QUEENSLAND COURTS

OFFICE OF THE STATE CORONER

FINDINGS OF INQUEST

CITATION:	**Inquest into the death of Dudley Gordon JACOBS**
TITLE OF COURT:	Coroner's Court
JURISDICTION:	Gladstone
FILE NO(s):	COR 2011/1939
DELIVERED ON:	23rd October, 2015
DELIVERED AT:	Mackay
HEARING DATE(s):	6th – 9th July 2015
FINDINGS OF:	Magistrate D O'Connell, Coroner
CATCHWORDS:	CORONERS: Inquest – Capsize of conventional tug – failure to adhere to prescribed Marine Execution Plan – failure of emergency tow release
REPRESENTATION:	
Counsel Assisting	Mr J M Aberdeen
Maritime Safety Qld	Ms K Philipson (instructed by Crown Law)
Sea Swift Pty Ltd	Mr J Hunter QC, and Ms Stephanie Williams (instructed by Brian White & Associates)
Family of Captain Dudley Gordon JACOBS	Mr Luke Forsyth (Solicitor, Hall Payne Lawyers)
Bechtel Australia Pty Ltd	Ms Annabel Baker (Solicitor, Norton Rose Fullbright)
Maritime Union of Aust	Mr David Quinn (Solicitor, CRH Lawyers)

Findings

Captain Dudley Gordon Jacobs

[1]. On 11 June 2011 Captain Dudley Gordon Jacobs was involved in a fatal capsizing incident on the tug '*Adonis*' in the Gladstone harbour. The tug had been involved in a two tug towing configuration of a non-powered barge. The tug which Capt Jacobs was travelling on 'girded', which is a dangerous situation when the towline moves from pulling over the stern, to pulling over the side of the tug. It is dangerous because it causes the tug to roll over, or capsize, very quickly.

[2]. This inquest will examine the circumstances of why the tug *Adonis* was in the situation where it could be girded[1], what caused the tug to roll over, and any other factors involved.

Tasks to be performed

[3]. My primary task under the Coroners Act 2003 is to make findings as to who the deceased person is, how, when, where, and what, caused them to die[2]. In Capt Jacobs's case there is no real contest as to who, when, where, or how he died. The real issues are directed to what caused his death.

[4]. Accordingly the List of Issues for this Inquest were:-

1. The information required by section 45(2) of the *Coroners Act 2003*, namely: who, how, when, where, and what, caused Capt Jacobs' death,

2. What was the course of events which led to the capsize of the tug *Adonis* in Gladstone Harbour on 11 June 2011, including the events relating to attempts to release the towline by use of the emergency release mechanism on the tow hook?

3. What factors contributed to the capsize of the tug including (without being exhaustive):-

   (a) the design and attempted use of the emergency release on the tow hook;

   (b) the length of the towline;

   (c) the breaking strength of the towline;

   (d) the failure to use the remote release facility for the tow hook in the wheelhouse;

[1] when there was a documented plan for conducting the towing manoeuvre
[2] Coroners Act 2003 s. 45(2)(a) – (e) inclusive

(e) the stability of the tug *Adonis* by reference to (i) its design characteristics; and (ii) the fitting of a towing winch, and H-bitts;

(f) the speed of the composite vessel (incorporating the tug *Aphros*, the dumb barge *Chrysus* and the tug *Adonis*);

(g) the tidal and current conditions.

4. What steps should be taken (including possible changes to the design of the tow hook) to try to prevent the recurrence of any similar incident in respect of harbour tugs in Queensland waters?

[5]. The second task in any inquest is for the coroner to make comments on anything connected with the death investigated at an inquest that relate to public health or safety, the administration of justice, or ways to prevent deaths from happening in similar circumstances in the future[3].

[6]. The third task is that if I reasonably suspect a person has committed an offence[4], committed official misconduct[5], or contravened a person's professional or trade, standard or obligation[6], then I may refer that information to the appropriate disciplinary body for them to take any action they deem appropriate.

[7]. In these findings I address these three tasks in their usual order, Findings, Coroners Comments, and then Reporting Offences or Misconduct. I have used headings, for convenience only, for each of these in my findings.

Factual Background & Evidence

[8]. The non-controversial aspects of the matter can be described briefly. Capt Jacobs was a very experienced maritime captain and had spent many years in Gladstone Harbour. He had particular local knowledge.

[9]. The Gladstone Harbour, underwent a very rapid increase in industrial work associated with the expansion of the LNG export facilities in that harbour in the years leading up to 2011. Due to this rapid expansion there was a significant increase in vessel traffic on the harbour. The then harbourmaster, very appropriately, took a cautious approach to ensuring the safe passage of this increased traffic. That cautious approach included ensuring a well thought out, and researched, Marine Execution Plan[7] (MEP) being put in place for

[3] ibid s.46(1)
[4] Ibid s.48(2)
[5] Ibid s.48(3)
[6] Ibid s.48(4)
[7] the purpose of the Marine Execution Plan was described as "*to provide an overview of the port of Gladstone on the way vessels are intended to be operated when in harbour, describes the nature and scope of operations to be undertaken, provides an indication of requirements for local bunkering and waste facilities, demonstrates the understanding of regulatory requirements for operating in the port of Gladstone, and demonstrate or reference the vessels' safety management system and handling of emergencies*" (see exhibit C.1 at page 9)

works such as the incident Capt Jacobs was involved in. The work involved a non-powered barge, commonly termed a 'dumb barge', which itself weighed 650 t, and which could carry a payload of freshwater of some 1400 t, which would be travelling from Auckland Point in the harbour to the delivery point a significant distance north west, much deeper up the harbour. The MEP required that two tugs accompany the barge because even though one powerful tug, such as the *Aphros*, could adequately handle the barge alone, a second barge secured to it would provide additional resources for manoeuvring, and a redundancy of control should the first barge suffer any mechanical issue. I am certainly not critical of that plan and a simple way to demonstrate its good effect is that, apart from 11 June 2011, this process delivered fresh water without any marine incident for well over two years.

