



**The Report of the Court of Inquiry into death of AHSO Byron Solomon  
has been disclosed by authority of the Chief of Navy  
in accordance with Armed Forces Discipline Rule of Procedure 159.**

A Court of Inquiry is a legally constituted fact-finding body which is assembled under the Armed Forces Discipline Act 1971, s 200. It has the power to summons witnesses, evidence given before it is generally on oath and contempt of its proceedings is an offence. It does not, however, make findings of guilt or blame and it has no power to punish. Courts of Inquiry are particularly used to investigate events which could affect future operations, both inside and beyond New Zealand. Courts of Inquiry provide a speedy and effective method by which the causes of such events can be ascertained, so that action can be taken to avoid a repetition of the event.

It should be noted, however, that the report of a Court of Inquiry is purely the expression of the opinion of the Court based on the evidence it has heard. Accordingly any of the findings of the Court which may affect individuals outside of the NZDF cannot be regarded as definitive until they have had the opportunity to be heard on the matter.

For rules relating to Proceedings of Courts of Inquiry see Armed Forces Discipline Rules of Procedure Part XIV

## 5. COMMENTS BY ASSEMBLING AUTHORITY

### Introduction

1. The Court has completed a comprehensive investigation of the incident and the Terms of Reference have been thoroughly addressed. The time taken to complete the Inquiry is indicative of the detail of the investigation, and also reflects the complexity of the sequence of events that occurred and the identified peripheral issues. I am satisfied, however, that the Court has been concluded in a satisfactory manner taking into account all the surrounding circumstances.

2. Notwithstanding the admirable efforts of personnel involved on the day of the accident, the events of 5 October 2007 resulted in the loss of life of AHSO Byron SOLOMON. His death is an untimely tragedy that has left his family, the Ship's Company of HMNZS CANTERBURY, the RNZN and the wider NZDF saddened and determined to prevent a recurrence of such an incident. It is reflective of such determination that I have directed a number of remedial actions to be implemented immediately. These actions have largely been drawn directly from the recommendations of the Court but others have been taken as corporate initiatives where there are opportunities to improve practices fleet-wide. The findings of the Court and the subsequent recommendations are discussed in greater detail below.

3. The 'what happened' and 'how it happened' components are relatively easy to explain and are to be found in the chronology of events which led to the tragedy. The 'why it happened' component is more complex and can only be considered against the various agencies that designed, certified, set to work and ultimately came to use the RHIB in CANTERBURY for the purposes of the capability it provides for the ship.

### Cause

4. The Court has unequivocally concluded that the accident was caused by a combination of several factors. These may be viewed in isolation but when viewed collectively the unusual nature and extent of the causal factors becomes clearer. The likelihood of that sequence occurring in the circumstances that existed at the time was quite unforeseeable. The Ship's Company involved at the time was operating the RHIB and its associated launch and recovery system in full expectation and understanding that it was able to be operated in the manner to which it was intended. Conditions were benign, there was nothing extraordinary about the launch drill, and there was no thought amongst any that the RHIB and its associated launch and recovery system presented dangers due to configuration or design. The overall actions and reactions of CANTERBURY's Ship's Company, and in particular those directly involved in the immediate aftermath of the incident, were notably consistent with the Navy's values and were indicative of a high degree of professionalism. [REDACTED]

5. There were two key contributing factors that, occurring concurrently, caused the RHIB to broach. These were:

- a. The premature release of the boatrope by unexplained release of the Gibb shackle. The Court was unable to discover how or why the Gibb shackle released as it did; and
- b. The damaged manually operated offload release hook connecting the RHIB to the davit wire preventing a timely release of the ovoid link.

### **Gibb Shackle**

6. Given factors of CANTERBURY's RHIB design and configuration of the RHIB launch and recovery system, it is clear that the integrity of the boatrope release arrangement is critical to the safe conduct of underway RHIB launch and recovery from CANTERBURY. The Gibb shackle has been in RNZN use for many years and is also in use in the Royal Australian Navy and the Republic of Singapore Navy. Nevertheless, the report notes at para 72 that it heard considerable anecdotal evidence of incidents of premature or unintended release of the Gibb shackle during launch and recovery of Navy RHIBs. In all but one incident the automatic offload release hook, *vice* the manual release hook in CANTERBURY's configuration, prevented more catastrophic events from happening. Two of the incidents have been documented but no subsequent action appears to have been taken, presumably due to the incidents being seen at the time as relatively minor technical or engineering matters. *I have directed that the Gibb shackle is to be withdrawn from service across the entire Fleet forthwith and replaced with a boatrope release arrangement of greater integrity.*

7. The process to replace the Gibb shackle will follow the Navy's Defective Materiel Design Report (DMDR) and Configuration Change Proposal (CCP) procedure through the Fleet Engineering Centre and overseen by the Commander of the Navy's Maritime Operational Evaluation Team (MOET). Navy subject matter experts will determine a boatrope release arrangement based on best practice suited to RNZN operating circumstances and conditions.

### **Off Load Release Hook**

8. I am concerned that the difficulty with removing and setting the ovoid link during launch and recovery were not brought to the Commanding Officer's attention. However, I accept the observation of the Court at para 48 that there was a strong "make it work" approach to issues by the RHIB crews. I agree with the Court's recommendation that the current ovoid link be replaced by a link of appropriate working load characteristics but smaller diameter which will enable the offload hook to operate as it should by use of the release wire lanyard. The wider issues of the suitability of the current offload release hook in the RHIB launch and recovery system needs to be addressed in the context of a design review (see below).

## Standard Operating Procedures

9. Despite the serious consequences of a premature boatrope release whilst still attached to the davit fall wire, this occurrence was not identified in any risk assessments conducted prior to the incident. I do not believe the risks associated with the RHIB design could have been easily identified by the ship's staff. CAN personnel were aware of previous instances on other ships that had experienced premature release of the boatrope. These invariably occurred after the fall wire had automatically detached and resulted in no adverse consequence. They did not fully appreciate just how different the result could be in CAN where a manually activated hook was used.

10. The report recommends that Standard Operating Procedures (SOPs) for the launch and recovery of seaboats in CANTERBURY be reviewed to ensure appropriate risk mitigation procedures are put in place. The procedures detailed in the recommendations have been forwarded to the Commanding Officer CANTERBURY for implementation. *In addition, until such time as the Gibb shackle has been replaced, the ship is to only conduct RHIB launch and recovery operations whilst the ship is virtually stopped in the water.*

11. It is also noted that Standard Operating Procedures (SOPs) for the implications of key equipment failure have yet to be developed. A 'what if?' risk analysis and risk mitigation procedures needs to be conducted for all ship systems.

## Certification

12. CANTERBURY is designated a Roll on, Roll off Passenger vessel for the purposes of International Maritime Organisation and SOLAS requirements.

13. The Special Purpose Ship (SPS) Safety Certificate states that the ship's lifesaving appliances, including rescue boats, were provided in accordance with the provisions of the SPS Code. Nevertheless the Court has found that there are several irregularities with respect to the seaboats' certification and compliance with SOLAS certification. Principal amongst these is whether the Gemini RHIB can be considered a 'Fast Rescue Boat', which CANTERBURY would be required to carry at least one under SOLAS regulations, or a 'Rescue Boat'.

14. The certification does not appear to cover the 'painter securing device' (boatrope), the self-righting gear or arrangements for lifting and hoisting. None of these sub systems appear to have undergone type approval. The fact that the ovoid link originally supplied and fitted to the lifting strops was not appropriate, the original boatrope quick release shackles needed to be replaced following a MOET inspection post delivery and the self righting gear failed to operate on activation during the incident bears out the inadequacy of the seaboat certification.

15. Furthermore, while the system complete might be described as functional there are clear questions around the safe operation of the RHIB and lifting strop arrangements:

- a. The location of the coxswain's position ahead of the lifting strop system, making it impossible to see what is happening behind him and manoeuvre the boat simultaneously. In fact the strop arrangement is configured so that the coxswain cannot take control of the RHIB until the off load release hook has been activated and the strops are clear of the coxswain's position;
- b. The shortness of the lifting strops. There is evidence that rather than a strop arrangement, best practice may be single hardpoint release system for the RHIB, as used in the RAN Armidale Class patrol craft.

16. This is problematic for I believe that the ship and the RNZN at large were entitled to believe that CAN had been delivered a seaboat system that was fully certified by competent authorities and that it could operate with SOPs developed around certification parameters. The Retrospective Operational Safety Case, as written, makes this assumption in providing for safety parameters. It requires review in light of this incident.

17. I note reference in the report to the current state of 'confusion' regarding safety certification of the seaboat arrangement. It is evident that the certification for the seaboats is incomplete and possibly compromised. The ease with which safety assurances can be undermined by a multi-tiered safety certification process under flag state jurisdiction as described by the director of Naval Construction (Witness 27) is concerning. Further investigation will need to occur to determine exactly what aspects of the RHIB configuration have been certified. Whilst I cannot comment on the state of certification for other ship systems, I note the concerns expressed by the witness as to the possible implications this has for the different tiers of certification across CAN as a whole.

18. An independent review of the SOLAS certification is the only mechanism by which the RNZN can be assured that the RHIB arrangement is satisfactory for launch and recovery underway and the purpose for which it was supplied.

19. Accordingly, *a full and comprehensive design review of the seaboat system, including assessment of solution options needs to be conducted forthwith. This review will include a determination of the status of the seaboat system SOLAS certification of the seaboat installation to determine that the RHIBs are SOLAS compliant as Fast Rescue Boats in all respects.*

### **Other Issues**

20. I note the Court's concerns with the lack of in depth knowledge of SOLAS understanding within RNZN. I do not believe that a lack of knowledge of those strategic design requirements amongst non-specialist personnel or Ship's Company is of concern. There is a legitimate expectation that the ship and its associated safety

systems and features have been certified in accordance with the hierarchical pyramid of certification under IMO and SOLAS requirements. But it is important that having established a duly certified system, any configuration change of a sub system or system be properly reviewed against IMO or SOLAS requirements and recorded accordingly. This process may be adequately captured in the provision of a Rigging Warrant as it is understood in Naval use.

