, making a judgement on whether the risk (a potential adverse outcome) was worth the potential benefit and putting controls in place to reduce the risks to ALARP. The SST was a useful framework and would, in most cases, reduce the risk to ALARP and ensured DoC obligations were being met. The DoC model placed responsibility for Health and Safety at every level but highlighted the increased responsibility for those with management functions. Exhibit 013

Duty Holding

1.4.37. In 2009, following the loss of a Nimrod aircraft in Afghanistan, Sir Charles Haddon-Cave QC recommended the introduction of a three-tiered Duty Holding construct to clearly identify those with both the authority and legal responsibility with respect to the operation of military equipment. The Defence Safety Policy stated that: 'Duty Holders (DH) shall be suitably qualified for their appointment and complete all necessary training within three months of taking up post, to include successful completion of a DSA approved DH Course'. Exhibit 012

1.4.38. The fundamental elements of Duty Holding management arrangements were that there are three descending levels from the Senior Duty Holder (SDH), Operating Duty Holder (ODH) and Delivery Duty Holder (DDH) and that any Risk to Life (RtL) is mitigated to ALARP and a level that was tolerable. Where this was not possible the Duty Holding arrangements shall allow risk to be elevated to the next level of DH. Importantly, the SofS's Policy Statement made provision for the SDH ultimately to elevate risks to the SofS, who held the underlying legal responsibility. The Duty Holding construct relevant to Ex FINAL THRUST was: Exhibit 022 Exhibit 023

a. SDH: The 1st Sea Lord / Chief of the Naval Staff (Admiral).

b. ODH: Commandant General Royal Marines (Major General RM).

c. DDH: There were two DDHs for this activity:

(1) Comdt CTCRM, (Colonel RM) 'for the CTCRM activities' that included Ex FINAL THRUST.

(2) CO Cdo 47 (RG) RM, (Colonel RM) 'for the generation of RM Landing Craft capabilities that are safe to operate and are able to operate safely to deliver Defence outputs'.

1.4.39. MOD policy for Duty Holding required the appointment of DHs where it had been assessed that there was a credible and reasonably foreseeable RtL from a Defence activity. Where appointed, an MOD DH was accountable for mitigating the RtL to ALARP and to a level that was tolerable for those involved in the activity and anyone affected by it, including the public. Importantly, an MOD DH's legal responsibility for health and safety was no different to those of any person who had responsibilities for managing or directing the safety of their activities. However, MOD DHs could be held formally to account for their actions. A DH had to put in place arrangements that conformed to the MOD's requirements for Duty Holding.

Navy Command Headquarters (NCHQ)

1.4.40. NCHQ was based at Whale Island, Portsmouth. According to the NCHQ organisational page on the MOD Intranet, the purpose of NCHQ, as the higher echelon of NC, was to carry out three main tasks: Force Generation, Planning for the future and Advice, Assurance and Accountability.

The Navy Safety Centre (NSC)

1.4.41. According to the NSC organisational page on the MOD Intranet, the NSC was responsible for the management of Safety and Environmental Protection for the RN, providing safety policy and advice to all personnel. The NSC's mission was to 'Transform safety throughout the Naval Service by fostering resilient, yet simple, safety management that engages with our people to promote effective risk-based safety behaviours'.

Commandant General Royal Marines (CGRM)

1.4.42. According to the CGRM Home page on the MOD Intranet, as Head of Fighting Arm for the RM, CGRM was the 1st Sea Lord's amphibious adviser and subject matter expert (SME) in Defence, and the proponent for Commando Forces. He was charged with the leadership and management oversight of the moral, conceptual and physical components of the RM.

Commando Training Centre Royal Marines (CTCRM)

1.4.43. CTCRM was the principal training centre for the RM and was based at Lympstone in Devon. CTCRM was divided into three training wings: Command Wing, Commando Training Wing (CTW) and Specialist Wing, each with its own

Commanding Officer (CO). CTCRM selected and trained all RM Officers, recruits and reserves. CTCRM was unique in that it also provided all Non-Commissioned Officer command training and 70% of all RM specialists training.

47 Commando (Raiding Group) Royal Marines (47 Cdo (RG) RM)

1.4.44. 47 Cdo (RG) RM was the lead for Amphibious Warfare and RN Board and Search Training. The group was tasked with training, the force generation and force development of core amphibious and surface assault skills and equipment, including the provision of Operational Support for the embarked Assault Squadrons.

1.4.45. Headquarters 47 Cdo (RG) RM was located at RM Tamar within HMNB Devonport, Plymouth. The Group ensured that operational capability can be maximised through the availability and sustainability of the current surface manoeuvre and amphibious assault force elements. In supporting operations, 47 Cdo (RG) RM provided the specialist advice or augmentation teams required for operations or exercises anywhere in the world. The Group also had the ability to provide advice and deliver training to foreign nations on behalf of the Foreign and Commonwealth Office as detailed in Memorandums of Understanding between countries. Pertinent to this inquiry, four Dutch Marines were on the LC2 Course and formed part of the crews of the LCVPs involved in the accident. Exhibit 109

10 Training Squadron (10 Trg Sqn)

1.4.46. 10 Trg Sqn was a subordinate squadron of 47 Cdo (RG) RM, was located at RM Tamar within HMNB Devonport, Plymouth and provided amphibious assault and surface manoeuvre coxswain training to the RM across five different craft types. Its primary role was to provide training for the four LC specialisation vocational career courses. 10 Trg Sqn's mission 'was to support the generation of Surface Manoeuvre (Maritime) Capability through the delivery of LC vocational courses and amphibious planning and assault training in order to provide enhanced Littoral Manoeuvre capability within the RM and across the wider defence community'. 10 Trg Sqn's organisational structure is at Figure 1.4.5.

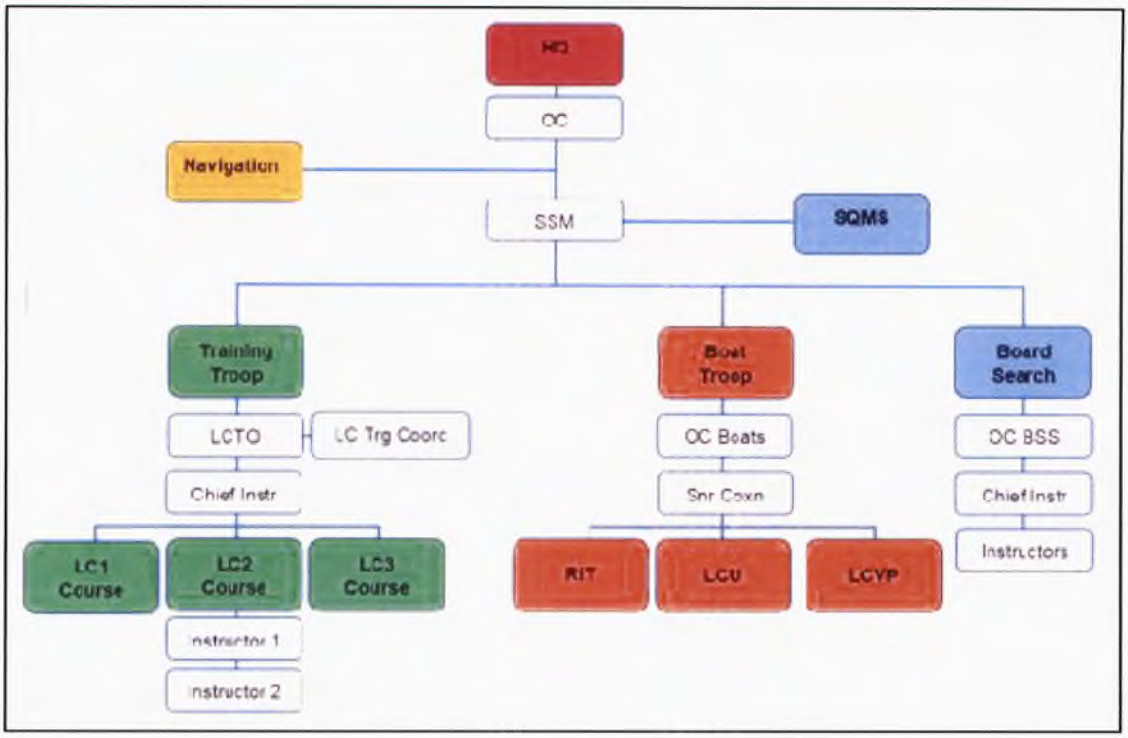

Figure 1.4.5 – The Organisational Structure of 10 Trg Sqn.

1.4.47. The relevant functional areas of 10 Trg Sqn are detailed below:

a. The Training Tp was responsible for the delivery of vocational course instruction to the LC3 Course, the LC2 Course, the LC1 Course, and the LC Officer Qualification Course. The courses were as follows:

(1) The LC3 Course taught the LC specialisation entry level career course and taught Marines to live and fight from both Offshore Raiding Craft (ORC) and Inflatable Raiding Craft (IRC), as well as to crew LCVP and LCU. Students learnt basic and tactical craft handling, basic navigation, and conduct sea-to-land live firing from ORC. Three courses were run a year, with a planned capacity of 15 students on each course

(2) The LC2 Course taught Junior Non-Commissioned Officers to become LCVP Commanders, LCU Second Coxswains, and Small Boat Section Commanders. This was the next step in the LC specialisation career once Marines had been selected for promotion to Corporal. Three courses were run a year, each with up to nine students.

(3) The LC1 Course taught RM Non-Commissioned Officers to become Landing Craft Utility (LCU) Commanders and Boat Group Commanders once selected for promotion to Sergeant; it involved consolidated navigation and planning. Two courses a year were run, each with six students.

(4) The LCOQ Course taught RM Officers to be Surface Manoeuvre advisors and Boat Group Commanders. The course content included

planning and conducting operations, littoral battle space management, and Estimate and Orders training. One course of six students was run annually.

b. The Boat Tp delivered amphibious craft training and support to LC vocational courses and supported CTCRM (Recruit, Young Officer and Command Training). The Tp was divided into three sections.

(1) Raiding Instructional Tp (RIT). RIT provided delivery of all small craft, ORC, IRC training to the vocational courses and instruction to all CTCRM courses.

(2) LCU Tp. Provided LCU craft and crew to assist with the delivery of instruction to all vocational courses and assistance to CTCRM during amphibious final exercises.

(3) LCVP Tp. Provided LCVP craft and crew to assist with the delivery of instruction to all vocational courses and assistance to CTCRM during amphibious final exercises.

The Defence Infrastructure Organisation (DIO)

1.4.48. According to the DIO Home page on the MOD Intranet, the DIO was responsible for building, servicing and maintaining Defence infrastructure including the Defence Training Estate (DTE). In this role it was required to maintain a safe, secure and sustainable training estate.

1.4.49. The training estate managed by the DIO was vast and its usage was extremely varied. From heavily regulated live fire ranges to open fields, the DIO was expected to comply with civilian legislation and MOD regulation. The Antony and Tregantle Training Area was managed by the UK Training Estates team (see Figure 1.4.6).

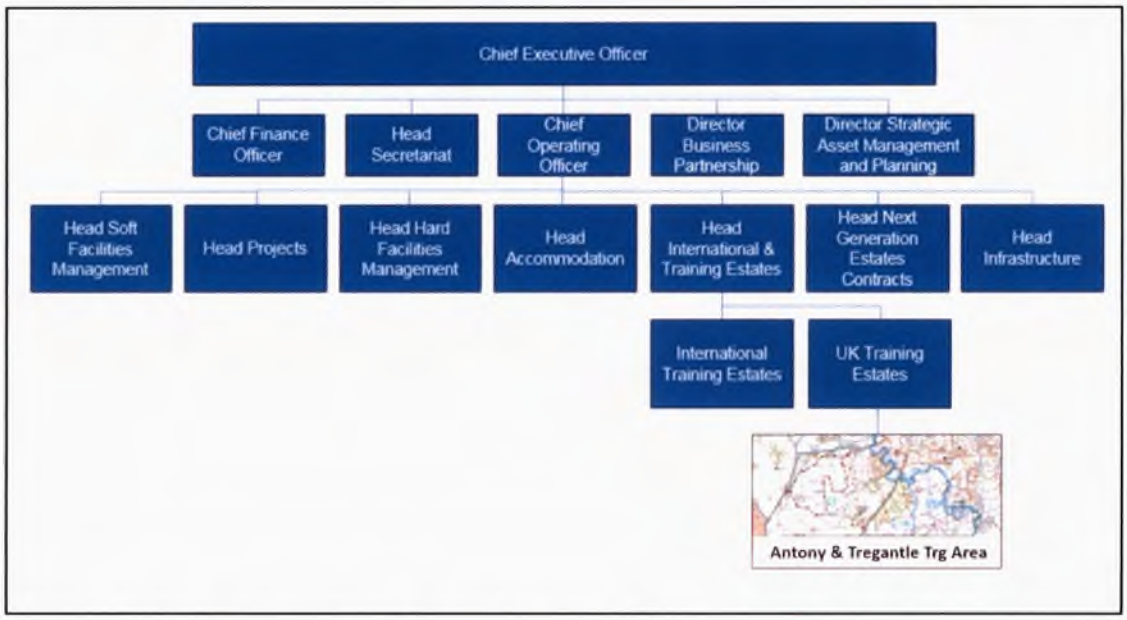

Figure 1.4.6 - The Organisational Structure of DIO.

SAFE SYSTEM OF TRAINING (SST)

1.4.50. The SST sets the conditions under which military training was to be conducted, ensuring personnel were provided with the appropriate information, instruction and supervision. This enabled the military to meet the training imperative set by the operational requirement whilst ensuring that personnel were provided with the best possible preparation for the roles they may undertake in times of conflict. The SST enabled Defence to maintain risks to an ALARP and tolerable state by ensuring that those who conducted the training were competent and that all associated risks had been considered and mitigated as far as reasonably practicable. Exhibit 015

1.4.51. The SST was broken down into four key elements:

a. Safe Place.

b. Safe Equipment.

c. Safe Persons.

d. Safe Practice.

Organisational Influences

1.4.52. The Panel examined some of the organisational factors that they believed to be present in 10 Trg Sqn and that played a part in the accident. The factors have been discussed throughout the report and a summary is provided at para 1.4.360 to 1.4.382.

SAFE PLACE

Definition

1.4.53. JSP 375 defined a Safe Place as one in which the controls, necessary to enable authorised training to be conducted safely, had been identified by a site-specific risk assessment and directed through appropriate Standing Orders such as Range Standing Orders. Commanders should have ensured that both Instructors and those under training were fully briefed on all necessary controls to be implemented in order to maintain the Safe Place.

Antony and Tregantle Training Area

1.4.54. The Antony and Tregantle Training Area was used frequently by CTCRM and 47 Cdo (RG) RM. At the time of the accident, activity on the training area was covered by an extant, comprehensive risk assessment produced by the relevant DIO representative, the Training Safety Officer (Cornwall). It was relevant to military training facilities for visiting troops and included activity on the beach but only applied to exercising troops on dry land and only once they were on dry land if they Exhibit 024 Exhibit 025 Exhibit 120

arrived by sea. Hazardous areas on the training area were illustrated on the Tregantle Ranges Known Hazards Map (see Figure 1.4.7).

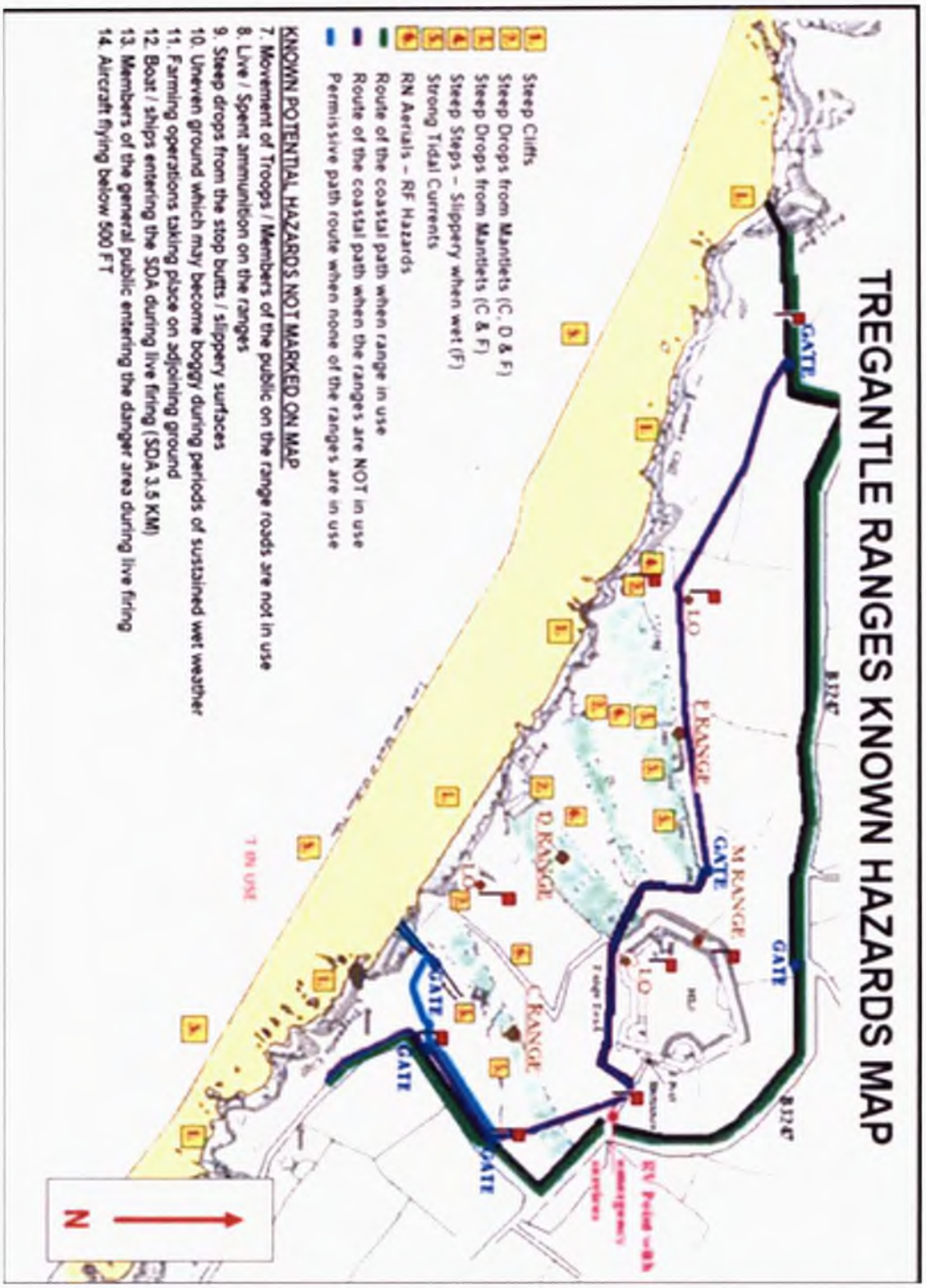

Figure 1.4.7 – Tregantle Ranges Known Hazards Map.

1.4.55. Figure 1.4.8 is an aerial view of the Beach Landing Area used during Ex FINAL THRUST taken by a Remotely Piloted Aircraft System on 13 October 2020.

Figure 1.4.8 – Tregantle Beach aerial view.

1.4.56. The Panel analysed three beach reconnaissance reports conducted by RM personnel and provided by the UKHO and observed that the gradient[10] of the beach was measured between 1:45 to 1:50 on each report.

1.4.57. No detailed beach reconnaissance had been carried out since 2009. The most up to date reconnaissance report conducted by 47 Cdo (RG) RM post-accident utilised the Hummingbird 10 Survey System attached to a small inflatable craft and was used to take sonar readings of the depth of water available at a specified time. Figure 1.4.9 below represents an overview of the beach area highlighting the depth contours as of 25 March 2020. The solid black line represents a drying height[11] of 2.5 m. Apart from the two anomalous features that are circled, the beach appears uniform in gradient across the whole area. Although environmental conditions will affect the profile of the beach, it was the Panel's opinion that when the beach was surveyed the beach profile would have been similar to that experienced on the evening of the accident. Exhibit 026

[10] The beach gradient is the severity of the slope from the back of the beach to the sea.
[11] A Drying Height is the vertical distance of the seabed that is exposed by the tide above the sea water level at the lowest astronomical tide.

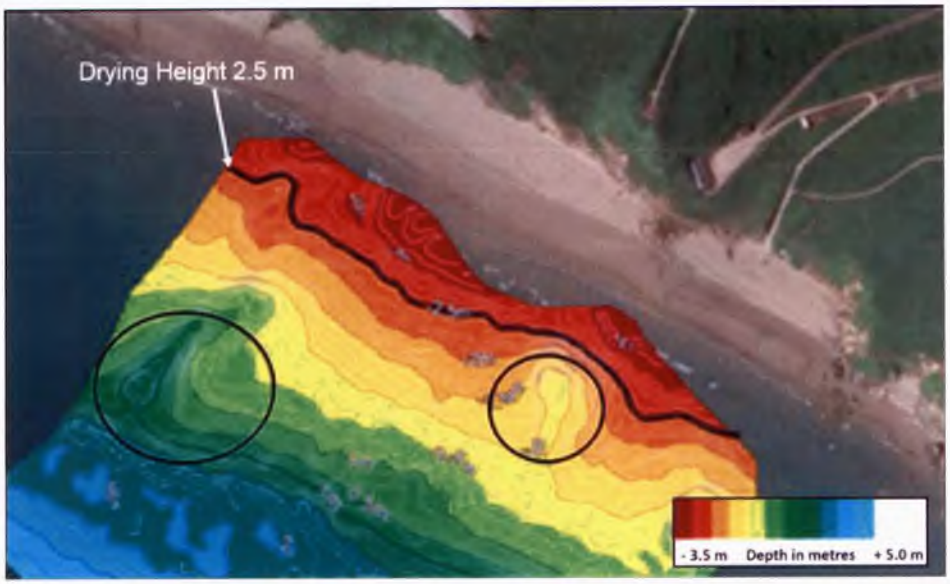

Figure 1.4.9 – Tregantle Beach Depth Contours as at 25 March 2020.

1.4.58. The Antony and Tregantle Training Area Standing Orders mentioned that the beach could experience some strong tidal currents, the Panel believe that this would have had negligible effect on troops disembarking from a LCVP into 0.77 m[12] of water.

1.4.59. The Panel assessed that the Antony and Tregantle Training Area with the associated risk assessment controls provided by the DIO was a safe place to conduct amphibious training during Ex FINAL THRUST. The Panel determined that beach gradient was well within the working operating parameters of the LCVP Mk5B and it was the Panel's opinion that the beach was safe to operate on at the time of the accident. The Panel finds that the physical characteristics of Antony and Tregantle Training Area that included Longsands (Tregantle) Beach were **not a factor**.

1.4.60. No beach survey information had been collated since 2009 and therefore no up to date beach information was available to Coxn A, B or the LC2 Course students in order to aid the beaching on the evening of the accident. The Panel finds this an **other factor.**

1.4.61. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should amend the Book of Reference (digital) 6600 to include a requirement for a beach survey to be conducted at a suitable interval prior to beach landings during amphibious training and exercises in order to enable accurate risk assessment of the beach conditions.**

[12] The first individual to disembark the craft reported experiencing 0.77 m of water.

Environmental Conditions at Tregantle Beach at the time of the accident

1.4.62. LCVP 0338 beached at approximately 21:35 when there would have been negligible rising or incoming tide. The Panel obtained environmental data from the Met Office that contained the following: Exhibit 027 Exhibit 028 Exhibit 029 Exhibit 030

a. The wind was from the East North East (ENE) at 3-5 Knots (Kts).

b. The sea surface temperature at midnight was 10.5°C.

c. The air temperature at the time of the accident was +1.6°C.

d. Visibility reduced from 13 km at 21:00 to 10 km at 22:00.

e. The Moon was a waning[13] crescent moon at 9.42% illumination at 21:00 and the light level was between 1.86 and 2.24 Millilux at sea level in Plymouth.

f. The significant wave height was < 1.0 m (at midnight).

g. The sea swell < 0.5 m in a South Westerly direction every 14 seconds (as at midnight).

h. Rainfall was zero throughout the evening.

i. The air pressure was 1040 mb at mean sea level between 21:00 and 22:00.

1.4.63. The lateral current of 0.5 Kts across the beach from left (NW) to right (SE)[14] was present but it would have had negligible effect to troops disembarking into water of 0.77 m. However, the Panel determined that it would have had a greater effect on those disembarking into deep water where they could not touch the seabed and were swimming. The swell and surf levels were low, presenting ideal conditions for the beach landing, as stated that day by both LCVP coxswains. Witness 10 Witness 14

1.4.64. The Met Office data showed that visibility was between 10 and 13 km and illumination from the moon was low. It is the opinion of the Panel that it was very likely that shadows from the cliffs at the rear of the beach would have lowered light levels further, making it harder to see with the naked eye.

1.4.65. The Panel concluded that the environmental conditions for the disembarkation of a troop from an LCVP into 0.77 m of water at Tregantle Beach were optimal. The Panel finds that the environmental conditions at Tregantle Beach were favourable to conduct a beach landing and that they were **not a factor**.

[13] A waning moon's illumination is decreasing to a new moon.
[14] Extracted from DIO's Risk Assessment for the Military Training Facilities as per LANDSO 1405 (3rd Rev).

CTCRM Exercise Documentation Relating to the Exercise Area

1.4.66. The Panel viewed the range of mandated documentation involved with the execution of Ex FINAL THRUST, which included: Exhibit 001 Exhibit 004 Exhibit 018 Exhibit 019 Exhibit 020 Exhibit 024 Exhibit 031 Exhibit 032

a. Antony and Tregantle Training Area Standing Orders.

b. Tregantle Fort Risk Assessments for Military Training Facilities.

c. Ex FINAL THRUST – Exercise Coordinating Instructions.

d. Ex FINAL THRUST – Exercise Action and Safety Plan (EASP).

e. CTCRM Generic Risk Assessment (Basic Recruit Training).

f. CTCRM Risk Assessment Signature List.

g. PAM 21 (Close Combat – Ranges).

h. Army Code 71850 – Operational Shooting Policy.

i. Army Code 71717 (Jun 17) – Close Combat Survivability Fieldcraft, Battle Lessons and Exercises.

1.4.67. The documentation was compiled from various reference sources to produce the exercise instruction that included the EASP and coordinating instructions that enabled the planned exercise to proceed. The mandated exercise paperwork for 282 Tp's Ex FINAL THRUST was written by the Exercise Conducting Officer (ECO) and checked and counter-signed by a qualified Senior Planning Officer (SPO) at CTW, CTCRM, as per policy in PAM 21. After the production of all the mandated documentation, the ECO uploaded the completed paperwork onto the DIO's Booking and Allocation Management System (BAMS) within the required lead time of 15 working days. This allowed sufficient time for deconfliction and prioritisation by DTE staff of training activity with other units on the same or nearby training areas. The Panel also noted that all risk assessments relevant to this training area and activity had been reviewed within the previous 12 months, were in date at the time of the accident and were duly referred to in the exercise paperwork for 282 Tp's Ex FINAL THRUST.

1.4.68. The Panel concluded that the standard of documentation completed to deliver the phase of Ex FINAL THRUST on Antony and Tregantle Training Area was satisfactory and finds it was **not a factor** in the accident.

SAFE EQUIPMENT

Definition

1.4.69. JSP 375 defined Safe Equipment as any equipment, including explosives and ammunition, brought into service following the Defence process for the production of a safety case (SC), with appropriate documentation defining the safe

operation and maintenance of the equipment under Service conditions. It was the unit commander's responsibility to ensure that:

a. Their subordinates had available, and made proper use of, the correct equipment to carry out an activity in accordance with the appropriate Service Equipment Support Publication or similar set of instructions.

b. Only Competent Persons or those under training who were being provided with the appropriate supervision were allowed to operate and service the equipment.

c. Complete training and maintenance records were kept.

Landing Craft Vehicle and Personnel Mark 5B (LCVP Mk5B)

1.4.70. **Description.** The Landing Craft Vehicle Mark 5 (LCVP Mk5) class was built under two different contracts, identified as Batch 1 and Batch 2. Batch 1 craft were built between 1994 and 1997 and Batch 2 craft in 2003 and 2004. LCVP 0338 was a Batch 2 craft. LCVP Mk5 B02 (commonly called the Mk5Bs) were designed to operate from a mothership, forming part of an Amphibious Assault Force to land and retrieve vehicles, troops and their equipment onto and from a hostile shore. In addition, the craft were required to act as a general-purpose support craft, operating between amphibious assault group ships, between ship and shore, and also as a mobile tactical headquarters and raiding support craft (see Figure 1.4.10). Exhibit 021

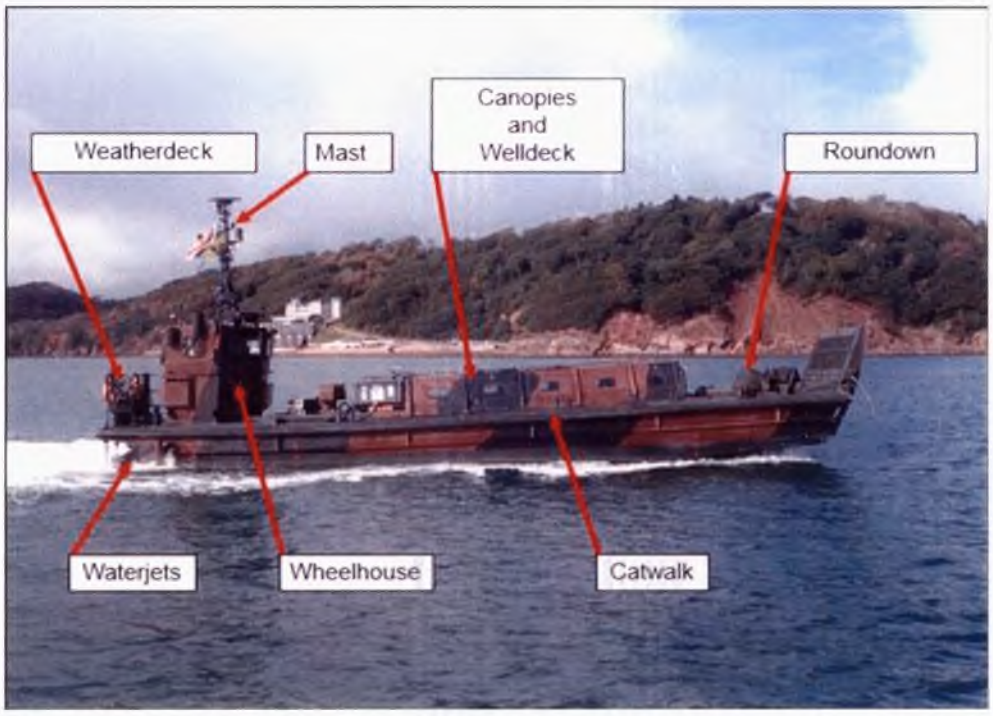

Figure 1.4.10 – LCVP Mk5B's main features as viewed from the starboard side.