[10]. The formulation of the MEP required a number of revisions and indeed required a representative of the tug operators, Sea Swift, to travel to the United States for simulation testing to be done before eventually the final plan was acceptable to the harbourmaster. It was evident that the MEP was not a simple document, nor a quickly compiled plan. Rather it was detailed, researched, and considered.

[11]. The critical part of the MEP was that the more powerful tug, the *Aphros*, would be the primary tug, and secured hard, or hipped up, to the port side rear quarter of the barge. The second barge, the *Adonis*, was only required to assist with manoeuvring at departure and arrival, or if the *Aphros* lost power. It was to be secured by a bowline secured to the forward port side quarter of the barge. The bowline was to be run deliberately short as once manoeuvring away from the wharf was completed the tug *Adonis* would simply 'fold back' alongside the barge and be pulled along by the barge, as it was powered by the *Aphros*.

[12]. This configuration was successfully employed in a number of practice runs, which were all completed without incident. This effectively demonstrated the 'workability' or effectiveness of the MEP in practise.

[13]. One requirement of the harbourmaster was that an experienced 'check' pilot be on board to ensure that the vessel's masters were aware of any idiosyncrasies peculiar to the Gladstone Harbour. Such an idiosyncrasy may be as simple as stronger tidal flows near a river mouth or in navigational channels, or areas of shallow water. Again there is no criticism of this, rather it was a sensible and conservative approach to take by the harbourmaster.

[14]. The role of the check pilot was also to assess the competency of a ship's master to see if that master should qualify for conducting activities in the Gladstone Harbour without the necessity of a check pilot.

[15]. Capt Jacobs was acting in this role on the day he died. It is important to remember that at no time was Capt Jacobs the master, nor was in charge of any vessel, rather he was there merely in an assessing role. This is important in

determining responsibility for the events as each master is responsible for their vessel[8].

[16]. The *Aphros* is a particularly powerful tug. Significantly it is a twin drive tug configured with Azimuth or Z drive motors. This configurations means that the tug does not need rudders as each motor can be turned in a 360° rotation[9] which allows it very good control.

[17]. The tug *Adonis* is called a conventional tug. Whilst it is twin motored it is fitted with rudders to control its steering. The *Adonis* is designed for towing over the stern, and can also be used for towing over the bow.

[18]. Towing over the stern is a significant risk for a tug whenever it is towing a non-powered craft. The evidence[10] from an experienced tug Captain was that for over-the-stern towing within a harbour, as distinct from simple manoeuvring, it should only be contemplated with a towline of a minimum 60 metres in length, and a greater length, in the order of 100 metres, is more desirable. For towing in open sea an over-the-stern tow line can be 1 kilometre in length.

[19]. As I stated earlier the movement of the barge was to be conducted in accordance with the MEP. The departure from this approved method warrants careful consideration. The evidence was that there was some "discussion" (which is as broad a term that I can label it, and some may have considered it more in the nature of a direction), between the masters of the two tugs, Mr Bearden and Mr Phipps, some of the crew, and 'possibly' present at this meeting was Capt Jacobs.

[20]. The crew members who gave evidence said that whilst they were at this discussion, held in the small cabin of a tug, they really had no input to the decision. I accept this, and due to the hierarchical nature of ships' crews that is not unusual. They were more, in my view, a passive observer of what changes were being announced. This is in contrast to seeking their input as to whether the change in the towing arrangement was appropriate or not.

[21]. Essentially the discussion[11] was between Master Phipps and Master Bearden. Mr Bearden's evidence was that since Master Phipps was the more senior master, and operating the tug controlling the towing combination, that Bearden would go along with the change to an over-the-stern tow for his tug. The only point he raised was to ensure that their speed was kept down so he could move appropriately as required.

[8] And the MEP places ultimate responsibility for the entire combination on the master of the primary tug, the *Aphros*
[9] hence its' designation as having azimuth drives
[10] Capt Beecroft
[11] And the evidence was that this first occurred on 7 June 2011, and again raised at a toolbox meeting on 11 June 2011

[22]. Master Phipps in his evidence conceded[12] that it was his suggestion, and at his instigation, that the tow departed from the MEP[13] to provide that the *Adonis* tow over its stern. This was an important concession made, and it certainly clarifies, indeed makes clear, why there was a departure from the MEP. Precisely why the departure from the MEP was required I really do not need to conclude, but I note that Master Phipps felt it would allow the *Adonis* to keep its 'head to the current'[14], but possibly it was due to the concern with how closely the *Adonis* rode to the bow of the *Aphros*.[15] Perhaps he was concerned that his vessel could be accidentally damaged.

[23]. Both Master Phipps and Master Bearden were asked in their evidence if Capt Jacobs had actual input to this decision. Both agreed that his input was not directly sought, as it was their job to decide how the tow would occur. The highest they could put it was that 'perhaps' (and only 'perhaps') if Capt Jacobs thought they were doing the wrong thing that he would say something, but they could not recall any input or response from him. One crew member thought that Capt Jacobs may have in fact been just outside of the cabin when this discussion occurred. In any event the essential point to remember is that Capt Jacobs was acting in the role of an assessor, and merely observing the operational performance of Master Bearden so he could obtain his tug master accreditation for the Gladstone Harbour.