21. I note the many safety observations made by witnesses to the Court, whilst gravely concerning in their own right, are not issues which in any way contributed to the broaching of the RHIB or the death of AHSO SOLOMON. The Court notes the 'generally self regulating environment' in which much RNZN seamanship policy and practice has been developed, focusing more on a 'functional rather than safety outcome'. The 'blend' of Naval and SOLAS best practice has led to some confusion around where solutions are both functional and safe. *It is my intention that seamanship training, practice and administration across that RNZN be reviewed by a third party subject matter expert at the earliest opportunity.*

### **Recommendations and Action**

22. The recommendations of the Court at para 102 of the report are accepted in their entirety. Due to the importance of ensuring these recommendations are followed up in detail and in a timely manner I am appointing CDR MOET to facilitate, monitor, and report back to me on the progress that is made against the action items identified. Designated Action Officers are drawn from CN, DCN and my own staffs given most of the agreed recommendations are already under action by the designated Officers.

- a. **Recommendation 102.A.(1)** – review of the function and safety of the existing boatrope securing arrangement.

**Agreed.** I have directed that the Gibb shackle is to be withdrawn from service across the entire Fleet forthwith and replaced with a boatrope release arrangement of greater integrity.

Action: Commander MOET

- b. **Recommendation 102.A.(2)** - the ovoid link fitted to the RHIB lifting strops to be replaced.

**Agreed.** This has been directed and actioned by the Commanding Officer CANTERBURY.

- c. **Recommendation 102.A.(3).(a).(b).(c) and (d)** – review of SOP's for launch and recovery of RHIBs in CANTERBURY.

**Agreed.** The Commanding Officer CANTERBURY has been directed accordingly. This review is to be verified by Commander MOET. In addition, the Commanding Officer CANTERBURY has been directed that until such time as the boatrope release arrangement has been replaced per (a) above, *RHIB launch and recovery operations are only to be undertaken with the ship virtually stopped in the water.*

Action: CO CANTERBURY/Commander MOET

- d. **Recommendations 102. B. and C.** – Review of the function and safety of the self righting gear and review SOLAS certification of the RHIB arrangement.

**Agreed.** The function and operation of self righting gear is to be proven immediately.

Action: Captain Fleet Support

- e. A Naval Staff sponsored 'Preliminary Design Review of Seaboat Installation' has been conducted by Burness Corlett – Three Quays and the RNZN and reported on 7 Dec 07. The review raises a number of issues which questions the validity of the certification of the RHIB and its launch and recovery arrangements and supporting the findings of the Court of Inquiry. The review recommends that a full and comprehensive design review, including an assessment of solution options be commissioned. This will be actioned forthwith with Naval Staff lead.

Action: ACN(C)

In the interim, I am confident that underway RHIB launch and recovery operations can be conducted safely once the direction at a. through c. above has been implemented and with due regard to prudent seamanship and risk management procedures.

- f. **Recommendation 102.D.** – Review of the Seaboat Capability Elements of the Retrospective Operational Safety Case.

**Agreed.** This is to be conducted by Naval Staff in consultation with MOET and CANTERBURY ship's staff. This will need to be conducted in conjunction with the completion and implementation of the recommendations of the comprehensive design review at e. above.

Action: ACN(C)

- g. **Recommendation 102.E.** – Record of the approved design of the rigging arrangement for the RHIB system.

**Agreed.** The status of certification approval for the design of the RHIB system is currently uncertain and will not be able to be verified until such time as any recommendations of the design review have been implemented. In the interim, the Commanding Officer is to compile a Rigging Warrant for the ship, commencing with the RHIB launch and recovery system, to be approved by Commander MOET. Any maintenance, removal or replacement of key components of the RHIB system is to be recorded in the Warrant. Defects are to be advised by Operational Defect reporting procedures.

Action: CO CANTERBURY/Commander MOET/CFS

- h. **Additional Action:**

(1) A review of the conduct of seamanship in general in the RNZN, including training, SOPs, safety standards, administration and configuration control is to be conducted forthwith. The review is to be conducted by a third party with recommendations considered by the RNZN Lifesaving and Safety Equipment Committee for implementation.

Action: Commander MOET



[REDACTED]

Action: CO CANTERBURY

Dated at Trentham this        day of February 2008

**A.J. PARR**  
Commodore, RNZN  
Maritime Component Commander

## REPORT OF THE COURT OF INQUIRY

### General

1. This inquiry was carried out over the period 8 October to 27 November 2007. Evidence from 29 witnesses and 84 exhibits was considered.

References:<sup>1</sup>

**<sup>2</sup>ToR 1: What was the time and exact location of the incident?**

2. The incident occurred at 1033 NZST 5 October 2007 in position 34°19.802'S, 172°46.164'E, approximately 6.5 nautical miles north east of Cape Reinga.

**ToR 2: What were the light, sea and weather conditions at the time of the incident?**

3. Evidence presented to the Court describing the weather and sea conditions at the time of the incident are generally consistent with a south – south westerly wind of 10-15knots, sea state 1 to 2 and a 0.5 to 1.5m swell also from the SW.

4. Actual assessment of the sea conditions varied slightly between those remote from the incident (on the bridge) and those close to the scene, with the later estimates of a generally higher and confused swell. Sea conditions alongside the ship as assessed from inside the RHIB were again, slightly more extreme, possibly resulting from the affect of the swell against the ships side.

5. The incident occurred mid-morning on a clear day when it can be surmised light conditions were good.

**ToR 3: What was the chain of events and circumstances that immediately led up to the incident?**

6. The chain of events and circumstances leading up to the incident (defined as the RHIB capsize) are as follows (all times from 4 Oct are in NZST):

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<sup>1</sup> References to specific witnesses and exhibits have been removed in accordance with Armed Forces Discipline Rules of Procedure 1983 rule 158 and 159, and the Official Information Act 1982 s 2(h).

<sup>2</sup> Refers to Terms of Reference Question

**Wednesday 12 September 2007:**

- a. **PM:** Seaboat operations conducted to transfer personnel to Wellington. This was the last occasion the PORT RHIB was used prior to 5 October 2007.

**Tuesday 3 October 2007:**

- b. **1040-1059K:** Seaboat operations with PLA(N) ships and HMAS KANIMBLA. STBD RHIB used. Sea conditions -sea state 4, Wind NE 30kn.

**Thursday 4 October 2007:**

- c. Independent passage, Tasman Sea. No major whole-ship activities conducted. Weather conditions improving.

**Friday 5 October 2007:**

- d. **0606:** Engine checks completed on both RHIBS.
- e. **0800:** Both watches of Seaman muster. RHIB drills, for training purposes, briefed to commence at 1030. RHIB crews detailed.
- f. **1024:** RHIB crew enter PORT alcove and begin to prepare RHIB for launching. RHIB crew checks include visual inspection of boatrope quick release shackle (GIBB shackle).
- g. **1026:** Report made to bridge from PORT alcove that boats crew are closing up. OOW reports to CO on the bridge that ECCD's are complete.
- h. **1027- 1029:** OOW orders speed reductions. CANTERBURY (CAN) speed reduces from 19kn to 12.5kn. I/C of PORT alcove reports boats crew closed up and checks carried out. Personnel present in PORT alcove (excluding boats crew) – LT SORENSON (Safety Officer), POSCS WAEREA (I/C Evolution), POSCS WEILAND (Acting Buffer/ Safety Number), ASCS ROEBECK (I/C Evolution – under supervision), ASCS SMITH (davit controls), OSCS KISSICK-PONGA (boatrope pick-up line tender) ASCS TAURIMA, ASCS COX (spare hands).
- i. **1030:** PORT RHIB crew in boat – LSCS PAKINGA (supervising Coxswain), ASCS COOK (actual Coxswain – gaining experience), AHSO SOLOMON (observing Coxswain,

gaining experience), OSCS SHELFORD (Bowman). Ships speed – 11kn.

- j. **1031:** Away seaboard pipe made by bridge. Ships speed – 8.2kn.
- k. **1032:08 – 1033:03:** RHIB manoeuvred outboard of CAN and into water. RHIB engine started during lowering. Ships speed on settling in water = 7.2kn.
- l. **1033:03:** RHIB in the water.
- m. **1033:09:** Slack in davit wire cable. RHIB coxswain behind controls but not taking wheel in hand. LSCS PAKINGA and AHSO SOLOMON attempting to release offload hook. 1-2m following swell alongside ship making slipping offload hook difficult.
- n. **1033:10:** Davit wire tensions.
- o. **1033:12:** Davit wire slackens.
- p. **1033:19:** Davit wire tensions as RHIB falls off a swell. Tension comes on boatrope and it disengages without manual activation of GIBB (quick release) shackle. RHIB begins to move aft.
- q. **1033:22:** RHIB coxswain behind control panel, operating controls. Fwd propulsion applied.
- r. **1033:24:** RHIB bow pays off to port. Davit wire still connected. Davit wire being veered out under power.
- s. **1033:26:** RHIB now at approx 45° angle, bow out, davit wire still connected. Ships speed 7.3kn. RHIB STBD pontoon being forced downwards, water enters over STBD pontoon and RHIB begins to broach. CO (on bridge) gives order to stop the ship.
- t. **1033:27:** ASCS COOK (Coxswain) and OSCS SHELFORD (Bowman) tipped out of RHIB. LSCS PAKINGA and AHSO SOLOMON caught between hanging strops and PORT pontoon as RHIB capsizes. Astern propulsion ordered by CO. Man overboard pipe made including requirement to muster by messes.
- u. **1033:30:** RHIB upturned 180° (fully capsized). RHIB being towed sideways near perpendicular to ship, bow out. Ships

speed approx 7.3kn.

**ToR 4: What actions, emergency and otherwise, were taken immediately after the incident in response to events? Where these actions in accordance with relevant RNZN or ships SOPs/Orders?**

7. The actions immediately after the RHIB capsize are as follows:
- a. **1033:30 – 1036:** Bridge MOB actions completed (not necessarily in following order):
    - (1) ECPINS MOB marker activated.
    - (2) CO applies engine orders to stop the ship in the water.
    - (3) Lookouts detailed to keep track of personnel in water.
    - (4) Narrative of incident commenced (in rough log).
    - (5) Ships Medical Emergency Team (SMET) piped to vehicle deck.
  - b. **1033:36:** LSCS PAKINGA and AHSO SOLOMON pinned under PORT pontoon but able to periodically force heads above water as RHIB rolls against swell. Davit wire being veered out maximum rate in attempt to take tension off wire. Ships speed around 7kn.
  - c. **1034:21:** Order given by Bridge for STBD seaboat to be sent away.
  - d. **1035:00:** POSCS TAYLOR enters water from PORT alcove to render assistance to personnel visibly trapped under RHIB. Ships speed around 3kn.
  - e. **1036 - 1037:**
    - (1) On scene actions: POSCS TAYLOR attempts to free AHSO SOLOMON from under the RHIB. Manages to pull upper body free momentarily (notes SOLOMON unconscious) but lower body trapped. CPL HAUGHEY enters water with a knife intending to assist POSCS TAYLOR cutting the rigging strops apparently trapping personnel under the RHIB. LSCS PAKINGA manages to partially free himself and is subsequently helped onto upturned hull of RHIB by LT SORENSON and POSCS WEILAND who had also entered water (from PORT alcove) to assist.

