

Accepted / Filed

16-26



JAN 13 2016

Federal Communications Commission  
Office of the Secretary

Vesper Marine Ltd  
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PO Box 91164  
Auckland, 1142  
New Zealand  
Tel: +64 9 950 4848

November 4, 2015

Federal Communications Commission  
1270 Fairfield Rd  
Gettysburg, PA 17325-7245  
Attn: WTB-TSI Daniel McCleary

RECEIVED & INSPECTED

NOV 06 2015

FCC-GBG MAILROOM

**WAIVER – EXPEDITED ACTION REQUESTED**

**Request for waiver of rules governing equipment authorization**

**Vesper Marine Type 3 AIS Aid to Navigation (VAB1252)**

Dear Sir/Madam,

Vesper Marine has developed a range of AIS Aid to Navigation (AtoN) products used to electronically mark hazards and points of interest on the water. Its latest product offering, the VAB1252 is a Type 3 AIS AtoN.

The USCG has reviewed the VAB1252 technical file as per Rule 33 CFR Part 66, and approved it as meeting the technical requirements as outlined in IEC 62320-2. USCG letter 2015-3421 dated Aug 18, 2015 is enclosed.

Normally AIS equipment must also meet FCC Rule 47 CFR Part 80. Class A and Class B AIS equipment is covered by this rule. However, there is currently no reference to AIS AtoNs in Part 80 and the international standard for AtoNs IEC 62320-2 is also not incorporated into the rule.

A KDB enquiry through TUV SUD BABT (tracking number 470228) and subsequent correspondence with Rashmi Doshi of the FCC Wireless Telecommunications Bureau confirmed the above and recommended we request a waiver of Rule 47 CFR Part 80 to permit equipment certification and 47 CFR Part 80.17(b), Administrative Classes of Stations, to permit licensing.

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List ABCDE

There is already FCC authorization of AIS AtoN equipment. Vesper Marine received FCC authorization for its AtoN OEM product, FCC ID: 2AEYIV AIS1 in August 2015. A list of all the AIS AtoN products currently authorized by the FCC is enclosed. It is important to note there is no functional difference between the VAB1252 and any of the Type 3 products listed as they all conform to the same IEC standard for AIS AtoN equipment.

The use of AIS AtoNs to mark hazards and areas of interest provides a significant contribution to both safety of life at sea and protection of the marine environment. The first installation of the VAB1252 in the US will be used to simultaneously protect both the commercial assets of New York Power Authority and the marine environment. By transmitting virtual marks to make the oil filled high voltage power cables crossing Long Island Sound electronically visible to vessels in the area, environmental damage and power outages caused by anchor strikes may be avoided. A detailed description of this project is enclosed.

Furthermore, AtoN equipment must comply to IEC 62320-2 for it to perform its intended function and since it operates on the dedicated marine VHF channels (AIS1 and AIS2), already in use by the AIS network, there is no additional risk to it causing interference to other users of the radio spectrum.

Therefore, we request that the Commission waive its rules to allow the use of AIS Aids to Navigation. If you have any questions or need further clarification on this please contact me over email or phone. The remittance advice Form 159 is also enclosed.

Sincerely,



**Carl Omundsen**

Director / Chief Engineer

**Vesper Marine Ltd**

45 Sale Street, PO Box 91164, Freemans Bay, Auckland

Ph: +64 9 950 4848, Mob: +64 21 227 5711

carl@vespermarine.com

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U.S. Department of  
Homeland Security

United States  
Coast Guard



Commandant  
United States Coast Guard

Martin Luther King Jr. Ave. SE  
Washington, DC 20593-7509  
Staff Symbol: CG-ENG-3  
Phone: (202) 372-1375  
Email: TypeApproval@uscg.mil

2015-3421  
16714  
August 18, 2015

Vesper Marine Ltd  
Attn: Mr. Carl Omundsen  
45 Sale Street  
Freemans Bay  
Auckland 1010  
New Zealand

Dear Mr. Omundsen,

Our office has evaluated the Vesper Marine Ltd Automatic Identification System (AIS) Aid to Navigation (AtoN) Virtual AIS Beacon VAB1252. Based on the information you submitted, this system meets the technical requirements outlined in the International Electrotechnical Commission (IEC) standards 62320-2 and 60945.