[24]. The events leading on the day up to the time of the capsize are uneventful except of course the fact that the *Adonis* was now towing over its stern on what some observed[16] was a relatively short towline of less than 40 metres. Fortunately these vessels are fitted with a tracking system called AIS[17]. This system broadcasts the ship's position, bearing, and speed, and for the *Aphros* it was issued approximately every 10 seconds, and the *Adonis* approximately every 30 seconds. This allowed investigators to establish the precise movements of the vessels as they made way up the Gladstone Harbour.

[25]. The AIS data shows the vessels leaving from Auckland Point wharves and then proceeding along the Clinton Channel, past the Clinton wharves. The combination then proceeded through the Clinton swing basin, to roughly opposite the mouth of the Calliope River. At this time I mention the Calliope River because there was some conjecture that perhaps there was a tidal influence at that location, but the evidence from a very experienced harbourmaster familiar with Gladstone harbour, Capt Beecroft, was that there was no discernible[18] tidal influence at all[19].

---

[12] T1-83 at 4
[13] And Master Phipps thought that the MEP permitted him a discretion in establishing the tow set up (his words), see T1-90 at 16 - 19
[14] See T1-82 at 1- 4, which seems a little curious as the tow was going with the incoming tide, not heading into it.
[15] This was an observation by a crew member
[16] Capt Beecroft thought it particularly short, I address this later in my findings
[17] AIS is an acronym of Australian Identification System
[18] It was an incoming tide so any influence was very minimal, an outgoing tide may have caused more movement, but again it was not contributory
[19] And this was agreed by Master Phipps

[26]. Examining the recorded AIS data[20] shows that the combination was moving at a speed over ground[21] at a rate of a little over 8 knots[22].

[27]. Master Phipps's evidence was clear that if the MEP was adhered to the combination could travel at any speed[23] and very safely. Master Bearden's evidence was that the approximate maximum speed for his vessel was just 9 knots. With a SOG above 8 knots, the master of the *Adonis* is left with precious little room for increasing his speed to manoeuvre out of any dangerous situation. The girding manoeuvre, which ultimately claims the vessel, could conceivably have been avoided if the *Adonis* did have the necessary capability, and steer appropriately, to increase its speed over the barge combination so as to bring its towline from the starboard side girding position, to back over its stern.

[28]. Whilst the combination was travelling abreast of the Clinton wharves, and before it came to be approximately abeam of the mouth of the Calliope River, the master of the *Adonis* claimed he radioed the master of the *Aphros* three times. Each time he claimed he advised the master of the *Aphros* to slow down the speed of the combination and also in one communication that he wished to let go of the towline. The master of the *Aphros* claimed there was only one radio call made, and he said that he was not asked to slow down at all[24], rather Master Phipps said that it was he who suggested that he would slow down for the other vessel[25].

[29]. The evidence of the masters on this issue needs to be resolved. The evidence of the master of the *Adonis* I prefer over the evidence of the master of the *Aphros*. My reasons for this is that in observing both men give evidence I felt that the master of the *Adonis* was being more open. It was clear, and the AIS data bears this out, that the speed of the combination was moving too quickly to allow for a safe margin of error in manoeuvring. The position, or tracking, of the *Adonis* indicated it was having difficulty maintaining its position ahead of the combination. It is very likely, indeed appropriate, that the skipper of the *Adonis* would radio with his concerns. I note it was also observed by the master of the *Aphros* in his evidence that the *Adonis* appeared to be tracking 'unusually', as it was not maintaining its position directly ahead of the starboard side of the bow of the barge[26], which is consistent with the AIS data and the concerns raised by Master Bearden over the radio.

[30]. In addition when Master Phipps was asked by Counsel Assisting if three times he was asked to slow down, he did not deny that there were three radio

[20] Reproduced on a chart of part of Gladstone Harbour in Exhibit D.1
[21] Termed SOG in the data. SOG is distinct from speed through the water which involves the influence of tidal flow
[22] various recorded points shows SOG of 8.2, 8.1, and 8.3 knots for the *Aphros*, and the tug *Adonis* at speeds of 8.1, 8.2, 7.9 and 8.3 knots
[23] His evidence was '100 miles an hour quite easily". Clearly he was merely conveying this information descriptively, rather than literally. He simply meant that realistic speeds of 4-10 knots would pose no issue.
[24] T1-87 at 11
[25] T1-84 at 40
[26] He described it as moving to starboard, then too far to port, etc.

conversations, rather his response was that he did not think he was asked by Mr Bearden to slow down at all[27]. In observing Mr Phipps when giving evidence I also noted he was rather 'cagey' in the answers he gave (although he did readily concede that Capt Jacobs was not involved in the decision to change the towing arrangement to an over the stern tow[28]).

[31]. The failure to slow down the combination, the speed of which is controlled by the *Aphros*, is perplexing. Whether slowing would have prevented the capsizing is unable to be determined by me on the evidence but I do note that the events unfolded quickly. Certainly if power was immediately cut by the *Aphros* then the likelihood of the *Adonis* suffering the girding manoeuvre would have been lessened, and quite possibly significantly so.

[32]. Ultimately the bow of the barge *Chrysus* moved abeam of the *Adonis*, and at this time the towline had moved from over the stern of the *Adonis*, to over the starboard side. Despite all efforts to release the towline, which I specifically address later, the *Adonis* was then in a fatal position where the towline to the barge was simply going to pull the *Adonis* sideways through the water which would cause it to roll. The reality is that no matter what the design of the *Adonis* was, once in this position it would simply be pulled laterally through the water. The evidence bears out that this situation occurred quickly[29].