- (2) Other actions: Life saving gear (life rings, life jackets) thrown by various members of ship's company to personnel in water. MOB Swimmer Recovery gantries prepared. Preparations commenced for warm food/clothing for personnel recovered from water.
- f. **1038:42**: STBD RHIB launched with Able Medic and proceeds directly to ASCS COOK and OSCS SHELFORD in wake of ship.
  - g. **1039 – 1050 (approx)**: CPL HAUGHEY unable to hold onto overturned RHIB to provide assistance to POSCS TAYLOR and subsequently drifts astern of ship. STBD RHIB recovers ASCS COOK, OSCS SHELFORD and CPL HAUGHEY. Proceeds to assist personnel in vicinity of overturned PORT RHIB.
  - h. **1039:10**: On scene assessment that davit wire should be cut to release tension on rigging strops that were potentially trapping person underneath RHIB. Command approval given to cut davit wire.
  - i. **1040:31**: Main engines emergency stopped. Ships speed approx 1.5kn.
  - j. **1040 – 1045**: Ships Medical Emergency Team (SMET) closed up in vehicle deck preparing to receive injured personnel.
  - k. **1044:28**: Davit wire cut. PORT RHIB begins to float free from ship.
  - l. **1052:15**: Order given to start main engines.
  - m. **1050 – 1055 (approx)**: LSCS PAKINGA recovered into STBD RHIB. POCSS TAYLOR and POSCS WEILAND decide on activation of self righting gear in attempt to reach AHSO SOLOMON trapped under hull. Initial difficulty locating activation lanyard (not in normal location). Activation lanyard pulled completely out and gear did not release as expected.
  - n. **1055**: POCSS TAYLOR, POSCS WEILAND and CPL HAUGHEY work together to free AHSO SOLOMON from underneath RHIB by pulling/manoeuvring his body forward to bow area and then out from under pontoon.
  - o. **1056**: AHSO SOLOMON recovered into STBD RHIB. First

Aid (CPR) commenced immediately by AMED JOHANNSEN and ASCS COOK. Personnel assisting in water (TAYLOR, WEILAND and HAUGHEY) join remaining members of PORT RHIB crew in STBD RHIB (PAKINGA, COOK and SHELFORD). RHIB proceeds directly back to CAN.

- p. **1102:** AHSO SOLOMON removed from RHIB into ship. All personnel accounted for.
- q. **1100 – 1130 (approx):** Remaining members of PORT RHIB crew and personnel previously assisting in water attended to by SMET and other ship's company. LSCS PAKINGA, suffering moderate facial injuries, attended to by SMET in ship's hospital.
- r. **1120:** Restrictions on Use of cellphones and external email implemented by Command.
- s. **1102 – 1124:** AHSO SOLOMON transferred to Sickbay. Medical team continue to administer CPR.
- t. **1125:** POMED BAKER-CLEMAS (Senior Medical Rating) makes decision to stop CPR on AHSO SOLOMON.
- u. **1130 (approx):** CO informed that AHSO SOLOMON was deceased.

8. There was no specific SOP for an incident involving a RHIB broach alongside and subsequent trapping of personnel. Risk assessments conducted prior to the incident by ship's personnel did not identify such RHIB broaching as a specific risk and there were no documented mitigation actions; however, there was an understanding amongst some of the RHIB coxswains that immediate application of power to "drive" the RHIB underneath the davit fall wire was the accepted practise in the event of the boatrope detaching before the offload hook had been released. This action was attempted by the RHIB coxswain, ASCS COOK, but due to a combination of the speed at which the RHIB was being pulled through the water and significant restriction on the manoeuvrability of the RHIB imposed by the attached davit wire, he was unsuccessful. It is the COI determination that it would be highly unlikely that a more experienced coxswain would have been able to maintain the RHIB position underneath the davit fall wire under identical circumstances.

9. Actions of the bridge staff immediately following the incident were consistent with SOP's for a MOB, modified as deemed appropriate for the particular circumstances of the incident. The predominantly support role to those in direct contact with the scene is considered appropriate

given the remoteness of the bridge and rapidly unfolding sequence of events that required on-scene decisions to be made by those best placed to make them.

**ToR 5: Were the personnel involved in the incident on duty at the time of the incident?**

10. All personnel involved in the incident were members of the NZDF either posted or attached to HMNZS CANTERBURY and can be considered to be on duty at the time of the incident occurring.

**ToR 6: Were there any injuries or fatalities sustained as a result of the incident and if so, what was the nature and extent of such injuries or fatalities and how did they occur?**

11. There was 1 fatality and 5 personnel injured as a result of the incident. The extent of the injuries and description of how they occurred is as follows (in order of severity):

- a. **AHSO SOLOMON – fatality.** Although yet to be confirmed by the Coroner, it is almost certain that the cause of death of AHSO SOLOMON is drowning. Examination of AHSO SOLOMON by medical staff when he was recovered onboard indicated no other injuries. It is the Courts determination that AHSO SOLOMON drowned as a direct result of being trapped underneath the upturned RHIB, initially from being pinned between the port pontoon and the lifting strops that were attached, under tension, to the hoisting/lowering davit wire.

- b. **LSCS PAKINGA –** [REDACTED]

**POCSS TAYLOR –** [REDACTED]



[REDACTED]

d. **OSCS SHELFORD** – [REDACTED]

e. **POSCS WEILAND** – [REDACTED]

**ToR 7: If injuries resulted from the incident, what immediate and subsequent action was taken with respect to the treatment of casualties?**

12. Action taken to treat those sustaining injuries resulting from the incident effectively commenced immediately after the MOB pipe was made with the closing up of the ship's medical staff and subsequent preparations for receiving injured personnel onboard. This included the POMED and SMET closed up at MOB locker in vehicle deck to prepare medical gear, including stretcher, backboard and blankets. The AMED also closed up immediately after the MOB pipe at her station, which was the medical number in the designated rescue boat, in this case the STBD RHIB.

13. Treatment of individual casualties arising from either the initial incident or subsequent actions to assist those in distress are as follows (in chronological order):

a. **LSCS PAKINGA** was the first of those personnel injured in the initial incident to receive attention when LT SORENSON assisted him on the hull of the overturned RHIB [REDACTED]

[REDACTED]

After an initial appraisal by SMET in the vehicle deck, he was subsequently transferred to the Hospital where he underwent a more detailed primary and secondary assessment by the POMED. [REDACTED]

[REDACTED]

[REDACTED] He was closely observed by medical staff and the CO advised of his condition and the Naval Hospital contacted via satellite phone. On being advised with an assessment of LSCS PAKINGA's condition, initial advice provided by the Director Naval Medicine, SGN CDR J. DUNCAN, was to transfer LSCS PAKINGA ashore as soon as possible. Various options were then considered involving the use of military and civilian helicopter evacuation but it was later decided after a reassessment of LSCS PAKINGA's condition that the level of care available in CAN was adequate until he could be landed ashore to specialist medical care on the ships return to Devonport Naval Base in around 12 hours. There is evidence to suggest that avoiding unwanted potential media interest that a helicopter evacuation might incur was also factor in this decision.

- b. **AHSO SOLOMON.** The first opportunity to render first aid of any kind to AHSO SOLOMON occurred at 1056, some 25 minutes after the RHIB capsized, on his recovery into the STBD RHIB. CPR was administered immediately by AMED JOHANNSEN and ASCS COOK, who was later joined by members of the SMET when SOLOMON was recovered into CAN around 1105 and subsequently transferred to the Sick Bay. CPR continued for a further 20 minutes, throughout which there were no visible signs of life from SOLOMON and he was assessed as deceased by POMED BAKER-CLEMAS at 1125 and CPR discontinued. AHSO SOLOMON was formally pronounced dead by a medical doctor on arrival at DNB at 0325, 6 October 2007.

14. Of the remainder of the personnel who were either part of the capsized RHIB crew or had entered the water to assist those in distress, the initial assessment of SMET was that none had suffered injuries serious enough to warrant immediate medical attention other than providing assurance and warm clothing. These personnel were escorted to the Embarked Dining Hall where they received warm soup, reassurance and support from other members of the ship's company prior to dispersing to their respective messes or accommodation.

[REDACTED]

[REDACTED]

b.



**ToR 8: What casualty reporting action was taken, including OHS and ACC requirements, and was it timely and in accordance with normal casualty reporting procedures? If not, why not?**

15. There were two "phases" of casualty notification concerning the incident; those actions carried out immediately after the incident, and those of a more administrative nature that occurred a number of days thereafter:

- a. **Immediate notification.** The first notification of the incident occurred around 1115 when DCN (CDRE A.J. PARR, RNZN) informed JFNZ and CN by satellite phone. An immediate PUBLINTCAS signal concerning the death of AHSO SOLOMON was released by the CO at 050135Z and a NOTICAS for LSCS PAKINGA at 050756Z.
- b. **Administrative notifications.** Such notifications involved Serious Harm notification, ACC and RNZN OSH requirements:
  - (1) **Serious Harm Notification.** The NSS Base Services Manager, LTCDR M.A. LE COMTE initiated contact with SO CANTERBURY 9 Oct 07 offering assistance to complete the necessary Serious Harm Notification, ACC and OSH forms. The Department of Labour was subsequently provided a Serious Harm Notification for the fatality and injuries arising out of the incident occurring in CANTERBURY on 5 Oct 07. The Department of Labour advised that the only requirement in this instance is to notify Maritime NZ, who in turn advised they did not have any reporting requirements for accidents in RNZN Warships at sea unless it involved a civilian vessel.
  - (2) **ACC reporting requirements.** The NSS BSM provided assistance to the ship and the Fleet Personnel and Training organisation (FPTO) concerning the necessary ACC reporting requirements (ACC form AEP 21 -

Accredited Employer Provider – Advice of fatal Injury), which was duly passed to FPTO for action on 24 Oct 07. Form RNZN 1 (Report of Safety, Health and Environment Accident and Incident) was completed within a week of the incident and submitted to the Staff Officer Safety Health and Environment (SOSHE) on 17 Oct 07.