This equipment is not subject to U.S. Coast Guard type-approval per Title 46 U.S. Code of Federal Regulations (CFR) subpart 159 nor should it be marketed as having received such type-approval. However, this letter may be used during the review and approval process performed by the U.S. Federal Communications Commission, as applicable.

If you have any questions please feel free to contact this office at the email address or phone number above.

Sincerely,

A handwritten signature in black ink, appearing to read "T. M. Howard".

T. M. HOWARD  
Commander, U.S. Coast Guard  
Office of Design and Engineering Standards  
Chief, Systems Engineering Division  
By direction

AIS /  
1-NC  
FCC I  
2AEY  
UYW-  
UYW-  
2AB5  
UYW-  
VIQ-K  
UYW-  
WZ77  
IB204  
IB204

**New York Power Authority**

*Environmental and operational impacts being addressed by virtual AIS AtoN's*

Transmission circuit Y-49 is owned by the New York Power Authority and operated at 345KV with load averaging 600 MW providing critical power to Long Island. The cable system is comprised of 4 Independent Self Contained Fluid Filled (SCFF) cables buried an average of 10 feet in the seabed crossing Long Island Sound between New Rochelle at the north end and Hempstead Bay at the south end on Long Island. The four cables are separated by approximately 600 feet in the middle of the Sound, but come together as you approach shore. Each cable is connected to a pressurizing plant that maintains a cable fluid pressure of 160 PSI to provide the cable insulation capability for operating at the 345KV level. Loss of pressure would cause the cable to fault and breach the protection barriers on the cable causing fluid loss into the Sound. The cables are terminated at the North Transition Station and the South Transition Station. The cable system operates utilizing three of the four cables with the fourth cable considered a spare in case one cable is damaged. In the event of cable damage or a failure, the cable is switched out of the circuit and the spare cable is switched in and the system can then be brought back on-line. The switch operation can be performed in approximately 2-3 days limiting the loss of transmission capability. In the event of two cables being damaged, the transmission system could be off line for up to 9 months with significant impact to customers on Long Island.

Damage history includes two anchor strikes, one in 2003 and a second in 2014. In both instances, the cable was damaged causing a fault and fluid loss of over 6000 gallons of cable oil. Since the cable has to maintain pressure and fluid flow through the damaged section to prevent sea water from entering the cable, the pressure and flow rate are controlled to maintain the condition of the cable. This control is monitored and adjusted as required until the cable can be cut and capped prior to repairs. Once the cable is capped, the loss of cable fluid into the Sound is mitigated. This process usually will take about 2 months and is a 24/7 operation. During the period that the cable is leaking oil, measures are taken to prevent any serious environmental impact that includes having on site an environmental group to collect the oil, provide containment and shore clean-up. Once the damage point is located, and dependent on the extent of damage, other containment measures are applied.

Benefits from the installation of the Vesper Marine Virtual AIS Beacon combined with the intelligent UltraMap Asset Monitoring System are to track vessels in the area of the cable and provide an enhanced level of protection to eliminate anchor strikes and environmental impact through virtual buoys and safety alert notification to prevent anchoring within the cable field.

*Robert J. Schwabe*

Director Asset and Maintenance Management

New York Power Authority

123 Main Street

White Plains, New York 10601

(W) 914 287-3794

(M) 914 774-1878

**AIS AtoN FCC Authorizations  
1-Nov-2015**

FCC ID	Manufacturer	Description	Grant Date
2AEYIVAI51	Vega Industries (mfg by Vesper Marine)	VegaAIS AtoN Station (Type 1)	08/18/2015
UYW-4180051	Software Radio Technology	Chronos AIS Aid to Navigation (AtoN) Type 1 & 3	07/09/2015
UYW-4230002	Software Radio Technology	TRS-418-0001 & 0003 AIS Aid to Navigation (AtoN) Type 1 & 3	03/03/2015
2AB5X-4180026	Zeni Lite Buoy Co, Ltd.	Akara AIS Aids to Navigation Transceiver (Type 1 & Type 3)	09/02/2014
UYW-4180013	Software Radio Technology	AIS AtoN Express (419-0013) Type 1 AtoN	07/16/2014
VIQ-KANATON	Orolia S.A.S.	KanAtoN Type 1 / 3 AIS AtoN Transponder	05/16/2014
UYW-4180003	Software Radio Technology	Carbon AIS Aids to Navigation Transceiver (Type 1 & 3)	05/16/2013
WZ7ATON-301-303	Alltek Marine Electronics	Mando 301 & 303 Type 1 & 3 AtoN (Tideland Informer)	06/18/2012
IB20ATN01	L-3 Communications	ATN01-350-00 shore based Protec-D Aid to Navigation (AtoN)	02/14/2011
IB20ATN01	L-3 Communications	L3AR AtoN ATN01, Tideland AtoN Informer, Zeni AtoN AKARI	01/07/2010