1.4.71. **Construction.** The craft was of an all-welded aluminium construction. The wheelhouse was placed well towards the stern, allowing room for a small, but adequate quarterdeck. This provided space for the kedging anchor and winch, rope spool and life-saving equipment. A welldeck, with bow ramp door, was separated from the engine room by a watertight bulkhead. Removable Arctic covers were provided to enclose much of the welldeck and afford some comfort to personnel in adverse weather conditions. A hydraulically operated bow ramp allowed embarkation and disembarkation. A triangulated 'goal post' mast with a pole mast at its apex straddled the wheelhouse and could be lowered to the wheelhouse roof level to allow sling or davit lifting.

1.4.72. **Payload.** All of the following payloads assume the crew of three, all boat stores and full fuel. The maximum payload was 8.2 tonnes (this could be increased at the expense of fuel and range). In terms of embarked troops, the craft could carry 35 fully equipped embarked troops, stores or vehicles.

1.4.73. **Principal Dimensions.** The LCVP Mk5B was 15.66 m long and had a beam (maximum width) of 4.27 m.

1.4.74. **Weatherdeck.** The aft weatherdeck (quarter deck behind the wheelhouse) provided the mounting and stowage for: light markers, two Lifebuoys, kedging anchor, rope locker, winch foot switch, the winch, the anchor warp drum and the engine room access hatch (see Figure 1.4.11).

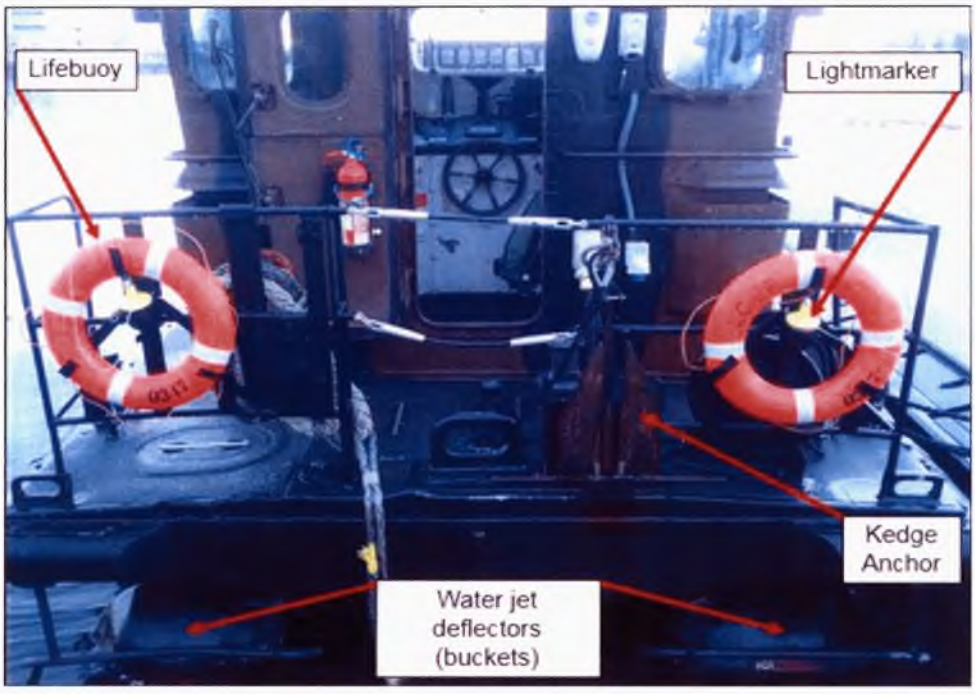

Figure 1.4.11 – LCVP Mk5B viewed from Astern.

1.4.75. **Welldeck.** Removable Arctic covers, when fitted, enclose much of the welldeck and afford some comfort to personnel in adverse weather conditions (see

Figures 1.4.12 and 1.4.13). Removable and collapsible seating for 35 embarked troops was provided under the canopy.

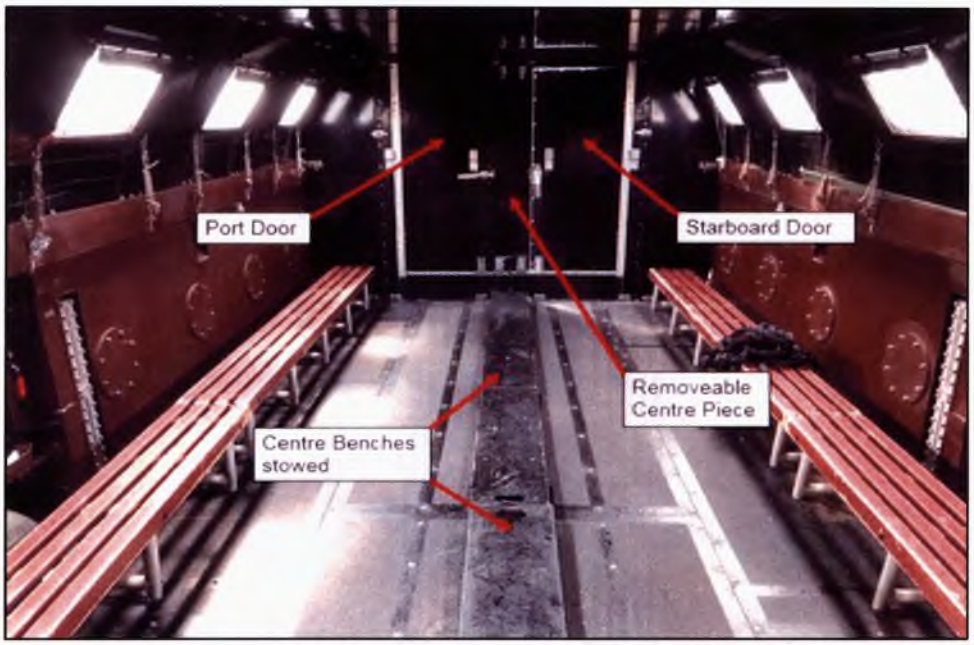

Figure 1.4.12 – LCVP Mk5B Welldeck viewed from aft looking Forward with the Centre Benches Collapsed.

Figure 1.4.13 – LCVP Mk5B Welldeck viewed from Forward looking Aft with the Centre Benches Collapsed.

1.4.76. **Bow Area.** The forward end of the welldeck was closed by a hydraulically operated bow door (the ramp), which in the fully open position, provided a ramp for the embarkation and disembarkation of vehicles and personnel (see Figure 1.4.14).

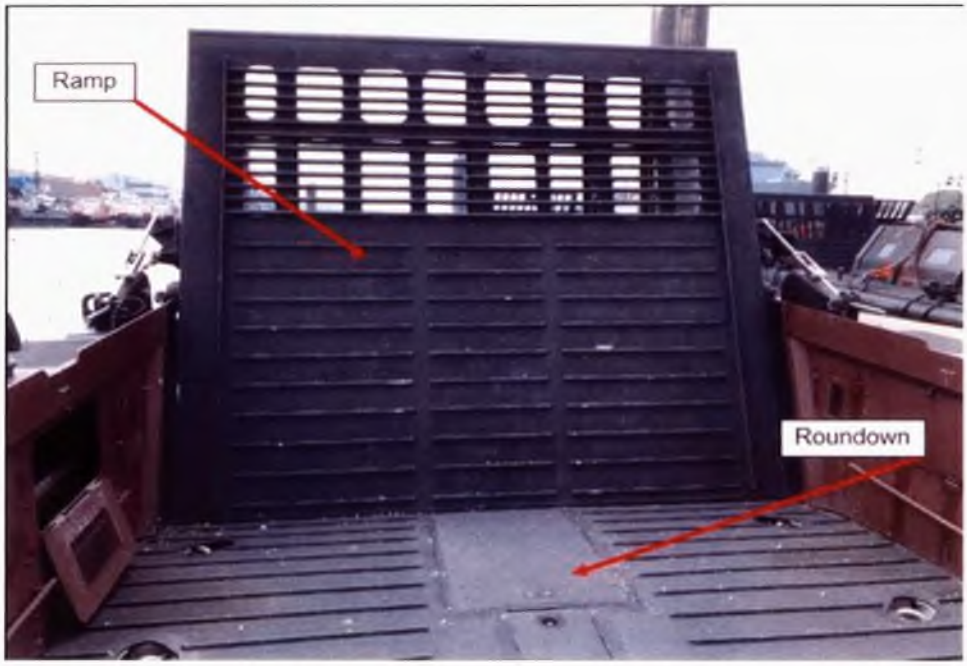

Figure 1.4.14 – LCVP Mk5B Ramp and Roundown viewed from the Canopy Doors looking Forward.

1.4.77. When fully opened, the ramp pivoted freely to allow for sea swell and movement due to changes in cargo weight. The ramp in the open or down position is shown on a beached LCVP in Figure 1.4.15.

Figure 1.4.15 – LCVP Mk5B with Ramp lowered onto a Beach.

1.4.78. **Ramp Operation.** The bow ramp operator's position was on the starboard side of the welldeck, forward of the canopy. A wandering lead control unit permitted the operator to leave the position while still having full control of the activity in the bow area (see Figures 1.4.16 and 1.4.17). Control of the ramp could also be overridden by the coxswain from a master unit located in the wheelhouse.

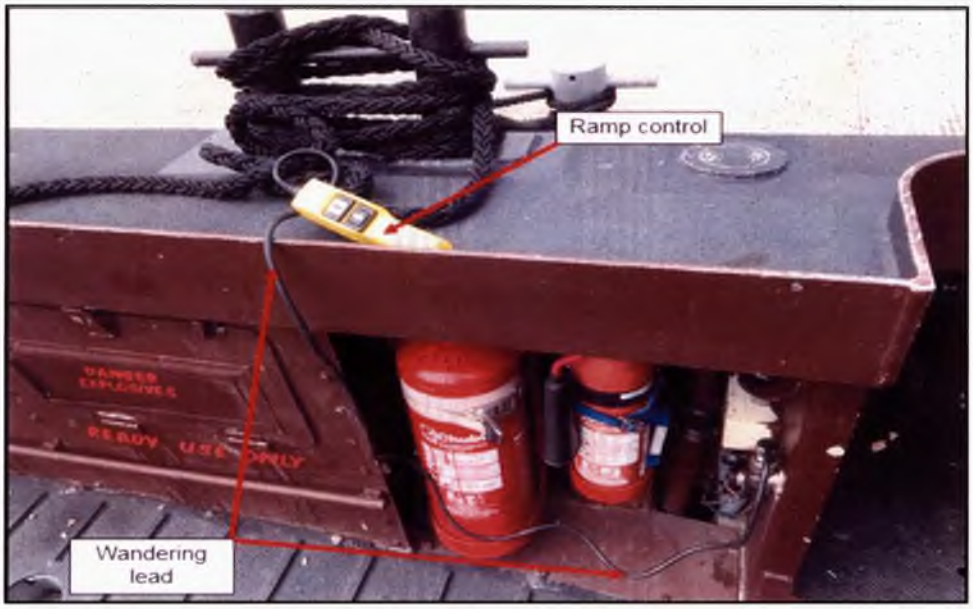

Figure 1.4.16 – LCVP Mk5B Ramp Operating Control on the Starboard Side viewed from the Roundown.

Figure 1.4.17 – Operating the Ramp using the Wandering Lead at maximum length.

1.4.79. **Wheelhouse.** The wheelhouse was a fully enclosed structure situated above the welldeck and towards the stern that had seating at the helm for the coxn and drop-down seating for two further crewmembers (see Figure 1.4.18). The coxn was afforded a wide-angle view of the welldeck and beyond through a large top hinged opening window directly in front and oblique angled sliding windows to the port and starboard quarters. However, when the Arctic covers are fitted the coxn's view of the welldeck in front of the canopy is restricted. There were further fixed windows to the port and starboard and two sliding windows to the rear on the port and starboard sides of a stable-type weatherproof door.

Figure 1.4.18 – LCVP Mk5B Wheelhouse viewed from the Port Side.

1.4.80. The wheelhouse contained the controls, indicators, navigation aids and communications equipment (see Figure 1.4.19).

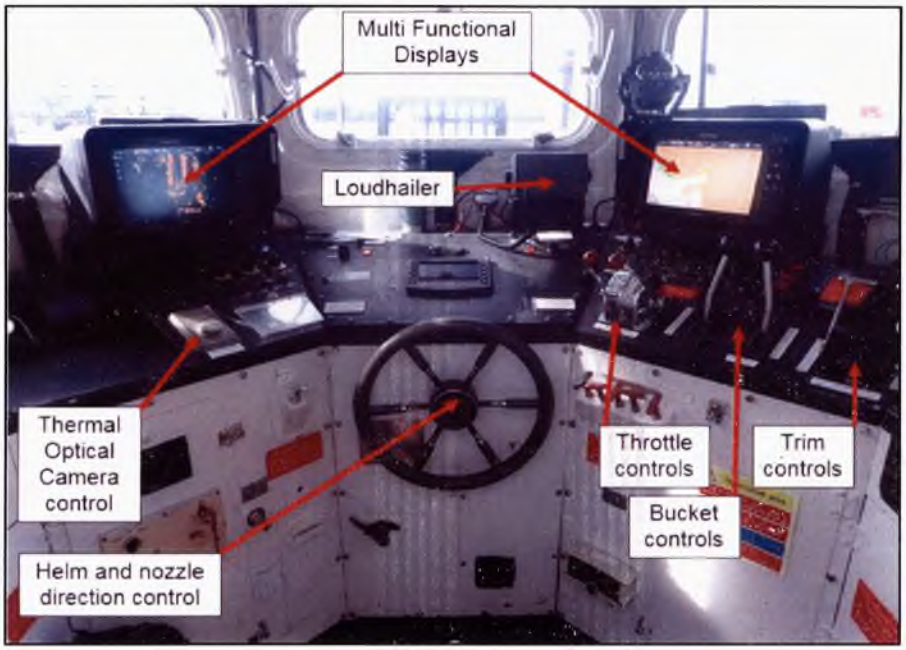

Figure 1.4.19 – LCVP Mk5B Internal Wheelhouse overview.

1.4.81. **Propulsion.** Propulsion power was provided by two Yanmar 309 Kilowatt (kW) marine diesel engines driving water jets through reversing gearboxes with integral clutches on the port and starboard stern of the vessel. The primary electrical power was provided by the main engine alternators, with auxiliary power provided by a 6.5 kW, 230 Volt, 60 Hertz generator. The reversing gearbox was not used to make the craft go astern as the water jet deflectors achieved that. The reversing gearbox function was to allow the selection of neutral and drive, and to change the direction of water jet impeller rotation in order to clear any obstruction by backflushing the system.

1.4.82. **Water Jet Propulsion System.** The Vospower170 Waterjet installation comprised a control system and two waterjet units. The Waterjet units were mounted at the stern of the vessel and were attached to the lower hull and transom. The Waterjets were arranged such that they drew water into the inlet ducts in the underside of the hull and expelled the jet of water. The Waterjets provided the thrust for the vessel in lieu of conventional propellers. Water entered the duct via the inlet underneath the hull and was accelerated through the impeller and ejected through the nozzle in a high-speed jet, thus providing ahead thrust. The Waterjet could also provide astern thrust by means of lowering the reverse deflector[15] into the jet. The deflector could be lowered to any intermediate position to provide a variable degree of thrust from full ahead to full astern. The Waterjet steered the vessel by deflecting the nozzle to port or starboard up to an angle of ±19°. In conjunction with the thrust control thus giving excellent manoeuvring qualities (see Figures 1.4.20 and 1.4.21).

[15] Deflector was the official term but throughout the remainder of the report it will be referred to as the bucket.

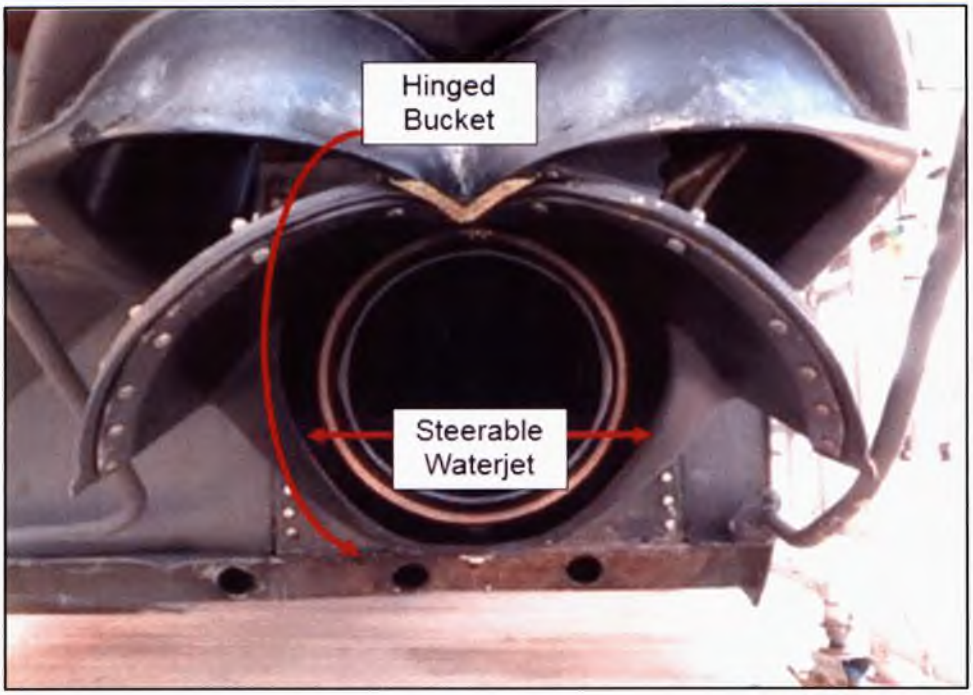

Figure 1.4.20 – Starboard Waterjet and Deflector viewed from the rear.

Figure 1.4.21 – LCVP Port Water Inlet Duct viewed from below and rear.

1.4.83. The control of the Waterjets was carried out by means of a pair of thrust control levers, one for each waterjet, and a common steering wheel which actuated the steering control on both jets (see Figure 1.4.22). The control system for the Waterjets was hydraulic, including the follow up control facility for the thrust control system. Electrical feedback was provided only in the form of a steering nozzle angle indicator mounted at the helm position.

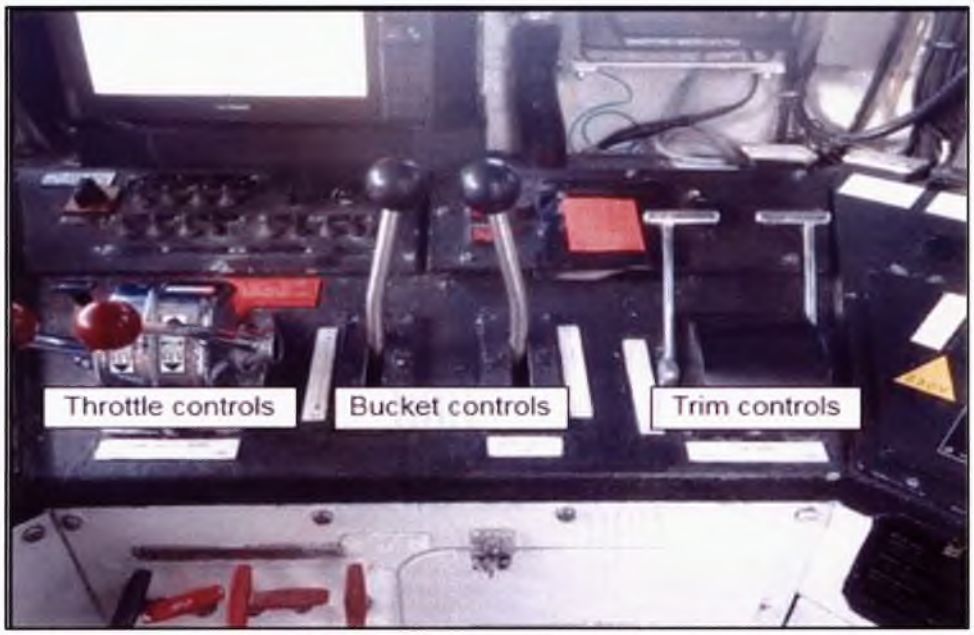

Figure 1.4.22 – LCVP Mk5B Throttle, Bucket and Trim controls in the Wheelhouse.

1.4.84. **LCVP Mk5B Multi-Functional Display (MFD).** The LCVP Mk5B was fitted with Raymarine eS128 Multi-Function Display (MFD) which incorporated the following functions:

a. Waypoints for navigation.

b. Routes that were a series of waypoints typically used to assist with passage planning and navigation. A route was displayed on screen as a series of waypoints linked by a line.

c. The ability to show and record tracks as an on-screen trail that shows the passage taken. The trail was made up of a series of track points which are created automatically throughout the passage.

d. A Man Overboard (MOB) function that was always available, irrespective of what other windows or applications that were in use on the MFD and, when activated, would mark the vessel's position.

e. Displayed distances and bearings.

f. Synchronised the Radar and Chart display by giving a Radar overlay.

g. Provided indication of the craft's speed and depth of water under the vessel using an internal sonar module and existing transducers (see Figure 1.4.23).

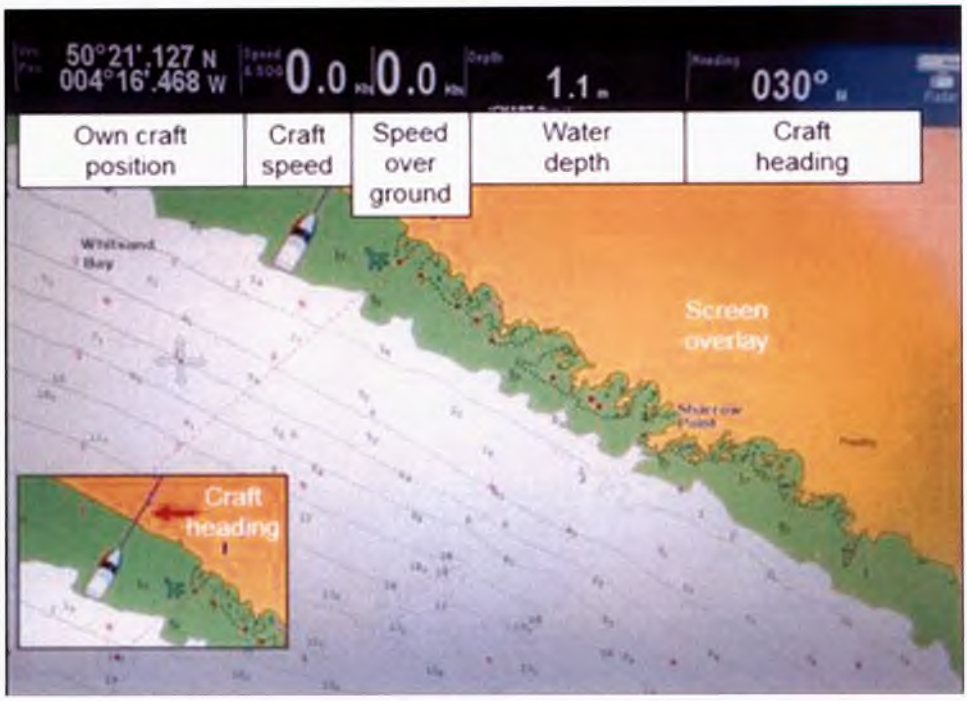

Figure 1.4.23 – LCVP Mk5B MFD Screen showing Nautical Chart and Navigational Information.

1.4.85. **LCVP Mk5B Communications.** LCVP Mk5Bs were fitted with a fixed Maritime Very High Frequency (VHF) radio, two emergency handheld Maritime VHF radios and a further two handheld Maritime VHF radios. LCVP Mk5B were fitted for BOWMAN High Frequency (HF) portable radio communications (PRC) 327 and BOWMAN VHF PRC 356 but neither were fitted at the time of the accident. LCVPs were also fitted with a two-way tannoy speaker system between the wheelhouse and roundown.

1.4.86. **Thermal Optical Camera.** The LCVP Mk5B was fitted with Raymarine T473SC Thermal Optical Camera. The non-stabilised thermal/low light camera was replaced with a stabilised, supportable alternative, integrated with the Raymarine navigation aid system in November 2016. The Thermal Optical Camera system comprised a Raymarine remote operable fully stabilised Thermal and Optical (Infra-Red/Visible light) Camera mounted on the LCVP mast, a Joystick Control Unit (JCU) and a PoE (Power over Ethernet) injector. The system was linked via the Raymarine SeaTalking system to the Multi-Function Displays (MFDs) to allow the camera to be controlled and the camera video to be displayed at either MFD position. The T473SC camera also included a mechanical stabilisation feature to improve image stability by compensating for vessel motion and provided both a thermal and continuous zoom, colour, visible light camera (see Figure 1.4.24).

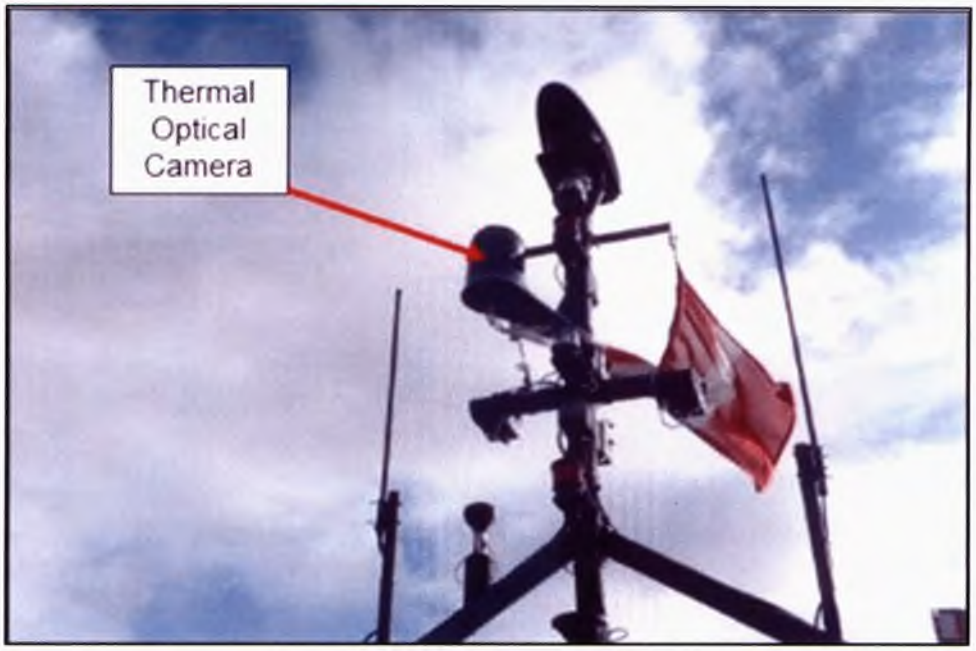

Figure 1.4.24 – Thermal Optical Camera mounted on LCVP Mk5B Mast viewed from front and below.

1.4.87. **Thermal Optical Camera control.** A JCU was fitted to the Forward console that controlled all camera functions from five push buttons and a rotary 'Puck' control wheel, which was a combined rotary and three-axis joystick control (see Figure 1.4.25).

Figure 1.4.25 – Thermal Optical Camera Control Panel.

1.4.88. Outputs to the MFD included a view in visible daylight mode and views in daylight in the thermal imagery mode (see Figures 1.4.26 and 1.4.27).

Figure 1.4.26 – LCVP Mk5B Camera view in Visible Daylight Mode viewed via the MFD.

Figure 1.4.27 – LCVP Mk5B Camera view in daylight in the Thermal Imagery Mode viewed via the MFD.

1.4.89. **LCVP Mk5B – Global Maritime Distress and Safety System (GMDSS) and Safety of Life at Sea (SOLAS) equipment.** The following equipment was to be carried onboard an LCVP Mk5B:

a. 1 x Emergency Position Indicating Radio Beacon.

b. 1 x Search and Rescue Transponder.

c. 1 x Fixed maritime VHF radio.

d. 2 x Handheld VHF radios.

e. 2 x Emergency handheld VHF radios.

f. 2 x 16 Person liferafts.

g. 1 x 6 Person liferaft.

h. 2 x Lifebuoys.

i. 2 x Light markers.

j. 2 x Emergency lifelines.