16. The use of satellite phone as the first means of notifying the relevant authorities of the incident, whilst not strictly consistent with the requirements in NZBR 23 Article 5103 (Reports of Casualties), is considered entirely appropriate given the availability of satellite communications and immediate priorities of the Command Team onboard. Release of PUBLINTCAS and NOTICAS signals occurred some hours after the incident but they essentially contained no new information that had not already been relayed via satellite phone to key personnel within the appropriate organisation. In the case of the PUBLINTCAS signal that was dispatched, NHS was unintentionally omitted as an action addressee but was kept well informed throughout by satellite and cellular phone updates.

17. Administrative notification action in the days and weeks following the incident was less timely, most likely due to confusion surrounding what was required and who by. The ship was initially not aware of any ACC reporting requirements and over 2 weeks had elapsed before a POC within FPTO was identified to action the requirements in NZBR 23, Ch 51 (after prompting by CO CANTERBURY).

**ToR 9: Were all actions taken following the incident adequate and proper given the circumstances?**

18. Actions taken by the Command and Ship's Company of CANTERBURY were adequate and proper given the circumstances, experience levels and knowledge of the ship at the time of the incident. In the review of actions taken post incident, it is the courts view that whilst a number of procedural omissions might have occurred, such as the lack of full "diver safety" checks or command approval prior to personnel entering the water during subsequent rescue attempts, all actions were consistent with what was considered necessary at the time by those best placed to make such decisions – in many cases, by personnel close to the scene with the most complete picture of the need for such actions and the risks involved.

19. In at least three instances following the incident, the rescue efforts by individuals was at the risk to their own personal safety. Such actions are in no way attributable to recklessness or considered improper given the circumstances that existed at the time.

**ToR 10: Will any injury cause, or be likely to cause, permanent ill effects that will impair the efficiency of those injured?**

20. All personnel suffering non-fatal injuries arising from either direct involvement in the incident or subsequent rescue efforts have undergone both a medical and psychological assessment by qualified practitioners. It is the assessment of the practitioners that none of these personnel have suffered injuries that will cause, or likely to cause, permanent ill effects.

**ToR 11: Was there any damage to any property or equipment? If so, what was the extent and cost of the damage, and is the damage able to be repaired?**

21. The PORT RHIB and associated launching and recovery system sustained significant damage as a result of the incident and subsequent recovery efforts. Damage to the PORT RHIB is summarised below:

- a. STBD FWD lifting anchor point distorted and bolt sheared.
- b. STBD AFT lifting anchor point distorted.
- c. Engine cover cracked.
- d. Water jet hydraulic ram distorted.
- e. Console frame damage and water damage to console electric components.
- f. Lifelines on STBD pontoon missing, evidence of forced removal.
- g. Potential water damage to engine (not determined during inspection).

22. Damage to other items are summarised below:

- a. Self Righting System missing activation pull cord indicating equipment is in an "armed" condition but has not activated.
- b. Offload release hook indicates wear preventing correct operation of kick out pawl.
- c. Davit head limit switch lever arm sheared off and groove evident in sheave block.
- d. Davit wire rope fall severed.

23. The total estimated cost to repair the above damage and return the RHIB and associated launching and recovery system to the same state prior to the incident is \$97,371. If subsequent inspection of the RHIB engine determines it is BER due to water damage, then the total cost of repairs is increased to \$113,085.

**ToR 12: Who was supervising the procedure at the time of the incident? Were they properly qualified to be doing so? Was the supervisor of the activity under training at the time of the incident?**

24. The evolution was being conducted primarily for training purposes and there were a number of key positions in both the lowering process and RHIB crew that were filled by personnel either understudying qualified personnel or relatively newly qualified personnel gaining experience.

25. Personnel involved in the evolution did not have a consistent interpretation of the role of supervisor, IC of the evolution and the safety number and just who was undertaking these positions. Some thought that POSCS WEILAND was overseeing the evolution whilst others believed it was POCSS WAEREA who was supervising ASCS ROEBECK as understudy I/C and the position of safety number was understood by some to be carried out by LT SORENSON and others to be POSCS WEILAND.

26. Notwithstanding the apparent confusion as to the role and nominated supervisor of the evolution, the majority of personnel involved believed that POSCS WAEREA was supervising the evolution and POSCS WEILAND was, in his capacity as Acting Chief Boatswains Mate (Buffer) was the safety number. Both of these Senior Ratings have extensive seamanship experience and have been part of the CANTERBURY's ships company prior to commissioning and had completed the training provided by Tenix relating to seaboat operations.

**ToR 13: What duties or activities had the supervisor and the injured or any other personnel involved in the incident been performing in the 24 hours prior to the incident?**

27. During the 24hr period prior to the incident, HMNZS CANTERBURY was conducting independent passage to DNB. Programmed non delaying Emergency Casualty Control Drills (ECCD), involving bridge and engineering department personnel were carried out during the afternoon of 4 Oct (1300-1430) and forenoon of 5 Oct and an un-programmed fire alarm activation requiring Standing Sea Emergency Party (SSEP) response 5 Oct (0850 to 0856), were the only activities of note.

Only 3 of the personnel injured or those directly involved in the immediate rescue efforts had conducted watchkeeping duties during the 24hr period prior to the incident. The maximum duration of the watchkeeping conducted by any one individual during the 24hrs prior to the incident was 6 hours (ENS McQUAID).

**ToR 14: Who was responsible for launching the RHIB? Was the launching in accordance with RNZN and international best practice, including relevant orders, instructions and international maritime regulations, relating to the operation of any equipment or machinery involved?**

28. The Executive Officer is responsible to the Commanding Officer for the safe conduct of all seamanship evolutions, including launching and recovery of seaboats, in accordance with NZBR 23, article 0706(4).

29. The comparison of the launching procedure with best practise is addressed in two parts; firstly, best practise in the RNZN; and secondly, within the international maritime community where a similar seaboat arrangement is used.

### **RNZN Best Practise**

30. Although evolutions of a similar nature have been routinely conducted in other RNZN FE's, the RHIB arrangement in CAN has a number of key differences which require different operating procedures and perhaps more importantly, different mitigating actions in the event of equipment failure or malfunction. Assessment of whether RNZN best practise has been adopted in CAN is based on how these differences are catered for to achieve a functional and safe arrangement.

31. Offload hook. A key difference to the equivalent RHIB arrangement employed in other FE's is the vestdavit offload hook used in CAN. This hook requires manual operation whereas the equivalent hook in other FE's activates automatically when the RHIB settles on the water and weight comes off the hook (ie it becomes "off load"). The SOP used in CAN specifies the RHIB coxswain operates the hook. This requires the coxswain to devote his actions to releasing the hook – which is situated astern of the RHIB controls – which means that in the event of an unintentional release of the boatrope, the coxswain is not in a position to manoeuvre the RHIB to maintain station underneath the davit fall wire to enable the offload hook to be released. This is contrary to the best practise employed in other FE's that, by the nature of the design of the offload hook and sling arrangement, enable the coxswain to remain at the RHIB controls and be ready to manoeuvre the RHIB as required in the event of the premature release of the boatrope.

32. Lifelines. RNZN SOP's for launching and recovery of RHIB's include the use of lifelines, which are manned by the RHIB crew during hoisting and lowering. The CAN RHIB arrangement does not include lifelines.

33. Davit operating limitations. Another key difference between the RHIB arrangements is the type of lowering/hoisting equipment. CAN is fitted with single point davit systems (Vestdavit PLAR 4500 model) whilst a trainable, boom-type crane (eg HIAB) is used in other RNZN FE's. The vestdavit's design parameters conform to IMO SOLAS requirements for Fast Rescue Boats (FRB) which include launching and recovery whilst the parent ship is underway up to a speed of 5 knots. The MRV Ships Specification specify the davits and ancillary systems shall allow launching and recovery of the RHIB's whilst the MRV is making way at speeds up to 10 knots and the SOP used in CAN specifies ships speed of between 6.5 – 7.5 knots, which although accepted practise in other FE's, is contrary to the davit certified parameters. The COI has not determined what the effect might be of operating the davit outside the design parameters; however, it is assumed this would as a minimum, affect the validity of associated equipment warranties in the event of damage or at worse, cause a major malfunction of the davit during hoisting and lowering of the RHIB leading to serious accident.

34. Overall, the RHIB launching procedure employed in CAN is generally consistent with RNZN best practise; however, it is apparent that the implications of key equipment failure have not been thoroughly considered and appropriate mitigation actions identified.

### **International Best Practise**

35. It is difficult to fully assess if the launching procedure used during the incident was in accordance with international best practise as it appears that virtually no commercial operators in the Maritime Industry use a similar RHIB arrangement to that employed in CAN. Nonetheless, there are significant departures from accepted good practise, of the procedures followed in CAN when compared to those used in commercial maritime shipping for the equivalent seaboard capability – the Fast Rescue Boat (FRB). The procedural differences concerned with launching the RHIB are listed below; further detail concerning the function and design of the associated equipment is covered later in this report.

36. Boatrope arrangement. There is significant variation between how the boatrope is used. RNZN practise is for the boatrope to be made fast to a set of bollards close to the ships side whilst commercial shipping



often affix the boatrope to the ship via a short towing-boom arrangement. When subsequently pulled through the water by the boatrope during launching and recovery, the RHIB will naturally rest against the ships side under RNZN SOP's whilst in the later case, the boom arrangement keeps the boat away from the ships side.

37. The SOLAS FRB concept involves the launching and recovery of the seaboat fully loaded, thus negating the need to transfer personnel and equipment from alongside the ship and reducing the risk of injury of personnel and damage to the seaboat from contact with the ships side. The davits fitted to CAN allow RHIB's to be launched and recovered fully loaded; however, the boatrope arrangement does not facilitate the RHIB remaining clear of the ships side and the RNZN practise of rigging the boatrope and operating the davit to "hold" the seaboat alongside the ship is followed. This is contrary to international best practise.

38. Another departure from international maritime best practise is the use of what would be considered an over-complicated method of providing a boatrope strong point – the RNZN bridle arrangement – instead of a bollard at the bow of the RHIB that is tested and certified as part of the rescue boat type approval.