[33]. Once the *Adonis* capsized the vessel flooded. There was some conjecture raised over whether certain portholes or other hatches or openings on the vessel contributed to it flooding more quickly, but ultimately I find this made no great difference. Capt Jacobs was at the critical moment then located in the wheelhouse, and the effect of the tug capsizing, and noting that the wheelhouse is located uppermost in the superstructure of the tug, meant that he was thrown within the wheelhouse, as Master Bearden described happening to himself. This would have had a disorientating effect, coupled with the wheelhouse being submerged in water, and effectively being inverted as the vessel capsized[30].

[34]. It took a little while for the entire combination to eventually cease moving through the water, after the power to the *Aphros* was cut and the drag caused by the capsized tug. This would have also meant that as the *Adonis* capsized it was still being pulled through the water with the associated turbulent effect experienced of water moving through the vessel until the combination ultimately stopped. The crew members that survived were those that quickly escaped the vessel. Capt Jacobs did not escape and divers later recovered his body from the wheelhouse.

---

[27] This issue was canvassed a number of times, and Master Phipps was quite sure that he was never asked by Master Bearden to slow down at all, see also T1-87 at 10 where the issue was also canvassed by counsel for MSQ

[28] See T1-83 at 1 - 4

[29] And Master Phipps said, T1

[30] it may be thought the captain Jacobs may have suffered slight concussion from a head injury when the vessel capsized but it was noted by the forensic pathologist during the autopsy that his only recent injury was a small abrasion around his left elbow, and there was a fresh bruise on his upper left chest. There was no identified any significant injury to his head. His cause of death was identified as drowning, see exhibit A.5

Investigations into the incident:

[35]. As the capsizing was a maritime incident it was reported to Maritime Safety Queensland (MSQ). They[31] conducted an extremely thorough and exhaustive investigation into the circumstances of the incident.

[36]. Without descending into the detail of the voluminous[32], and comprehensive, report it can be adequately summed up by the MSQ investigation conclusions[33] which were:-

a. That several interwoven factors directly, indirectly or circumstantially contributed to the occurrence of the fatal marine incident. Primarily these include:

i. the towing arrangement of the tug/barge combination,
ii. deficiencies and irregularities concerning the *Adonis's* tow line, towing hook release mechanism, and tow hook release testing processes,
iii. the vessel's stability,
iv. the vessel's suitability to be used as an over-the-stern towing vessel,
v. acts and omissions by the company in relation to modifications that were carried out on the tug that invalidated the class Certificate and Certificate of survey for the *Adonis* issued by DNV on behalf of AMSA,
vi. shortfalls in Sea Swift Pty Ltd's management style, business administration, audits, safety, training and risk management practices,
vii. human error, misjudgement and failings on the part of Sean Bearden, master of the *Adonis* and Anthony Phipps, master of the *Aphros*[34],
viii. expert evidence suggests that the *Adonis* might be unsafe and was not suited to be used as an over-the-stern tug,
ix. the *Adonis's* MEP and work instructions for towing operations were not followed.

[37]. Whilst these are the considered conclusions[35] of the MSQ investigator I had the advantage, which the investigator did not, of requiring to have certain employees of Sea Swift give evidence in the knowledge of the complete investigation that had then been concluded.

---

[31] MSQ is the appropriate agency to conduct the investigation into the circumstances of the capsize. They hold the appropriate expertise in the circumstances of a maritime incident rather than the Queensland Police Service or the Office of Fair & Safe Work Queensland, then termed Workplace Health & Safety Queensland

[32] exhibit C.1 fills three lever arch volumes

[33] See exhibit C.1

[34] The *Aphros* is simply the later in time name of the *Woolli*. It is of course the same vessel.

[35] and of course they are the conclusions of the investigator based on the information available to them, they are not of course binding on me, and I must act on the evidence presented before the inquest and reach my own conclusions on the issues for the inquest supported by the reliable, credible, evidence presented at the inquest

Identified shortcomings in the system of work:

[38]. This is essentially covered in the nine summarised points identified by the MSQ investigation report, detailed in paragraph [36] above. My task is to identify[36] what particular aspects of the shortcomings in the system of work actually did lead to Capt Jacobs' death.

Inquest Issues Evidence

[39]. Issues 2 and 3 are best dealt with in reverse order, as the issues identified in issue 3 support the conclusion reached in answer to issue 2. Accordingly I will deal with them in that order.

Issue 3(a) the design and attempted use of the emergency release on the tow hook.

[40]. The tow hook was fitted to the aft of the wheelhouse superstructure. Following the incident testing of the tow hook demonstrated that its design and operation were not in question. The tow hook operated satisfactorily, in releasing, under load.

[41]. The vessel was fitted with H-bitts, as a retrofit, and I deal with this aspect later in my Findings.

[42]. One issue canvassed was whether the locking pin had been placed in the armed position, which meant the quick release could be activated. Experienced tug masters stated that that is a step they take as soon as towing is commenced using the hook. Master Bearden's evidence was that this was not an ordinary step he undertook, which appeared to me to be due to his lack of experience.

[43]. On this particular date the evidence from the crewmember was that he considered he had unlocked the pin to allow the release of the tow hook, but it did not release. Significantly this crewmember was operating that pin from the port side of the vessel, reaching over the tow hook to where the pin is located on the starboard side. Whilst I accept the crewmember's recollection that he ensured the pin was in the unlocked, or armed, position, it is noted that the slots demonstrate a significant amount of wear and the movement he felt of the pin may have merely been it moving within the detent of the slot. This is certainly possible where you are operating it from the opposite side, without visual confirmation. Ultimately the evidence was unclear to allow me to draw a definite conclusion as to precisely what occurred, but what is clear is that the later testing of the hook revealed no defect in its design or operation.