1.4.90. The Panel found no evidence that any of the equipment above was defective and concluded that the correct equipment and scaling were carried onboard both craft at the time of the accident. The Panel also concluded that the correct certification and paperwork was in place, apart from the Emergency Handheld VHF radios that required the expiry date of their batteries to be checked. The Panel finds that the GMDSS scaling and equipment was **not a factor**.

Defence Accident Investigation Branch Technical Report on LCVP 0338

1.4.91. **Introduction.** As part of the SI, the DAIB was tasked to conduct an equipment engineering assessment of the subject craft, LCVP 0338. After the LCVP was released by the HSE, the DAIB deployed a Technical Investigating Officer (IO) to the site to complete a detailed technical report on the subject craft. The DAIB Technical Report detailed the findings of the engineering investigation of LCVP Mk5B, ERM 0338 (LCVP 0338), operated by 47 Cdo (RG) RM. This was conducted to ascertain if there were any pre-existing faults or damage that would have made the accident more likely to occur or would have affected the outcome. Exhibit 114

1.4.92. **Maintenance.** LCVP 0338 was managed from an administration, engineering and practical maintenance aspect within Equipment Support Tp (ES Tp), 47 Cdo (RG) RM. Some maintenance aspects were also completed by LCs from 10 Trg Sqn. All maintenance for the LCVP was recorded on the Unit Maintenance Management System (UMMS) software package. ES Tp Engineers and LCs conducted Level 1 and Level 2 planned and corrective maintenance. Level 3 and Level 4 planned and corrective maintenance[16] was conducted under the Landing Craft Continuous Engineering Support contract via Babcock Marine.

1.4.93. **Maintenance History.** LCVP 0338 had a period of Level 3 and 4 maintenance between 7 October and 15 November 2019. The report for this period

[16] In the case of the LCVP Mk5B the levels of Maintenance are: 1 – Operator, 2 – Unit, 3/4 – contractor support.

was finalised on 15 November 2019 and stated that there were no tests, trials, defects or agreed work outstanding at Level 3 and 4.

1.4.94. **Outstanding Maintenance at the time of the accident.** At the time of the accident there were a total of nine outstanding Level 1 and 2 maintenance tasks (two Safety / Environmental (SE) and seven Operational (Op)). There were no extant concessions for either SE or Op maintenance tasks.

a. The SE outstanding maintenance which by their nature are priority items were:

(1) Check presence and legibility of all LCVP Health and Safety Warning Notices.

(2) Check expiry date of all Maritime VHF Radio Batteries and renew as required.

b. The Op outstanding maintenance items were:

(1) Carry out after use cleaning and inspection: wash down, inspect hull, fendering and mooring ropes.

(2) Record running hours for main engines.

(3) ZF gearbox carry out oil change and clean gearbox suction filter and magnetic chip.

(4) Clean hydraulic tank strainer and replace system filter.

(5) Clean simplex and duplex filters and fit new filter element.

(6) Operate stripping system on both fuel tanks. On completion take samples and check contamination. On completion vent fuel system and run up engines.

(7) Run Eberspacher heater (provided heating to the wheelhouse and welldeck).

No mitigation was presented for the lapses in maintenance or the lapses in the administration process to deal with incomplete maintenance. These outstanding maintenance tasks were rectified post-inspection on 2 March 2020 by ES Tp to make the craft serviceable.

1.4.95. **Maintenance Assurance.** Internal periodical assurance of maintenance activity was conducted by 47 Cdo (RG) RM. The most recent assurance report was conducted over the period 8 to 10 July 2019 and resulted in a reinspection of Water Safety and Engineering aspects. Areas highlighted in the report relevant to LCVP 0338 were:

a. Snap hooks on life raft span sets required changing as soon as possible due to heavy corrosion.

b. The port aft lifebuoy was missing at the time of the inspection.

c. Starboard aft light marker cord was not secure.

d. The red safety catch on the SART was missing and was to be replaced as soon as possible.

e. The CO_2 fire extinguisher on the back of wheelhouse door required the locking nut on the discharge horn to be tightened or the extinguisher to be replaced.

As at 16 June 2020, the above points were still outstanding. The IO could not establish any reason why the reinspection did not happen and could not identify any evidence to show that the tasks had been completed.

1.4.96. **Documentation.** A complete inspection of LCVP 0338 documentation was completed. Apart from the routine maintenance that accumulated from the accident date to the date that the craft was released from quarantine and the nine outstanding tasks highlighted in this report no further discrepancies were found.

1.4.97. **Technical Report Conclusion.** The technical report found no causal, contributing or aggravating factors during the physical inspection of LCVP 0338. The IO concluded that the vessel was in a serviceable condition at the time of the accident. The IO was unable to identify any pre-existing faults or damage to the vessel that should be considered by the Panel as a causal, contributory, aggravating or other factor in the accident. It should be noted that the vessel had maintenance outstanding required at the time of the accident, however none of the work outstanding could be considered as having had an impact on the functionality of the vessel. The IO concluded that it was highly likely that the landing craft was operating normally at the time of the accident.

1.4.98. The Panel concluded through evidence and information gained throughout the course of the DAIB technical investigation that the vessel was in a serviceable condition at the time of the accident. The Panel finds that the serviceability of LCVP 0338 was **not a factor**.

Assault Troop Life Jacket (ATLJ)

1.4.99. **Introduction.** An ATLJ was issued to each member of 282 Tp that embarked onto LCVP 0338 on the night of the accident. The ATLJ was a MOD approved life jacket for use by the military only[17]. Although not SOLAS[18] approved due to not having automatic inflation and only a single buoyancy chamber, the ATLJ in many other aspects met and exceeded the requirements and test criteria of the

Exhibit 002

[17] DE&S Water safety Equipment Catalogue Issue 1 Nov 2016 page 16 and BRd 67 Ch 6.
[18] SOLAS - International Maritime Organisation - Safety of Life at Sea Regulations.

International Organization for Standardization (ISO)[19]. It was designed for use in amphibious operations, in conjunction with stretchers when transferring patients at sea, and when personnel were carrying heavy equipment attached to their person. The ATLJ could also be used in aircraft as it was inflated by manual operation. It was neat and compact in the folded state and allowed complete freedom of movement by the wearer when worn in that condition. When inflated it would support the wearer together with 45 kg[20] of equipment. It was fitted with a quick-release clip so that it could be quickly discarded when no longer required.

1.4.100. **Description.** The life jacket consisted of an inflatable stole, adjustable webbing harness and inflation equipment. The inflatable stole consisted of a pillow section and two lobe sections. The life jacket was inflated from a nitrogen cylinder with a manually operated head. The stole was packed in a zipped outer cover, which would open on inflation. Each lobe had a reflective panel system, which could be opened or closed. A handling loop was fitted to each lobe and a light and whistle were provided. A spray hood was fitted with an alternate position for the light (see Figure 1.4.28).

Figure 1.4.28 – Assault Troop Life Jacket Mk 4 (ATLJ).

1.4.101. **Operation.** Inflation was initiated by pulling on the operating handle, which protruded from the bottom of the left-hand lobe of the jacket, and would cause the life jacket to inflate. An oral inflation tube and valve were fitted to the left-hand lobe so that the valve was convenient to the mouth of the wearer. This facility

Exhibit 033

[19] ISO Standard 12402 - 1:2005 Personal Flotation Devices Part 1.
[20] Stated in both BRd67 Admiralty Manual of Seamanship and BRd6600 Royal Marines Landing Craft and Small Craft Operations Vol 1.

was for emergency inflation and topping-up during long periods of flotation. The valve could be locked in the closed position by rotating it on the inflation tube.

1.4.102. According to the design specification data, the life jacket would provide sufficient buoyancy to support the wearer and their equipment (weighing a maximum of 45 kgs[21] and when predominantly distributed between a waist belt and a backpack). It would keep the wearer's mouth at least 120 mm clear of the water when inclined backwards at an angle of not less than 20 degrees and not more than 50 degrees from the vertical.

1.4.103. **INM ATLJ Trial.** To understand the capability of the ATLJ, the Panel commissioned the INM to conduct trials involving the ATLJ Mk4. The key elements of the trial are described below.

INM Trial Summary

1.4.104. **Description.** The INM ATLJ water-based trials took place within the INM Sea Survival Complex, Gosport and at the RN Sea Survival Training Centre (SSTC) at Horsea Island, Portsmouth in June 2020. The 3 m deep immersion pool at the INM contained fresh water at an overall temperature of 28°C and the swell machine in the pool replicated a sea state of 1 to 2[22]. The open-air lake at the SSTC was brackish[23], had a variable depth of 0.5 m to 6 m and a water temperature of 20°C at or near the surface. The ambient conditions at SSTC had an air temp of 16°C with a 12 Kt South Westerly wind which created wavelets on the lake surface. The INM's male participant was of athletic build, 1.74 m in height, body mass of 80 kg and with a Body Mass Index (BMI) of 25.6 kg/m^2, similar to that of Recruit Jones, and was dressed and equipped with similar clothing and equipment. The participant's total weight with his clothing and equipment was 108 kg. The trial was divided into two elements (pool and lake) and in three configurations: Exhibit 034

a. Full clothing and equipment but no ATLJ worn.

b. Full clothing and equipment, with ATLJ worn but not inflated.

c. Full clothing and equipment, with ATLJ inflated.

1.4.105. **INM Observations.** The trial resulted in the following observations:

a. Without wearing an ATLJ the participant did go under the water but then resurfaced almost immediately.

b. Without wearing an ATLJ the daysack although positively buoyant, forced the helmet upwards and forwards restricting visibility and creating pressure by pushing the helmet chinstrap into the throat.

[21] ATLJ itself weighs 2.5 kg and when considered as worn equipment will support 47.5 kg.
[22] Sea State 1 to 2 will provide ripples and small wavelets and a wave height between 10 to 20 cm.
[23] Brackish water is water having more salinity than freshwater, but not as much as seawater.

c. Without wearing an ATLJ and after less than two minutes of treading water the participant became fatigued and started to find it difficult to remain on the surface with his airway clear.

d. When the ATLJ was worn but not inflated, the ATLJ did give some positive buoyancy and improved the immersion angle by counteracting the forward/upward force of the daysack.

e. When not wearing an ATLJ or when wearing an uninflated ATLJ, and when the swell machine was used (sea state 1 to 2) the participant found it significantly harder to keep afloat and swimming increased the onset of fatigue.

f. When worn and inflated, the ATLJ although uncomfortable, provided sufficient buoyancy to keep the participant's airway clear of the water and kept his body at the optimum immersion angle for survival.

g. The helmet was positively buoyant and did help the participant to remain at or near the surface.

h. When using one hand to release the helmet chinstrap it was to the detriment of the participant's ability to keep his airway clear and head above the surface.

i. Swimming on one side was easier than fully on front or back.

1.4.106. **INM Trial Conclusions.** The INM concluded that two of the key features from the original ATLJ design intent were:

a. That the life jacket would provide sufficient buoyancy to support the wearer and all equipment (weighing a maximum of 45 kgs and be predominantly distributed between a waist belt and a backpack).

b. It should also keep the wearer's mouth at least 120 mm clear of the water when inclined backwards at an angle of not less than 20 degrees and not more than 50 degrees from the vertical.

1.4.107. The Panel concluded from the INM trial data that the operating capability of the ATLJ Mk4 was not in question. The Panel finds that the operating capability of the ATLJ Mk4 was **not a factor** in this accident.

Landing Craft Life Jacket (LCLJ)

1.4.108. **Introduction.** The LCLJ was worn by all crew members of LCVP 0338 and LCVP 0354 on the night of the accident. Originally developed for use by the crews of landing craft, this life jacket was used for certain specific small boat operations. The life jacket had 243 Newtons of buoyancy, was light and comfortable to wear, and had an automatic inflation assembly with a manual override facility. The wearer was limited to 22.5 kg of additional equipment when wearing a LCLJ. Exhibit 002

Exhibit 002

1.4.109. **Description.** The LCLJ comprised an adjustable waistcoat and an inflatable stole which was contained within a protective pouch by means of a Velcro fastener. Front closure of the waistcoat was achieved by means of a heavy-duty zip fastener and a large nylon buckle. The buckle was attached to a wide webbing belt, which provided girth adjustment. A battery and lamp assembly, attached to the stole, activated automatically upon life jacket inflation. The battery was fitted with an on/off switch. A spray hood was attached to the pillow section of the stole, which was stowed in a folded condition and could be deployed quickly and simply. It was fitted with an alternate light position. Additional features included large-capacity pockets for the stowage of survival/location aids and a small pocket on the rear of the waistcoat which was intended to accommodate a chemical light stick (Cyalume®) and which were also fitted with a facility to permit the light to be covered or exposed as required. Handling loops, a lifeline and a whistle were also fitted.

1.4.110. **Operation.** The LCLJ was designed to be inflated automatically on immersion in water. The gas was contained in a replaceable cylinder attached to the operating head which was an integral part of the life jacket. On immersion in water the life jacket would automatically inflate and burst from the valise within a few seconds without any action by the wearer (see Figures 1.4.29 and 1.4.30). However, the automatic mode of operation was to be treated as a backup system in case the wearer was unconscious or unable to inflate the life jacket on immersion. A person falling into the water was to sharply pull down on the 'inflation operating mushroom'; if the manual and automatic mechanism failed to function, the oral inflation tube was to be used. If required, the automatic operating facility could be temporarily nullified by opening the valise at a point adjacent to the cylinder and placing the operating head sealing cap over the operating head.

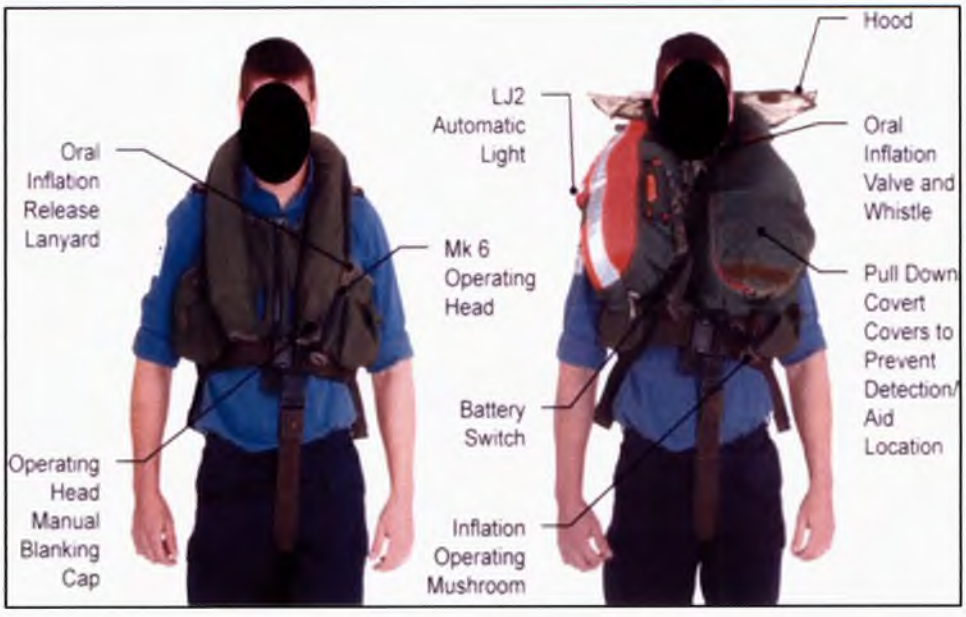

Figure 1.4.29 – Landing Craft Life Jacket (LCLJ) front view.

Figure 1.4.30 – Landing Craft Life Jacket (LCLJ) deployed and spray cover used – front view.

1.4.111. The LCLJ was worn by all crew members of LCVP 0338 and LCVP 0354 on the night of the accident. When Coxn A jumped into the sea it automatically inflated as expected and provided him buoyancy. The Panel assessed that the LCLJ worked as designed and therefore concluded that the operational capability of this life jacket was not in question. The Panel finds that the capability of the LCLJ was **not a factor** in the accident. Witness 10

Recruit Clothing and Equipment

1.4.112. At the time of the accident the recruits of 282 Tp wore and carried in-service equipment that weighed approximately 28 kg, as detailed in Table 1.4.2. Two recruits also carried General Purpose Machine Guns (GPMGs), which weighed approximately 13.5 kg, instead of an SA 80 rifle which weighed approximately 4.7 kg. A photograph of a RM recruit dressed in similar clothing and equipment is at Figure 1.4.31.

Daysack (Virtus)	Water Bottle Pouch	Chorley Grenades x2
Bivvy Bag	24Hour Rations x1	Combat Body Armour (no plates)
Softi Trousers	Water Bottle (Full) x2	354 BOWMAN Radio
Softi Jacket	Combat Trousers	Personal Role Radio
Cap Cold Weather	Under Body Armour Clothing	Smock
HMNVS and Counterweight	Altberg Boots	Gloves
Yoke Main	Black Socks	Clasp Knife
Webbing Belt	Undershorts	Compass and Map
Hip Pad	SA 80 Rifle	Head Torch
Ammunition Pouch x2	Blank Firing Attachment	Helmet (Virtus)
Utility Pouch x2	6 x Magazines of Blank 5.56	

Table 1.4.2 – Clothing and Equipment carried by 282 Troop Recruits.

Figure 1.4.31 – A RM Recruit wearing similar Clothing and Equipment to the Recruits of 282 Troop at the time of the accident.

1.4.113. The Panel concluded that the quality and scale of the in-service military clothing and equipment as issued was appropriate for the activity being conducted. The Panel finds that the clothing and equipment worn and carried by the recruits was **not a factor**.

1.4.114. The involvement of the in-service clothing and equipment during the accident is discussed further at para 1.4.104 to 1.4.106.

UK PRC 343 Personal Role Radio (PRR)

1.4.115. **Introduction.** The PRR entered service in March 2002. The PRR was issued and worn by all members of 282 Tp, including 282 Tp Trg Team, and was issued to both LCVP crews.

1.4.116. **Purpose.** The PRR provided units and personnel with a communications capability for General Purpose, Force Protection and Security use. The PRR enhanced command and control at the lowest levels by reducing the reliance on a unit's internal communications and the need for shouting, hand signals, lights and whistles. The PRR's employment is examined later in the report at para 1.4.246.

1.4.117. **Operation and Performance.** The PRR was a short-range lightweight low power, 2.4 GHz digital radio transceiver capable of insecure voice-only communications up to 500 m. The compact system in its camouflaged pouch was designed to be fitted to standard webbing associated with the in-service Personal Clothing System (PCS) and the in-service equipment (see figure 1.4.32). Exhibit 124

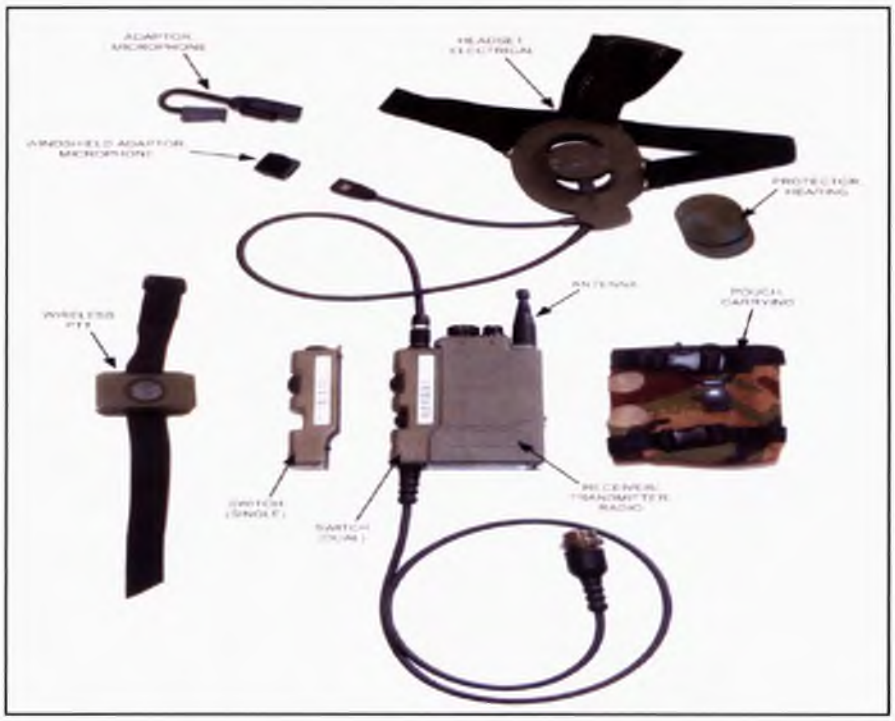

Figure 1.4.32 – Personal Role Radio and Ancillaries.

1.4.118. The Panel concluded that the in-service PRR was within its working parameters for use on both the craft and ashore on the evening of the accident. The Panel finds that the capability of the PRR was **not a factor**.

Head Mounted Night Vision System (HMNVS)

1.4.119. **Introduction.** The HMNVS (see Figure 1.4.33) was issued and worn by all members of 282 Tp, including the 282 Tp Trg Team. HMNVS and other Night Vision Devices (NVD) were available for use by both LCVP crews from the armoury at 10 Trg Sqn, however none were drawn from the armoury.

Figure 1.4.33 – In-Service Head Mounted Night Vision System.

1.4.120. The monocular HMNVS was worn by the operator and either mounted onto a helmet or facemask. It enabled improved night vision using ambient light from the moon, stars, sky glow, etc. The mono-goggle required some ambient light to operate, offered a magnification of x 1, a focus range of 0.25 m to infinity and a field of view of up to 41 degrees.

1.4.121. The Panel assessed that, as individuals who used the HMNVS could recall events observed through the NVD, the HMNVS operated as expected and designed in the environmental conditions on the evening of the accident. The Panel concluded that the in-service HMNVS was within its working parameters for use on both the craft and ashore on the evening of the accident. The Panel finds that the capability of the HMNVS was **not a factor**. Witness 6 Witness 7

SAFE PERSONS

Definition

1.4.122. JSP 375 defined that Safe Persons were those who had received the appropriate information, instruction, training and supervision required to carry out a specific task correctly and safely. A competent person within the SST was deemed

competent by virtue of qualifications, currency, experience and maturity. It was essential that commanders ensured that instructors and those supervising the training were competent and given an appropriate level of supervision to ensure that the delivery of training matched the ability of the trainees and complied in full with all the elements of the SST.

Delivery Duty Holders (DDH)

1.4.123. DDHs were to complete mandated training within three months of appointment as per DSA 1.2.3(7) (issued Jul 18). Exhibit 012

1.4.124. **CO 47 Cdo (RG) RM.** CO 47 Cdo (RG) RM assumed command on 6 November 2018 and completed the DSA delivered DH training at MOD Main Building in London on 5 September 2019, before becoming a DDH on 20 November 2019. The position of CO 47 Cdo (RG) RM was not a designated DDH position as part of the Duty Holding construct prior to 20 November 2019. The Panel determined that CO 47 Cdo (RG) RM was an appointed and trained DDH at the time of the accident. Exhibit 035 Exhibit 036

1.4.125. **Comdt CTCRM.** Comdt CTCRM assumed command on 10 July 2019. He had not completed the mandated DH training but had received a brief on Duty Holding from the Navy Safety Director (NSD) on 23 January 2019 as part of a Commanding Officer of Training Establishments course. This briefing was not recognised by the Navy Safety Centre (NSC) or the Defence Safety Authority as an approved training course. The Panel believed that it was more likely than not that the Comdt CTCRM deemed that the NSD briefing qualified as formal DH training. The NSC did not conduct assurance checks of the trained status of appointed DHs. Exhibit 035 Exhibit 037 Exhibit 115

1.4.126. The Panel concluded that Comdt CTCRM had not completed the required DH training in accordance with DSA Policy at the time of the accident. The Panel finds this is an **other factor**.

1.4.127. **Recommendation. The Navy Safety Director should implement an assurance regime in order to ensure that all Duty Holders' are trained in accordance with Defence Safety Authority policy.**

CTCRM 282 Troop Training Team Personnel

1.4.128. The Panel reviewed the instructor status of the members of 282 Tp Trg Team who were all in the vicinity of Tregantle Beach at the time of the accident and compared their trainer status to extant policy. The Panel examined the aspects of the OSP publication and PAM 21 applicable to the activities conducted on Ex FINAL THRUST and used by the 282 Tp Trg Team. PAM 21 defined a Safe Person as being: Exhibit 014 Exhibit 018 Witness 1 Witness 2 Witness 3 Witness 4 Witness 5 Witness 6

a. **'Competent.** To be deemed competent, an individual must be qualified or authorised, experienced and current and have the correct attitude to participate as exercise / range staff or as exercising troops.

b. **Qualified.** A qualified individual must have attended and passed one of the qualifying courses laid down in PAM 21 and remained current.

c. **Authorised.** An authorised individual must have been trained and tested using the Course Folder issued by Dismounted or Mounted Close Combat Training Design Teams and be authorised by the Commanding Officer.

d. **Experienced.** To be deemed experienced an individual must possess the knowledge and skill acquired through participation in or exposure to the same or similar training in that appointment on a qualifying/authorising course or over a period of time.

e. **Current**. Regardless of rank and appointment it is the individual's responsibility to remain current in all aspects of the role in which they are to be employed.'

1.4.129. All members of the 282 Tp Trg Team were Skill at Arms or Platoon Weapons trained and qualified to deliver fieldcraft and Battle Lessons. In addition, JSP 822 stipulated the criteria to teach Phase 1 and Phase 2 recruits as the Defence Trainer (Ph 1 or 2) Level 1 (Foundation) competence, that was achieved by passing the Defence Train the Trainer (DTTT) v2 course. All of the 282 Tp Trg Team were DSAT compliant less Cpl 3, who had been placed on a waiting list by CTCRM to attend the DTTT v2 course. During Cpl 3's instructional delivery periods with 282 Tp his lessons were attended and monitored by a qualified DTTT v2 or a Defence Training Supervisor. The panel determined that the pragmatic solution employed by 282 Tp Trg Team to assure Cpl 3's training delivery was of sufficient standard whilst also developing his instructor's skills prior to attending his DTTT v2 course and within the policy in JSP 822.

1.4.130. The experience of members of 282 Tp Trg Team in relation to Ex FINAL THRUST was as follows: it was the first exercise for Cpl 1, 3, 4 and the Tp Comd; the third exercise for Cpl 2; and the second for the Tp Sgt. The Panel assessed that it was likely that there was sufficient understanding of Ex FINAL THRUST within the 282 Tp Trg Team at the time of the accident.

1.4.131. The Panel concluded that 282 Tp Trg Team's qualifications, currency and experience met the definition of Safe Persons and finds that this was **not a factor**.

Landing Craftsman – Qualification

1.4.132. The status of a qualified coxn was described and defined in BRd6600. It stated that a 'qualified coxswain was a person who has completed the prescribed course at 1 Assault Group Royal Marines[24] (1 AGRM) and who, if he had not handled the appropriate type of craft during the previous six months, is authorised so to do by his Officer Commanding'.

[24] 1 AGRM became 47 Cdo (RG) RM in November 2019.

1.4.133. BRd6600 also stated that 'No unqualified person is to be permitted to take the helm of a craft unless under supervision of a qualified coxswain aboard the craft. A qualified coxswain is deemed in date if he has been trained and operated that craft type within six months. If the coxswain is out of date, he is to be locally trained, by the Snr Coxn and signed off in his Craft Operator's Log Book'. The Panel assessed that within the above statement of frequency of craft operation is a component of currency and not qualification. Exhibit 002

Landing Craftsman – Currency

1.4.134. The Panel referred to JSP 375 and the SST, particularly the information on Safe Persons, and noted that the only prescribed currency metric for a coxswain within BRd6600 was to be in date for a Rules of the Road Test. The Rules of the Road was an integral part of the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996, which came into force on 1 May 1996. The Regulations implemented the Convention on the International Regulations for Preventing Collisions at Sea, 1972, and enhanced safe navigation, by prescribing the conduct of vessels underway, specified the display of internationally-understood lights and sound signals and set out collision avoidance actions in close-quarter situations. Exhibit 002

1.4.135. In the Craft Operator's Log Book it states for Rules of the Road that 'any rank not in date may not command or helm coxswain an in-service landing craft'. It also referred to the frequency of Rules of the Road testing in that 'a Rules of the Road test is to be carried out quarterly in the months of Jan, Apr, Jul, Oct. The test will be administered by the unit's Navigator or, in the case of the LC Units without RN Navigators, an LCOQ or LC1 not below the rank of Colour Sergeant (Snr Coxn function)… and the RM test by the 1AGRM Specialist Navigating Officer'. BRd6600 stated that 'Bi-annual Rules of the Road results are to be recorded in the log book under passages'. There was a disparity in the frequency of Rules of the Road testing between a 6 monthly requirement in the BRd6600 and a quarterly requirement in the Craft Operator's Log Book. Exhibit 038 Exhibit 40

1.4.136. The Panel concluded that the frequency of Rules of the Road testing between the BRd6600 and the Craft Operator's Log Book was inconsistent and had led to confusion. The Panel finds this was an **observation**.