39. Offload hook. The offload hook used in CAN requires manual activation; this is not in accordance with RNZN or international best practise where FRB or equivalent arrangements generally use offload hooks that automatically release as soon as weight comes off the davit or crane fall wire.

40. Seating arrangement. RNZN SOP's specify that personnel being hoisted or lowered with the RHIB sit on the outboard pontoon. This is contrary to international best practise and SOLAS (LSA code) which require RHIB crew to sit within the main body of the RHIB to reduce the risk of falling overboard. In all RNZN RHIB's, the sling arrangement makes sitting within the main body of the RHIB dangerous and sitting on the outboard pontoon is the only practicable alternative and the risk of falling out of the RHIB is mitigated by the use of lifelines. In CAN, where there are no lifelines fitted (nor is it a SOLAS requirement), the risk of falling from the RHIB appears to be deemed acceptable as the fall distances involved are less than those in the majority of other RNZN FE's.

41. Lifting Slings. The use of lifting slings in CAN and other RNZN seaboat arrangements is contrary to international best practise where an automatically releasing offload hook such as the Henricksen type, is hard mounted atop an elevated frame fitted to the FRB, removing the need for slings altogether. This has the advantage of reducing the difficulty in attaching the fall wire in adverse sea conditions and removes

the risk of injury from uncontrolled movement of the sling or potential entrapment from them in the event of the RHIB broaching. Such frames are normally situated forward of the RHIB controls, thus permitting the coxswain to observe the hooking/unhooking of the davit fall wire whilst operating the RHIB. Another departure from best practise incurred with the use of lifting slings is the requirement for personnel to sit on the outboard pontoon to avoid contact with the sling. This is addressed in the preceding paragraph.

42. Boat rope release. RNZN procedures involve the use of a quick release mechanism that is remotely activated via a lanyard. International best practise and SOLAS regulations require the means of operating the release mechanism from within the boat and whilst the RNZN SOP achieves this, the method of rigging the release lanyard and its length are not in accordance with best practise. Best practise arrangements using a quick release mechanism generally employ a shorter lanyard and a shackle with proven reliability that is subject to type approval as part of an integrated rescue boat system. As reported elsewhere in this report, the GIBB trigger release shackle has a dubious history and appears to never have been subject to a rigorous testing process and was not part of the type approval certification for the Gemini RHIB used in CAN.

**ToR 15: Had appropriate operational risk management steps been undertaken and were these sufficiently robust?**

43. A formal and documented Operational Risk management (ORM) assessment of the seaboat operations planned for 5 Oct 07 was not conducted. The Commanding Officer was aware of the mandated requirements for a formal ORM prescribed in NZBR 97 and the decision to not complete a formal ORM in this instance was based on the benign weather conditions and relatively routine nature of the boat drills.

44. As a means of demonstrating his decision to not have conducted an ORM for the seaboat evolution, the Commanding Officer presented to the Court an ORM Risk profile that he had completed post incident based on the perceived and real risks that would have been identified under the prevailing conditions and circumstances. None of the risks fell within the "square of attention" that would then require further consideration and management throughout the activity.

45. Based on the information at hand to the command team, the decision to not conduct a formal ORM is sound. ORM of routine seaboat operations in benign conditions is not a mandated requirement in NZBR 97. Regular seaboat operations had been conducted successfully in the preceding weeks, in some instances in much less favourable conditions

and all of those directly involved (the Alcove and RHIB personnel) were familiar with the evolution.

46. Even if the formal ORM process had been conducted, it is unlikely the level of detail present within the retrospective ORM would have identified the unintentional parting of the boatrope as a specific risk. In this aspect, the ORM process might be considered deficient; however, the quality of the risk definition might also be lacking. Given that there were instances in the previous weeks where the RHIB boatrope had parted through suspected GIBB shackle malfunction and/or unintended release, it is reasonable to consider it as a significant risk, albeit a specific and relatively detailed one, noting the increased likelihood of it occurring and the potentially serious consequences. It is not certain, however, that the consequences of the boatrope parting were fully appreciated by the command team onboard, in that it was felt that the mitigating actions identified of immediate slipping of the offload hook or the RHIB coxswain "driving" the boat to maintain station directly under the davit hook to enable its release, were sufficient – when they clearly were not in this instance. What was not appreciated was the increasing difficulty by RHIB crews to release the offload hook, which may be due in part, to a desire to "take what they've got and try to make it work". It is possible that, if the command or those responsible for completing the ORM were fully aware of the problems with releasing the offload hook, that it may have featured in an ORM that may have, in turn, influenced the conduct of the operation.

**ToR 16: Were any oral or written instructions given to the operators of the recovery system and occupants of the RHIB prior to the incident, and if so, what were they and were they complied with?**

47. This question is addressed in three parts – those instructions given to the launching of the RHIB and the crew therein specific to the day of the incident, the general instructions and training provided prior to the event and finally, the compliance with these instructions.

- a. **Instructions given on 5 Oct 07.** At around 0730 on 5 October, the XO briefed LT SORENSON that he was to be the Safety Officer for RHIB drills programmed for 1030 that morning. Apart from the intention to rotate RHIB coxswain's and conduct "touch and go" drills, limited information was passed during this briefing.
- b. The operators of the RHIB launching and recovery system and the occupants of the RHIB were given an oral briefing by the Acting CBM – POSCS WEILAND at "Both Watches" around 0800 on the morning of the incident. Contents of this

brief included an outline of the RHIB drills that were planned for 1030 and the personnel filling the key positions were identified. The time for closing up in the Alcove prior to the serial start at 1030 was also advised.

- c. Further instructions were provided by the A/CBM to the Ordinary Seaman involved in the evolution once personnel had closed up in the port alcove at around 1025. This instruction comprised of a "refresher" on what to check as part of RHIB bowman duties. This included a visual check of the GIBB trigger-latch to ensure there was sufficient slack in the release lanyard and it was not fouled in any way.
- d. **General Instruction provided prior to 5 Oct 07:** The formal training provided by Tenix of the launching and recovery system comprised of a 1 day course on the operation of the Vestdavit whilst the ship was in Melbourne prior to the ship commissioning. This training was only delivered to those identified as being directly involved with the davit operation and attendees indicate it was pitched at a very basic level and did not involve a practical demonstration of the launching and recovery of the RHIB whilst the ship was underway. Not all of the personnel directly involved in the incident of 5 Oct 07 had received the Tenix training.
- e. Some months prior to the ships commissioning, a series of Standard Operating procedures (SOPs) for the operation of the RHIB's and associated equipment were developed and progressively enhanced as the ships personnel gained experience in RHIB operations in CAN. These SOPs include basic detail on the light tension mode of operation and the operation of the vestdavit offload release hook.
- f. All of the RHIB occupants and those directly involved in its launching on 5 Oct 07 had received varying levels of internal training in their respective roles through regular seaboard continuation training prior to the incident.
- g. **Compliance with instructions.** The instructions given on the day of the incident to key personnel were generally complied with. There is conflicting evidence on whether the Bowman that actually went away with the RHIB completed the designated Bowman checks; however, there is sufficient evidence from a number of witnesses that the checks as detailed in the RHIB SOP's were carried out by other personnel immediately prior to the RHIB being launched. It is worthy of note that the RHIB SOP's in CAN specify a check of

the GIBB shackle, which could be interpreted as a visual check without the need to prove the correct connection by some form of physical action such as shaking/pulling on the shackle.

- h. Although the CAN Lowering and Hoisting SOPs do not include specific detail on the use of the davit offload hook, RHIB crews had developed a procedure for the hook release that was substantially different to the designed operation and possibly from what was delivered during Tenix training. This modified procedure involved the physical manipulation of the ovoid link (also known as a forged ring) attached to the RHIB strops, as it was being connected/disconnected to the offload hook. The diameter of the ovoid links provided by the shipbuilder was such that the links could only barely fit into the mouth of the open offload hook. RHIB crews were rotating the link to its narrowest part - a partially flattened section (by design) on either side of the ring – to be able to fit into the offload hook mouth. This procedure often required two people to accomplish and could take up to 2 minutes particularly when the RHIB experienced significant movement from the swell once fully lowered.
- i. The design of the offload hook was to enable a near instantaneous, single handed release by pulling of a release wire lanyard which will activate a kick-out-pawl that in turn will eject the ovoid ring clear of the hook mouth. Loading the hook is again, designed to be a single handed operation, requiring the ovoid link to be pushed into the offload hook mouth which will cause a safety pin device to activate, securing the link firmly in place. Clearly, the modified procedure in use by the CAN RHIB crews is not in line with the designed operation of the hook; however, this non-compliance was borne out of necessity to make the hook work, albeit at sub-optimum standard.

**ToR 17: When and by whom was the RHIB launching and recovery system last inspected for function and safety? Was this in line with ships orders or any other relevant order or safety standard including international maritime safety requirements? Was this documented and if so are the relevant papers in order? *These papers are to be inspected by the court of inquiry.***

48. The RHIB launching and recovery system was subject to two, quite separate, inspection processes. These were the Safety and Readiness Checks (SARC) carried out by the RNZN Maritime Operational Evaluation Team (MOET) and the series of inspections associated with

SOLAS and other IMO regulations. These are summarised below.

### **RNZN MOET Checks**

49. CAN conducted a SARC (Harbour) on 7 June 07. During this check the MOET Fleet Seamanship Inspector (FSI) inspected the RHIB arrangement and noted a number of irregularities. Three items were deemed critical to the safe operation of the seaboat, requiring rectification before the ship could proceed to sea. These were:

- a. A broken quick release shackle on the PORT boat;
- b. No crash bag or floatation equipment to support flying operations and the emergency flares were the incorrect type;
- c. Safety chains and securing arrangements in both seaboat alcoves needed to be improved.

50. There is no formal documentation or inspection record to show that the above actions were taken; however, the COI has been presented evidence elsewhere to confirm that the quick release shackles on both RHIB's were replaced with RNZN sourced GIBB trigger release shackles prior to 22 June 07.

51. The ship subsequently conducted a SARC (Sea) on 17 June 07. Separate day and night Man Overboard Exercises (MOBEX) were conducted during the SARC, resulting in a SAFE assessment by the FSI. The MOET seamanship report raised as part of the SARC (S) does not specify which RHIB was used for the MOBEX's.