[44]. Two further issues I can briefly deal with. Firstly is that there was no axe located next to the tow line. An axe is used in an emergency for severing the towline if the emergency release does not work. The evidence of the crew member, which I accept, is that even if an axe was present[37] the crew member did not have sufficient time to sever the tow line. Accordingly it is reasonable to

[36] if I can identify these, and it is borne out by the evidence
[37] There was no axe present

conclude that even if an axe was available it would not have prevented the *Adonis* from capsizing due to the speed at which the events occurred.

[45]. Secondly there was fitted an emergency release for the tow hook in the wheelhouse. The evidence was clear, and I find, that this emergency release was obscured by a bookshelf built over it at a later time. The evidence was that this wheelhouse emergency release had the connecting wires replaced, and tested, in the weeks just prior to the incident. It was clear from Master Bearden's evidence that he did not attempt to use this wheelhouse emergency release, possibly because it was obscured, possibly because he was attempting to steer the vessel in an emergency, but even if operated it may not have released the towline, because the crew member pushing[38] the tow hook release lever did not release the line. I will comment later on the location of the wheelhouse emergency release in my Recommendations.

Issue 3(b) the length of the towline.

[46]. During the practice runs the tow line of the *Adonis* was set on an over-the-bow tow, and the vessel 'folded back' alongside the barge once under way. On the day of the incident a towline of approximately 37 metres was used, which was simply two mooring lines joined together. Following the incident, and after it had undergone intense strain caused by the girding motion, the tow lines were measured at 41.5 metres, obviously due to a degree of stretch caused by the strain the ropes had been placed under. As the tow line, in its 'pre'-stressed configuration was some 37 metres long, and was secured from the tow hook which was a little behind amidships of the tug, there was clearly only a distance of well less than 37 metres from the stern of the *Adonis* to the bow the barge[39]. A number of photographs[40] of the *Adonis* actually conducting the tow on the day of the incident, 11 June 2011, gives a visual guide[41] to the approximate distance.

[47]. In evidence Capt Beecroft was asked his opinion as to what is a safe length of towline for an over-the-stern "in harbour" tow. His evidence was that once under way a minimum towline length of 60 metres would be required, but that himself he would set 80 to 100 metres of towline. His reason for this was that the greater the length of tow line, the more time he has to react and perform any required manoeuvres. In addition the short towline places the stern of the *Adonis* very close to the bow of the dumb barge which, due to its significant load of water, and its flat bow, creates at speed the effect of a percussive bow wave, disturbing the water ahead of it. Whilst that bow wave, and its effect, could not be determined with any precision, Capt Beecroft talked of his experience that on occasions as he had attempted to come alongside the bow of a vessel where he encountered disturbed water which affects manoeuvring. He described it as giving a feeling that your steering is not as responsive as when you are moving through undisturbed water. He commented that if he ever encounters that

[38] 'pushing' is used in its widest sense, as the crew member said he even struck it with his hammer
[39] it needs to be remembered that the towline was secured from the tow hook on the rear deck of the tug, to the forward cleat of the barge, which is set a little bit back from the bow of the barge
[40] See photograph no.10 (page 31), of exhibit C.1, and by way of rough scale reference the *Adonis* is 21.3 metres in overall length.
[41] And I do not 'scale' off the photographs, rather use them as merely representative

situation, which can change from vessel to vessel dependent upon the underwater configuration of the vessel, its load, and speed, he would make a mental note of where he would not position his vessel in future.

[48]. The evidence of Master Phipps was that it was his decision as to the length of towline to be adopted. I find that this decision was flawed as it placed the *Adonis* too close to the dumb barge, and its length was not sufficient to allow the master of the *Adonis* sufficient time to react to any required course or speed changes needed. Perhaps[42] it also placed its stern too close to any disturbed water which may have been generated from the bow of the *Chrysus*.

[49]. In my view the length of the towline is clearly a factor which placed the *Adonis* in a dangerous position for the towing operation.

Issue 3(c) the breaking strength of the towline.

[50]. Towlines are ordinarily used at a set multiple of the strength of the bollard, to which they are attached, on the tug. Evidence from the experienced masters was that the multiple was two or three times the bollard pull. The bollard pull on the *Adonis* was 10.2 t, giving a towline strength of approximately 22 – 33 t maximum. Interestingly, in this case, the personnel involved did not have an appropriate length of towline, and so simply connected two mooring lines. Clearly this was an inappropriate procedure, and in some way demonstrates, objectively, the cavalier approach of the tug masters to the task they were conducting. I was never given any clear explanation as to why mooring lines, rather than a towline, was used but perhaps the answer lies in the fact that the authorised towing configuration dictated by the MEP required the *Adonis* to 'fold back' alongside the barge and in this configuration it was noted by one crew member[43] that the stern of the *Adonis* rode uncomfortably close to the bow of the *Aphros*. Accordingly, although I do not find this as it is not necessary, the lines used were deliberately over-capacity[44] for the job to ensure that the *Adonis* did not come adrift through a broken towline and strike the bow of the *Aphros*.

[51]. It may be that a design feature of the breaking strength of a towline is so that if a girding manoeuvre occurred then the amount of drag as the tug pulled sideways through the water would cause the towline to break and the vessel would not capsize. In this matter even the best expert evidence could only determine that the pull on the towline whilst in the girding manoeuvre may have been somewhere in the vicinity of 18 to 30 t, but the evidence was not high enough to determine that an appropriately sized breaking strain towline would have prevented the capsize. Accordingly there is insufficient evidence[45] to find that the breaking strength of the towline was a determinative factor in the Adonis capsizing.