1.4.137. A coxswain was deemed current if he had been trained and operated that craft type within 6 months and if that period lapsed, refamiliarisation in the form of local training on that particular craft type was required. The Panel considered refamiliarisation as a function of currency and the Panel then attempted to quantify the local training process. After interviewing a range of ranks (Lance Corporal to Lieutenant Colonel) of 47 Cdo (RG) RM, no one could explain what constituted local training for a person who had not operated a craft in the last 6 months. Interviewees' estimates for periods of local training ranged from a couple of hours to 2 weeks. The Panel assessed that it was highly likely that the lack of formalised local training led to ambiguity when quantifying a coxswain's overall level of competency (as currency is a component of competency). The Panel further assessed that it was very likely that a standardised format of local training for each craft type would assist the unit in quantifying a coxswain's overall competency. Witness 38 Witness 40 Witness 41 Witness 42

1.4.138. The Panel concluded that the lack of a formal procedure for local training led to an inconsistent understanding of the standards required. The Panel finds this is an **other factor**.

1.4.139. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should direct and ensure that refamiliarisation training and assessment of craft coxswains who have not operated a particular craft type for the period of time specified in the Book of Reference (digital) 6600 is developed, formalised and delivered in accordance with the Defence Systems Approach to Training principles, and that these changes are recorded in the Book of Reference (digital) 6600, in order to formalise craft refamiliarisation procedures and assure coxswain competency.**

Landing Craftsman – Experience

1.4.140. **Introduction.** The only method of assessing an individual's experience in Landing Craft operations was from the craft operating history recorded within an individual's Craft Operator's Log Book. The purpose of the Craft Operator's Log Book was to account for the qualification, experience and certification of all craft coxswains and regular craft users within the RN, RM, Royal Fleet Auxiliary and MOD Police, thereby ensuring the highest of standards of professionalism and safety during all craft tasks and operations. Commanding Officers, Officers Commanding, Heads of Department and Line Managers were to ensure that such standards were set and maintained. The Craft Operator's Log Book was an official document and was the property of her Majesty's Government, was to be carefully preserved by the individual to whom it related and, if lost, the facts were to be reported to the CoC without delay. Craft Coxswains and regular craft users to whom the Log Book relates were responsible for completing the log legibly and accurately, for obtaining the correct signatures, and for the information required within the Log. The Panel also noted that, within BRd6600, all LCs were responsible for the upkeep of their Craft Operator's Log Book. Exhibit 040

1.4.141. Additionally, it stated in BRd6600 that the Craft Operator's Log Books were to be countersigned by a Snr Coxn, Tp Sgt or LC Officer after each entry and that units were to take particular care and interest in the initial issue and subsequent maintenance of the Craft Operator's Log Book. 10 Trg Sqn Snr Coxn's TORs stated that he was to ensure that all Boat Tp ranks recorded craft movements in their Craft Operator's Log Book and he was to check this by means of a quarterly inspection. Exhibit 002 Exhibit 038 Witness 38

1.4.142. The BRd6600 states that the Craft Operator's Log Book is to be checked every 6 months and when an individual joins and leaves a unit. The Panel noted that the Craft Operator's Log Book states that the LC enters a record of passage after every evolution and the Log is to be presented every 6 months for signature and stamp. The Snr Coxn's TORs states he had the responsibility of inspecting each Craft Operator's Log Book every 3 months. In addition, the annual functional inspection[25] of the unit also included inspection of all the Craft Operator's Log Exhibit 002 Exhibit 038 Witness 38

[25] The Annual Functional Inspection is a part of the 1st Party Assurance regime for the unit.

Books. The Panel concluded that there were sufficient checks and assurances if the Craft Operator's Log Books were used in accordance with policy to assess experience. The Panel finds that the general use of Craft Operator's Log Books was **not a factor** in the accident.

Landing Craftsman – Maturity

1.4.143. For completion of the analysis of the components of competency as defined in JSP 375, the Panel attempted to assess the component of maturity. The Panel could not determine from current policy and guidance a measurement for maturity as a function of competency with regards to coxswaining, operating or crewing a craft. The Panel could not determine if an individual may be deemed mature by virtue of age or experience, or how this function of competency was recognised and measured and so will not be discussed further. The Panel concluded that the absence of any guidance or metric in JSP 375 to determine maturity was more likely than not to lead to differing interpretations of the level of competency in operating units, which in turn could affect safety. The Panel finds this is an **other factor**. Exhibit 015

1.4.144. **Recommendation. The Director Health Safety and Environmental Protection should address the absence of any guidance or metric to determine maturity in the Joint Service Publication 375 in order to enable valid assessments of competency to be made.**

Specific Persons Involved – Coxn A

1.4.145. **Qualification.** In the context of the SST as defined in JSP 375 and the definition of qualification within BRd6600, Coxn A was qualified to coxswain an LCVP having passed his LC2 Course in 2011. He qualified as a DTTT v2 whilst at CTCRM. By virtue of holding these two qualifications, Coxn A was qualified to teach LC3s to coxn a LCVP. Exhibit 002 Exhibit 014 Exhibit 044 Exhibit 052

1.4.146. **Currency.** On joining 10 Trg Sqn, Coxn A visited the Snr Coxn and it was in this meeting that Coxn A was instructed to undertake refamiliarisation training on the LCVP Mk5B because he had not helm coxswained a LCVP in the previous 6 months. During this meeting Coxn A did not present his Landing Craft Operator's Log Book as he had lost it before arrival at 10 Trg Sqn. Coxn A had not helm coxswained a LCVP in the previous 6 months and so he conducted local refamiliarisation training on a LCVP in the vicinity of RM Tamar in order to reinstate currency. The coxn that facilitated the local training stated that most of the training was conducted whilst the craft was along-side and that Coxn A accompanied him on some routine tasks in the vicinity of RM Tamar totalling no more than a couple of hours. Coxn A subsequently recorded 2 days craft operation for his local training period in his replacement Craft Operator's Log Book which was issued to him after the accident. In Coxn A's second witness interview he confirmed that the local training was of around 2 hours duration. The Panel could not determine the exact extent of the local training due to discrepancies between the written and verbal evidence. The Panel believe it was almost certain that it was no more than a couple of hours in duration and with no time at the helm of the craft. Coxn A was also not in date for a Rules of the Road test at the time of the accident. The Panel could not Exhibit 040 Witness 10 Witness 38 Witness 43

establish the date of his last successful Rules of the Road pass as he had lost his Craft Operator's Log Book. The CoC was aware of Coxn A's lost Craft Operator's Log Book. Coxn A was also out of date for the RM Battle Swimming Test (BST), (see para 1.4.160 to 1.4.165).

1.4.147. **Experience.** Coxn A's last LCVP experience before re-joining the squadron on the 6 January 2020 was between September 2014 and May 2015 whilst at 10 Trg Sqn. In the 2 years prior to the accident, Coxn A had been assigned to CTCRM as a member of a recruit Trg Team and it was highly unlikely that he would have helm coxswained any kind of landing craft in that time. The Panel could not verify the total amount of time that Coxn A had spent helm coxswaining an LCVP during his career due to the loss of his Craft Operator's Log Book and, therefore, could not make an assessment of Coxn A's level of LCVP coxswaining experience. Exhibit 041 Exhibit 042 Exhibit 043

1.4.148. The Panel determined that Coxn A was qualified but not current due to a lapsed Rules of the Road test and the unit had also not identified this deficiency. Furthermore, the Panel assessed that the local refamiliarisation training delivered to Coxn A was almost certainly insufficient after an absence of coxswaining any craft for 2 years and an LCVP for 4½ years. The Panel concluded that Coxn A was not competent to command or helm coxswain an in-service landing craft and therefore, not a Safe Person in the context of the SST as defined in JSP 375. The Panel finds this was a **contributory factor** (see recommendation at para 1.4.139).

Specific Persons Involved – Coxn B

1.4.149. **Qualification.** The Panel found that in the context of the SST as defined in JSP 375 and the definition of qualification within BR 6600, Coxn B was qualified to coxswain an LCVP having passed his LC2 course in July 2018. By virtue of holding the LC2 qualification and DTTT v2 (in accordance with DSAT policy), Coxn B was qualified to teach LC3s to coxswain a LCVP. Exhibit 002 Exhibit 045 Exhibit 052

1.4.150. **Currency.** Since Coxn B had passed his LC2 Course, he had spent the majority of the time in LCVP Tp at 10 Trg Sqn. Coxn B was not in date for a Rules of the Road test or the RM BST at the time of the accident. The Panel determined that Coxn B was current in LCVP coxswaining but due to a lapsed Rules of the Road test was not current in the context of the SST as defined in JSP 375.

1.4.151. **Experience.** In the time since his LC2 Course in July 2018, Coxn B was employed at 10 Trg Sqn and in LCVP Tp until December 2019. Coxn B presented his Craft Operator's Log Book to the Panel that contained 17 and 18 hours by day and night respectively coxswaining a LCVP since successfully completing his LC2 Course. In the opinion of the Panel, Coxn B had accumulated sufficient LCVP coxswaining experience to conduct the task of delivering 282 Tp onto Tregantle Beach. Exhibit 046 Exhibit 047 Exhibit 048 Exhibit 049 Exhibit 050 Exhibit 051

1.4.152. The Panel determined that Coxn B was qualified, but not current due to a lapsed Rules of the Road test and the unit had also not identified this deficiency. The Panel determined that Coxn B, therefore, was overall not competent to command or helm coxswain an in-service landing craft. The Panel concluded that

Coxn B was not competent to command or helm coxswain an in-service landing craft and therefore, not a Safe Person in the context of the SST as defined in JSP 375. The Panel finds this an **other factor** (see recommendation at para 1.4.139).

Competency of the Landing Craftsman Two Course students on LCVP 0338

1.4.153. **Introduction.** LCVP 0338 was crewed by one UK rank (Crewman 1) and two Dutch ranks (Crewman 2 and 3) on the evening of the accident.

1.4.154. **Qualification.** Crewman 1 was qualified to crew the LCVP by virtue of having passed a UK LC3 Course in 2012 and was subsequently selected for the LC2 Course. Both the Dutch ranks were qualified to crew the LCVP by virtue of having passed a Dutch LC3 Course in Holland, which the Panel understood to be of an equivalent standard to the UK LC3 Course. Crewman 2 passed his LC3 Course in 2014 and Crewman 3 in 2018. There was no English language standard to be achieved for Dutch students attending the UK LC2 Course (see para 1.4.369). Exhibit 053 Exhibit 054 Witness 11 Witness 12 Witness 13

1.4.155. **Currency.** The Panel determined that all three students had passed both the Rules of the Road tests and the RM BST as these were tests conducted in the earlier phases of the LC2 Course and they would have not been able to continue on the course if they had failed either test. All three students were current to crew an LCVP as LC3 crewmen.

1.4.156. **Experience.** The panel noted from the course Main Events List (MEL) and witness statements that, during the week preceding the accident, the LC2 course students had conducted basic LCVP handling, which included some beaching of the craft, in daylight without embarked troops, all within the confines of Plymouth harbour. Since passing his LC3 course Crewman 1 had spent over 100 hours crewing LCVPs through various assignments. Crewman 2 had spent 2 years on Dutch LCVPs and Crewman 3 had spent 6 months on Dutch LCVPs. Exhibit 055 Exhibit 056 Exhibit 077

1.4.157. The Panel concluded that there was sufficient evidence to demonstrate that the three Crewmen on LCVP 0338 were qualified, current and experienced, and therefore competent to conduct the duties of a LCVP LC3 Crewman.

1.4.158. The Panel finds that the LC2 Course students who formed the crew onboard LCVP 0338 as LC3 Crewmen at the time of the accident were Safe Persons in the context of the SST as defined in JSP 375 and this was **not a factor**.

SAFE PRACTICE

Definition

1.4.159. JSP 375 defined Safe Practices as those conducted strictly in accordance with drills, procedures and instructions laid down by the Service authorities. These drills and procedures, taking into account the Training Imperative, were identified in the safety case and developed in accordance with DSAT policy. Safe Practice included following correct procedures, the provision of effective supervision and

delivery of effective training, the briefing of all warnings, cautions and controls together with the use of appropriate personal protective equipment. Training was only to be delivered by a competent person to ensure that procedures were strictly adhered to and such instruction and training was closely supervised by the CoC to ensure that Safe Practice was implemented.

RM Battle Swimming Test (BST)

1.4.160. All RM had to complete Military Annual Training Tests (MATTs) in order to be prepared for operations. The RM MATT 2 Fitness Test included the BST. At the time of the accident the BST comprised the following standard: the RM entered a swimming pool from a 3 m board dressed in PCS with weighted webbing weighing 2.7 kg and carrying a rubber weapon (inert drill version of current in-service rifle (SA80)) weighing 5 kg. The subject swam 30 m and then removed equipment and passed the equipment (weapon and webbing) out of the pool unaided. The RM then treaded water for a further 2 mins before exiting the water at the side of the pool without using the steps. On passing the BST, the competency was valid for 12 months. The policy changed in February 2019 to include all serving RM ranks; prior to that date it only applied to ranks within 3 Commando Brigade. It was also noted that, in accordance with CTCRM Recruit Syllabus (2019), all recruits must have passed the BST by week 13 of recruit training. Exhibit 057 Exhibit 058

1.4.161. Coxn A's last BST pass was on 23 August 2016 and Coxn B's last pass was on 24 April 2018, making them both out of date for a BST at the time of the accident by 29 and 9 months respectively. All the recruits of 282 Tp, except Recruit 28, were in date for the BST at the time of the accident. Recruit 28's BST pass ran out on 5 July 2019 having passed it on 6 July 2018. In addition, 282 Tp Trg Team Instructors were all out of date for a BST, at the time of the accident, except for Cpl 3. Exhibit 044 Exhibit 045 Exhibit 059

1.4.162. The Panel identified that there were inconsistencies in adherence to BST policy for those involved in the activity on the evening of the accident. The Panel determined that it was highly likely that the lapse of the BST pass for Recruit 28 was an oversight by staff at CTCRM due to the total time he had spent in training since early 2018 through back-trooping.

1.4.163. The Panel concluded that five out of the six 282 Tp Trg Team Instructors, Coxn A and B, and one recruit were out of date for the BST, contrary to RM policy. The Panel finds this is an **other factor.**

1.4.164. **Recommendation. The Commandant Commando Training Centre Royal Marines should implement a process for tracking Battle Swimming Test currency in order to ensure that all Training Teams and Recruits[26] are in date.**

1.4.165. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should implement a process for tracking**

[26] The term 'recruit' is used throughout this report. CTCRM refer to individuals in Phase 1, 2 and 3 training as trainees.

Battle Swimming Test currency in order to ensure that all coxswains and crew are in date.

Training Applicable to Beach Landings – Wader Package

1.4.166. The Wader package was the CTCRM recruit troop introduction to RM amphibious operations. It included landing and small craft operations involving embarkation, disembarkation, cross-decking and landing on beaches and capsize drills[27] prior to their involvement on Ex FINAL THRUST. It was delivered on behalf of CTCRM by 47 Cdo (RG) RM at HMNB Devonport. The Wader package for 282 Tp was delivered in accordance with CTCRM L / ISPEC. The L / ISPEC included evolutions on three types of craft: the landing craft, the Offshore Raiding Craft (ORC) and smaller inflatable Zodiacs. The L / ISPEC did not specify that these evolutions were to take place at day and night, however, the ASPEC for amphibious training stated that the activity was to be assessed by day and by night, and by the LC Training Team. Exhibit 060 Exhibit 061

1.4.167. The LCVP night beach landing for 282 Tp recruits was not delivered due to bad weather. The beach used for the 282 Tp's LCVP disembarkation evolution was located inside the breakwater in Plymouth Harbour. Recruits described the conditions as very benign and also experienced less than boot depth level of water as they disembarked. All recruits did recall being taught that the disembarkation involved fanning out to the left and right as two sections disembarked the craft simultaneously. Recruits also recalled that ATLJs were worn for the duration of the LCVP phase of the Wader package and instructors only talked through the theory of returning ATLJs to the craft. 282 Tp travelled from Lympstone to Devonport for their Wader package and returned the same day. 282 Tp's Tp Sgt was the only member of the Trg Team who accompanied the recruits on the journey but did not attend any of the Wader package training. Exhibit 059 Witness 24 Witness 26 Witness 27 Witness 44 Witness 45 Witness 46 Witness 47 Witness 48

1.4.168. It was very likely that all training objectives for the Wader package and that all the criteria with regards to the LSPEC were achieved. However, not all criteria in the ASPEC for the Wader package were achieved due to the absence of the night evolutions and the Panel found that the deficient criteria were not reported to the CTCRM training office. In addition, the Panel could not ascertain whether the night evolution was mandatory as there was incoherence between the ASPEC and LSPEC. Furthermore, the Panel were unable to identify a method for recording if all the ASPEC content of the Wader package was achieved. Finally, the Panel determined that the absence of the 282 Tp Trg Team on the Wader package meant that they were unable to make a first-hand assessment of the recruits' aptitude for amphibious operations.

1.4.169. The Panel concluded that 282 Tp Trg Team not accompanying their recruit troops on the Wader package meant that they were unable to make a first-hand assessment of the recruits' aptitude for amphibious operations and finds this is an **other factor**. The Panel also concluded that not all the Wader package training documentation aligned with reference to the delivery of amphibious training, specifically night beach landings. The Panel finds this is an **other factor**.

[27] Capsize Drills involve recruits entering deep water wearing life jackets to right a capsized small inflatable raiding craft.

1.4.170. **Recommendation. The Commandant Commando Training Centre Royal Marines should mandate that Training Teams attend Wader Packages with their troops / courses in order to assess their Recruits' aptitude for amphibious operations.**

1.4.171. **Recommendation. The Royal Marines' Training Requirements Authority should remove discrepancies in the Recruit Wader Package training documentation in order to direct coherent training.**

Organisational Adherence to JSP 822

1.4.172. 1st and 2nd Party Assurance[28] (PA) sought to objectively review management of a training system and associated training procedures, the implementation of policy and effectiveness of training. Although non-conformities and observations for improvement may be outlined, an audit was conducted to provide training support to a unit and was a catalyst for continuous improvement. As part of the inquiry, the Panel reviewed the 1st and 2nd PA reports for 47 Cdo (RG) RM. The Panel also reviewed the 2016 OFSTED Report for CTCRM that was awarded a grade of 'Good'. The Panel concluded that, at the organisational level, both CTCRM and 47 Cdo (RG) RM followed the guidance and requirements of JSP 822 and the DSAT process and finds this was **not a factor**.

Exhibit 014
Exhibit 068
Exhibit 069
Exhibit 070
Exhibit 125

CTCRM Compliance with PAM 21, the OSP and AC 71717

1.4.173. The Panel reviewed PAM 21, the OSP and AC71717 that covered the planning, conduct and supervision of training, applicable to the activity conducted on Ex FINAL THRUST and used by the 282 Tp Trg Team. The Panel noted from witness interviews that all of the 282 Tp Trg Team had qualifications that complied with the requirements of the policy, and were aware of the policy contained therein, at the time of the accident. The Panel concluded that 282 Tp Trg Team adhered to the policy stipulated within PAM 21, the OSP and AC71717 that covered the planning, conduct and supervision of training, applicable to the activity conducted on Ex FINAL THRUST. The Panel finds this was **not a factor**.

Exhibit 001
Exhibit 004
Exhibit 018
Witness 2
Witness 3
Witness 4
Witness 5
Witness 6

LC2 Course – Mandatory Training Documentation

1.4.174. The purpose of the following documents was to standardise training documentation, training procedures and policy in order to comply with DSAT policy:

a. JSP 822.

b. 1AGRM[29] Training Manual.

c. 47 Cdo (RG) RM Training Quality Manual.

d. Supervisory Care Directive.

Exhibit 014
Exhibit 071
Exhibit 072
Exhibit 073
Exhibit 074
Exhibit 075

[28] Party Assurance (PA) as described in para 1.4.22 as the three levels of Audit and inspection (A and I).
[29] 1AGRM became 47 Cdo (RG) RM in November 2019.

e. RMT LCVP 2 19 Specific Risk Assessment.

f. RMT LCVP Generic Risk Assessment.

1.4.175. The following components were mandated in DSAT policy, including the requirement, formulation, design and delivery of training, and specifically applied to the LC2 Course: Exhibit 076 Exhibit 077 Exhibit 078 Exhibit 079 Exhibit 080 Exhibit 081 Exhibit 082

a. LC2 Course LSPEC.

b. LC2 Course Main Events List (MEL) / Course Programme.

c. Training Authorisation Documents that contain:

(1) Formal Training Statement.

(2) Course Title – Landing Craftsman Class 2.

(3) JPA Course Code – RM_5002.

(4) LC2 Course Training Objectives.

(5) LC2 Course Training Requirements Authority – NCHQ RM.

(6) LC2 Course Training Delivery Authority – 1AGRM.

d. LC Vocational Courses Internal Validation (Instructor) 1 – 19.

e. LC Vocational Courses Internal Validation (Student) 2 – 19.

f. LC2 Course AStrat and ASPEC.

1.4.176. The Panel reviewed the training and supporting components. The Panel found that 10 Trg Sqn were in possession of all the required training documentation for the LCVP phase of the LC2 course. The Panel believe that it was generally accepted as good practice to review L / ASPEC when the contents changed or every 12 months (which ever came first). The Panel reviewed the SPECs for the LC2 Course at the time of the accident and made the following observations: some LSPECs had not been reviewed since 2013; LSPEC information was contained on ISPEC formats; some ISPEC formats had been extracted from JSP 822 from 2010; and that some of the ISPECs contained out of date information such as an updated fire-fighting system which had been fitted to the LCVP Mk5B in 2019. In addition, only 50 % of the LSPECs were dated and the remainder were last reviewed on 31 October 2017 and had a future review date of 31 October 2018. The Panel determined that in the case of the fire-fighting LSPEC that the information was inaccurate and could compromise safety if taught.

1.4.177. The Panel concluded that the LC2 Course LCVP phase documentation was not DSAT compliant as it exceeded review dates and contained inaccurate information. The Panel finds this is an **other factor**.

1.4.178. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should ensure that Landing Craftsman Two Course training documentation is updated and kept up to date in order to be compliant with Defence Systems Approach to Training policy.**

LC2 Course Supporting Documentation – BRd6600

1.4.179. BRd6600 set out the definitions, general operating instructions, policy and safety information for the LC Specialisation and, importantly for this inquiry, the operating procedures for the LCVP Mk5B. The last recorded update to BRd6600 occurred on 28 July 2015. Exhibit 002

1.4.180. 10 Trg Sqn used BRd6600 as reference material for landing craft operations and were using the latest controlled version to deliver the LC2 Course. It was recognised by the staff of 47 Cdo (RG) RM that some of the detail in the BRd6600 was out of date and required updating. Witness 42 Exhibit 076 Exhibit 083 Exhibit 084

1.4.181. The Panel determined that BRd6600 had not been reviewed within the last 5 years. In the Panel's opinion it was more likely than not that individuals would be inclined to not refer to BRd6600 as some of the information was over 5 years out of date and other information conflicted with references in other more up-to-date documents.

1.4.182. The Panel concluded that the lack of accuracy and relevancy of some of the information within BRd6600 had undermined its effectiveness as the policy for the Royal Marines Landing Craft and Small Craft Operations and could therefore contribute to a future accident. The Panel finds this is an **other factor**.

1.4.183. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should direct that Book of Reference (digital) 6600 is updated and reviewed periodically thereafter, in order to incorporate current procedures and equipment specifications.**

Ex FINAL THRUST – Duties of the Exercise Conducting Officer (ECO)

1.4.184. The Panel reviewed the mandated paperwork that was produced by the ECO (282 Tp Sgt) and countersigned by the SPO, which included the EASP, Risk Assessment, Ex Coordinating instruction and BAMs bookings (see para 1.4.67). The ECO conducted a full safety brief for Ex FINAL THRUST and an exercise coordination meeting was conducted with the 282 Tp Trg Team prior to the start of Ex FINAL THRUST. He also delivered a full safety brief to 282 Tp recruits that covered each phase and the training areas to be used during the exercise. Exhibit 004 Exhibit 085 Witness 2

1.4.185. Both Dartmoor and Bodmin Training Area Standing Orders and the Antony and Tregantle Training Area Standing Orders (procedures during training) stipulated that any changes of key appointments, such as the ECO appointment, must be notified to the Range Control Office and the Trg Area Supervisor. The Panel understood that the ECO left the training areas on numerous occasions due to the administrative requirements of running the exercise. Although the Range Exhibit 024 Exhibit 086 Exhibit 087 Witness 2

Control Office was not notified when the ECO left, the ECO did nominate a deputy and conducted a handover of his duties to other qualified individuals within the Trg Team.

1.4.186. The Panel concluded that the action of the ECO leaving the training area without notifying the respective Range Control Offices was, more likely than not, an oversight on the part of the ECO. The Panel finds that this was **not a factor**.

1.4.187. Although there is a civilian ambulance RV point nominated on the Tregantle Known Hazards Map, it was stated within the Antony and Tregantle Training Area Standing Orders that, 'In the event of a civilian ambulance being required, the following information is needed: You must select a suitable rendezvous for civilian ambulances which will be dependent on where the casualty is. Consider sending a guide to it. Inform the ambulance service of the number and type of casualties'. A civilian ambulance rendezvous point was not selected by the ECO prior to the arrival of the civilian Emergency Services. Exhibit 024 Witness 2

1.4.188. The Antony and Tregantle Training Area Standing Orders also required the nomination of an Incident Control Point (ICP). The ECO did not select an ICP, nor brief its location at the time of the accident.

1.4.189. The Panel concluded that the absence of a nominated ICP or rendezvous point had no consequence on this accident or the post-accident response. However, the Panel also concluded that not nominating and briefing the locations of an ICP and civilian ambulance rendezvous points could impact future accident response to Antony and Tregantle Training Area. The Panel finds this was an **observation**.

Unit Liaison

1.4.190. The RM Additional Resources Table is a system designed to request and allocate additional resources between RM units. It was also the standard process for formally requesting additional resources from one unit to another. Exhibit 088

1.4.191. 47 Cdo (RG) RM's support to CTCRM's Ex FINAL THRUST for 282 Tp was requested and satisfied using the RM Additional Resources Table. Exhibit 088

1.4.192. The Panel noted that a detailed Exercise Coordination Instruction for Ex FINAL THRUST was published by CTCRM on 2 December 2019, but 47 Cdo (RG) RM were omitted from the distribution list. 282 Tp Comd was given a specific task within the instruction to liaise with OC Boats at 10 Trg Sqn. The Panel, in the course of the inquiry, could not establish if the liaison took place either formally or informally and noted that the Tp Comd was not in post at the time of publication of the orders, having only joined the Tp on 6 January 2020. Within the Exercise Coordination Instruction, the details of the Amphibious Phase to Ex FINAL THRUST had been included and was assessed by the Panel to be of adequate detail to enable the phase of the exercise to proceed. Coxn B liaised with the 282 Tp Comd during the day on 21 January 2020 prior to the task that evening to Exhibit 001 Exhibit 004 Witness 1 Witness 14

confirm sail timings and that it had been changed from a single craft task to a two craft task.

1.4.193. The Panel observed that liaison between 282 Tp Trg Team and other exercise supporting elements, including 47 Cdo (RG) RM, took place using Modnet[30] emails and at an informal level using mobile phone Whatsapp[31] messages. In addition, the use of Whatsapp for liaison between members of 282 Tp Trg Team and exercise supporting elements prior to the accident was considered normal procedure.

1.4.194. It was the opinion of the Panel that formal tasking of 47 Cdo (RG) RM assistance in support of Ex FINAL THRUST was timely and followed correct procedures. However, liaison between 282 Tp Trg Team, 10 Trg Sqn and other exercise supporting elements in preparation for the task on the evening of the accident was limited and conducted over informal means. In the Panel's opinion it was likely that this informal and limited communication means was susceptible to misinterpretation and had the potential for error.

1.4.195. The Panel concluded that there was limited liaison between 282 Tp Trg Team and the exercising supporting elements within 10 Trg Sqn to Ex FINAL THRUST. The Panel finds this is an **other factor**.

1.4.196. **Recommendation. The Commandant Commando Training Centre Royal Marines should assure that formal liaison takes place between all exercising elements after the publication of the Exercise Coordinating Instruction in order to ensure a full understanding by all exercise staff and supporting elements.**

Coxn A's Involvement in Instructing the Landing Craftsman 2 Course

1.4.197. Coxn A was informed by his CoC either on the afternoon of 9 January 2020 or morning of 10 January 2020 that he would be supporting the LC2 Course from 13 January 2020. The LCVP SNCO believed that Coxn A would be coxswaining the craft only and not delivering instruction. At the same time, Coxn A was handed a MEL[32] that listed the outline of lessons to be covered over the next 9 working days for the LCVP phase of the LC2 Course.

Exhibit 005
Witness 10
Witness 41
Witness 51

1.4.198. DSAT policy stated that the Training Provider, and specifically the Trainer, was to complete preparation for the delivery of the lesson and / or collective training event. This included the use of the LSPEC and ASPEC to generate lesson or event plans and assessments suitable for the chosen training environments. JSP 822 mandated that the DSAT process should be iterative and that the assurance activity should take place regularly and as part of all elements. It also stated that

Exhibit 014
Exhibit 052

[30] Modnet is UK Defence's intranet and work system.
[31] WhatsApp Messenger, or simply 'WhatsApp', is an American freeware, cross-platform messaging and Voice over IP (VoIP) service owned by Facebook. It allows users to send text messages and voice messages, make voice and video calls, and share images, documents, user locations, and other media.
[32] A Main Events List is an unofficial document that listed the training to be covered within the LCVP weeks.

consideration should be given to the development of a remedial training strategy and the requirements associated with deployed collective trainer training.