# AssetMonitor

Logged in as Robert Schmitz

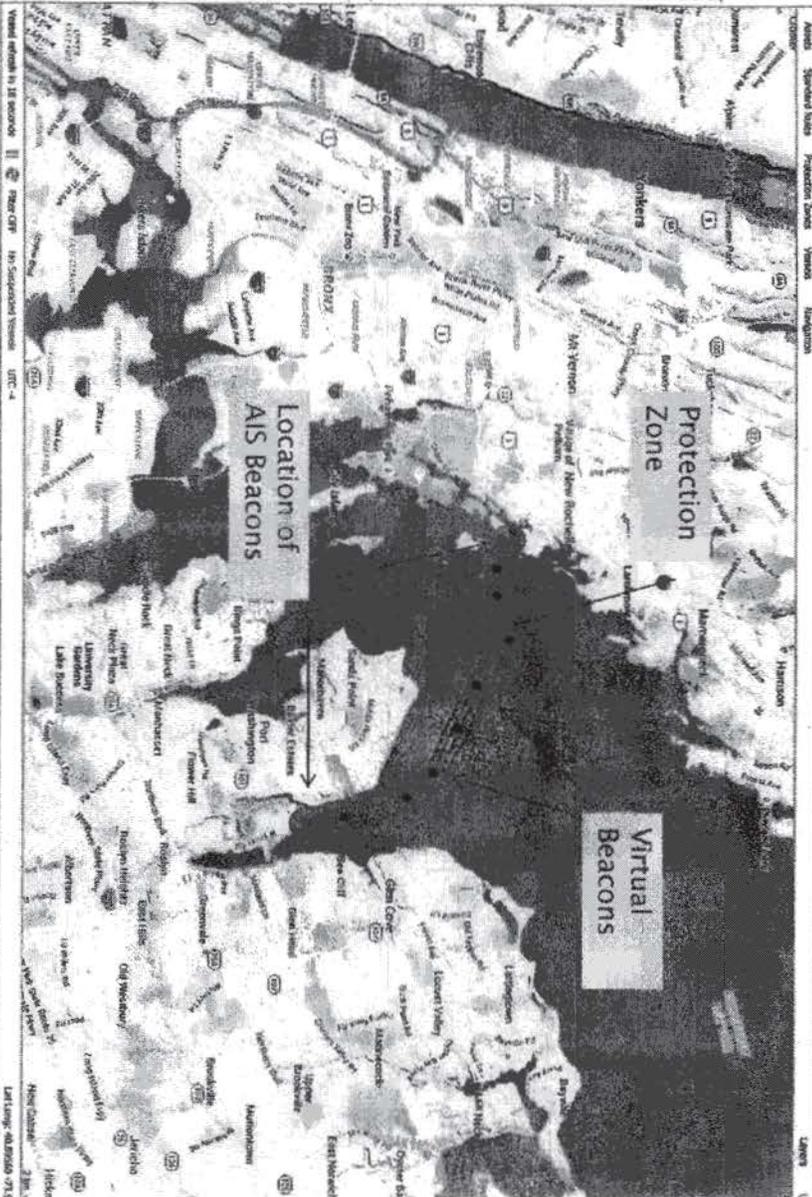
Assets

- Station
- Cable A
- Cable B
- Cable C
- Cable D
- VAD Point Transition Station
- VAD High Transition Station
- VAD South Transition Station
- VAD South Transition Station
- Virtual Assets