[42] I say 'perhaps' because it cannot be proven in the circumstances with any scientific accuracy
[43] Mr Mepham
[44] by 'overcapacity' I mean that their breaking strength was well above what is used on towlines
[45] and in this regard I am not being critical that there is insufficient evidence, rather it is just that the expert does not have sufficient accurate data to reach a logical and reasoned conclusion, and that is to be respected.

Issue 3(d) the failure to use the remote release facility for the tow hook in the wheelhouse.

[52]. Whilst the tow hook is situated just above deck height affixed to the aft of the superstructure of the wheelhouse there is an emergency, or remote release, for the tow hook located in the wheelhouse. In the case of the *Adonis* this remote release was located on the port side rear within the wheelhouse. Most significantly, in my view, it was not within reach from the helm, such that the master needed to leave the helm and move across to the aft of the wheelhouse to activate it. In an emergency situation, which is when the emergency release would be used, the master does not wish to leave helm. In the case of the *Adonis* there appears to have been a complete lack of appreciation of just what the emergency tow hook release is for. Some person[46] had decided in the past that they should construct a bookshelf over where the emergency release was located, which obscured its location, and made it more difficult to reach in an emergency. Clearly the emergency release needs to be reached whilst remaining at the helm, and not be in a position where it can be obscured. The inquest was shown photographs of such an arrangement where the emergency release was located on the ceiling of the wheelhouse immediately above, and slightly in front of, the helm such that the master can remain with one hand on the helm and simply reach up to activate the emergency release. This is a well thought out location. Evidence at the inquest was that it is not a difficult job to re-plumb the lines for the emergency release to this location.

[53]. Incidentally the emergency release was inspected prior to the *Adonis* commencing its work on the Gladstone harbour[47]. The cables were found to be in less than serviceable condition, and so were replaced. That would tend to indicate it would be operational in the few weeks after this work was done[48], but there was never a suggestion that any attempt was made to operate it, very likely as the master was at that time 'fighting' the helm for control as he felt he had lost steering. One matter which did concern me was that if the locking pin located at the tow hook was engaged then even if you operated the emergency release from the wheelhouse it would not release the towline. This strikes me as completely counterintuitive. What is clear from the evidence is that no attempt was made to operate the emergency release in the wheelhouse when the vessel capsized.

Issue 3(e) the stability of the tug *Adonis* by reference to (i) its design characteristics; and (ii) the fitting of a towing winch, and H-bitts.

[54]. Whilst there was a great deal of conjecture made regarding the stability of the tug there was in my view no issue regarding its stability if used in accordance with the process outlined in the MEP, within the protected waters of the Gladstone harbour. Certainly stability ultimately became an issue because of the girding manoeuvre, but it is because it was placed in this situation that its stability became a factor at all. In view of the evidence ultimately I consider that the stability of the *Adonis* was not a factor which caused it to capsize, rather there

[46] They are unknown
[47] Why the bookshelf was not removed at this time perplexes me
[48] although a later inspection found that the cable was caught around a pulley, but it could not be established it was like this before the capsizing occurred

were other more important factors which caused it to be in a position where it was exposed to the capsizing motion.

[55]. I do note that the expert evidence was that once the *Adonis* reached a heel of 19° it would then have begun to flood. Had those that hatches been closed then the tug could have withstood a heel of 36° before it reached its 'zero point', which is the point at which it will simply not right itself[49]. Whether the hatches not being closed made any difference to the final outcome is very unlikely as the incident was described by all as occurring very quickly.

[56]. Before the *Adonis* was commenced in service in Gladstone harbour there was fitted to it a towing winch and H-bitts.

[57]. The towing winch is merely a powered drum to recover an unladen towline.

[58]. H-bitts were placed immediately after the towing winch and these effectively act as a guide to the direction of the towline so no matter what direction the tug may be pulling on the towline the direction of pull on the tow hook itself does not exceed a set maximum angle. The expert[50] calculated that the directional deflection of the towline from the tow hook by these components was in the order of 11.5 degrees elevation in the vertical plane (deflected by the tow winch), and in the horizontal plane 11° to port or to starboard, by the H-bitts. Effectively this meant that the towline was always kept in an alignment of pull, or force applied, which the tow hook could easily cope with in its design and operational configuration[51]. There was no suggestion by any person that the slight elevation caused by the towing winch affected the tow hook operation.

[59]. There was quite some degree of conjecture over whether these modifications required a re-survey of the vessel. Ideally that should have occurred but it is important to focus on the fact that the expert evidence was that the changes did not affect, in any measurable way, the appropriate operation of the towline or tow hook, particularly as to its quick release mechanism.

<u>Issue 3(f) the speed of the composite vessel (incorporating the tug *Aphros*, the dumb barge *Chrysus* and the tug *Adonis*).</u>

[60]. Factors now move into areas of dispute where I need to resolve certain aspects. It was clear from the evidence that had the two tug and barge combination been travelling in the configuration dictated by the MEP then speed would not have been an issue. The evidence of Master Phips was that in the MEP configuration the combination could have travelled at 100 mph[52] without incident. Most fortunately for investigators, and myself, was that each vessel had

[49] and the design of the *Adonis* is a completely different naval design than that of, for instance, a monohull sailing boat with a significant ballast in its keel which allows for self-righting after a capsizing event. A conventional tug such as the *Adonis* does not have this self-righting design.
[50] Mr Cosh
[51] that is the towline could not be pulling at, say, 60 or 90° to the direction of the tow hook as the H-bitts restricted its direction of travel in the horizontal plane
[52] not that the combination was at all possible of travelling at that speed, rather he used it as a figurative analysis

activated its Automatic Identification System (AIS). Helpfully investigators plotted this recorded information on a chart of the Gladstone harbour. What is recorded is the speed and bearing of each vessel in the lead up to, and the time of, the incident.