1.4.199. When interviewed, Coxn A stated that he was unaware that LSPEC or ASPEC were available to support the teaching. The Panel also determined that the LC2 Course Instructors did not offer the LSPEC and ASPEC to Coxn A. The Panel opined that it was more likely than not that Coxn A would have known the purpose of the LSPEC and ASPEC due to his previous assignment within the training environment at CTCRM. Coxn A stated that he did not know the content of the LSPEC and ASPEC as he had only received the MEL listing the LCVP activities to be covered. Exhibit 077 Exhibit 014 Witness 10

1.4.200. No formal or informal assurance of Coxn A's instructional abilities were conducted by the Defence Training Supervisor (DTS), who was also the LC2 Course Instructor 1. There was also no formal feedback to the LC2 Instructors on how the students were performing However, on one or more occasions, Coxn A gave informal feedback of the students' progress to the LC2 Course Instructors. Witness 10 Witness 17

1.4.201. At the time of the accident, LC2 Course Instructor 1 had not been out on the LCVPs with the course students at any point and LC2 Course Instructor 2 had only visited the course during the LCVP phase a couple of times. The Panel determined that it was almost certain that the Instructors would not have been able to assess the instruction being delivered or the training progression of the students. Witness 17

1.4.202. It was the opinion of the Panel that Coxn A was insufficiently prepared to deliver the LCVP phase of the LC2 Course and that his instruction was not consistent with the policy contained in JSP 822 at the time of the accident. However, the Panel also noted that there was an obligation on Coxn A's CoC and the LC2 Instructors to ensure that Coxn A was given appropriate time and CoC assurance to prepare his lessons and deliver them to the standards required to be DSAT compliant.

1.4.203. The Panel concluded that there was an absence of preparation by Coxn A. The Panel finds this is an **other factor**.

1.4.204. The Panel also concluded that there was an absence of assurance of Coxn A's preparation and delivery of instruction by both his CoC and the LC2 Course Instructors. The Panel finds this is an **other factor**.

1.4.205. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should assure that individuals selected to instruct are competent and suitably prepared to deliver training in order to ensure training delivery in accordance with the Defence Systems Approach to Training policy.**

Landing Craftsman Two Course Progression of Training

1.4.206. The LC2 Course was a formalised training course delivered by 10 Trg Sqn. The course followed a recognised progression of training which was detailed within the course documentation.

1.4.207. Coxn A stated during his interview that he had deviated from the LC2 Course MEL and wished to conduct the Boat Tp task to deliver 282 Tp onto Tregantle Beach in order to give the LC2 Course students night-time experience driving an LCVP. It was assessed by the Panel that Coxn A's decision to include the LC2 Course students in the Boat Tp task was out-with the recognised progression of training within the LC2 Course L / ASPEC. The Panel determined that the LC2 Course instructional documentation, which had not been provided to Coxn A, would have given him a structured method for delivering training, and conducting formative and summative assessments, within a progressive training syllabus. Exhibit 077 Exhibit 090 Witness 10

1.4.208. The Panel identified that the LC2 Course had conducted practical instruction of beaching during daylight without troops and that this instruction was conducted following the Explain, Describe, Imitate, and Practice; the method of instruction recognised within DSAT policy. Before the accident and whilst on the course, the LC2 Course students had not conducted a beaching at night, nor any beaching with troops.

1.4.209. The Panel concluded that the deviation from the LC2 Course documentation resulted in unauthorised training being conducted and did not meet the prescribed progression of training. The Panel finds this was a **contributory factor**.

1.4.210. **Recommendation**. A recommendation to address this finding is at para 1.4.205.

10 Trg Sqn's Task Management to Deliver 282 Troop onto Tregantle Beach

1.4.211. 47 Cdo (RG) RM's support to Ex FINAL THRUST was a regular occurrence. Coxn B was allocated the routine task of facilitating a recruit troop beach landing with a single LCVP and was assigned a crew prior to 21 January 2020. Coxn B was part of Raiding Instructional Tp and not LCVP Tp, having transferred between troops prior to Christmas 2019. Witness 10 Witness 14

1.4.212. On the day of the accident Coxn A was instructing on the LC2 Course and volunteered both himself and the LC2 Course to assume Coxn B's task, in order to provide the LC2 Course students with night-time craft handling. Coxn A first discussed his proposal with Coxn B and then sought permission from the LC2 Instructor 1, who approved the change. This was done informally during a meeting in a corridor where verbal permission was given. Up until that point the students of the LC2 Course had only conducted LCVP coxswaining under instruction and within the harbour limits during daylight. Coxn B then went to the Striker building in HMNB Devonport and briefed the Tp Comd of 282 Tp that the evening's task would now involve two craft and that the whole Tp would be carried on one craft. Witness 10 Witness 14

1.4.213. The Panel determined that the LCTO, Snr Coxn, LCVP SNCO and OC Boats were unaware that the personnel (including the LC2 Course students) and craft numbers to deliver 282 Tp on to Tregantle Beach had changed. The Panel opined that this was very likely to be information that they should have been made aware of as it was consistent with their roles and responsibilities. The Panel assessed that Coxn A, Coxn B and LC2 Instructor 1 should have consulted their respective CoCs over the change in task and sought permission to proceed. The Panel also assessed that it was almost certain that neither the LC2 Instructor 1, nor Coxn A recognised any additional risk with regards to training (LC2 Course) facilitating training (282 Tp's exercise) when verbal permission was given to change the task. Exhibit 038 Witness 38 Witness 50 Witness 39

1.4.214. LC2 Course Instructor 1 in interview, stated that he thought the LCVP Tp was providing full crews for both craft, in addition to the presence of the LC2 Course students. In addition, the LCVP SNCO thought that the LC2 Course Instructors would be out on the craft providing instruction to the LC2 Course as well as the LCVP Tp personnel. The Panel concluded that this demonstrated a lack of understanding between the training department and Boat Tp elements of 10 Trg Sqn. Witness 17 Witness 41

1.4.215. In the opinion of the Panel there was no recognition, and therefore no consideration, of the associated risks of training facilitating training[33], or the need for suitable training progression for the LC2 Course students when the task was changed. LC2 Course Instructor 1 and Coxn A's lack of recognition of additional risk was analysed by the INM HF advisors and assessed to be an example of a 'planning fallacy'; a manifestation of 'optimistic bias'. Optimistic bias is a common error in human thinking where people take an overly positive view of themselves and the world they live in. The planning fallacy occurs when people make plans and forecasts which are unrealistically close to best-case scenarios, overlooking the potential for problems and mistakes. This was almost certainly the case for LC2 Instructor 1 and Coxn A when they did not sufficiently consider the additional risk arising from using the LC2 Course students to deliver the task. Exhibit 077 Exhibit 089

1.4.216. The Panel concluded that the informal act of changing the task to deliver 282 Tp onto Tregantle Beach, although well intentioned, introduced additional risks that were not recognised. The Panel finds this was a **contributory factor**.

1.4.217. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should assure that any changes to craft operations and tasks are formally authorised, following an appropriate risk assessment, in order to safely operate craft.**

Landing Craftsman Two Course activity prior to the Task

1.4.218. BRd6600 stated that good planning and sound preparation played a major part in achieving safety in both amphibious training and operations. It also added that commanders and coxns were to devote as much time as possible to careful Exhibit 002 Exhibit 091 Witness 10

[33] Students under instruction facilitating all or part of training for other trainees was permissible with correct planning, resources and appreciation and management of any potential elevated levels of risk within a risk assessment.

planning, preparation and the delivery of orders. Coxn A instructed the LC2 Course students to conduct a passage plan from HMNB Devonport to an FRV and, once they had completed the plan they could stand down for the rest of the afternoon. The Panel reviewed the Admiralty Chart passage plan between HMNB Devonport and the FRV and found that the LC2 Course students had prepared a safe passage plan. Neither Coxn A nor B supervised the passage planning evolution and checked that it had been completed 30 minutes prior to sailing.

1.4.219. Before both coxswains arrived at their respective craft, pre-start checks[34] had been completed and no faults were reported by the LC2 Course students. Coxn A described the amphibious landing as a tactical evolution as opposed to an administrative movement of troops. The Panel established that neither Coxn A or Coxn B, nor the LC2 Course students had considered including any preparations to fit in with the tactical scenario of Ex FINAL THRUST. Such preparations could have included the employment of NVD, tactical radio fits and their own personal combat equipment and weapon systems, their own tactical orders and contributions to 282 Tp's planning and orders process. Witness 10 Witness 14 Exhibit 006

1.4.220. The Tp Comd of 282 Tp could not describe the status (a tactical or a non-tactical administrative move) of the sea passage and how that would have affected the preparation and operation of the craft and crews. The Panel assessed that it was almost certain that there was an absence of a shared awareness between the 282 Tp Trg Team and the LCVP crews of the activity to be undertaken and how the task would progress. Witness 1

1.4.221. The Panel concluded that the LC2 Course students had prepared a safe passage plan and prepared the craft for sea. The Panel finds this was **not a factor**.

1.4.222. The Panel also concluded that there was a lack of clarity between the crews and 282 Tp Trg Team regarding the LCVPs' involvement in Ex FINAL THRUST and whether the task was an administrative or tactical move. The Panel finds this was an **observation**.

282 Troop arrival in HMNB Devonport

1.4.223. On 20 January 2020, 282 Tp moved by road from Dartmoor Training Area to RMB Stonehouse in Plymouth. The same day, they were transported from RMB Stonehouse to RM Tamar via LCVP by Coxn B. The Tp then occupied the Striker building located in RM Tamar. They remained overnight in order to conduct administration, rehearsals and the preparation and delivery of orders prior to conducting the final phase of the exercise. During the evening of 20 January 2020 a reconnaissance of the land-based final objectives of the attack was conducted by five members of 282 Tp.

[34] LCVP Pre start Checks involve ensuring that all preparations are complete in all respects before the vessel proceeds to sea.

282 Troop Orders – Attendance and Content

1.4.224. Prior to the tactical evolution, the plan and associated information was given to all those involved at an orders group so that mutual understanding of what was involved, the sequence of what was to be expected, and all timings were promulgated. Tactical Orders for the Amphibious Phase and Final Assault of Ex FINAL THRUST to be conducted at Tregantle Fort by 282 Tp on the evening of 21 January 2020 were delivered by the Tp Comd in the Striker building. Witness 1 Witness 2

1.4.225. Although the recruits and instructors from 282 Tp were present at the orders process, there was no representation from other third parties who were also to be involved in this phase of the exercise. The Tp Comd had briefed that there were two means of dealing with the ATLJs (either to wear them ashore and return them to the craft or disembark without ATLJs being worn) and that the LC Coxn's would confirm the method at a later point. Witness 7 Witness 9 Witness 10 Witness 14

1.4.226. It was stated within the All Arms Tactical Aide Memoire that attached personnel and command relationships must be briefed during the orders process. It was also policy that good planning and sound preparation play a major part in achieving safety in both amphibious training and operations. Although a brief liaison between Coxn B and Tp Comd had taken place earlier during the day prior to orders no LC personnel were present during the orders to brief specifics relating to the amphibious phase. Exhibit 002 Exhibit 093

1.4.227. INM HF analysis of the arrangements assessed that the limited coordination and communication between the LCVP crews and 282 Tp Trg Team represented a limitation in 'multi-team' co-ordination towards a common goal. The LCVP crews and the 282 Tp Trg Team were part of a multi-team system as they were separate teams who worked independently yet shared the common goal of getting recruits safely onto the beach. It was likely that the limited coordination and communication between the LCVP crew and 282 Tp Trg Team reduced their ability to perform collectively on the evening of the accident. Exhibit 089

1.4.228. The Panel opined that it was reasonable to expect that 282 Tp should have received information from a LC SME at the planning stage and at the orders. Likely information should have included: Load Plan, Route out, Actions on[35] and Medical, ATLJs and actions on beaching and disembarkation. Non-attendance at the 282 Tp orders by a LC SME would have limited the knowledge of 282 Tp of the practical aspects and their expectations of the amphibious phase of the exercise, especially during the transit to and the subsequent landing at Tregantle Beach. In addition, it was almost certain that the absence of multi-team coordination resulted in limited understanding between the LCVP crews and 282 Tp Trg Team.

1.4.229. The Panel concluded that the absence of attached LC SME personnel, during the tactical orders process within the multi-team phase of the Ex FINAL THRUST, degraded overall awareness and understanding of the practical aspects of LC operation and procedures. The Panel finds this was a **contributory factor**.

[35] Actions on is the term used to describe expected and pre-planned reaction to foreseen or unexpected events.

1.4.230. **Recommendation. The Commandant Commando Training Centre Royal Marines should mandate that relevant Subject Matter Experts attend the tactical orders process in order to ensure that command relationships and specialist roles are briefed to facilitate a comprehensive level of understanding for all exercise participants.**

282 Troop Rehearsals – Participants and Content

1.4.231. In military exercises and operations, rehearsals occur after orders have been delivered and subordinates have had time to assimilate the information and produce their own plans. The aim of a rehearsal was to enhance an understanding of a plan by a visual, sequenced representation and should ensure a greater degree of familiarity with an operation. 282 Tp's rehearsals were conducted in the vicinity of the Striker building after the Tp Comd had delivered his orders and concentrated on the clearance of rooms within Tregantle Fort for the assault phase of the exercise. The rehearsals did not include any amphibious activity such as embarking on to the LCVP or the sequence for disembarkation once on the beach. At the time of the rehearsals a communications check between those that had BOWMAN radios took place. Exhibit 092 Exhibit 093 Witness 1 Witness 3 Witness 6 Witness 26

1.4.232. The consequences of the absence of rehearsals for embarking (paras 1.4.240 to 1.4.243) and disembarking the craft (paras 1.4.276 to 1.4.282) during the amphibious phase of the exercise are discussed later in the report.

Pre-Sail Brief

1.4.233. After rehearsals 282 Tp left the area of the Striker building and proceeded to the jetty. It was at this point that Coxn A met with the 282 Tp Comd and Trg Team and informed them that 282 Tp would remove life jackets prior to disembarking. His reasoning was due to the benign conditions forecast for Tregantle Beach and that it would speed up the process of getting the Tp onto the beach without the need to return ATLJs back to the craft. Exhibit 002 Witness 4 Witness 10

1.4.234. BRd6600 stated that, before sailing, all troops must receive a pre-sail brief. The brief should have included, but was not limited to: seating sequence, transit time, embark / disembark routine and fire drill. The Panel considered that there were omissions from the BRd6600, notably regarding safety equipment and drills. Exhibit 002 Witness 3 Witness 18

1.4.235. Coxn A gave a pre-sail brief from the catwalk of LCVP 0338 to 282 Tp and Trg Team who were on the jetty by the craft. Some recruits did not remember hearing the brief, others remembered a brief taking place but did not hear it, whilst others remarked that it was very short and concentrated on the craft layout and to be wary of levers in the canopy which were the fuel cut off valves. The Panel assessed that it was very likely that there was more content in Coxn A's brief than that, but as the Recruits were interviewed some time after the accident they may not have recalled all the content of the brief. Cpl 1 did recall that Coxn A briefed the subjects of the fire drill and safety on the craft, however, the Panel concluded that Coxn A did not include all of the information prescribed in BRd6600. In the opinion Exhibit 002 Witness 3 Witness 18

of the Panel there were significant safety equipment and drills omitted from the document that should be updated to include a standardised pre-sail brief.

1.4.236. The Panel finds that the LCVP pre-sail brief given by Coxn A was incomplete and also not heard by all of the intended audience and this is an **other factor**.

1.4.237. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should mandate that a full pre-sail brief is delivered in accordance with the Book of Reference (digital) 6600 in order to ensure safe craft operations.**

1.4.238. The Panel concluded that the pre-sail brief in the extant BRd6600 omitted significant safety aspects and finds this is an **other factor**.

1.4.239. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should update the Book of Reference (digital) 6600 to include a more comprehensive pre-sail brief in order to ensure safe craft operations.**

282 Troop – LCVP Embarkation and Seating

1.4.240. The policy for embarkation onto and seating of troops within a LCVP was contained within BRd6600 that stated 'that before sailing all troops must receive a pre-sail brief that should include seating sequence and that all men must be seated'. The Panel noted that, although the LCVP seating plan was covered during the tactical orders process by the Tp Sgt, physical confirmation of lining sections up correctly and embarking drills were not conducted during the rehearsals. Nevertheless, when 282 Tp approached and loaded onto LCVP 0338, they did so in the correct order as briefed: Section 3 first, then Section 2 and finally Section 1. The sections' seating positions within the canopy are shown in Figure 1.4.34.

Exhibit 002 Witness 2

Figure 1.4.34 – 282 Troop Section Seated Positions inside the LCVP Canopy looking Forward.

1.4.241. 282 Tp's order of march onto the LCVP would have been correct if they had embarked and loaded through the rear canopy doors; this would have placed all three sections in the correct order of march on their respective benches. However, the Tp did not load through the rear canopy doors, as briefed, but entered the canopy through the forward canopy doors. The recruits of Section 3 who entered the canopy were in the wrong order for disembarkation. Sections 1 and 2 also entered the canopy but managed to end up in the right order and Recruit Jones was seated in the correct position. The recruits were joined by two of the Trg Team Cpls and the Tp Comd. Due to the cramped conditions within the Canopy area a number of 282 Tp recruits ended up sitting in non-recognised seating positions. One recruit sat on the floor on his daysack and another leaned against the rear starboard ladder. Witness 32

1.4.242. The Panel was unable to determine why the Sections entered through the front canopy doors instead of the rear doors. However, the Panel was certain that Coxn A and the crew of LCVP 0338 were unaware of what had been briefed in relation to the boarding and seating plan, as they did not attend the 282 Tp orders.

1.4.243. The Panel concluded that the confusion in loading of the craft that resulted in the incorrect seating of Section 3 was due to the absence of supervision by the crew of LCVP 0338. The Panel finds this was an **observation**.

LCVP Overloading and Safety Equipment

1.4.244. The Principal Vessel Publication for the LCVP Mk5B stated that the maximum payload was 35 fully equipped troops and 3 crew. The publication also stated that the following liferafts were to be carried 1 x 6 person and 2 x 16 person, Exhibit 021 Witness 10 Witness 11

totalling 38 persons in accordance with the SOLAS requirement. When 35 members of 282 Tp embarked onto the LCVP and joined Coxn A, Crewman 1, 2 and 3 there was a total of 39 persons on board LCVP 0338. The Panel determined that LCVP 0338 sailed with one too many personnel on board as a result of the combination of the 282 Tp task and the LC2 Course training. | Witness 14

1.4.245. The Panel concluded that the overloading of LCVP 0338 was contrary to policy in the Principal Vessel Publication for the LCVP Mk5B and finds this is an **other factor**.

Communications on the LCVP

1.4.246. Neither craft had been fitted with BOWMAN military radios and the Panel could not establish the policy requirement for the fitment or use of BOWMAN radios on a LCVP whilst conducting amphibious activity. | Exhibit 002

1.4.247. The LCVP was fitted with a two-way Tannoy system between the roundown and the wheelhouse. Coxn A explained that the two-way Tannoy speaker in the roundown was too loud when used and would have detracted from the tactical scenario. Instead, the crew relayed, conversations between the wheelhouse and the bow area by walking up and down the craft's catwalks. | Witness 10

1.4.248. Neither Coxn A, Coxn B nor any of the LC2 Course students had their issued PRR with them on the evening of the accident. The LC2 Course students stated that they had not used PRR in the previous week's LCVP instruction. PRR would have provided communication between the Coxns and Crews of both LCVPs out to a distance of 500 m. It was explained by Coxn A and Crewman 1 that the preferred method of communication was either to shout instructions from the wheelhouse through an open window forward to crew in the roundown, or have another member of the crew walk up and down the catwalks. The Panel acknowledge that it would have been difficult for a crewman to transit through the welldeck canopy when it was loaded with 35 troops and their equipment. | Witness 10
Witness 11
Witness 13
Witness 52

1.4.249. In the opinion of the Panel, it was very likely that it was common practice not to employ PRR within Boat Tp on LCVPs. The Panel assessed that it was almost certain that the use of PRR would have been a more efficient way of communication for the crew and would have negated the requirement to transit the catwalks, thus making it safer for the crew. It would also have been a more sympathetic communications method in a tactical scenario and would have provided an increased level of command and control of the evolution. Finally, the Panel concluded that the absence of PRR for crew communications prevented the timely and accurate passage of information between the bow and the wheelhouse. The Panel finds this is an **other factor**.

1.4.250. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should direct that the Book of Reference (digital) 6600 is amended to state when Personal Role Radios are to be worn by coxswains and crew of Landing Craft Vehicle and Personnel in order to improve communication between crew members.**

LCVP Passage from HMNB Devonport to FRV

1.4.251. The Dockyard Port of Plymouth Amphibious Training Guide stated that the Queen's Harbourmaster (QHM) Plymouth was the authority responsible for managing all waterborne activities within the dockyard port of Plymouth and the Plymouth Amphibious Training Areas. All craft were to report by radio at designated reporting points. Exhibit 006 Exhibit 094

1.4.252. LCVP 0338 with Coxn A supervising Crewman 2 at the helm, followed by LCVP 0354 departed HMNB Devonport at 19:45 and 19:50 respectively. Crewman 2 conducted the mandated vessel reporting[36] by radio for both craft. The Panel determined that it is almost certain that a total number of souls for both craft was reported by LCVP 0338 and that reporting was not conducted separately by each craft. Witness 10 Witness 12 Witness 13

1.4.253. The Craft Log for LCVP 0338 was annotated with 43 souls on board and the Log was filled in by either Crewman 2 or 3. The Panel concluded that the anomalous souls on board reporting to the authorities and the incorrect craft log entry for LCVP 0338 were inconsistent with local procedures at the time. The Panel finds this was an **observation**. Exhibit 006 Exhibit 116 Witness 10 Witness 12 Witness 13

Change of Helmsman on LCVP 0338

1.4.254. When both craft were south of Plymouth Breakwater, they slowed to allow the planned test firing of the GPMGs with blank ammunition and, during this activity, Crewman 3 swapped places with Crewman 2 at the helm of LCVP 0338. Witness 10 Witness 11 Witness 12 Witness 13

Passage of Information between 282 Troop Training Team on the LCVP and Ashore

1.4.255. The Tp Comd and Cpls 1,2 and 3 were carrying BOWMAN 354 radios. However, the Tp Sgt and Cpl 4, at the top of the vertical assault, did not have BOWMAN 354 radios ready for use and, therefore, could not be contacted by the other members of the Trg Team on LCVP 0338 once in radio range. In addition, Mountain Leader (ML) 1 and ML2 and the Medical Assistant (MA) ashore in the vicinity of the vertical assault did not have BOWMAN 354 radios or any other forms of communications, apart from mobile phones, with them on the exercise. Witness 1 Witness 2 Witness 3 Witness 4 Witness 5 Witness 6

1.4.256. Cpl 3 on board LCVP 0338 attempted to communicate, via his personal mobile phone, with the Tp Sgt and ML1 at the top of the vertical assault to establish when the vertical assault was ready and when the craft was to proceed from the FRV to the beach. That communication failed prior to LCVP 0338 leaving the FRV as the battery charge on Cpl 3's phone ran out. The Panel determined that, although Cpl 3 was the only member of 282 Trg Team on board to use his mobile phone, the Tp Comd, Cpl 1, and Cpl 2 were also in possession of mobile phones. No members of the 282 Tp Trg Team, ML1, ML2 and the MA had mobile telephone numbers for crew members of either LCVP. Witness 1 Witness 2 Witness 3 Witness 5 Witness 6 Witness 7

[36] Vessel name, souls on board, destination and activity is the information reported via Maritime VHF to the Authorities.

1.4.257. The Panel assessed that communications via BOWMAN should have been the primary method between the 282 Tp Trg Team on the LCVP and exercising personnel ashore once in the FRV. As this was not the case, the Panel concluded that the communications plan was inadequate and finds this is an **other factor**.

1.4.258. **Recommendation. The Commandant Commando Training Centre Royal Marines should ensure that all exercising troops have a workable communications plan using issued Military communication equipment for all phases of an exercise including amphibious evolutions in order to improve the passage of information between all exercising elements.**

1.4.259. The Panel also concluded that the reliance on mobile phones as a means to conduct and coordinate a military exercise was not reliable and finds this is an **other factor**.

1.4.260. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should ensure that all craft are equipped with an appropriately layered communications system, consisting both military and civilian equipment, for amphibious evolutions in order to improve the passage of information between all exercising elements.**

Movement from FRV to Beach and removal of ATLJs

1.4.261. Both LCVPs arrived at the FRV at 20:50, approximately 1 NM off Tregantle Beach for the beaching which was planned for 21:30. Coxn A asked the Tp Comd when he was to proceed toward the beach and was told to wait whilst Cpl 3 attempted to communicate with the Trg Team members at the top of the vertical assault. This was to establish if they were ready for the craft to proceed to the beach. After some time without confirmation from the Tp Comd and concerned that he would miss the planned beaching time, Coxn A sent Crewman 1 to inform the Tp Comd that if they did not leave at that point they would miss the beaching time. With the consent of the Tp Comd, Coxn A gave instruction to Crewman 3 at the helm to proceed to the beach. As the LCVP started toward the beach the crew observed a red flashing light from the top of the vertical assault which they subsequently used as a point of reference for a landing point. As the approach started, Coxn A told Crewman 1 to conduct the duties of the Bowman[37] for the beaching and Crewman 3 remained at the helm. Exhibit 002 Witness 1 Witness 10

1.4.262. The flashing of a single red light was not a recognised form for marking a beach. Furthermore, Coxn A stated that there was no landing point given to him by his CoC or 282 Tp Trg Team prior to sailing. The Panel assessed that the absence of a plotted route from the FRV to a precise beaching point would have made the final approach to the beach more difficult, and this would have been compounded by low light levels, a lack of external visual cues and the absence of beach transit Exhibit 002

[37] The Bowman on board a LCVP operates the bow ramp from the roundown at the front of the craft.

markers[38]. Transit markers are separate points at the front and back of a beach that when aligned from seaward would present a bearing on which a craft can use to maintain a heading towards a landing point. Transit markers for day and night are illustrated in Figure 1.4.35.

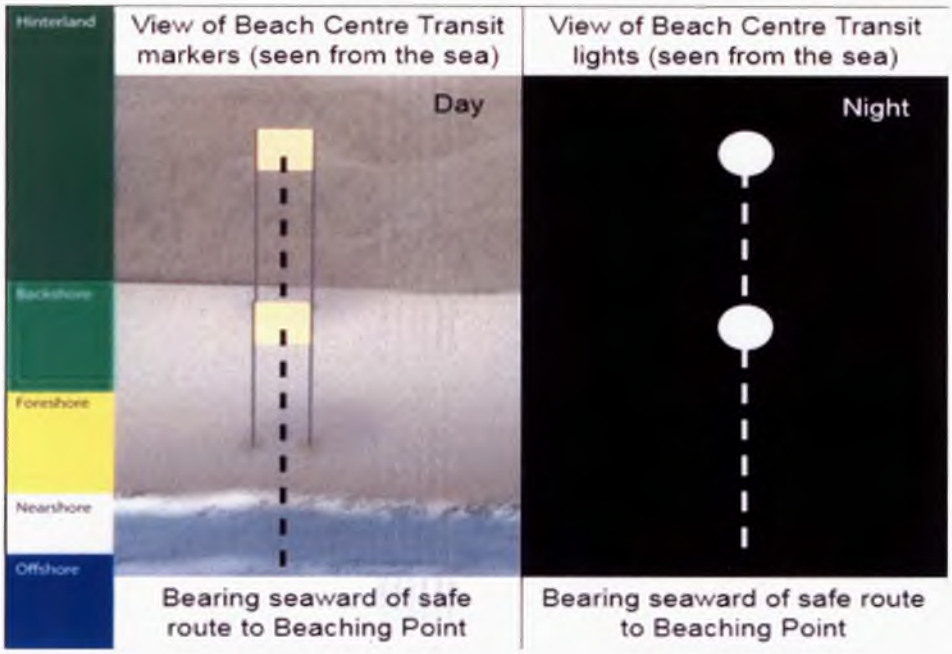

Figure 1.4.35 – Transit Markers for Day and Night showing a Safe Bearing.

1.4.263. The Panel opined that the absence of a planned route from the FRV to a designated landing point, compounded by the lack of transit markers on the beach, would have made it extremely difficult for a coxswain to conduct an accurate transit from the FRV to a specific landing point on the beach. The Panel concluded that the lack of this information and equipment on the beach would have made a coxswain's beaching task more difficult. The Panel finds this is an **other factor**.

1.4.264. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend Book of Reference (digital) 6600 to ensure that all Coxswains are provided with a designated landing point, marked as appropriate, in order to allow the safe navigation of the craft from the final rendezvous point to the landing point.**

1.4.265. BRd6600 stated that 'all personnel who travel in RM Landing Craft either operationally or non-operationally are mandated to wear at all times a Service Issued Life Jacket. There are absolutely no exceptions to this rule. Life jackets may be removed during transit and at the craft Commander's discretion when embarked in the well-decks of LCVP and LCU where the risk of man-over-board is negated. The Life jackets are nonetheless to be held closely at hand at all times'. Coxn A and B had previously discussed the weather and surf conditions on the beach that

Exhibit 002
Witness 1
Witness 10
Witness 14

[38] BRd6600 does not mandate the use of beach marking; the employment of the technique, is however, widely understood to represent best practise. BRd6600 Chpt5, Sect 8 does provide guidance for *how* to position beach markings to assist landing.

night after referring to the 'Magic Seaweed' internet site[39] and agreed that the removal of ATLJs for the landing was valid and within their delegated powers as coxswains, as stated in BRd6600.

