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**REPORT OF INVESTIGATION
INTO A GAS EXPLOSION
ON BOARD THE 'MAURENELLA'
AT LOWTOWN, GRAND CANAL,
CO. KILDARE
ON
21st APRIL 2010**

The Marine Casualty Investigation Board was established on the 25th March, 2003 under the Merchant Shipping (Investigation of Marine Casualties) Act, 2000.

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**REPORT No. MCIB/182
(No. 11 of 2010)**

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1. SYNOPSIS

- 1.1 On 21st April 2010 an explosion occurred on board the privately owned cruiser, '*Maurenella*', at Lowtown, Co. Kildare. The owner was injured and hospitalised.
- 1.2 Whilst the causes of the explosion cannot be conclusively determined, all indications are that it occurred due to a gas leak which may have ignited when the engine was started.

2. FACTUAL INFORMATION

2.1 General description of vessel:

The vessel was a centre cockpit Norfolk Broads cruiser. There were two cabin spaces below deck and a raised central cockpit with controls on the port side. The forward cabin area was used for sleeping and contained a head (toilet) compartment. The aft cabin contained the galley, dinette and could be converted to a double berth. The engine was located under the cockpit sole boards. The centre cockpit was designed to be open with a canvas canopy for inclement weather conditions. Gas cylinder storage was in a locker in the cockpit area, behind the helmsman's position.

2.2 Technical Details:

Vessel Name:	<i>'Maurenella'</i>
Vessel Type:	Elysian 27 centre cockpit
Length:	8.20 m (27' 00")
Beam:	2.90 m (09' 06")
Draft:	0.56 m (01' 10")
Construction:	GRP
Date of build:	1973
Builder:	Appleyard, Lincoln & Co., (Boatbuilders) Ltd., Ely, Cambridgeshire, England
Engine:	Perkins 4 -108, 4 cylinder diesel
Heating/Cooking:	Butane gas supplied by domestic gas cylinder
Owner: (on board at time of incident)	Mr. Larry McGrath, Newbridge, Co. Kildare.



Photo 1 - Sister vessel at Lowtown



Photo 2 - Sister vessel in the UK

3. EVENTS PRIOR TO THE INCIDENT

- 3.1 The '*Maurenella*' was purchased from Albert Marina, Co. Longford, in March 2010 by Mr. Larry McGrath and brought to Lowtown, near Robertstown, Co. Kildare via the River Shannon and the Grand Canal.
- 3.2 The vessel was not surveyed prior to purchase.
- 3.3 At Lowtown Mr. McGrath, with assistance from a friend, commenced refurbishing the vessel whilst afloat. This involved dismantling hard furnishings and part of the gas system.
- 3.4 On the morning of 21st April 2010, Mr. McGrath boarded the vessel and ignited the gas cooker to boil water. He was alone at the time.
- 3.5 Whilst waiting for the water to boil he decided to start the engine in order to charge up the batteries.

4. THE INCIDENT

- 4.1 As the engine was started an explosion occurred followed by fire.
- 4.2 The entire superstructure of the vessel was blown off and the interior was substantially damaged (see photo 3).
- 4.3 Mr. McGrath fell into the engine compartment, sustaining a severe injury to his left eye, a fractured right wrist and general bruising/abrasions. He managed to scramble clear and onto the canal bank. The emergency services attended the incident and he was taken to Naas General Hospital by ambulance.



Photo 3 - Vessel in the immediate aftermath of the explosion

EVENTS FOLLOWING THE INCIDENT

5. EVENTS FOLLOWING THE INCIDENT

- 5.1 The vessel partially sank at its berth. Some of the resultant debris was removed and placed on the bank of the canal (see photos 4, 5, 6, 7 and 8).
- 5.2 The vessel was raised by Waterways Ireland on 7th May 2010 with the Investigator present.
- 5.3 An examination of the vessel was undertaken by the Marine Casualty Investigation Board and the findings are set out in the following Section.



Photo 4 - Vessel as first sighted



Photo 5 - Vessel in canal



Photo 6 - Remains of superstructure on canal bank



Photo 7 - Inside of vessel as it was lifted from the water



Photo 8 - Shows inlet manifold missing from engine

CONCLUSIONS

6. CONCLUSIONS

- 6.1 The Owner had partially dismantled the gas system by disconnecting a gas heater mounted on the port aft face of the forward galley bulkhead (see photo 9). The pipe was not blanked off. When the cooker was switched on gas leaked from the disconnected pipe. When the engine was turned over to start the vessel exploded.



Photo 9 - Remains of gas heater

- 6.2 Virtually nothing was left apart from the hull moulding. The heat of the fire was sufficient to melt the cast manifolds on the engine, while only fragments of copper piping remained, sufficient only to determine what purpose they served.
- 6.3 There was no other source of gas on board the vessel other than that used for heating and cooking. The gas fired equipment included a cooker, a refrigerator and three open flame heaters (see photo 10).



Photo 10 - Galley arrangement

- 6.4 None of the gas fired equipment on board had a flame supervision device.
- 6.5 There was no gas leakage detection system.
- 6.6 It was not possible to conclusively determine what was the source of the ignition. The possible primary sources of a spark are considered to have been:
 - 1) Sparks caused by the brushes of the alternator;
 - 2) A flame-back occurred through the air intake caused by overuse of the engine pre-heating fuel system.

Note: The Perkins 4 - 108 series engines have two different engine pre-heat systems. Both utilise an open coil glow plug to heat the fuel. One system incorporates a secondary fuel tank which releases fuel into the system once the glow plug reaches the correct temperature.

7. RECOMMENDATIONS

- 7.1 The Board recommends that Marine Notice No. 1 of 2002 be updated to reflect current best practice in the use of liquefied petroleum gas (LPG) installations and systems on merchant vessels, fishing vessels, pleasure craft and other marine craft.
- 7.2 The Board recommends that the Department of Transport Code of Practice for the Safe Operation of Recreational Craft be amended to include a section covering LPG installations.
- 7.3 The Board recommends that the Minister issues appropriate advisory material to all boatowners highlighting the dangers inherent in gas systems on board vessels.

12. CORRESPONDENCE RECEIVED

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An Garda Síochána

An Leas-Choimisinéara
(Oibríochtaí)
An Garda Síochána
Ceanncheathrú na nGardai
Páirc an Fhionn-Uisce
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OPS79.13/09, ER76.77710

Web Site : www.garda.ie
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Your Reference: MCIB/182

Ms. Teresa Walsh,
Secretariat,
Marine Casualty Investigation Board,
Leeson Lane,
Dublin 2.



Re: Draft Report of the Investigation into a gas explosion on the "Maurenella" at Lowtown, Grand Canal, Co. Kildare on 21 April 2010.

Dear Ms. Walsh,

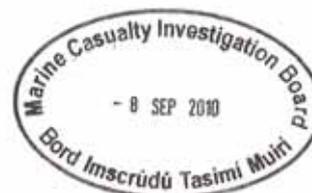
I am directed by Deputy Commissioner, Operations to refer to Mr. John O'Donnell's correspondence to the Commissioner in relation to the above matter dated the 16th August, 2010.

I wish to advise that the draft report in relation to this tragic incident has been reviewed and An Garda Síochána have no observations or submissions to make in respect of same.

Yours sincerely,


Frank Walsh
Superintendent for
Deputy Commissioner

6th September 2010



Ráiteas Misin / Mission Statement :
Ag obair le Pobail chun iad a chosaint agus chun freastal orthu / Working with Communities to Protect and Serve

MCIB RESPONSE

The MCIB notes the contents of this correspondence.