### **SOLAS and associated Regulations**

52. In order to address if the inspections of the RHIB installation, conducted to satisfy SOLAS and other associated regulations were correct, it must first be established what regulations apply. Fundamental to this is the defining what type of vessel CAN is under existing IMO regulations. The COI has found that the level of knowledge of SOLAS within the RNZN was not of sufficient depth to address these two questions and external SME was engaged to provide a credible interpretation of the SOLAS regulations pertaining to the type of vessel detailed in the MRV Ship Specification. The following statements are largely drawn from this interpretation.

53. Project Protector Specification requires the MRV to comply with IMO Resolution A534 relating to the Code of Safety for Special Purpose Ships (SPS Code). The PP Specifications further define the MRV as a Roll on, Roll Off, Passenger (Ro Pax) vessel with respect to statutory regulatory compliance.

54. Under the SPS Code, the MRV is considered a passenger ship with respect to compliance with Chapter III of SOLAS relating to Life Saving Appliances. Part B of Ch III requires a minimum of one Rescue Boat each side of the vessel, one of which shall be a Fast Rescue Boat (FRB).

55. Another series of statutory regulations apply in the form of the IMO Maritime Safety Committee (MSC) 48(66) - the International Life Saving Appliance Code (the LSA Code). These regulations include specific requirements for Rescue Boats and general requirements for launching appliances. Also applicable is the MSC Circular 809, containing recommendations for the testing of FRB in order to meet statutory compliance.

### **Compliance with SOLAS and associated Regulations**

56. There is a considerable amount of testing and subsequent certification of equipment and systems required to demonstrate compliance with SOLAS and associated regulations. Sitting atop of this certification tree is the Special Purpose Ship Safety Certificate, supplemented by a Record of Approved Safety Equipment and Record of Equipment. Collectively, these can be considered as the "Ships Papers".

57. The MRV underwent a change of Flag State in May 2007 and a new set of "Ships papers" were issued on 31 May 2007 by Lloyds Register Asia – Melbourne Office. It is not clear if a complete survey of the subordinate systems and equipment subject to the new papers was carried out during the change of Flag State process, although the SPS Safety Certificate states that the survey on which the certificate is based was completed on 14 August 2006. If this was in fact the last occasion a full survey was conducted, it would have been under the previous Flag State authority that may have had a different interpretation of the vessel designation and subsequent compliance requirements. Notwithstanding whether a survey was carried out on or near the change of Flag State date, the issue of the SPS Safety Certificate states unequivocally that the lifesaving appliances including rescue boats were provided in accordance with the provisions of the SPS Code.

58. Inspection of the SPS Safety Certificate and associated Record of Equipment reveal significant irregularities with what exists in CAN. Some of these irregularities are summarised below:

- a. Item G1.4 of the Record of Equipments states the type of Rescue Boats carried in CAN as "Fast". The RHIB's carried in CAN are not FRB because:

- (1) The Certificate of Compliance held for the 730 T WJ type boat manufactured by Gemini Marine is for a Rescue Boat, not a Fast Rescue Boat. There were two exemptions relating to the Gemini RHIB's issued by the Naval Authority acting as Flag State; however, even when these are taken into consideration, the Gemini RHIB appears to fall well short of what is considered a FRB under SOLAS and LSA Code regulations.
  - (2) There are significant omissions in the certification provided for the Gemini RHIB to call into doubt the compliance with minimum Rescue Boat requirements. An example of this is the lack of a painter securing device and associated release mechanism, which under SOLAS, is considered an integral part of the RB/FRB and is required to undergo type approval testing with the boat. Another example is the Self Righting Gear – which is also required to undergo type approval as part of an integrated FRB. Neither of these are mentioned in the Certificate of Compliance for the Gemini RHIB.
- b. The use of the lifting strop arrangement for the RHIB's in CAN, whilst not in themselves specifically precluded under SOLAS, do cause significant difficulty adhering to other regulations. An example of this is the significant obstruction and subsequent restriction in movement the strops create during hoisting and lowering, causing the RHIB crew and passengers to sit on the outboard pontoon when the strops are in use. This contravenes the LSA Code which specifically states that no part of the Rescue Boat or Fast Rescue Boat shall be on the gunwale or inflated buoyancy tube along the sides of the boat.
- c. The equipment used for lifting and hoisting the RHIB's, whether this comprises of a hard mounted, "in-boat" type hook (eg a Henriksen type) or a sling arrangement such as that fitted to CAN, are a critical element in the overall RHIB system and is required to form part of the type approval testing. It is almost certain, however, that the strop arrangement was not part of the type approval for the Gemini RHIB fitted to CAN. This is borne out by:
- (1) The certificate of compliance for the Gemini RHIB in CAN does not contain any details on the equipment used for lifting and hoisting, including fastening device for connecting to the davit/crane wire fall(s).



- (2) The load testing carried out for the actual lifting stops used for each of the RHIB's in CAN indicate the load angles for the stop "legs" may not be consistent with the design angle for the anchor points on the RHIB hull.
  - (3) The "Master Link" (also known as a Forged Ring or Ovoid Link) fitted to the apex of the lifting strops was clearly not appropriate in terms of its size and SWL, as described in detail elsewhere in this report. It is extremely difficult to believe that this vital component would have been approved as part of the lifting gear if it had been inspected during a type approval carried out in accordance with SOLAS regulations.
- d. SOLAS requires that lifeboats and rescue boats must be able to be launched even in unfavourable conditions of vessel trim and with respect to list, this includes a list of up to 20 degrees either way. SME appraisal is that the latest versions of the RHIB arrangement in CAN depict a maximum allowable list of 15 degrees for the launching of the RHIB. This is in direct contravention to SOLAS. Furthermore, it appears that earlier drawings on the RHIB arrangement do show a compliant 20 degree allowable list; however, this was subsequently changed indicating potentially serious flaws in the configuration design review and approval process.

59. Due to the complexity of the IMO regulations involved and resources available to the COI, it is highly probable that the irregularities and non-compliances pertaining to the RHIB arrangement in CAN are not restricted to that listed in this report.

**ToR 18: Has the RHIB system been accepted into service with RNZN, and if not, has this contributed in any way to the incident?**

The RHIB and associated launching and recovery system (the RHIB system) has been accepted into service with the RNZN. Although there is some variance as to what defines actual acceptance into RNZN service for the RHIB system, it is generally understood to be on the completion of the Contractor Sea Acceptance Trials (CAT 5) that occurred in June 07 prior to the ship commissioning.

**ToR 19: Have any modifications been made to any of the RHIBs or associated systems since HMNZS CANTERBURY was accepted into service? If so, what were the modifications, why were they implemented, what was the authority for doing so and**

**did the modification have any bearing on this specific incident?**

60. Evidence presented by a number of witnesses indicates that a detailed description of the “as fitted” equipment that comprises the RHIB launching and recovery system in CAN (for example a rigging warrant) was not delivered with the ship on commissioning. It is therefore difficult to determine exactly what modifications have been made to the RHIB arrangement; however, it is certain that the following has been changed since the RNZN accepted the RHIB's and associated systems into service:

- a. **Boatrope trigger latch.** The boatrope is connected to the RHIB via a trigger latch that can be operated remotely via a release lanyard. On delivery, the trigger latches supplied with the ship (by Tenix) were noticed by RNZN personnel to be different from what was in use in the RNZN, in that the release mechanism required a sideways pull to activate. This was proving difficult to operate by RHIB crews during trials and is contrary to the GIBB trigger-latch shackle arrangement which requires an inline pull consistent with the normal rigging of the release lanyard through the outboard buoyancy tube handholds as detailed in BR 67 (NZ Supp AL 2). The Tenix supplied trigger shackles were later confirmed to be deficient when one physically broke during RHIB trials at anchor and were subsequently replaced with RNZN sourced GIBB trigger-latch shackles with the approval of MOET staff.
- b. **Boatrope towing bridle.** On acceptance into RNZN service, the boatrope for each RHIB's in CAN was connected via the Tenix supplied trigger latch to a short towing bridle that was in turn connected directly to the forward securing post (also known as a staghorn) located near the bow of the RHIB. During initial trials and the Sea Acceptance and Readiness Check – Harbour (SARC(H)) it was observed that the securing post was displaying excessive movement when weight was being applied as the RHIB settled back on the boatrope whilst the ship was underway. Subsequent physical inspection revealed that the securing post appeared to be insufficiently braced underneath the RHIB for the typical forces applied through the boatrope and with the approval of the Fleet Seamanship Inspector (FSI), a boatrope towing bridle rig modelled on the design specified for a RNZN Pacific 22 RHIB in BR 67 (NZ Supp AL2) was implemented around two weeks prior to the incident on 5 Oct 07.
- c. **RHIB lifting strop – ovoid link.** During the SARC (S) conducted in Jun 07 it was noticed by both CAN and MOET

staff that the ovoid link (forged ring) attached to the RHIB lifting stops was difficult to insert/remove from the mouth of the davit offload hook. This was initially attributed to the rough surface of a section of the ovoid ring this component from both RHIB's was smoothed during the SARC to aid the insertion and removal of the ring from the hook.

61. The change to the RNZN approved GIBB trigger-latch and the modifications to the RHIB boatrope towing bridle are considered logical improvements and there is no evidence to suggest they adversely contributed to the incident on the 5 Oct 07. Indeed is likely that an incident involving the premature parting of the boatrope due to the catastrophic failure of either the Tenix supplied trigger-latch or the forward securing post may have occurred prior to the events of 5 Oct 07, resulting in similarly tragic results if they were not modified as and when they were.

62. The smoothing of the ovoid links, whilst sensible and resulting in their improved operation, did not address the core issue of their suitability for use with the offload hooks fitted to the davits. This may be attributable to a "make do" attitude onboard and faith in what was supplied was for purpose.

**ToR 20: Was a detailed examination of the machinery or equipment carried out following the incident? Did the recovery system have any mechanical or structural defects that could have contributed towards the incident?**

63. An examination of the PORT RHIB and the launching and recovery system was conducted 15 - 30 Oct 07. SME input was sought in the assessment of damage as follows:

- a. Lloyds Register representative - assessment of damage to RHIB and associated fittings (with the exception of Self Righting Gear).
- b. Vosper, Thornycroft Fitzroy (VTF) – assessment of damage to PORT davit (including lifting wire).
- c. Denray Marine Services - assessment of damage / function to the Self Righting Gear (SRG).

64. Additional analysis of the damage incurred to the offload release hook and the davit head limit switch was conducted by SME within the Fleet Support Organisation (FSO).