1.4.266. On leaving the FRV, Coxn A told Crewman 1 to relay the order 'Prepare to Beach' to 282 Tp, which included the implied action to remove their ATLJs. 282 Tp removed their ATLJs and stowed them under the benches. The Panel determined that Coxn A's and B's collective decision to remove ATLJs was valid due to the relatively benign environmental conditions forecast for Tregantle Beach at the time of beaching.

Beaching

1.4.267. Coxn A stated that he was concerned about the risk of getting stuck on Tregantle Beach and had warned Crewman 3 on the helm about this risk. The Panel assessed that Coxn A's concerns of getting stuck on the beach were overestimated when the following aspects that would have affected the craft at the time were considered:

Exhibit 002
Witness 10
Witness 12

a. The reduction in overall weight of the craft when 282 Tp disembarked would have meant that the craft would have become increasingly higher in the water compared to the point of beaching.

b. The craft beached after low water and so would have been exposed to a rising tide and thus the craft would have increased water under the keel if kept at the same point as the beaching.

1.4.268. During LCVP 0338's approach, preparations were made for the disembarkation that included a series of orders from Coxn A, who was stood behind and to the left of Crewman 3 on the helm, to Crewman 1 in the role of Bowman located in the roundown. Each order given by Coxn A was relayed through Crewman 3 on the helm, who then passed the order through the opened front wheelhouse window to the bow area via Crewman 2 on the catwalk. Confirmation of receipt of the orders was done using the same method in reverse.

Exhibit 002
Witness 10
Witness 11
Witness 12
Witness 13

1.4.269. Some of the recruits stated that the craft rocked and moved around on approaching the beach and the Panel assessed that this was the LCVP entering into the Surf Zone which is depicted in Figure 1.4.36.

[39] https://magicseaweed.com/ is a web site that provides surf reports, forecasts, web cams and surfing photos for spots around the globe.

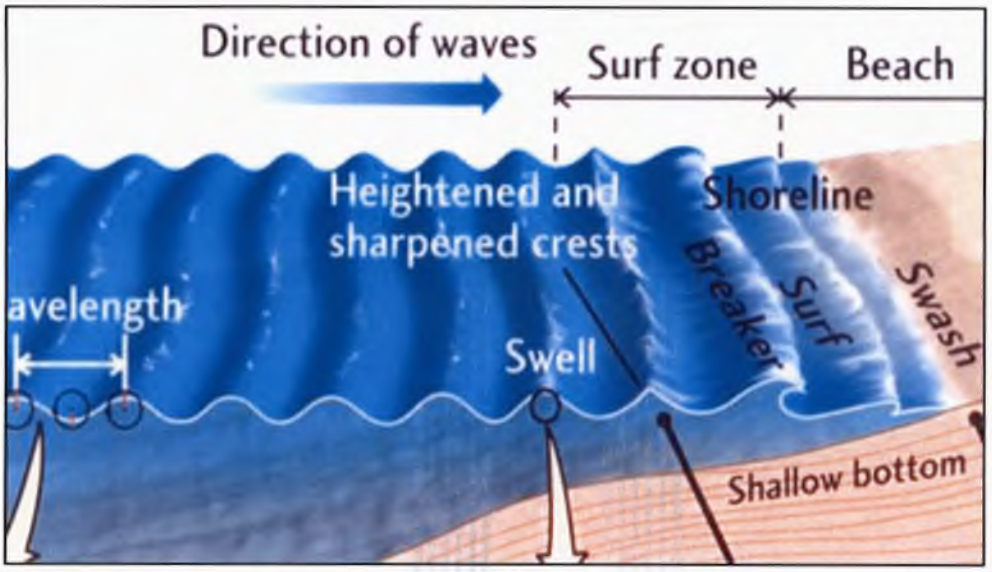

Figure 1.4.36 – A Pictorial Representation of a Surf Zone.

1.4.270. Near the point of beaching, Crewman 2 proceeded further forward on the starboard catwalk, from where he was relaying orders, in order to assist Crewman 1 in the estimation of distance to the beach. Crewman 1 was only able to give one estimation of distance to the beach before the craft touched the sand 2 seconds later and he lowered the ramp. In witness interviews, numerous embarked troops said that they felt a very light landing and some said they did not feel the LCVP touch the beach at all. The approach and beaching of the LCVP was observed from the top of the vertical assault by Cpl 4 through HMNVS. When the craft touched the beach Coxn A, was convinced that the craft was being powered forward, and that at no point were the buckets in the neutral position. The Panel assessed that it was more likely than not that the LCVP conducted a cautious and slow approach to the beach and the front of the craft touched lightly on the sand. Witness 4 Witness 6 Witness 10 Witness 11 Witness 13 Witness 29

1.4.271. The Panel concluded that the craft conducted a light landing on Tregantle Beach and that the landing itself was **not a factor**.

1.4.272. No beaching point had been designated by the CoC to Coxn A prior to the task commencing and during the final approach Coxn A picked a beaching point in the centre of Tregantle Beach from the Raymarine chart. During witness interviews, Coxn A provided a screenshot of where he thought LCVP 0338 had touched the beach. Crewman 1 recorded a beaching point in the Craft Log of LCVP 0338 whilst departing the area of Tregantle Beach for HMNB Devonport after the accident. The only accurate craft position for either craft from the evening of the accident, was obtained from the navigation equipment on board LCVP 0354, which showed its closest position to the beach. Exhibit 006

1.4.273. The Panel tried to establish a more precise landing or beaching point for LCVP 0338. The UK MOD Naval Architects for Amphibious Ships were requested to provide a likely draft of the LCVP on the evening based on the following information: Exhibit 096

a. 35 troops weighing, on average, 80 kg and carrying 28 kg of equipment.

b. 35 troops all situated under the canopy.

c. 4 crew all weighing on average 80 kg.

d. Standard craft stores as per BRd6600.

e. The craft was 50% fuelled.

Utilising a stability model, the UK MOD Naval Architects concluded that, LCVP 0338's draft would have been approximately 0.62 m forward and 0.72 m aft.

1.4.274. Having established the approximate draft of the craft and using the information in the beach survey report dated 20 March 2020 and provided by 47 Cdo (RG) RM, the UKHO was requested to provide a contour, where the craft could have beached using the estimated height of tide of 1.7 m at Devonport for the evening of the accident. Figure 1.4 37 shows the results of their analysis and the solid bold blue line represents a contour where the craft could have touched the beach. Exhibit 096

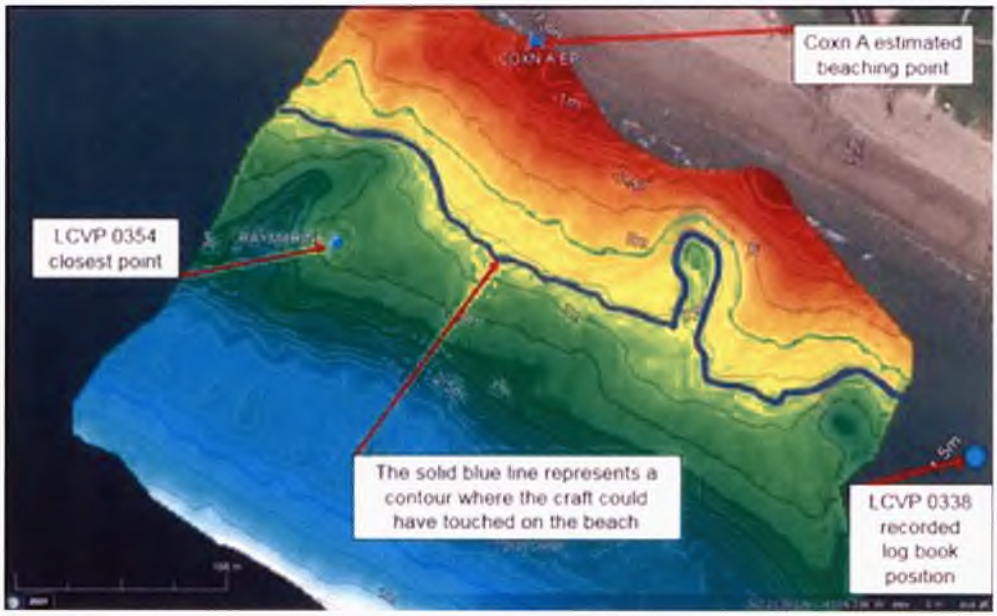

Figure 1.4.37 – Beaching Contour on Tregantle Beach.

1.4.275. The Panel determined that, based on the above information, it was certain that the craft was not in the position Coxn A estimated or in the position entered in LCVP 0338's Log Book by Crewman 1. Furthermore, using the known location of LCVP 0354 and the contour where LCVP 0338 could have touched the beach, it is very likely that LCVP 0338 beached somewhere on the highlighted red dashed line shown in Fig 1.4.38. Exhibit 097

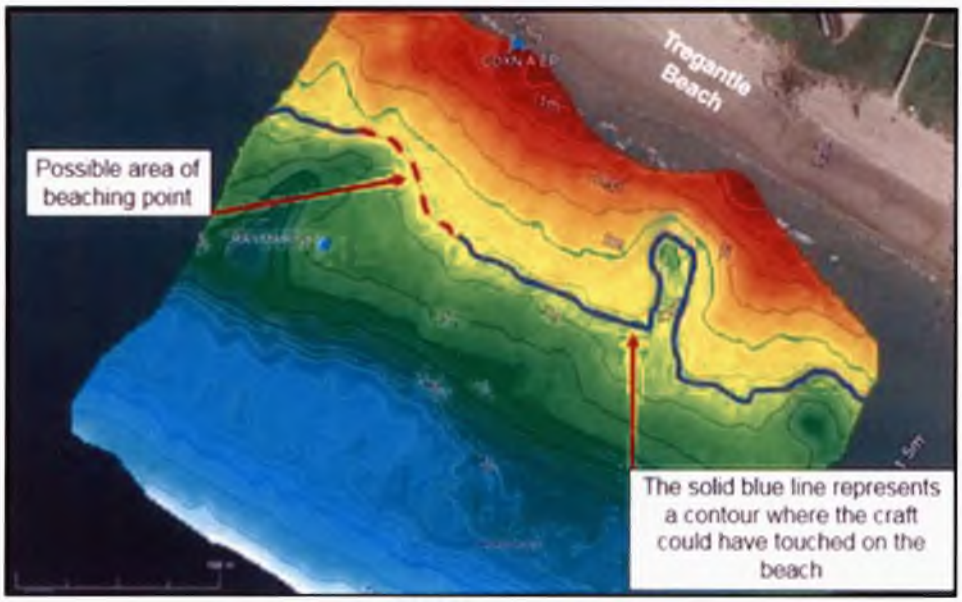

Figure 1.4.38 – Likely Beaching Point of LCVP 0338.

Commencement of the Disembarkation

1.4.276. BRd6600 stated the method for the disembarkation of troops was that the centre section would leave first followed by the simultaneous disembarkation of the outboard sections via the port and starboard sides of the ramp. Disembarkation from both sides of the ramp was policy as it sped up disembarkation and had been taught during the Wader package. Once the order 'Out Troops' was given the disembarkation process would be a swift evolution requiring no input from the crew unless they deemed it a requirement to intervene. Exhibit 002

1.4.277. Prior to the first individual of 282 Tp leaving the LCVP, Cpl 2 told Cpl 1 that he would go off first to assist lining up the recruits at the bottom of the vertical assault. This was contrary to what had been briefed at 282 Tp orders in that each Trg Team Cpl was supposed to disembark with their respective section. Both front canopy doors were opened and the centre section of the canopy front remained in place ready for the troops to disembark. Witness 3 Witness 4 Witness 10 Witness 11

1.4.278. Crewman 1, the Tp Comd, Cpls 1, 2 and 3 were at the bow of LCVP 0338 when the disembarkation commenced. Crewman 1 was positioned on the starboard side, mid-way between the canopy front and the ramp. Cpl 3 was stood on the port side, mid-way between the canopy front and the ramp. Crewman 2 was on the starboard catwalk at the start of the disembarkation process. Witness 11

1.4.279. Crewman 1, as Bowman, was responsible to Coxn A for the disembarkation of 282 Tp at the front of the craft. Cpl 2 was the first individual to disembark and experienced water to his mid-thigh that was later measured to be approximately 0.77 m. Cpl 1 then disembarked and was followed by Section 1. Crewman 1 reported that he could see the disembarking troops clearly. Section 1 all experienced water levels between their knees and hips. Witness 5 Witness 11

1.4.280. Crewman 1 expected the troops to disembark off both sides of the ramp but did not challenge why they only disembarked off the port side or direct a two-sided disembarkation. No one took any action to rectify the single-sided disembarkation. Concurrently, the troops were initially observed, through an NVD, to be disembarking and progressing up the beach by ML1 and Cpl 4 at the top of the vertical assault. None of the recruits in Section 1 described any significant craft movements whilst disembarking. Witness 6 Witness 7 Witness 11

1.4.281. The Panel assessed that the recruits of Section 1, instead of conducting a two-sided disembarkation method, as taught on the Wader package, replicated the actions of Cpl 2 and Cpl 1 disembarking in single file off the port side. Section 2 and 3 followed in the same manner. This prolonged the disembarkation process. Furthermore, the Panel assessed that if the Tp had been seated and disembarked correctly it is more likely than not that the Tp would have disembarked faster.

1.4.282. The Panel concluded that because 282 Tp did not start the disembarkation as per the method prescribed in BRd6600[40] and practised during their Wader package or as briefed in orders, this prolonged the disembarkation, and resulted in the recruits of Sections 2 and 3 entering deep water. The Panel finds this was a **contributory factor**. The recommendations to address this finding are at paras 1.4.170 and 1.4.230.

Identification of Disembarking Troops

1.4.283. There was no mandated policy within BRd6600 that stated that LCVP crews must have HMNVS on their person or on the craft during amphibious evolutions. 47 Cdo (RG) RM's Generic risk assessment (RA) for LCVP operations identified risks of man overboard, capsizing and sinking and one of the existing control measures stated that crew and passengers were to be identified with a blue Cyalume® or suitable alternative during night-time evolutions. The Panel could not find any evidence that 282 Tp had been issued with Cyalumes® to identify themselves whilst on the craft or when disembarking. This was contrary to the RA. The Panel assessed that if 282 Tp had been wearing blue Cyalumes®, or a suitable alternative, the recruits would have been able to be identified by the LCVP crew and each other whilst disembarking. 282 Tp were issued with Infra-Red (IR) Cyalumes®[41], which had been placed in the rear of the recruits' helmets and were intended for use as a means of identification of the recruits in the subsequent night attack at Tregantle Fort. Exhibit 098 Exhibit 099 Witness 3

1.4.284. There was sufficient night vision equipment held in the 10 Trg Sqn Armoury at the time of the accident, but neither the CoC in Boat Tp nor the LC2 Course Instructors gave any direction or suggested that HMNVS should be drawn from the Armoury and used during the task. It was also not a consideration made by Coxn A, Coxn B or the LC2 Course students in planning for the task that night. Witness 10 Witness 11 Witness 14 Witness 17 Witness 50

[40] BRd6600 states that 'When the craft is beached the coxswain orders 'Out troops'. The troops must run out as fast as possible, going off the sides of the ramp and not the front. The centre file comes out first. The two outboard files disembark together. Ranks carrying heavy equipment and weapons come out last'.
[41] Blue Cyalumes® are visible to the naked eye, IR Cyalumes® are only visible through IR compatible NVDs.

1.4.285. Although it was a clear night, illumination on the beach was low. Recruits who had already left the craft were seen clearly by other recruits waiting in line to disembark, were seen intermittently by Cpl 3 in the bow area and by Cpl 4 located at the top of the vertical assault, thus proving the validity of the use of HMNVS in low light levels. The Panel assessed that HMNVS would have been a useful visual aid for observing the disembarkation of recruits from the craft. The Panel determined that the control measure detailed in 47 Cdo (RG) RM's Generic RA for LCVP regarding the use of blue Cyalumes® or suitable alternatives was not applied. Exhibit 030

1.4.286. The Panel concluded that the absence of blue Cyalumes® or a suitable alternative degraded the ability to monitor recruits' location. The Panel finds this an **aggravating factor**.

1.4.287. The Panel concluded that the absence of HMNVS on the craft and its use by the crew reduced the ability to monitor the situation in the water from the craft. The Panel finds this an **aggravating factor**.

1.4.288. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend Book of Reference (digital) 6600 to include a statement to mandate that Night Vision Devices are to be carried on board Landing Craft Vehicle and Personnel and available for consideration for use by crew during night or low light conditions in order to aid observation.**

Craft Moves Astern

1.4.289. The Tp Comd disembarked off the port side of the ramp followed by Section 2. During the disembarkation process, recruits inside the canopy experienced several jolts that made some of the recruits fall down. Cpl 4, located at the top of the vertical assault, observed the disembarkation through an NVD and noticed the LCVP move backwards from the surf zone towards deeper water. In addition, both ML1 and Cpl 4 observed IR Cyalumes® in random places in the white water around the front of the LCVP. The Panel assessed that the lights seen in random places in front of the LCVP were the IR Cyalumes® on the helmets of the recruits of Section 2 who were having difficulty progressing up the beach. The Panel also assessed that it was certain that the jolts were caused by the craft moving astern through the surf zone and hitting breaking waves. Witness 6 Witness 7

1.4.290. Coxn A stated that he had instructed the LC2 Course students, before the evening of the accident, on the differences in craft behaviour and the craft control required between disembarking troops / cargo onto a rising tide and embarking troops / cargo on a falling tide. Coxn A had explained that the loss of weight on disembarkation was likely to require subtle forward thrust to maintain a positive contact with the beach and when embarking troops on a falling tide a similar subtle reverse thrust was generally required to prevent the craft becoming stranded on the beach as the tide fell. Witness 10 Witness 13

1.4.291. Coxn A said that he did not specifically tell Crewman 3 to keep the buckets forward during the disembarkation; instead, he gave a less specific order to simply keep the craft in place and this order was acknowledged to his

satisfaction. The Panel found no evidence of miscommunication or misunderstanding arising from the Dutch students' level of English.

1.4.292. After beaching, Crewman 3, who was at the helm stated that he had used the bucket controls between the neutral and astern positions to counteract the wave action on the LCVP in order to keep the craft in the same position on the beach. The Panel assessed that, as the beaching was light, it was very likely that Crewman 3 did not experience the positive resistance of the sand on the bow of the craft and therefore did not have that as a reference 'feeling' to maintain the craft on the beach. Coxn A did not take the helm for any part of the beaching or for the remainder of the evening and would have not been able to experience the 'feeling' of being in contact with the beach. Witness 10 Witness 12

1.4.293. The INM HF report suggested that, for this type of control, where feedback in the form of the 'feel' of the control may require familiarity to determine its position. External visual cues (such as movement of other objects in the surroundings relative to the operator / LCVP) would play a key role in providing additional feedback about how the movement of the bucket controls were affecting movement in the LCVP. Visual cues on the night of the accident might have been limited in terms of ascertaining forward and backward movement of the LCVP. The Panel assessed that it was very likely that the LCVP's movement astern was a result of a lack of experience in coxswaining a LCVP by Crewman 3 and by a lack of visual cues to him and Coxn A from outside the wheelhouse. Exhibit 089 Witness 10 Witness 11 Witness 12 Witness 13

1.4.294. The Panel assessed that Crewman 3's movement of the bucket controls between neutral and astern positions repeatedly was an attempt by himself to counteract the wave action and keep the craft in the same position as ordered by Coxn A. However, in a craft that was getting progressively lighter in the environmental conditions, as previously described, this was almost certain to result in the craft moving astern from the beach through the surf zone.

1.4.295. The Panel concluded that the craft moved astern into deep water during the disembarkation and finds this was a **causal factor**.

1.4.296. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend Book of Reference (digital) 6600 to mandate that Coxswains are to ensure that the Landing Craft Vehicle and Personnel remains in contact with the beach whilst disembarking troops in order to avoid troops disembarking into deep water.**

Appreciation of the Water Depth at the Bow Ramp

1.4.297. Crewman 1 acknowledged that he had seen the first troops disembark into water depth of around mid-thigh and later observed individuals at chest height. Crewman 1 stated that he had never disembarked individuals into progressively deepening water before. The depth of water increased during the disembarkation and the last 8 recruits (including Recruit Jones) of the 26 individuals to leave the craft were submerged. The Panel assessed that, due to the residual buoyancy in the recruits' clothing and predominantly in the waterproofed contents of their Witness 11

daysacks, the recruits submerged and resurfaced immediately; this could have given the impression that they were touching the seabed.

1.4.298. Crewman 1 stated that he was under the impression that the individuals were clearing the ramp and moving forward up the beach under their own control. Crewman 1, Crewman 2 and Cpl 3 did not notice that the last six recruits of Section 2 had disembarked into water above their heads; they said that the recruits appeared to be chest-deep. However, Cpl 3 stated that he had observed the depth of the water increase as the recruits disembarked until water had reached head height and recognised this as deep. Cpl 3 also stated he had seen one or two recruits become submerged. Perceiving the recruits to be in shallower water than they really were, the Panel assessed that it was almost certain that it took longer for Crewman 1, Crewman 2 and Cpl 3 to realise that recruits were disembarking into deep water. A recruit in Section 2 stated that he and another recruit shouted for help whilst in the water. A recruit still on board the LCVP reported hearing these shouts and seeing one of those recruits in visible distress but neither Crewman 1, Crewman 2, nor Cpl 3 reported hearing or seeing these events. The Panel assessed that it was extremely likely that Crewman 1's impression of recruits in the water moving forward was in fact the LCVP moving astern. The Panel believed that Crewman 1 suffered sensory misperception in believing that the recruits were making their way up the beach. The Panel concluded that the delay in recognising that the water was deep by Crewman 1 and Cpl 3 resulted in the continued disembarkation of recruits into deep water. The Panel finds this was a **contributory factor**. The Panel also concluded that the continued disembarkation of recruits into water deeper than their height made it extremely difficult for them to make their way safely ashore. The Panel finds this was a **causal factor**.

Exhibit 034
Exhibit 089
Witness 5
Witness 28
Witness 32

1.4.299. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend Book of Reference (digital) 6600 to include a requirement to confirm and monitor the depth of water at the bow ramp of a Landing Craft Vehicle and Personnel prior to and whilst disembarking troops in order to prevent troops disembarking into deep water.**

Control of the Disembarkation at the Bow

1.4.300. The last six recruits of Section 2 had been submerged on entering the water. Cpl 3 stated that he raised concern over the depth of water to Crewman 1, saying that the water was at chest level. The Panel assessed that Crewman 1 reacted to Cpl 3's concern by pausing the disembarkation process.

Witness 5
Witness 11

1.4.301. Cpl 3 had planned to be the last member of 282 Tp to leave the craft to ensure that all recruits had disembarked. He was the only individual located on the port side of the roundown and was the nearest person of authority to the recruits as they passed him to get to the port side of the ramp. Cpl 3 also stated in his witness statement that he believed that he was controlling part of the disembarkation. Crewman 1 and Cpl 3 coordinated the holding and release of recruits between the wave sets so that they would not jump into the sea as a wave passed the ramp. During the disembarkation, Crewman 1 stated that he was looking rearward alongside the starboard side of the LCVP, spotting for waves and indicating to Cpl 3

Witness 5
Witness 11

when to let the recruits go off the ramp. Cpl 3 stated that he was also spotting for waves by looking rearward down the port side of the LCVP.

1.4.302. It was not standard practice for disembarkation to be controlled by two people in the way that Crewman 1 and Cpl 3 conducted the disembarkation that night and that their control of the disembarkation process was spontaneous rather than planned. INM HF explained that scientific evidence has found that people take longer to act, or are less likely to act at all, in potentially dangerous and loss-incurring situations when other people are present and a common explanation for these findings is a 'diffusion of responsibility'[42]. In the Panel's opinion the presence of Cpl 3 and his involvement in controlling the disembarkation led to a diffusion of responsibility between Cpl 3 and Crewman 1 who, as the trained Bowman, did not fully impose his authority on the disembarkation process. The Panel assessed that there seemed to be little appreciation over the depth of the water by Crewman 1 until prompted by Cpl 3 and it was more likely than not that Crewman 1 would have continued to allow individuals to disembark if concerns over the depth of water had not been raised to him by Cpl 3. The Panel assessed that it was almost certain that Cpl 3 acted out of a DoC to the disembarking recruits when he warned Crewman 1 of the deep water. The Panel concluded that the absence of clear control at the bow with the involvement of two individuals was not standard practice, was spontaneous rather than planned and very likely led to a delay in pausing the disembarkation thereby exposing an increasing number of recruits to the deep water. The Panel finds this a **contributory factor**.

Exhibit 002
Exhibit 089
Witness 5
Witness 27
Witness 32
Witness 45

1.4.303. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend Book of Reference (digital) 6600 to clearly state that the roles and responsibilities of the Bowman include that they are responsible to the Coxswain for the control of disembarking troops in order to maintain full control of the disembarkation process.**

Bowman returns to the Wheelhouse to raise concerns over the Water Depth

1.4.304. Crewman 1 paused the disembarkation between Section 2 and 3 and after telling Cpl 3 he was going to the wheelhouse, proceeded rearward down the starboard catwalk. He then informed Coxn A about the depth of the water. This conversation was conducted through the centre window at the front of the wheelhouse with Crewman 3 still at the helm and Coxn A to his left and rear. Crewman 1 raised his concerns to Coxn A over the depth of the water as it was now coming up to the recruits' chests and requested that the craft be moved forward. Coxn A told Crewman 1 that the craft was on the beach, could not be moved further forward and to continue the disembarkation. That order to continue was not questioned by Crewman 1 and he returned to the bow and resumed the disembarkation.

Witness 10
Witness 11
Witness 12

1.4.305. Crewman 1 stated that, after his conversation with Coxn A, he was confused about the LCVP's position. Coxn A had told him that the LCVP was on the beach so he believed this must be true, but at the same time he was unsure how it could be true when he had seen the water depth visibly increase. Crewman 1's

Exhibit 089
Witness 11

[42] A phenomenon where people in group situations view others as sharing the responsibility to act, thus their own responsibility is lessened and the chances of them acting decrease accordingly.

confusion was almost certainly an example of 'cognitive dissonance'[43]. It is common for people to eliminate cognitive dissonance by forming a new belief to resolve their initial contradictory beliefs. Attempting to resolve cognitive dissonance in this way is a common human trait but can lead to an inaccurate impression of events (the LCVP was almost certainly not on the beach). Crewman 1 reasoning that the LCVP had drifted backwards and then returned to the beach could explain why he resumed disembarkation without questioning Coxn A's order. However, the Panel concluded that on the balance of probabilities Crewman 1 constructed this view after reflection and was not his thought at the time. The Panel concluded therefore that Crewman 1's actions were more out of an act of obedience to Coxn A's order to continue the disembarkation and less of a reaction to cognitive dissonance.

1.4.306. Coxn A did not take over the helm from Crewman 3, nor ask Crewman 3 about the status of the bucket positions in order to establish whether the craft had lost contact with the beach and moved position after the initial beaching. Coxn A did not verify the craft's position or the depth of water other than stating in interview that he had read zero for depth on the MFD. The Panel assessed that Coxn A could not have read zero for depth due to the depth of water evident at the bow at that time experienced by the disembarking recruits. In the Panel's opinion, Coxn A continued the disembarkation because he believed that the craft was still on the beach, without using all available means to confirm the craft's exact position.

Exhibit 117
Witness 10
Witness 12

1.4.307. The Panel concluded that the decision by Coxn A, as the Commander of the craft, to continue the disembarkation after receiving information about the deep water made the situation worse for the disembarking recruits. The Panel finds this was an **aggravating factor**. Recommendations to address this finding are at paras 1.4.296 and 1.4.303.

Bowman returns to the Bow and continues the Disembarkation

1.4.308. After visiting the wheelhouse to converse with Coxn A, Crewman 1 returned down the starboard catwalk, resumed his position in the bow area and allowed Recruits 17 and 22 to disembark. Recruits 17 and 22 entered the water and although their heads initially went under the surface, neither touched the seabed, nor were they covered by waves. The Panel determined that both Recruits 17 and 22 disembarked into the water behind the surf zone.

Witness 5
Witness 11
Witness 32
Witness 45

1.4.309. Crewman 1 stated that he thought he had no choice but to continue with the disembarkation as Coxn A had directed him to carry on. The INM HF report interpreted that this was almost certainly an act of obedience. When interviewed Crewman 1 explained that Coxn A informed him they were on the beach and Crewman 1 accepted that as fact. Crewman 1 dispatched a further two recruits because he was ordered to do so by Coxn A and it was highly likely that this was an act of obedience. The INM HF report noted that the act of obedience is a known and documented aspect of human behaviour. The Panel assessed that although Cpl 3 raised concern over the depth of the water and safety of the disembarking

Exhibit 089
Witness 11

[43] Cognitive Dissonance is a state of psychological discomfort arising from holding two incompatible beliefs.

recruits, he was witness to the resumption of the disembarkation when Recruits 17 and 22 were submerged.

1.4.310. Table 1.4.3 shows the sequence of individuals disembarking the craft and their roles within 282 Tp. The depth of the water experienced by the disembarking individuals shown against their height is shown in Figure 1.4.39. The Panel could not determine the depth of the water beyond the 19th disembarking individual except that it was greater than 1.85 m.

Order of disembarking Craft	Role in 282 Troop
1	Cpl 2
2	Cpl 1
3 – 12	Recruits of Section 1
13	Tp Comd
14 – 19	Recruits of Section 2
20	Recruit Jones of Section 2
21 – 24	Remaining Recruits of Section 2
25 and 26	1st and 2nd Recruits of Section 3

Table 1.4.3 – Order of Disembarkation of Individuals from the LCVP.