[61]. The MEP, despite its vast amount of information, actually provides no recommended speed for the combination to travel at, although there is a table which indicates 'transit times' at various speeds which varies from 4 kn up to 8 kn. I was advised that this was merely given as a guide to estimate the travel time of certain segments of the journey, and was not given as an advisory speed for travel.

[62]. Evidence provided was that an appropriate speed for such a combination was around 6 kn. Why this was considered appropriate was that the *Adonis* had a top speed of around 9 ½ kn, and so 6 kn would allow it to have a margin to increase its speed should it need to in a given situation. I accept that 6 kn was an appropriate speed that the combination should have been travelling at. The AIS data shows that the combination was travelling at 8 kn or a little above, 8.3 kn[53], in the lead up to the capsizing incident. Clearly this meant that the combination was travelling too fast for the *Adonis* to have a sufficient margin to increase[54] its speed to avoid, or recover from, an incident. Excessive speed was clearly a factor.

Issue 3(g) the tidal and current conditions

[63]. Whilst there was initially speculation that perhaps when the *Adonis* was near the mouth of the Calliope River that there may have been an increased tidal movement in this area which caused its steering to appear affected, the evidence from Capt Beecroft, an experienced pilot of the Gladstone harbour, was that any effect of the tidal influence near the mouth of the Calliope River on an incoming, or flood tide, would be very minimal[55].

[64]. There is no suggestion from any person or party that the weather conditions on that day[56] would in any way have detrimentally affected the vessels or the towing operation.

[53] and these figures are given as SOG, or speed over the ground. That meant the speed through the water would have been approximately 6.25 kn as there was estimated that the tide was flooding in at about 1.75 kn, that is in their direction of travel, it was a flood tide, and it was then about 1 hour & 45 minutes into the roughly six-hour tidal movement. One could use that day's tidal range, and a calculation based on the 1/12th approximation of tidal movements to calculate the approximate speed of the tide but witnesses agreed that 1.75 kn was a fair figure.

[54] and it should be remembered that tugs do not increase their speed dramatically like a motor vehicle, rather it can take a period of time for an increase in engine power (and revs) to result in an increase in speed through the water, especially when this incident occurred over what was estimated by some as just 45 seconds

[55] And Master Phipps also conceded in his evidence that there was no tidal effect caused by the river mouth

[56] See exhibit C.1 at Appendix 2 showing only moderate temperatures and wind conditions, although gusts were recorded up to 46 km/h at a direction from the ESE, so was a 'tailwind' in the direction of travel at the critical time

[65]. The most that can be said was that the incoming tide caused the configuration to be travelling at a speed which was excessive to allow a safe margin of error for the *Adonis* to increase its speed to avoid any incident.

[66]. Accordingly I do not consider that the tide, or other current or tidal conditions, on the Gladstone harbour that particular day influenced the incident occurring[57].

[67]. Additional areas of concern raised in the inquest included that where the towline was secured to the dumb barge it did not first pass around the barge's cleat before being secured by way of a figure of eight lashing with the bits "turned up". This termed, "turned up", is a reference to the towline firstly passing around the most forward of the two bollards on the dumb barge's cleat, before the line is then wrapped with a number of turns around the forward cleat, and a 'figure of eight' is then formed on top with the loose end being the uppermost, or 'turned up', as it is phrased. The specific purpose of this is so that the line can be undone even though the line is under immense pressure because the first number of turns around the bollard or cleat hold the line by friction and that way even if the towline is under load it can be released. The evidence was that this did not occur, which is very poor seamanship, and a deficiency in best practice. Again the evidence was there was insufficient time for the towline to be separated by undoing it at the forward port side bollard of the dumb barge. Again the incident simply occurred too quickly.

[68]. Lastly there was comment made by some witnesses about numerous alleged shortcomings or deficiencies in the vessel *Adonis*. It was a vessel built in 1995. It underwent regular surveys which, sometimes after specific work was required, it did pass. At inquest there was a request to lead evidence regarding alleged deficiencies, or defects, in other vessels within the Sea Swift fleet. Whilst those matters may certainly be relevant to those other vessels in the fleet I do not consider them directly relevant to the coronial issues involving the specific vessel, the *Adonis*, as at June 2011. Certainly if there are any deficiencies in other vessels within the Sea Swift fleet that is a matter that MSQ can pursue in the appropriate forum[58].

[69]. One matter which was raised in evidence was that Capt Jacobs was on the *Adonis*, rather than the *Aphros*, where some thought he should have been. There was some conjecture as to why this came to be. In considering the evidence I find it reasonable to draw the conclusion that Capt Jacobs, who was described by many to be a person of fairly quiet personality, has simply preferred the company of Master Bearden, rather than Master Phipps. Master Phipps was described by persons as having a fairly dominant character[59], and

[57] Leaving aside the speed over ground of the combination.

[58] and I did not wish to appear abrupt or in any way discourteous to counsel for Marine Safety Queensland in not allowing evidence about alleged deficiencies in other vessels in the Sea Swift fleet, rather I considered that any alleged deficiencies in other vessels discovered in 2014 or 2015 to not be of particular relevance to me in determining the list of issues for this inquest

[59] the evidence of Mr Bearden was that Master Phipps was always 'butting heads' (which was the expression he used) with Captain Jacobs, see T1-59 at 16

certainly I formed that impression of him from his evidence in the witness box. Accordingly it is very likely Capt Jacobs simply chose, on this day, to conduct his assessing role from the wheelhouse of the *Adonis*.