65. The offload release hook and the GIBB trigger-release shackle were the focus of particular attention during the post-incident

examination. Neither the GIBB shackle nor associated bridle arrangement displayed any evidence of damage that would indicate mechanical failure of the GIBB shackle.

66. Examination of the offload hook revealed burring on the inside of the hook mouth which is consistent with damage caused by use of an oversized ovoid link. The minimal clearance through the offload hook mouth has caused personnel to insert the ovoid link at a flattened (by design), narrower section of the ring. When load is subsequently applied through the weight of the RHIB transferring onto the lifting strops (sometimes quite abruptly), the flat section of the ovoid link appears to have been over time, burring the inside face of the offload hook mouth.

67. The burring has reduced the already minimal clearance within the hook mouth, making it increasingly difficult to remove the ovoid link and fully disengage the offload hook. In the weeks prior to the incident, releasing the hook was typically taking two people around 30 seconds - 2 minutes to achieve. During the process of examination of the offload hook in the days that followed the incident, it took the Lloyds surveyor approximately 5 minutes to work the ovoid ring clear of the hook and although this may have been in part due to damage sustained during the incident, it is clear the offload hook had not been operating within the expected design performance of one person, almost instantaneous operation. Inspection of the offload hook fitted to the STBD RHIB reveals similar damage, although at a slightly lesser extent.

68. It is the COI determination that the malfunction of the offload hook in not enabling a near instantaneous release when operated by one person in an offload condition was a prime contributor to the broaching of the PORT RHIB.

69. The SRG was also an area that was subject to particular scrutiny after the equipment failed to operate during rescue efforts immediately following the incident. The results of the SME inspection are addressed later in this report.

**ToR 21: What role did safety systems play in the incident eg self-righting equipment, lifejackets, smoke markers and other forms of locator beacons? Did all systems function as expected? If not, why not?**

70. Safety equipment used or deployed during the incident comprised of a number of life rings, lifejackets and the Self Righting Gear (SRG) fitted to the PORT RHIB. The role and performance of these items are listed bellow:

- a. **Life rings.** A number of life rings, each fitted with salt-water

activated lights, were manually deployed by ship's personnel immediately after the capsizing of the RHIB and were effectively used by the personnel in the water to assist staying afloat. All of the lights fitted to the life rings used during the incident operated correctly. None of the life rings used was fitted with smoke markers.

- b. **Life jackets.** All of the occupants of the PORT RHIB were wearing personal lifejackets of the salt water activated, self inflating type. All lifejackets operated correctly.
- c. **RHIB SRG.** The SRG comprises an inflatable bag, CO2 cylinder and associated gas release mechanism and manual activation lanyard, all fitted to a frame at the stern of each RHIB. The equipment is designed to enable a minimum of two crew to successfully right the RHIB after capsizing. The SOP as produced by the manufacturer involves manual activation of the SRG via a pull cord once recovered from a ready use pocket near the bottom of the SRG frame.
- d. The SRG fitted to the PORT RHIB was manually activated after the incident but did not operate. There was some difficulty recovering the pull cord which had become dislodged from its stowage, presumably during the capsize and when it was located and pulled to its full extent by POSCS TAYLOR, the righting bag did not inflate.
- e. Subsequent inspection of the SRG by an appropriate SME confirms that the cylinder operation head was in an "operated" vs "armed" condition indicating correct activation procedure (ie removal of the safety pin and pulling of the release lanyard); however, the cylinder cutting device was found to be intact and had not pierced the bursting disk of the CO2 cylinder. Detailed inspection of the cutting device was conducted and apart from the non-activation, no evidence of damage or incorrect assembly or design fault of the operating head was identified. The system was reassembled and tested and operated correctly. The CO2 cylinder was confirmed to be fully charged.
- f. Whilst the SME report is inconclusive on the reason for the non-activation of the SRG, a number of concerns are raised concerning the lack of accurate manufacturer or serial number details. Furthermore, it is uncertain if the operation head fitted to the SRG is subject to a Safety Notice relating to the non-operation of the units that have been reassembled since new.

- g.** Whilst the failure of the SRG is of concern, it is highly unlikely that its correct operation at the time it was activated, some 17 minutes after SOLOMON has become trapped underneath the RHIB, would have prevented his drowning. It should be noted that the SRG has no automatic activation function and even if it had, it is unlikely the fully inflated buoyancy bag would have been able to counteract the forces applied by the under-tension lifting wire until this was cut approximately 11 minutes after the RHIB capsized.
- h.** Prior to the incident, there is no record of any of the CAN ship's company participating in or witnessing any demonstration or functional test of the SRG. There are no test or type approval certificates held by either CAN or within CFS for the SRG.
- i. RHIB EPIRB.** The PORT RHIB was fitted with an EPIRB which is normally stowed inside a weatherproof locker underneath the STBD "navigator's" seat. Due to the location of the EPIRB, it is unable to self-activate during or after a RHIB capsized and the COI found no requirement for this within SOLAS regulations (specific to rescue boats). The EPIRB was not used at any time during the incident.

**ToR 22: Is there any history of RHIB related incidents in the RNZN, particularly any which result in the RHIBs capsizing? Are there any common trends that can be discerned from any such incidents?**

71. Considerable anecdotal evidence was heard by the COI relating to the premature or unintended release of the GIBB trigger release shackle during the launching and recovering of RNZN RHIB's but only one instance was identified where this led to a capsizing of a RHIB. This occurred in September 1998 in HMNZS WELLINGTON. A Formal Inquiry convened in that instance determined that the inadvertent release of the boat rope at the moment the RHIB hit the water initiated a sequence of rapidly unfolding events that resulted in the RHIB capsized.

72. The circumstances in the WELLINGTON incident are almost identical to that which occurred in CAN on 5 October 07, in that after the boatrope had been released, the RHIB was physically pulled through the water by the davit wire and the speed at which the ship was proceeding (10kn in the WELLINGTON incident) contributed to a rapid broaching of the RHIB. The main difference, however, is that the

boatrope released almost instantaneously on hitting the water, preventing the automatic release of the RFD offload hook whereas in the latest incident in CAN, the boatrope did not become detached for around 10 seconds after the RHIB had settled in the water, during which time the manual release of the offload hook should, if working correctly, have been possible. Nonetheless, the initiator (the unintended release of the GIBB trigger release shackle) and the outcome of both incidents are the same with the exception that there were no injuries sustained in the WELLINGTON capsizing.

73. Evidence was presented detailing one occasion in 2004 where a GIBB trigger release shackle parted through the actual breaking of the stainless steel swivel eye. The GIBB shackle failure was raised at the Seamanship Working Group and the subsequent action items to “..investigate any short falls within the present system and look at viability of the use of substantial snap hook for recovery only...” and “FSI is to raise a signal advising of the GIBB shackle failure” appear in the SWG minutes of 24 May 2004. There is no evidence to indicate that these actions were completed.

74. Apart from the above two instances where an inadvertent release or failure of the GIBB shackle has been recorded, there is no documented evidence of further incidents relating to problems with this specific equipment item; however, the COI was presented with numerous witness accounts of GIBB trigger release mishaps. The majority of these included premature release of the shackle through inadvertent activation either by RHIB personnel or through the fouling of the release lanyard. In some cases, the premature release occurred whilst the hoisting/lowering wire was still connected and broaching of the RHIB was only avoided from immediate action by the coxswain in manoeuvring the boat to remain directly underneath the crane fall wire.

75. There is sufficient evidence to conclude that the unintended activation of the GIBB trigger release shackle, either through accidental or other means, presents a common trend in RHIB incidents where significant potential exists for broaching of the RHIB during underway launching and recovery operations. This is particularly so if the unintended GIBB shackle activation results in the boatrope detaching whilst the RHIB is still connected to the crane/davit fall wire.

**ToR 23: What was the cause of the incident? (NOTE: If it is the opinion of the Court that the cause of the incident is attributable in whole or in part to the conduct of a person or persons the Court is to establish this finding in the evidence it collects but in its report the Court is not to apportion guilt or negligence.)**

76. The primary cause of the incident was the unintentional activation

of the GIBB trigger release shackle that resulted in a series of events leading to the trapping of AHSO SOLOMON underneath the hull of the capsized RHIB. Within this series of events, the failure of the davit offload hook to operate correctly and the ensnaring action of the RHIB lifting strops during the capsize are considered to have played a significant part.

77. The cause of the unintentional GIBB shackle activation has not been determined but there is no evidence to indicate it was through any negligence of those responsible for its correct operation in accordance with accepted and documented SOP's.

**ToR 24: Are there any other systems or processes used within the Naval community that could have assisted in preventing the incident? What impact, if any, would such change have on operations?**

78. **Rigging Warrant.** A key contributing factor to the incident is the use of an inappropriate component in the RHIB rigging arrangement (the oversized ovoid link). It is highly likely that a detailed plan or statement of the approved design and consolidated equipment for the RHIB launching and recovery system would have highlighted the inappropriate component and almost certainly prevented the incident.

79. Historically, RNZN vessels operated a consolidated list and approved design of ship's rigging, known as a Rigging Warrant. Although still commonly referred to within the RNZN, little documented policy exists that describes the authority, function and contents of a Rigging Warrant. General opinion of those interviewed is that official Rigging Warrants based on RN doctrine were supplied and operated with the Leander Class Frigates and subject to formal inspection and approval process; however, subsequent Rigging warrants operated in ANZAC Class frigates and other RNZN vessels have since devolved to a less official, ad-hoc document serving more as a list of rigging held and not subject to approval or standardisation by a higher authority, such as the Fleet Seamanship Inspector (FSI).

80. CAN was not delivered with a Rigging Warrant or any such consolidated description of an approved list and design of ships rigging. In the case of the RHIB launching and recovery arrangement, the design drawings available to the Ship's Company describe the general layout but do not contain detail to component level. It is uncertain if an actual Rigging Warrant was a contract deliverable but given the lack of documentation in general, it is highly unlikely a description or definition of what such a deliverable should be was ever produced.

81. **Risk Identification and Management.** The need for a



Retrospective Operational Safety Case (OSC) was identified in 2006 as a means to obtain a robust and transparent appreciation of the full scope of risks associated with the MRV. Various SME input was obtained to address various hazard areas, including Seaboard Operations and a list of hazard items identified. These items were identified exclusively from interpretation of the various plans and design documents and although relatively comprehensive, lack the detail that might have been revealed through a physical inspection of the actual hazard area, ie the finished ship. Whilst it is acknowledged that the OSC was developed in parallel to the ship build, it is considered that a review of the OSC by ships staff directly involved in the operation of the associated systems and equipment might have revealed the existence of further risks requiring elimination or mitigation.