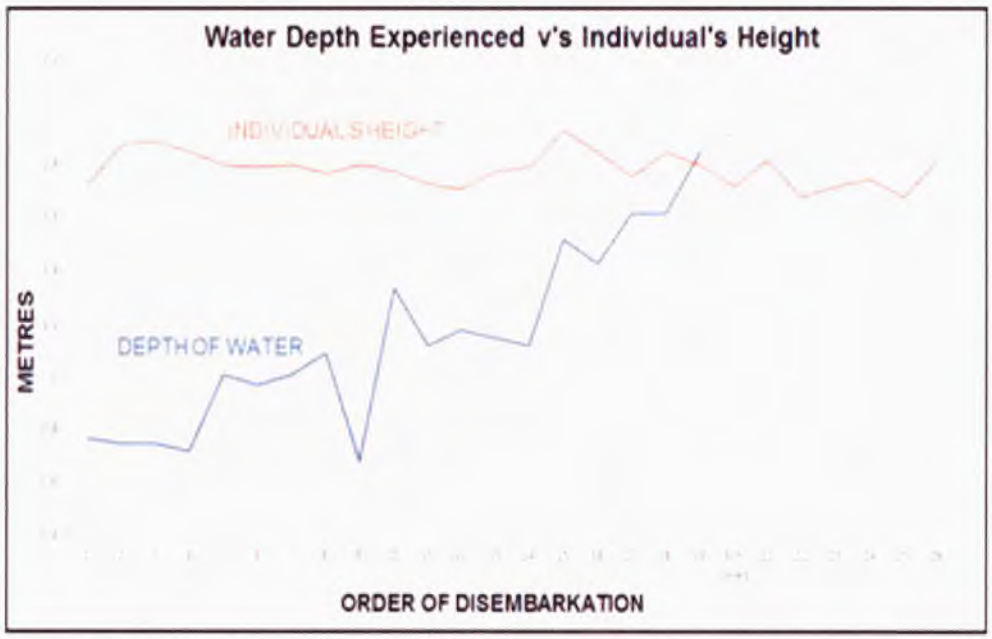

Figure 1.4.39 – Water Depth Experienced shown against the Height of Each Individual.

1.4.311. DAIB Triage Investigators arrived the day after the accident and later photographed the available members of 282 Tp indicting the depth of water they had experienced when disembarking. These photographs are shown in Figure 1.4.40[44].

[44] The Tp members' heights and water level are illustrative.

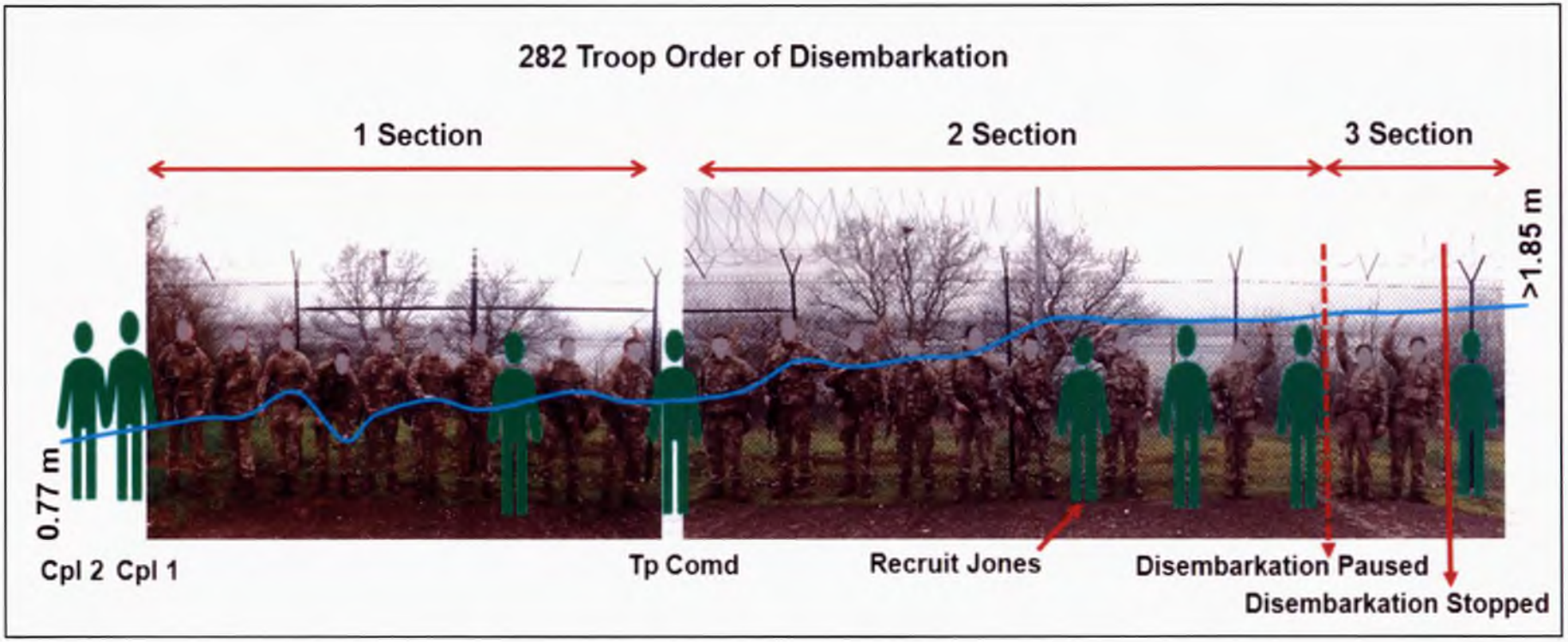

Figure 1.4.40 – Illustrative Water Depth (blue line) Experienced and as shown by the Members of 282 Troop.

1.4.312. Based on the information in Figure 1.4.39, there was an increase in water depth of 1.1 m between the 1st and 19th individuals who disembarked. The Panel determined that as Tregantle Beach had a gradient of between 1:45 and 1:50, that the craft must have moved astern very likely between 45 to 55 m (around three times the length of the craft).

1.4.313. After Recruits 17 and 22 disembarked, Crewman 2 in the welldeck, seized a boat hook, and dipped its entire length into the water but could not feel the seabed. The LCVP carried two boat hooks of different lengths and although it could not be determined which boat hook was used, the Panel noted that the shortest boat hook was 1.85 m long and therefore concluded that the depth of water must have exceeded 1.85 m at that point. Witness 13

Coxn A leaves Wheelhouse

1.4.314. After Crewman 1 had dispatched the first two individuals of Section 3, another recruit was observed in the water on the port side of the craft. Both Cpl 3 and Crewman 1 were temporarily occupied with the recruit on the port side and Crewman 1 was concerned that he may drift under the ramp of the craft. This recruit was the last recruit of Section 2 (Recruit 13) and who had disembarked before Crewman 1 went to the wheelhouse to converse with Coxn A. It was later stated by Crewman 1 and Crewman 2 that the last recruit of Section 2 was recovered onto the port side of the ramp, but the Panel determined that they were mistaken in their evidence. After interviewing all of the key witnesses the Panel determined that this recruit had managed to make his own way through the surf zone and up the beach. Witness 5 Witness 11 Witness 28

1.4.315. Approximately 1 to 2 minutes after Crewman 1 had left the wheelhouse to return to the bow area, Coxn A stepped outside of the wheelhouse on the port side and proceeded towards the bow. At this point, Crewman 3 was left unsupervised at the helm of the craft. Simultaneously, Crewman 1 shouted for the craft to be moved astern and the craft was moved astern by Crewman 3. Coxn A continued to proceed down the port catwalk to ascertain why the disembarkation was taking so long. On seeing recruits in the water, Coxn A ordered Crewman 3 to move the LCVP forward and at this point the disembarkation was stopped. Crewman 1 told the next recruit due to disembark, Recruit 5, (the third recruit of Section 3) to stop. Crewman 2 grabbed the shoulder of Recruit 5 and held him back, and Coxn A ordered all remaining recruits in the roundown to go back inside the canopy. Witness 10 Witness 11 Witness 20

1.4.316. As the craft moved forward, Coxn A, from the catwalk also noticed recruits in the water on the starboard side of the craft (later identified as Recruits 17 and 22). As the craft went forward again, Recruits 17 and 22 (the last two recruits to disembark the craft) appeared to move rearward in relation to the craft. The Panel assessed that it was at this point that the crew realised that an emergency was developing and any previous concerns for the tactical situation were disregarded. The crew of the craft and Cpl 3 used white light (head torches) to search the water for other recruits. Raised voices were heard coming from the craft by ML1 at the top of the vertical assault and white light was seen on the craft by both ML1, and by Coxn B on LCVP 0354. It was around this time that Cpl 3 contacted the Tp Comd, Cpl 1 and Cpl 2 (all now at the base of the vertical assault) via BOWMAN radio Witness 1 Witness 5 Witness 7 Witness 10 Witness 11 Witness 12 Witness 14

stating that they had recruits in the water and they were to conduct a head count ashore.

1.4.317. The Panel concluded that Crewman 3 (a student) being left unsupervised at the helm of the craft is an **other factor**.

Experiences of the Submerged Recruits

1.4.318. The last eight recruits (that included Recruit Jones) to disembark the craft were submerged in water greater than their own height. In witness' statements the majority of recruits reported they had each seen the person in front of them go under the water and pop back up to the surface. Recruit 5 (a GPMG gunner), who was stopped from getting off the craft, saw the last recruit to disembark the craft be submerged. Before the disembarkation was paused, Recruits 2 and 24 recall the instruction to get off the craft was given by an individual on the port side of the roundown, who the Panel believe to be Cpl 3. Witness 5, Witness 11, Witness 16, Witness 27, Witness 28, Witness 32, Witness 34, Witness 45, Witness 47

1.4.319. Seven of the last eight recruits to disembark reported that they did not touch the seabed and had to swim towards the shore. The Panel assessed that it was almost certain that none of the recruits expected to swim ashore because it was such a departure from their experiences during their Wader package. Several reported having problems with the weight of their equipment as they were swimming and considered removing it. Other recruits reported that the buoyancy of their daysacks pushed their helmets forward over their eyes preventing full vision. Recruit 2 reported in detail how the daysack had pushed the helmet forward over his eyes and face and forced him to roll onto his back. The Panel assessed that the act of turning onto his back was not a planned action to take nor had it been taught to the recruits on the Wader Package. Witness 16, Witness 27, Witness 28, Witness 32, Witness 34, Witness 45, Witness 47

1.4.320. Recruits 2, 12, 13, 17 and 22 reported panicking and feeling cold when they first entered the water. The Panel assessed that it was almost certain that the panic experienced by the recruits was the effect of cold-water shock (see para 1.4.338) and being in deep water. Estimates for the time the recruits spent swimming until they could touch the seabed vary between 30 seconds and 4 minutes. Recruit 19 explained that himself and Recruit 12 were subjected to the lateral drift from left (NW) to right (SE) across the beach. In the opinion of the Panel it was certain that any recruit who could not touch the seabed would have been subject to the lateral drift across the beach. Witness 16, Witness 27, Witness 28, Witness 32, Witness 45, Witness 34

1.4.321. Recruit 2 stated that he reached for the toggle of his ATLJ but had forgotten that he was not wearing one. Six of the eight recruits reported to the Panel that they were struggling to swim in the deep water and Recruit 12 had to hold onto Recruit 19's daysack to assist him to make his way to the shore. Recruit 19 reported being very tired when he got ashore and staggered around exhausted. Recruit 13 reported that at one point he thought that his progress to the shore was becoming futile, but realised that he had to keep going. Witness 16, Witness 27, Witness 34, Witness 28

1.4.322. After being submerged, Recruit 12 later developed a temperature and felt unwell. He reported sick at the CTCRM Medical Facility and was admitted to a Exhibit 123, Witness 27

civilian hospital on the 24 January 2020. As part of the NLIMS process, accidents and near misses are reported to enable learning from safety. The incidence of disembarking recruits into deep water at night without ATLJs was not reported to NLIMS. The Panel concluded that it was certain that recruits entering deep water without ATLJs is a near miss and should have been reported to NLIMS and finds this was an **observation**.

The Rescue of Recruits 17 and 22

1.4.323. Recruit 22 was in the water near the starboard side of the craft and so Crewman 1 and Crewman 2 (who already had the boat hook to hand) moved to the starboard side to effect his recovery. As they were reaching to rescue Recruit 22, Coxn A passed Crewman 1 and Crewman 2 on the starboard catwalk and informed them that he was going to jump into the sea to rescue the recruit furthest from the craft who was Recruit 17. Recruit 22 was dragged to the starboard side of the ramp by Crewman 2 using the boat hook and was brought onto the ramp and sent inside the canopy to get warm. Witness 10 Witness 11 Witness 13 Witness 45

1.4.324. Coxn A also told Crewman 3 through the wheelhouse window that he intended to jump into the water. Coxn A then jumped from the craft from a point level with the starboard side of the wheelhouse and as soon as he entered the water his LCLJ activated and inflated. Coxn A entered the water in the vicinity of Recruit 17 approximately 3 to 4 metres from the side of the craft and recovered Recruit 17 to the starboard side of the ramp. Recruit 17 explained to the Panel during the investigation that he only manged to keep his head above water by relying on the buoyancy of his daysack. The Panel determined that Recruit 17 was further away from the craft than Recruit 22 as he had disembarked before him and was subjected to the lateral current for longer. Witness 5 Witness 10 Witness 11 Witness,12 Witness 13 Witness 32

1.4.325. Coxn A and Recruit 17 were assisted on board by Crewman 1, Crewman 2 and Cpl 3. Recruit 17 was instructed to move inside the canopy and change into warm dry clothing. None of Recruits 17, 22 nor Coxn A (who jumped in from the catwalk) touched the seabed on entry into the water or were exposed to waves. The Panel determined that the rescue of Recruits 17 and 22 occurred outside of the surf zone. Witness 10 Witness 20 Witness 32 Witness 45

1.4.326. When Coxn A jumped into the water he was no longer in a position to command the craft. Other rescue options (two Lifebuoys and two throwing lines) were at the disposal of the crew and could have been used to rescue Recruit 17. It is likely that the employment of this equipment would have negated the requirement for Coxn A to enter the water.

1.4.327. The Panel concluded that the rescue of Recruits 17 and 22 was conducted in a timely manner and finds this was **not a factor**.

Recruit Jones

1.4.328. Recruit 24, who disembarked directly before Recruit Jones, did not touch the seabed. Recruit 2, whilst waiting to disembark after Recruit Jones, stated that it Exhibit 102 Witness 16

looked to him as though Recruit Jones had fully submerged on entry. When Recruit 2 followed Recruit Jones and disembarked he could not touch the seabed. Both Recruits 24 and 2 were taller than Recruit Jones and therefore the Panel determined that it is almost certain that Recruit Jones did not touch the seabed on entering the water. | Witness 47

1.4.329. The last recruit of Section 2 disembarked into the water and experienced waves over his head. However, the first two recruits of Section 3 to disembark after the pause did so into flat water, submerged and did not experience waves over them. The Panel assessed that the craft had moved out of the surf zone during the pause between the disembarkation of Sections 2 and Section 3. Therefore, the Panel assessed that it was almost certain that Recruit Jones disembarked into water deeper than his own height towards the rear of the surf zone and therefore was exposed to breaking waves. | Witness 28 Witness 32 Witness 45

1.4.330. When Recruit 2 surfaced from having been submerged on disembarkation he saw Recruit Jones quite close ahead of him. Recruit 2 recalled encouraging Recruit Jones by telling him to keep swimming and then they were both covered by a wave. As Recruit 2 continued to swim towards the shore, another wave came over his head, pushing him fully under and at that point, he reached for his life-jacket. Realising he was not wearing an ATLJ, he rolled onto his back and started swimming on his back towards the shore. | Witness 16

1.4.331. Recruit 2 remembered that after the first wave he could see Recruit Jones in front of him, however after the second wave, he rolled onto his back and lost sight of Recruit Jones. This was the last sighting of Recruit Jones until his rescue. | Witness 16

1.4.332. The INM ATLJ trial report stated, that if each recruit had been wearing and had activated an ATLJ it would have been very likely that he would have remained on the surface with his airway clear improving the likelihood of survival. The Panel determined that if the Recruits who entered deep water, had been wearing and had activated their ATLJs, it is almost certain they would have gained sufficient buoyancy to remain on the surface and maintain their airway clear of the water. | Exhibit 034 Exhibit 119

1.4.333. The Panel concluded that the removal of ATLJs made it more difficult for some members of 282 Tp disembarking into deep water to safely get ashore. The Panel finds this was an **aggravating factor**.

1.4.334. **Recommendation. The Commanding Officer 47 (Raiding Group) Royal Marines should amend the Book of Reference (digital) 6600 to clearly state the conditions, occasions and level of authority for the decision to remove life jackets in order to safely disembark troops and operate craft.**

1.4.335. The INM provided the Panel with a Cold-Water Shock Information Note that stated 'the cold shock response is initiated immediately on immersion and is characterised by an involuntary gasp (2 to 3 litres) and followed by uncontrollable, rapid over breathing (hyperventilation) …and…an adult male will drown if they inhale 1.5 to 1.8 litres of sea water, which is about one-third of their lung volume'. The note also stated that 'the cold shock response is maximal 30 seconds after entering the water and abates 2 to 3 min after immersion. The response is | Exhibit 034

instigated by the rate of fall of skin temperature...and the response is reported to be maximal in water temperatures at 10°C. It further proports that 'swimming in cold water is extremely difficult'. The UKHO reported that the surface sea temperature in the vicinity of Tregantle Beach on the evening of the accident was between 10 and 10.4°C. The Panel assessed that Recruit Jones would have suffered the maximum effects of cold-water shock on entering the water and this would have impeded his ability to effectively swim to shallower water.

1.4.336. When Recruit Jones was rescued he was not wearing his helmet. Several recruits reported that the buoyancy of their daysacks pushed their helmets forward over their eyes preventing full vision. During the INM ATLJ trial it was observed that the daysack was positively buoyant and forced the helmet upwards and forwards, restricting visibility and creating pressure by pushing the helmet chinstrap into the throat. The Panel opined that it was very likely that Recruit Jones removed his own helmet to increase his visibility, orientation and to aid breathing. The Panel concluded that the act of Recruit Jones disembarking into deep water greater than his height significantly restricted his ability to make his way ashore. Witness 10 Witness 32 Witness 16

1.4.337. The Panel concluded that Recruit Jones being submerged by breaking waves made his situation worse. The Panel finds this was an **aggravating factor** in the accident.

1.4.338. The Panel concluded that Recruit Jones disembarking into cold water resulted in cold-water shock and restricted his ability to swim to shallower water. The panel finds this was an **aggravating factor** in the accident.

Recruit Jones' Rescue

1.4.339. After rescuing Recruit 17, Coxn A got onto the ramp and stood up, his inflated LCLJ was constricting his breathing and he was urgently trying to remove it. Concurrently, those in the welldeck were still searching for any other recruits in the water when a daysack was spotted by Cpl 3 in the water on the starboard side of the craft. The urgency of Coxn A getting out of his LCLJ increased as he believed a recruit was wearing the daysack, and his LCLJ was finally removed with assistance from Crewman 2. Coxn A entered the water once again from the starboard side of the ramp and swam over to the daysack, approximately 10 m away from the craft. On grabbing the daysack, he realised that his suspicion was correct, and it was being worn by a recruit. Coxn A also noticed that the recruit was not wearing his helmet. Witness 5 Witness 10 Witness 13

1.4.340. Coxn A swam back with the recruit to the craft where the hydraulic powered ramp was used to lift them both from the water. At no time throughout the rescue of the recruit did Coxn A touch the seabed. As soon as Coxn A and the recruit were recovered into the area of the roundown, Crewman 1 removed some of the recruit's equipment before Coxn A started Cardiopulmonary Resuscitation (CPR). The rescued recruit was identified as Recruit Jones. The Panel were unable to determine the exact amount of time that Recruit Jones had spent in the water. Witness 5 Witness 10 Witness 11

1.4.341. The Panel assessed that Coxn A's decision to enter the water without his LCLJ was the fastest means of effecting a rescue as deploying a Lifebuoy or

throwing lines would have been ineffective for an unresponsive casualty. In addition, moving the craft to the unresponsive casualty would have taken too long and been too hazardous as the location of any other recruits in the water was unknown at that time.

1.4.342. The Panel concluded that Coxn A's decision to enter the water to rescue Recruit Jones was more expedient than either moving the craft or using throwing lines and life buoys and finds that it was not a **factor**.

Accounting for all the Recruits

1.4.343. During the recovery of the recruits back to the craft, Cpl 3 established BOWMAN radio communications with the Tp Comd, Cpl 1 and Cpl 2 informing them of the developing situation and initiated a head count of the recruits on board the LCVP and ashore. At this point, 282 Tp were dispersed between the landing craft, the sea, the beach en-route to the vertical assault and at the base of the vertical assault. Despite the dispersion of 282 Tp recruits, the 282 Tp Trg Team were able to account for all of the recruits. The Panel could not determine how long it took the 282 Tp Trg Team to account for all the recruits.

Witness1
Witness 3
Witness 4
Witness 5

1.4.344. The panel concluded that given the circumstances the headcount was initiated quickly and finds it was **not a factor**.

Emergency Beaching of the Craft

1.4.345. Emergency beaching is an unofficial term to describe the action of propelling the craft onto the beach with sufficient forward momentum to afford accessibility to the craft and / or provide a stable platform, often with disregard to the tactical situation and the timely retraction of the craft back into deep water.

1.4.346. During the period of time Coxn A and Crewman 1 were conducting CPR on Recruit Jones, Crewman 3 on the helm received an order from the front of the craft to conduct an emergency beaching. On receipt of the order, Crewman 3 reported that he drove the LCVP forward approximately 30 to 50 m before firmly beaching the craft. The Panel were informed by other witnesses that Coxn A gave the order to emergency beach the craft and Crewman 3 drove the craft onto the beach.

Witness 11
Witness 12

1.4.347. The Panel concluded that the emergency beaching was the correct action to take to provide a stable platform to treat Recruit Jones and provide access for the emergency services and finds this was **not a factor**.

Post-Incident Management – First Aid

1.4.348. CPR was delivered continuously by members of the crew until the LCVP emergency beached. After the LCVP had emergency beached, the Tp Comd and Cpl 1, who were waiting at the water's edge, waded out to the craft and took over the provision of CPR. The MA at the top of the vertical assault in the Battlefield Ambulance (BFA) was alerted to the accident by the ML1 and then they proceeded

Witness 1
Witness 2
Witness 3
Witness 4
Witness 5

to the beached LCVP. ML1, Cpl 4 and the Tp Sgt made 999 calls on their mobile phones at 22:01, 22:03 and 22:06 respectively and Cpl 4 also requested helicopter evacuation during his 999 call. However, Cpl 4's call dropped out before he could relay the 'What3words'[45] location of the LCVP to the 999 operator. Witness 6 Witness 7 Witness 8

1.4.349. Mobile phone coverage was intermittent leading to broken speech and loss of call continuity during the 999 emergency calls. The Panel assessed that, on the balance of probabilities the intermittent mobile phone signal coverage at Tregantle ranges and beach area did not delay the 999 response. The Panel concluded that the mobile phone coverage was variable in the Tregantle range and beach area and could not be relied upon as the primary means of alerting the emergency service. The Panel finds this was an **observation**. Exhibit 103 Exhibit 104 Exhibit 007 Exhibit 008 Exhibit 024

1.4.350. On arrival of the MA at the LCVP, CPR was being provided to Recruit Jones by Cpl 1, Cpl 2 and the Tp Comd and the MA assumed control of the medical care. ML2, Recruit 2 and Recruit 14 subsequently arrived at the LCVP with additional medical equipment that could not be carried by the MA. The Principal Medical Officer (PMO) at CTCRM was asked to provide a medical opinion on the evidence gathered relating to the medical treatment of Recruit Jones. The PMO made the following observations: Exhibit 105 Witness 9 Witness 16 Witness 29

a. That all medical equipment functioned as expected.

b. The MA conducted the resuscitation according to recognised guidelines.

c. The MA was not at the location for the amphibious landing but as mandatory medical cover for the cliff assault.

d. The CPR provided by the 282 Tp Trg Team as witnessed by the MA was of a very high quality.

e. The LC Crew and 282 Tp Trg Team were knowledgeable and able to assist (for example, positioning the pads for the Automated External Defibrillator enabled the MA to focus on the airway).

1.4.351. The Panel concluded that the standard of first aid provided to Recruit Jones was delivered continuously by trained individuals to a high standard and finds this was **not a factor**.

1.4.352. The Tp Sgt observed the blue flashing lights of an ambulance at 22:07.01 and the SWAST paramedics descended from the main road via the coastal path and arrived on board the LCVP at 22:16.29. The response times for Ambulance Trusts set out in the Handbook to the NHS Constitution for England[46] to Category 1[47] calls is 7 minutes on average, and they respond to 90 % of Category 1 calls Exhibit 104 Exhibit 106 Witness 2

[45] **What3words** is a proprietary geocode system that is designed to identify any location with a resolution of three metres (about 10 feet). What3words encodes geographic coordinates into three dictionary words; the encoding is permanently fixed.
[46] https://www.gov.uk/government/publications/supplements-to-the-nhs-constitution-for-england/the-handbook-to-the-nhs-constitution-for-england on Gov.UK accessed 6 Nov 20.
[47] Category 1 ambulance calls are those that are classified as life-threatening and needing immediate intervention and/or resuscitation, e.g. cardiac or respiratory arrest. https://www.nuffieldtrust.org.uk/resource/ambulance-response-times accessed on 6 Nov 20.

within 15 minutes. Ambulance services are measured by the time it takes from receiving a 999 call to a vehicle arriving at the patient's location[48]. The time between the first 999 call and sighting of the ambulance lights was approximately 6 minutes. The SWAST paramedics took approximately a further 9 minutes to descend the coastal path to the beached LCVP. The Panel determined that 9 minutes was a reasonable time given the type of ground to be covered at night between the ambulance and the LCVP. The response from SWAST fell within the average time for Category 1 calls. The Panel concluded that the response by SWAST paramedics to reach the scene was below the national average and finds this was **not a factor**.

1.4.353. The MA conducted a formal casualty handover with the SWAST paramedics. Recruit Jones was then moved ashore to provide a stable base for continued CPR but there was a requirement to move him once again, further up the beach due to the rising tide. The MCA Search and Rescue (SAR) helicopter landed on the beach at 22:36 and evacuated Recruit Jones, accompanied by the Tp Sgt, to Derriford Hospital in Plymouth. The SAR helicopter took off from the beach at 23:04 and arrived at Derriford Hospital at 23:11. Exhibit 009 Exhibit 107 Witness 1 Witness 9

1.4.354. The Panel noted that there was nothing in Recruit Jones' medical record to suggest that he had any illness or injury when he went on Ex FINAL THRUST. The Plymouth, Torbay and South Devon Coroner's Office notified D and C Police on 29 January 2020 that the Coroner considered that there was no requirement for a post-mortem. The cause of death of Recruit Jones, was offered by the Doctors of Derriford Hospital to the Coroner's Office of Plymouth, Torbay and South Devon, as [redacted] from drowning. Exhibit 011 Exhibit 122

Post-Incident Management – Unit Notification

1.4.355. The Tp Sgt alerted the Company Sergeant Major (CSM) of Portsmouth Company at CTCRM of the accident at approximately 23:00 who in turn alerted the CTCRM CoC. Coxn B alerted the Snr Coxn, just after Recruit Jones had been rescued from the sea, who then informed the 47 Cdo (RG) RM CoC. Witness 53 Witness 14

1.4.356. After the accident, the recruits on the beach and the 282 Tp Trg Team moved to Tregantle Fort. The 11 recruits who had remained on LCVP 0338 returned to HMNB Devonport on the craft were subsequently collected by Cpl 1, Cpl 2 and Cpl 4 and taken by road to Tregantle Fort to re-join the Tp. The 11 recruits on the LCVP consisted of 8 recruits of Section 3 who did not disembark the craft, Recruits 17 and 22 who were recovered from the water and Recruit 14 who assisted with the medical equipment and stayed on the craft. Witness 1 Witness 3 Witness 4 Witness 6 Witness 14 Witness 29

1.4.357. The Tp Sgt was replaced at Derriford Hospital in the early hours of the morning by a Warrant Officer from 47 Cdo (RG) RM and returned to Tregantle Fort. At approximately 04:00 on 22 January 2020, 282 Tp were joined by the CO CTW and the Padre from CTCRM to start the initial pastoral care process. CTCRM and 47 Cdo (RG) RM later conducted the Trauma Risk Management (TRiM) process in accordance with extant policy. Witness 49 Witness 37

[48] https://www.nuffieldtrust.org.uk/resource/ambulance-response-times accessed on 6 Nov 20.

1.4.358. The Panel finds that the notification of the incident to the respective unit CoCs and the initiation and subsequent delivery of pastoral care and TRIM and was **not a factor**.

1.4.359. The Panel noted that neither unit notified the DAIB, which was not in accordance with extant policy for the reporting of accidents and finds this was an **observation**.