Issue 2. What was the course of events which led to the capsize of the tug Adonis in Gladstone Harbour on 11 June 2011, including the events relating to attempts to release the towline by use of the emergency release mechanism on the tow hook?

[70]. Essentially I have already dealt with this in response to the various aspects of Issue 3 of the List of Issues of this inquest. In very short compass the course of events which led to the capsize of the tug *Adonis* was that the masters of both vessels, at the instigation of Master Phipps, was to depart from the MEP, and instead implement an over-the-stern tow for the tug *Adonis*. This was inappropriate in the circumstances, and entirely contrary to the authorised, and already then practised, approach set out in the MEP. The capsizing was an entirely avoidable incident had the masters of the tugs simply adhered to the MEP.

[71]. Matters relating to attempts to release the towline by use of the emergency release mechanisms[60] or the use of an axe, I have already dealt with above in my findings.

List of Inquest Issues Answers

Coroners Act s. 45(2): 'Findings'

[72]. Dealing with the list of issues for this inquest the answers are as follows:-

[73]. Issue 1. My primary task is the information required by section 45(2) of the *Coroners Act 2003*, namely:

a. Who the deceased person is – Gordon Dudley Jacobs[61],
b. How the person died – Capt Jacobs died after becoming trapped in the wheelhouse of the tug *Adonis*, when it capsized,
c. When the person died – 11 June 2011 [62],
d. Where the person died – Gladstone Harbour, Queensland, adjacent to the mouth of the Calliope River [63], and
e. what caused the person to die – Drowning[64]

[74]. Issue 2. The masters of the vessels departed from the established MEP, and implemented an over the stern tow by the tug *Adonis*, which tow was an inappropriate procedure.

[60] I say 'mechanisms' (plural) because there was an emergency release at the towline itself on the deck, and also in the wheelhouse
[61] See exhibit A1 QPS Form 1
[62] See exhibit A2 Life Extinct Form
[63] See exhibit A2 Life Extinct Form
[64] See exhibit A3, Form 3 Autopsy Certificate

[75]. Attempts to release the towline were made by use of the emergency release mechanism on the tow hook. Why it did not release I am unable to precisely determine, but I do note that the person attempting to operate the emergency release was doing so from the port side, reaching over the hook to the release mechanism located on the starboard side. It should also be remembered that the crew member was attempting to do this under immense time pressure[65].

[76]. Later testing of the tow hook, after it was recovered, showed that the emergency release mechanism operated satisfactorily.

[77]. Issue 3. I will not detail all the factors already dealt with above in these findings but it was clear to me that neither the design of the tow hook, its emergency release mechanism, the stability of the tug as to its design characteristics or the later fitment of a towing winch or H-bitts, nor tide or current conditions, either caused or contributed to the capsizing.

[78]. Rather it was the failure by the Masters to adhere to the MEP[66], and then after this failure to adhere to the MEP, there were a number of departures from what are considered appropriate work practices, such as using a towline of insufficient length, using mooring lines as a towline[67], obscuring the remote tow hook release in the wheelhouse, and significantly the speed of the entire combination, were relevant factors on that particular day.

[79]. Issue 4. As I noted earlier the particular tow hook, when later tested, operated satisfactorily. There was no suggestion that the design of the tow hook was contributory to the incident occurring. Accordingly no change in design is recommended.

Coroners Act s. 46: 'Coroners Comments' (Recommendations)

[80]. An important aspect of the coronial process is to recommend improvements aimed at reducing the recurrence of any incident.

[81]. Whilst it is possible to consider that better training, or more appropriate practices be put in place, I have found that this incident had its primary cause in the tug masters departing from the Marine Execution Plan (or MEP) devised by the company after extensive revision and consultation.

[82]. Significantly this MEP was the only plan approved by the Harbourmaster for the towing of this barge. The masters of the tugs departing from the MEP, even after it had been practised, is very perplexing, but in practical terms no

[65] And well regarded authors claim that "*Experience teaches that in many cases it is nearly impossible to open the quick release hook in very critical situations, often with dramatic consequences. When a tug is listing caused by very high tension in the towline, as is nearly always the case in critical situations, it is often impossible to open the hook. One cannot rely on such a system*." (see page 62 of exhibit C.1)

[66] and this is the primary, or sole cause, as to why the event even occurred

[67] which mooring lines did not have the appropriate breaking strength threshold

amount of training or guidance can prevent an incident where individuals simply choose to ignore the established safe method for operation of work[68].

[83]. One recommendation which was evident from the evidence was that the wheelhouse emergency tow hook release needs to be in a position where it can readily be reached by the master whilst they remain at the helm. The inquest was shown a number of photographs showing one located in an overhead position on the ceiling of the wheelhouse, just forward of the helm. I was advised that it is not a very difficult exercise for the cabling of the emergency release to be plumbed this further distance, and the emergency release positioned there. That is one safety aspect that the relevant authorities should investigate, and implement, as it certainly appears a reasonable and practicable solution. Accordingly I make that recommendation.

Coroners Act s. 48: 'Reporting Offences or Misconduct'

[84]. The *Coroners Act* imposes an obligation to report offences or misconduct.

[85]. It was not suggested, nor recommended, to me by any party at the inquest that any further person or entity should be referred for investigation of an indictable or other offence. Accordingly no referrals are formally made.

[86]. If any information available for use in another jurisdiction has arisen it is, of course, a matter for that regulatory authority to take whatever action they consider appropriate and is available to them.

Magistrate O'Connell
Central Coroner
Mackay, Qld
23 October 2015

[68] and it is particularly concerning that the Masters chose to depart from the MEP after it had been practised, so it is not as if this was the very first occasion that they were performing this tow, or were in any doubt as to how the tow was to be performed