82. The broaching of a RHIB during underway launching and recovery is such a risk that might had led to critical examination of key components such as the offload hook and oversized ovoid link, which has been determined by the COI as a key contributor to the incident on 5 October 2007.

**ToR 25: Are there any recommendations or changes that could be made to prevent a recurrence of such an incident?**

83. In the short term, there are a number of changes to the existing procedures for the launching and recovery of the RHIB's in CAN which would reduce the risk of a recurrence of the incident. These are expanded in greater detail at the end of this report.

84. A more permanent solution is required to significantly reduce or possibly prevent a similar incident. Central to the recommendations is the adoption of a functional and safe RHIB arrangement that is based on international best practise. Key changes from the existing RHIB arrangement in CAN would be:

- a. Replacing the GIBB trigger release shackle with a more robust mechanism. This equipment should be certified as part of the type approval for the RHIB system.
- b. The bridle arrangement currently fitted in the RHIB should be replaced by an appropriately constructed forward bollard (stag horn). This securing point is to undergo appropriate testing to ensure it is fit for purpose and subsequently certified as part of the type approval for the RHIB.
- c. Replacement of the manual offload hook and strop system with a fixed in-boat automatic offload hook such as the Henriksen type. This equipment should be mounted forward

of the RHIB coxswain position.

**ToR 26: What actions were taken to report the incident and were they timely and in accordance with normal reporting procedures, including any Maritime Safety Authority requirements? If not, why not?**

85. The first notification of the incident occurred around 1115 when DCN (CDRE A.J. PARR, RNZN) informed HQJFNZ and CN by satellite phone. An immediate PUBLINTCAS signal concerning the death of AHSO SOLOMON was released by the CO at 050135Z and a NOTICAS for LSCS PAKINGA at 050756Z.

86. The NZ Police were notified by HQJFNZ mid afternoon on 5 October 2007.

87. The incident was not reported to Maritime New Zealand.

88. The use of satellite phone as the first means of notifying the relevant authorities of the incident, whilst not strictly consistent with the requirements in NZBR 23 Article 5103 (Reports of Casualties), is considered entirely appropriate given the availability of satellite communications and immediate priorities of the Command Team onboard. The subsequent release of a PUBLINTCAS signal was timely and in accordance with reporting procedures. There is no requirement to report the incident to Maritime New Zealand.

**ToR 27: Has the NZDF insurer been advised of the incident and on what date?**

89. The NZDF insurer has not been formally notified of the incident.

**ToR 28: Comment on any other matters the Court considers relevant to the purpose of the Inquiry.**

90. It became apparent during the COI that there is significant departure between RNZN best practise and that employed in the international maritime industry, particularly concerning lifesaving equipment. In particular, the generally "self-regulating" environment, in which much of RNZN seamanship policy relating to small craft has been developed, encourages a "can do" attitude which focuses more on a functional rather than safety outcome. There are many examples of this, such as the adoption of a boatrope bridle arrangement instead of perhaps critically examining the apparent deficiencies of the forward stag horn in RNZN RHIB's and the apparent acceptance of the GIBB trigger release shackle despite a lengthy history of failures.

91. With the advent of the MRV and an increased requirement to conform to international maritime safety regulations (SOLAS), in particular the Fast Rescue Boat, a “blend” of RNZN and SOLAS best practise has led to a wholly unsatisfactory RHIB arrangement. The significance of using a manual offload release, although functional, was not fully appreciated – otherwise the relevance of the GIBB shackle failures might have caused a review of the rigging arrangement; another example is the retention of a lifting strop arrangement instead of adopting a safer, fixed in-boat offload hook.

92. The lack of in-depth SOLAS knowledge within the RNZN has been mentioned elsewhere in this report. Whilst this situation may have been acceptable pre-Project Protector, it is anticipated there will be a need for increased organisational knowledge of SOLAS and associated best practise in order to maximise the benefits such classification can bring and perhaps more importantly, enable appropriate de-confliction where class requirements may impinge on military capability.

93. During the course of the COI, members were surprised with the lack of a coherent and complete record of incidents of a similar nature occurring within the RNZN, despite substantial anecdotal evidence presented during witness interviews to the contrary. One of the few documented incidents was the subject of a previous Formal Inquiry and despite knowing the ship and year concerned, the absence of a Formal/ Court of Inquiry database frustrated initial efforts to locate the relevant document. Notwithstanding the often sensitive nature of Inquiry contents, the lessons learned derived from them are a fundamental outcome and should be tracked and managed in a more transparent and discoverable manner than at present.

94. There was some confusion surrounding reporting requirements for ACC and other “business” matters relating to the death of a serviceperson following the incident on 5 October 2007. Chapter 51 of NZBR 23 provides instructions for Casualty procedures including Naval Funerals but does not include details of any reporting requirements for ACC. The general instructions also require the bulk of the administration action to be carried out by the Commanding Officer of the serviceperson – this may not be either practical or appropriate in ships with a small complement. A review of the relevant procedures laid out in NZBR 23 cognisant with the resources available to CO’s of the modern RNZN Fleet is recommended.

95. The actions of a number of HMNZS CANTERBURY’s ship’s company in the events that followed the incident on 5 October 07 were commendable [REDACTED]

## Conclusions

96. During routine boat drills on 5 October 2007 in calm sea conditions off the N coast of New Zealand, a RHIB from HMNZS CANTERBURY capsized as it was being launching from the ship. One of the four personnel in the RHIB, AHSO Byron SOLOMON, became trapped under the upturned hull and subsequently drowned whilst the remaining crew members were safely recovered, one with moderate injuries. The primary cause of the RHIB capsizing was the unintentional release of the boatrope before the davit fall wire had been detached, subsequently causing the RHIB to broach.

97. There was damage to the hook connecting the RHIB to the davit wire prior to the incident, which was caused by an incorrectly sized component in the RHIB lifting strops. This damage contributed to the broaching by preventing the correct function of the offload hook to enable disconnection of the RHIB from the davit wire in a timely manner. The subsequent ensnaring action of the lifting stops as the RHIB capsized led to the drowning of the crewmember.

98. All actions, decisions and reporting of the incident was adequate and appropriate in the given circumstances and conditions. Rescue efforts were executed in a rapid and appropriate manner [REDACTED]

99. The RHIB arrangement in CAN is different to the equivalent installation in other RNZN ships. A key difference is the use of a davit system in combination with a manually operated offload release hook, whereas an automatically release hook is used in other RNZN ships. CAN personnel were aware of previous instances on other ships that had experienced premature release of the boatrope but because this invariably occurred after the fall wire had automatically detached and resulted in no adverse consequence, they did not fully appreciate just how different the result could be in CAN where a manually activated hook was used. Despite the serious consequences of a premature boatrope release whilst still attached to the davit fall wire, this occurrence was not identified in any risk assessments conducted prior to the incident.

100. Under SOLAS regulations, CAN is required to carry a minimum of two Rescue Boats, one of which is to be a Fast Rescue Boat. There are significant irregularities with the SOLAS certification for the RHIB's in CAN and it is highly likely they do not meet the minimum SOLAS requirement for either craft and most certainly do not meet best practise standards.

101. Configuration management of the RHIB arrangement in CAN is poor. The lack of an approved and documented design of sufficient detail of the RHIB arrangement invariably contributed to an inappropriate component being introduced into the lifting gear.

## Recommendations

102. It is recommended that:

- a. A thorough review of the existing RHIB lifting (off load hook and lifting strops) and boatrope arrangement (bridle and boatrope release mechanism) is to be reviewed for function and safety. The review is to include consideration of alternative lifting, hook and boatrope arrangements consistent with international maritime best practise and involve SME input from this sector. Until this review is completed and the outcomes implemented, the following immediate actions are recommended:
  - (1) A review of the function and safety of the existing boatrope securing arrangement is conducted. This review is to include appropriate SME input to ensure a robust and transparent analysis of the operating limits of the equipment is achieved, supported by a credible testing and trials process.
  - (2) The ovoid link (forged ring) fitted to RHIB lifting strops are replaced by a link of a smaller diameter that enables the correct function of the Vestdavit offload hook and meets the SWL requirements for the RHIB arrangement.
  - (3) A review of the SOP's for the launching and recovery of RHIB's in CAN is undertaken to ensure appropriate risk mitigation procedures are put in place to avoid the RHIB broaching. These are to include, but not be limited to:
    - (a) A physical check of boatrope securing arrangement must be made by both the coxswain and bowman immediately prior to lowering or hooking on during recovery. Such physical checks shall include a "hands on" check of the operation of any release shackles (or equivalent) fitted.
    - (b) The coxswain is to maintain their position at the RHIB controls at all times whilst the RHIB is alongside the ship and attached to the

davit fall wire and be prepared to manoeuvre the RHIB as required to maintain station directly beneath the davit.

- (c) Only one member of the RHIB crew is to operate (by attaching or detaching as appropriate) the offload hook and boatrope release. This should normally be the bowman. Use of the RHIB coxswain to carry out these tasks should be avoided.
  - (d) The davit operator is to ensure they maintain a clear and complete view of the RHIB at all times whilst it is connected to the davit wire. They are to ensure that ample slack is provided in the wire to safely engage/disengage the offload hook when required.
- b. An immediate review of the function and safety of the Self Righting Gear is conducted.
  - c. A review of the SOLAS certification of the RHIB arrangement is conducted by an appropriately qualified SME.
  - d. The Seaboat Capability elements (HAZID ID 802 – 806) of the Retrospective Operational Safety Case are reviewed by appropriately qualified personnel with operating experience of the RHIB's in HMNZS CANTERBURY.
  - e. A means of accurately recording, to component level, the approved design of the rigging arrangement for the RHIB system (as a minimum) is implemented. This system is to include appropriate tracking and control of key items that require SOLAS certification and mandatory maintenance. This system is to be approved and regularly inspected by an appropriate RNZN authority.

Dated at Auckland this ..... day of November 2007

MNZM

D.L. MUNDY,

Commander, RNZN  
President

Commander, RNZN

S.D. ARNDELL  
Lieutenant

Member

P.A. JOHNSON  
Lieutenant, RNZN  
Member