ORGANISATIONAL INFLUENCES

Introduction

1.4.360. This section aims to provide the context for actions on the evening of the accident. The report thus far has predominately discussed actions of individuals and the Panel believed that some of those actions arose due to Organisational Influences. Organisational Influences are often far-reaching and can affect the lower levels of the HFACS[49] model. For example, decisions of senior management can affect supervisory practices that give rise to preconditions. These can be those factors, most difficult to link directly to incidents and are often so widespread as to be almost accepted as part of the organisation. Such factors if ignored can be considered systemic issues which, unless addressed, have the potential to give rise to future unsafe conditions. This report in the SST construct has addressed aspects of three of the four HFACS model categories (Unsafe Acts, Preconditions and Unsafe Supervision) shown in Figure 1.4.41. It will now address the final HFACS model category of Organisational Influences that is further subdivided and encompasses the subjects of Resource Problems, Personnel Selection and Staffing, Policy and Process Issues and Climate / Culture Influences. Exhibit 089

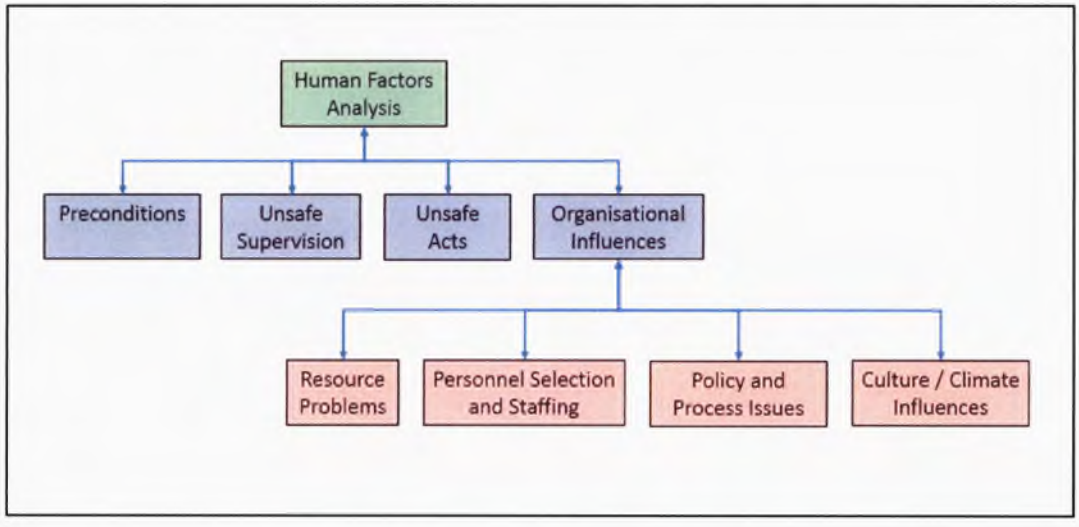

Figure 1.4.41 – HFACS Model Categories and Sub Categories.

[49] HFACS is the United States Department of Defense (DOD) Human Factors Analysis and Classification System (HFACS) (DOD, 2017).

Resource Problems

1.4.361. **Introduction.** During the process of the inquiry, the Panel found several examples where resource constraints (both workforce and equipment) had been raised.

1.4.362. **The CTCRM Workforce.** During witness interviews with staff at CTCRM, statements were made that Trg Teams always required more personnel to deliver recruit training and the issue had been raised to the CoC. Despite requests from the Panel for documentary evidence to support these claims no evidence was provided. However, there was witness testimony at Trg Team level to explain that additional people were available on request and this personnel resource was managed by the CSM. The Panel concluded that there was adequate human resource within the Trg Team allocated to 282 Tp and finds this was **not a factor**. Witness 2 Witness 37

1.4.363. **The 10 Trg Sqn Workforce.** Boat Tp delivered amphibious craft training and support to LC vocational courses and support to CTCRM. LCVP Section provided LCVP craft and crew to assist with the delivery of instruction to all vocational courses and assistance to CTCRM during Amphibious Exercises. The LC2 Course was delivered by two instructors from the Training Department and specifically Training Tp (see para 1.4.47 and Figure 1.4.5). The instructors were responsible for resourcing and delivering the LC2 Course. In preparation for the LCVP phase of the LC2 Course, LC2 Course Instructor 1 requested assistance from the LCVP Section and the LCVP SNCO allocated Coxn A and another coxn to assist. Coxn A was informed by his CoC on either the afternoon of 9 January 2020 or the morning of 10 January 2020 that he would be supporting the LC2 Course starting 13 January 2020. The task to deliver 282 Tp to Tregantle Beach was allocated to a separate coxn (Coxn B) from Boat Tp and was planned to take place in the late evening after the LC2 Course had concluded their day's instruction. After reviewing the 10 Trg Sqn workforce and tasking spreadsheet the Panel concluded that both the LC2 Course and the task to deliver 282 Tp to Tregantle Beach were adequately and separately resourced. The Panel finds that the workforce within 10 Trg Sqn was **not a factor**. Exhibit 090 Witness 10 Witness 14 Witness 17 Witness 41 Witness 51

1.4.364. **Coxn A.** Coxn A's involvement in the task to deliver 282 Tp to Tregantle Beach was unknown by the LCVP SNCO until after the accident. Coxn A was given permission to proceed with involving the LC2 Course students and himself in the 282 Tp task by the LC2 Course Instructor 1 who was not in Coxn A's direct line management. No one else in the 10 Trg Sqn CoC was aware that the personnel and number of craft for the 282 Tp task had been changed. It is the opinion of the Panel that the decision to involve the LC2 Course in delivering 282 Tp to Tregantle Beach was not within the authority of the LC2 Course Instructor 1. The Panel concluded that this type of informal decision making was likely commonplace within 10 Trg Sqn and finds this was a **contributory factor**. A recommendation to address this finding is at para 1.4.217. Witness 17 Witness 38 Witness 39 Witness 41

1.4.365. **Equipment Availability.** The INM HF report stated that 'resource planning has been identified as perhaps one of the most important aspects of safety and risk management as inadequate resource can impact on the levels of Exhibit 089

workload experienced by personnel, and therefore their ability to plan and execute work appropriately'. The equipment issues relevant to Organisational Influences within 10 Trg Sqn are discussed below.

1.4.366. **LCVP.** There was concern within 47 Cdo over the number of LCVPs available to deliver all of their tasks and frustration that a further four LCVPs were held in long term preservation for future use and therefore unavailable for tasking. The Panel acknowledged that there was a consensus across the unit that the number of LCVPs available to conduct all RM tasks was barely adequate and that this issue had been raised to NCHQ by CO 47 Cdo (RG) RM. The Panel acknowledged comments in the post-course feedback from the LC1, LC2 and LC3 Courses regarding availability of craft and the instances of instructors adapting MELs to ensure that students had sufficient time at the helm on the respective craft types to ensure course success. However, the Panel could not establish if any student had failed a course, left a course with a training deficiency, or whether a course had been cancelled directly due to the non-availability of craft. Prior to its modification, the original task to deliver the troop to Tregantle Beach was resourced with one LCVP and with Coxn B as coxn. After Coxn A and the LC2 Course students became involved, two LCVPs were committed to the task. The Panel concluded that there were adequate LCVPs available to conduct the 282 Tp task. Witness 42 Witness 56

1.4.367. **Other Equipment.** The Panel identified that there was other equipment not employed by 10 Trg Sqn personnel for the 282 Tp task but was resourced and available for use. This included blue Cyalumes® or an alternative to aid visibility during the disembarkation, NVDs, PRR and beach marking equipment. The Panel assessed that it is more likely than not that LCVP crews had previously deployed without the equipment listed above for tasks and this had become a normalised practice in 10 Trg Sqn. Had the LC2 Instructors or either coxn planned the task in accordance with BRd6600 and the LCVP Operations Risk Assessment, and made provision for the equipment, the Panel concluded that it may have positively influenced the outcome of the accident. The Panel finds that the availability of equipment was **not a factor**. However, the Panel finds that the absence to plan and employ equipment to aid the task was an **aggravating factor**. Recommendations to address this finding are at paras 1.4.250, 1.4.264 and 1.4.288. Exhibit 002 Exhibit 098 Exhibit 099 Witness 10 Witness 14 Witness 17 Witness 51

Personnel Selection and Staffing

1.4.368. **Introduction.** The Panel identified examples of Personnel Selection and Staffing that directly and indirectly contributed to Organisational Influences.

1.4.369. **LC2 Course Students.** The Panel determined that all six students on the LC2 Course had met the criteria to attend the course; all were qualified LC3s in their respective National standard, had all passed a Rules of the Road test and a RM BST whilst on the course. There was no English language standard to be achieved for Dutch students attending the LC2 Course. Coxn A reported no misinterpretation whilst instructing the Dutch students over the 6 days prior to the accident. However, Coxn B who only had contact with the Dutch students for the duration of the 282 Tp task commented that occasionally their English language Exhibit 077 Exhibit 109 Witness 10 Witness 14

was not perfect. Coxn B added that when the accident had occurred and his vessel was asked to provide assistance, the two Dutch students reverted to conversing in Dutch. The Panel interviewed all four of the Dutch students of the LC2 Course and found their level of spoken English to be workable. The Panel concluded that the absence of a Standardised Language Profile[50] for members of the RNMC attending LC Courses at 47 Cdo (RG) RM was inconsistent with other UK courses delivered to international students within Defence and finds this was an **observation**.

1.4.370. **Coxswain Selection.** Coxn A was directed to support the LCVP phase of the LC2 Course by the SNCO of LCVP Section in Boat Tp. The LCVP phase commenced 5 working days after Coxn A had joined the unit. After conducting an induction process with the unit and HMNB Devonport, Coxn A was instructed by the Snr Coxn to organise his own refamiliarisation on the LCVP Mk5, which he did with a peer coxn. The content of the refamiliarisation was not assured by anyone in Coxn A's CoC. It was during the initial interview with the Snr Coxn that the loss of Coxn A's Craft Operator's Log Book was made known. The Panel concluded that Coxn A should have been directed to fill out a replacement Log Book and also to pass a Rules of the Road test before being allowed to take the helm of a craft. Despite this, Coxn A continued to be employed as a coxn. The Panel finds this is an **other factor**. A recommendation to address this finding is at para 1.4.139. Witness 10 Witness 38 Witness 41 Witness 43

1.4.371. **282 Troop Task – Crew Allocation.** Coxn B and two crewmen were allocated to the task of delivering 282 Tp to Tregantle Beach. Crews were allocated to tasks and notification was made on a Tp tasking board in the working accommodation. The Panel was unable to determine who had filled out the tasking board but it was very likely to have been an SNCO within Boat Tp. The LCVP SNCO described in his witness interview that it was commonplace to afford the troop corporals the authority to allocate crews to LCVP tasks. The LCVP SNCO stated that he was content to allow this to happen as long as the tasks were fulfilled. On the evening of the 282 Tp task none of the 10 Trg Sqn SNCOs were aware of the exact number of craft, which coxns and which crew members were at sea. The Panel assessed that although LC2 Course Instructor 1 gave permission to Coxn A to proceed in modifying the original task, he did not have the authority to do so. He was not in Boat Tp and so neither commanded or controlled the craft, coxns or crews. In the Panel's opinion this low-level decision making to fulfil the tasks had become a norm within 10 Trg Sqn. The Panel concluded that if LC2 course Instructor 1 had passed Coxn A's request to the Boat Tp CoC it is likely that the modification to the task would have been considered in greater detail and possibly declined. The Panel finds that low-level, informal arrangements of modifying tasks and the absence of recognition of the possible additional risks involved was a **contributory factor**. A recommendation to address this finding is at para 1.4.217. Exhibit 089 Witness 41

Policy and Process Issues

1.4.372. **Introduction.** There were several instances relating to the accident in which activities were not conducted in line with best practice or existing policy. The Panel also found locally developed norms. Norms that had emerged over time as Exhibit 089

[50] NATO STANAG 6001 Ed 5 refers.

operational practice repeatedly moved towards accepted and pragmatic day-to-day practice, which were then adopted as the normal way of operating.

1.4.373. **Policy – BRd6600.** Under the 'Safe Practice' element of the report the Panel concluded that key documentation relevant to the Landing Craft Branch was out of date and had been so for a prolonged period. The BRd6600 contained out of date information and had not been amended for over 5 years (para 1.4.183). Although the COS 47 Cdo (RG) RM stated that it had been under review since November 2019, the Panel could not establish if any policy changes had been made and promulgated to the LC community prior to the accident. Exhibit 002

1.4.374. **Policy – LC2 Course Documentation.** The Panel found that the key supporting documentation mandated by JSP 822 for the provision of the LC2 Course had not been reviewed for over 2 years despite being due for review every 12 months (para 1.4.177). The L / ASPEC for the LC2 Course also contained incorrect and out of date information in regard to the fire suppressant systems on board the LCVP, which if taught could have had safety implications. The Panel found the equivalent supporting documentation for the LC1 and LC3 Courses to be in good order and up to date but could not establish why the LC2 Course supporting paperwork was not similarly updated. Exhibit 014 Exhibit 076 Exhibit 079 Exhibit 082 Exhibit 110 Exhibit 111

1.4.375. The Panel found no evidence that representation had been made to the document owners in regard to the out of date documentation and concluded that the LC Branch including 10 Trg Sqn tolerated the use of the outdated and inaccurate reference documentation. The Panel finds that the acceptance by the CoC for the continued use of out of date documentation is an **other factor**. Recommendations to address this finding are at paras 1.4.178 and 1.4.183.

1.4.376. **Process and Procedural Issues.** The Panel found examples of deviations from regulation and guidance that included:

a. Incorrectly addressing the loss of Coxn A's Craft Operator's Log Book (para 1.4.140 to 1.4.142).

b. Not fully planning the task to deliver 282 Tp to Tregantle Beach that included the absence of blue Cyalumes® as required by the 47 Cdo (RG) RM Risk Assessment for LCVP Operations (para 1.4 283).

c. The absence of a transit from the FRV to the beach and the absence of Beach Markers (paras 1.4.261 to 1.4.264).

d. The absence of accurate Craft Log Book keeping (paras 1.4.272 and 1.4.275).

e. The absence of a LC SME at tactical orders (para 1.4.228).

f. The anomalous vessel call up procedure to the maritime authorities (para 1.4.251 to 1.4.253).

g. The conduct of unauthorised training (para 1.4.209).

h. The absence of comprehensive pre-sail briefs for embarked troops (para 1.4.236 and 1.4.239).

i. The incorrect understanding of the regulations regarding SOLAS equipment and the permitted maximum numbers to be carried on a LCVP (para 1.4.245).

The Panel also found that observations in reference to the minor shortcomings in checking of Craft Operator's Log Books by the Snr Coxn were made in the LC Standards paragraph of the 1 PA Functional Inspection conducted 8 to 10 July 2019, however these actions had not been followed up.

1.4.377. This inquiry revealed practices that deviated from current policy and procedures. Possible reasons for these deviations may have been as a result of a lack of adequate training, experience or currency, a lack of explicit procedures and / or policy, operational pressures and resource constraints. It was the opinion of the Panel that further extensive investigation would be required to determine when and why these deviations in practice may have begun, how widespread these trends were, or what their impact on safety may have been. The INM HF report described such deviations with the term 'practical drift'[51]; deviations were noted in hindsight by a difference between 'what should have happened' and 'what actually happened'. They may not have been noticed for a long period of time and were often only highlighted when an incident occurred. Exhibit 089

1.4.378. The Panel opined that the instances of deviation from prescribed practices within 47 Cdo (RG) RM and 10 Trg Sqn had become normal practice. Within the timeframe of the inquiry the Panel were unable to establish the full extent of the deviations. However, the Panel concluded that the deviations witnessed would have had an accumulative detrimental affect to safe craft operation. The Panel finds this was a **contributory factor**.

1.4.379. **Recommendation. The Commanding Officer 47 Commando (Raiding Group) Royal Marines should introduce an assurance mechanism to ensure that all relevant prescribed policy is understood and adhered to by all ranks under command in order to safely generate and operate landing craft.**

Climate / Culture Influences

1.4.380. **Introduction.** The INM HF report alluded to the fact that culture and climate can be defined by a collective identity which is reflected in shared practices and 'norms' of behaviour but can very rarely be 'proved' as they are abstract concepts. The Panel observed aspects of the climate / culture within 47 Cdo (RG) RM and 10 Trg Sqn. Exhibit 089

[51] The term 'practical drift' may help to explain how, with hindsight, it is possible to identify where individuals/organisations have deviated from either policy, procedures or best practice, and yet these conditions appear to be 'normal' to those involved in the situation; The concept of practical drift has also been used to describe a situation where there is a gradual deviation from the intended course of action / policy, with many examples of cases where a gradual erosion of safety performance hasn't been identified until an accident or near-miss highlights it (Berman and Ackroyd, 2006).

1.4.381. **Climate / Culture.** The Panel learned that the unit morale of 10 Trg Sqn was good before the accident. However, it was also reported that the squadron consistently contained individuals who were not fully fit for duty, could not go to sea for various reasons and thus unable to perform the duties of a coxn or crew. This was reported to be both an historical and an on-going issue. Witness testimony confirmed that this placed an extra burden on those who were fit to conduct their duties and go to sea and the Panel assessed that this may have caused some animosity within the junior ranks of the squadron. The OC had been absent through ill health and individuals had been required to cover his responsibilities, notably the LCTO and the 10 Trg Sqn Squadron Sergeant Major. It was the view of the Panel that the OC's absence may have added to the extant conditions for personnel to deviate from policy and accept new norms. However, the Panel accepted that the case of 'what should have happened' and 'what actually happened' was not as a result of a single individual, but would have likely accumulated over a period predating the OC's tenure but not noticed or rectified by the CoC. The Panel assessed that it may have been harder for long serving members to recognise the emerging deviations from prescribed practices and procedures. The Panel opined that the deviation from policy and accepted best practice had occurred, over time, and that these deviations and latent behaviours were likely to have existed for some time prior to the accident; the event that subsequently brought these to light. Witness 40 Witness 49

1.4.382. Manifestations of new norms within 10 Trg Sqn were most evident in the trust placed in subordinates that tasks were being completed to a sufficient standard without scrutiny. These included:

a. The occasion of Coxn A's lost Craft Operator's Log book which was only replaced and filled in after the accident.

b. Coxn A's refamiliarisation on the LCVP and the Craft Log Book of LCVP 0338 that was predominantly filled in after the accident and void of basic details such as the time and place of beaching.

c. In addition, and in the opinion of the Panel, Coxn A together with Coxn B believed they had the authority and freedom to change the task to deliver 282 Tp to Tregantle Beach with consent only from LC2 Course Instructor 1 and not their respective CoCs. This was considered by the Panel to be the epitome of a norm.

The Panel assessed that individuals in the CoC were prepared to delegate assumed responsibility but not apply scrutiny and concluded that the lack of scrutiny in changing the task to deliver 282 Tp to Tregantle Beach set the conditions for the accident. The Panel finds this was a **contributory factor**. A recommendation to address this finding is at para 1.4.217.

SUMMARY OF FACTORS

The following were Causal Factors:

1.4.383. The Panel concluded that the craft moved astern into deep water during the disembarkation and finds this was a **causal factor**. 1.4.295

1.4.384. The Panel also concluded that the continued disembarkation of recruits into water deeper than their height made it extremely difficult for them to make their way safely ashore. The Panel finds this was a **causal factor**. 1.4.298

The following were Contributory Factors:

1.4.385. The Panel concluded that Coxn A was not competent to command or helm coxswain an in-service landing craft and therefore, not a Safe Person in the context of the SST as defined in JSP 375. The Panel finds this was a **contributory factor**. 1.4.148

1.4.386. The Panel concluded that the deviation from the LC2 Course documentation resulted in unauthorised training being conducted and did not meet the prescribed progression of training. The Panel finds this was a **contributory factor**. 1.4.209

1.4.387. The Panel concluded that the informal act of changing the task to deliver 282 Tp onto Tregantle Beach, although well intentioned, introduced additional risks that were not recognised. The Panel finds this was a **contributory factor**. 1.4.216

1.4.388. The Panel concluded that the absence of attached LC SME personnel, during the tactical orders process within the multi-team phase of the Ex FINAL THRUST, degraded overall awareness and understanding of the practical aspects of LC operation and procedures. The Panel finds this was a **contributory factor**. 1.4.229

1.4.389. The Panel concluded that because 282 Tp did not start the disembarkation as per the method prescribed in BRd6600 and practised during their Wader package or as briefed in orders, this prolonged the disembarkation, and resulted in the recruits of Sections 2 and 3 entering deep water. The Panel finds this was a **contributory factor**. 1.4.282

1.4.390. The Panel concluded that the delay in recognising that the water was deep by Crewman 1 and Cpl 3 resulted in the continued disembarkation of recruits into deep water. The Panel finds this was a **contributory factor**. 1.4.298

1.4.391. *Although LC2 Instructor 1 had been consulted*....no one else in the 10 Trg Sqn CoC was aware that the personnel and number of craft for the 282 Tp task had been changed. It is the opinion of the Panel that the decision to involve the LC2 Course in delivering 282 Tp to Tregantle Beach was not within the authority of the LC2 Course Instructor 1. The Panel concluded that this type of informal decision making was likely commonplace within 10 Trg Sqn and finds this was a **contributory factor**. 1.4.364

1.4.392. The Panel finds that low-level, informal arrangements of modifying tasks and the absence of recognition of the possible additional risks involved was a **contributory factor**. 1.4.371

1.4.393. The Panel opined that the instances of deviation from prescribed practices within 47 Cdo (RG) RM and 10 Trg Sqn had become normal practice. Within the timeframe of the inquiry the Panel were unable to establish the full extent of the deviations. However, the Panel concluded that the deviations witnessed would have had an accumulative detrimental affect to safe craft operation. The Panel finds this was a **contributory factor**. 1.4.378

The following were Aggravating Factors:

1.4.394. The Panel concluded that the absence of blue Cyalumes® or a suitable alternative degraded the ability to monitor recruits' location. The Panel finds this an **aggravating factor**. 1.4.287

1.4.395. The Panel concluded that the absence of HMNVS on the craft and its use by the crew reduced the ability to monitor the situation in the water from the craft. The Panel finds this an **aggravating factor**. 1.4.287

1.4.396. The Panel concluded that the decision by Coxn A, as the Commander of the craft, to continue the disembarkation after receiving information about the deep water made the situation worse for the disembarking recruits. The Panel finds this was an **aggravating factor**. 1.4.307

1.4.397. The Panel concluded that the removal of ATLJs made it more difficult for some members of 282 Tp disembarking into deep water to safely get ashore. The Panel finds this was an **aggravating factor**. 1.4.333

1.4.398. The Panel concluded that Recruit Jones being submerged by breaking waves made his situation worse. The Panel finds this was an **aggravating factor** in the accident. 1.4.337

1.4.399. The Panel concluded that Recruit Jones disembarking into cold water resulted in cold-water shock and restricted his ability to swim to shallower water. The panel finds this was an **aggravating factor** in the accident. 1.4.338

1.4.400. The Panel finds that the availability of equipment was not a factor. However, the Panel finds that the absence to plan and employ equipment to aid the task was an **aggravating factor**. 1.4.367

The following were Other Factors:

1.4.401. No beach survey information had been collated since 2009 and therefore no up to date beach information was available to Coxn A, B or the LC2 Course students in order to aid the beaching on the evening of the accident. The Panel finds this an **other factor**. 1.4.60

1.4.402. The Panel concluded that Comdt CTCRM had not completed the required DH training in accordance with DSA Policy at the time of the accident. The Panel finds this is an **other factor**. 1.4.126

1.4.403. The Panel concluded that the lack of a formal procedure for local training led to an inconsistent understanding of the standards required. The Panel finds this is an **other factor**. 1.4.138

1.4.404. The Panel concluded that the absence of any guidance or metric in JSP 375 to determine maturity was more likely than not to lead to differing interpretations of the level of competency in operating units, which in turn could affect safety. The Panel finds this is an **other factor**. 1.4.143

1.4.405. The Panel concluded that Coxn B was not competent to command or helm coxswain an in-service landing craft and therefore, not a Safe Person in the context of the SST as defined in JSP 375. The Panel finds this an **other factor**. 1.4.152

1.4.406. The Panel concluded that five out of the six 282 Tp Trg Team Instructors, Coxn A and B, and one recruit were out of date for the BST, contrary to RM policy. The Panel finds this is an **other factor.** 1.4.163

1.4.407. The Panel concluded that 282 Tp Trg Team not accompanying their recruit troops on the Wader package meant that they were unable to make a first-hand assessment of the recruits' aptitude for amphibious operations and finds this is an **other factor**. 1.4.169

1.4.408. The Panel also concluded that not all the Wader package training documentation aligned with reference to the delivery of amphibious training, specifically night beach landings. The Panel finds this is an **other factor**. 1.4.169

1.4.409. The Panel concluded that the LC2 Course LCVP phase documentation was not DSAT compliant as it exceeded review dates and contained inaccurate information. The Panel finds this is an **other factor**. 1.4.177

1.4.410. The Panel concluded that the lack of accuracy and relevancy of some of the information within BRd6600 had undermined its effectiveness as the policy for the Royal Marines Landing Craft and Small Craft Operations and could therefore contribute to a future accident. The Panel finds this is an **other factor**. 1.4.182

1.4.411. The Panel concluded that there was limited liaison between 282 Tp Trg Team and the exercising supporting elements within 10 Trg Sqn to Ex FINAL THRUST. The Panel finds this is an **other factor**. 1.4.195

1.4.412. The Panel concluded that there was an absence of preparation by Coxn A. The Panel finds this is an **other factor**. 1.4.203

1.4.413. The Panel also concluded that there was an absence of assurance of Coxn A's preparation and delivery of instruction by both his CoC and the LC2 Course Instructors. The Panel finds this is an **other factor**. 1.4.204

1.4.414. The Panel finds that the LCVP pre-sail brief given by Coxn A was incomplete and also not heard by all of the intended audience and this is an **other factor**. 1.4.236

1.4.415. The Panel concluded that the pre-sail brief in the extant BRd6600 omitted significant safety aspects and finds this is an **other factor**. 1.4.238

1.4.416. The Panel concluded that the overloading of LCVP 0338 was contrary to policy in the Principal Vessel Publication for the LCVP Mk5B and finds this is an **other factor**. 1.4.245

1.4.417. Finally, the Panel concluded that the absence of PRR for crew communications prevented the timely and accurate passage of information between the bow and the wheelhouse. The Panel finds this is an **other factor**. 1.4.249

1.4.418. The Panel assessed that communications via BOWMAN should have been the primary method between the 282 Tp Trg Team on the LCVP and exercising personnel ashore once in the FRV. As this was not the case, the Panel concluded that the communications plan was inadequate and finds this is an **other factor**. 1.4.257

1.4.419. The Panel also concluded that the reliance on mobile phones as a means to conduct and coordinate a military exercise was not reliable and finds this is an **other factor**. 1.4.259

1.4.420. The Panel opined that the absence of a planned route from the FRV to a designated landing point, compounded by the lack of transit markers on the beach, would have made it extremely difficult for a coxswain to conduct an accurate transit from the FRV to a specific landing point on the beach. The Panel concluded that the lack of this information and equipment on the beach would have made a coxswain's beaching task more difficult. The Panel finds this is an **other factor**. 1.4.263

1.4.421. The Panel concluded that Crewman 3 (a student) being left unsupervised at the helm of the craft is an **other factor**. 1.4.317

1.4.422. The Panel concluded that Coxn A should have been directed to fill out a replacement Log Book and also to pass a Rules of the Road test before being allowed to take the helm of a craft. Despite this, Coxn A continued to be employed as a coxn. The Panel finds this is an **other factor**. 1.4.370

1.4.423. The Panel finds that the acceptance by the CoC for the continued use of out of date documentation is an **other factor**. 1.4.375

The following were Observations:

1.4.424. The Panel concluded that the frequency of Rules of the Road testing between the BRd6600 and the Craft Operator's Log Book was inconsistent and had led to confusion. The Panel finds this was an **observation**. 1.4.136

1.4.425. The Panel concluded that the absence of a nominated ICP or rendezvous point had no consequence on this accident or the post-accident response. However, the Panel also concluded that not nominating and briefing the locations of an ICP and civilian ambulance rendezvous points could impact future accident response to Antony and Tregantle Training Area. The Panel finds this was an **observation**.	1.4.189
1.4.426. The Panel also concluded that there was a lack of clarity between the crews and 282 Tp Trg Team regarding the LCVPs' involvement in Ex FINAL THRUST and whether the task was an administrative or tactical move. The Panel finds this was an **observation**.	1.4.222
1.4.427. The Panel concluded that the confusion in loading of the craft that resulted in the incorrect seating of Section 3 was due to the absence of supervision by the crew of LCVP 0338. The Panel finds this was an **observation**.	1.4.243
1.4.428. The Panel concluded that the anomalous souls on board reporting to the authorities and the incorrect craft log entry for LCVP 0338 were inconsistent with local procedures at the time. The Panel finds this was an **observation**.	1.4.253
1.4.429. The incidence of disembarking recruits into deep water at night without ATLJs was not reported to NLIMS. The Panel concluded that it was certain that recruits entering deep water without ATLJs is a near miss and should have been reported to NLIMS and finds this was an **observation**.	1.4.322
1.4.430. The Panel concluded that the mobile phone coverage was variable in the Tregantle range and beach area and could not be relied upon as the primary means of alerting the emergency service. The Panel finds this was an **observation**.	1.4.349
1.4.431. The Panel noted that neither unit notified the DAIB, which was not in accordance with extant policy for the reporting of accidents and finds this was an **observation**.	1.4.359
1.4.432. The Panel concluded that the absence of a Standardised Language Profile [52] for members of the RNMC attending LC Courses at 47 Cdo (RG) RM was inconsistent with other UK courses delivered to international students within Defence and finds this was an **observation**.	1.4.369

[52] NATO STANAG 6001 Ed 5 refers.