- 1
- 2
- 3
- 4
- 5

Protection Zone

- Orange
- Dangling on
- Dangling or underwire on
- Mobile
- Other Type
- Passenger
- Rail Vehicle
- Railway
- Train
- Unknown



Vertical offset in 25 seconds

Central Element (Real Time 9)  
 Key Event Log Event: 0038: Events: Link Elements: Selected Zone: Model: Repair Events: Selected: Summary: High/Low: Last details in 10 seconds  
 Severity: This: Zone: Rail Group: Virtual Assets: Assets: RAO Number: First Occurrence: Last Occurrence: Coordinates: Asset Type: Dashboard  
 No content needs to display

Real Time: None

## CUSTOMER EXAMPLES

### Perenco Oil & Gas – Africa

Perenco, an independent oil and gas company based in London and Paris with activities in sixteen countries owns and manages both onshore and offshore liquid natural gas (LNG) rigs. Instead of deploying a costly AIS AtoN on each rig, Perenco used a single Virtual AIS Beacon to electronically mark not only each rig, but anchorages and dangerous areas. This approach increased safety at the same time as reducing install and ongoing maintenance costs.



### Ports of Auckland – New Zealand

Managing port facilities on two coasts, the Ports of Auckland wanted to increase safety on their smaller west coast port. This bay harbor has a difficult entrance channel along with high cliffs, many sandbanks and a strong tidal current flow. By using a Virtual AIS Beacon they were able to mark additional hazards in a tough environment where maintaining physical aids was not cost effective.

### 34<sup>th</sup> America's Cup – San Francisco

With condition-dependent race course boundaries in a busy San Francisco waterway, the America's Cup Event Authority needed to ensure that spectators, officials and any other vessels could determine their position relative to the course for each race. Using a Virtual AIS Beacon to electronically create a virtual fence, anyone equipped with a commonly available Class B AIS could easily ensure they remained outside the course at all times.



### MH370 Search – Indian Ocean

An international multi-company team searching for missing Malaysian Flight MH370 needed to ensure their 6 mile long cables towing deep-water side-scan sonar arrays didn't collide with vessels. The otherwise invisible underwater hazards were electronically marked using a Virtual AIS Beacon, enabling vessel on-board systems to alert crews of their presence and avoid damage. In a similar application, seismic survey vessels have been outfitted with Virtual AIS Beacons to continuously transmit the moving positions of multiple streamers used for 3D acquisition.

## TECHNICAL DATA

Access mode	RAIDMA, FAIDMA
Transmission mode	Type 3 AtoN operates in mode A, B or C
Radio frequency	Dual channel AIS transmit & receive. Default AIS 161.975 / 162.025 MHz
AtoN marks	Maximum of 65 (dependent on configuration)
Message formats	ITU-R M.1371 - Message 6, 8, 14, 21 (others available)
Number of transmitters	1 x AIS
Number of receivers	2 x AIS, 1 x GPS (50 channel)
AIS receiver sensitivity	-113dBm
GPS receiver sensitivity	-142 dBm acquisition, -159 dBm tracking
Power supply	12VDC, 5A. Includes isolated AC power pack
Transmission power output	2W (33 dBm) or 12.5W (41 dBm)
GPS antenna connector	TNC connector - GPS antenna included with surface or pole mounting
VHF antenna connector	S0239 connector, 50 ohm, max 2:1 VSWR
Serial data	1 x RS232, 1 x RS422 (opto-isolated)
Networking	Ethernet optional
Size	162mm by 122mm by 90mm high (6.32" x 4.8" x 3.54" high)
Environmental	Waterproof (IP67). Not including AC power pack
Operating temperature	-25°C to +55°C (-13°F to 131°F)
Indicators	Multi-color LED indicators for power, status, transmit and error
AtoN mark management	Configuration software - Windows, Mac, Linux

#### Standards:

- ITU-R M.1371, Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band
- IEC 62320-2, Automatic Identification Systems (AIS) - Part 2, AIS AtoN Stations - Operational and performance requirements, method of testing and required test results
- IALA Recommendation O-143: On Virtual Aids to Navigation
- IALA Recommendation A-126: On The Use of the Automatic Identification System (AIS) in Marine Aids to Navigation Services

## AWARD WINNING



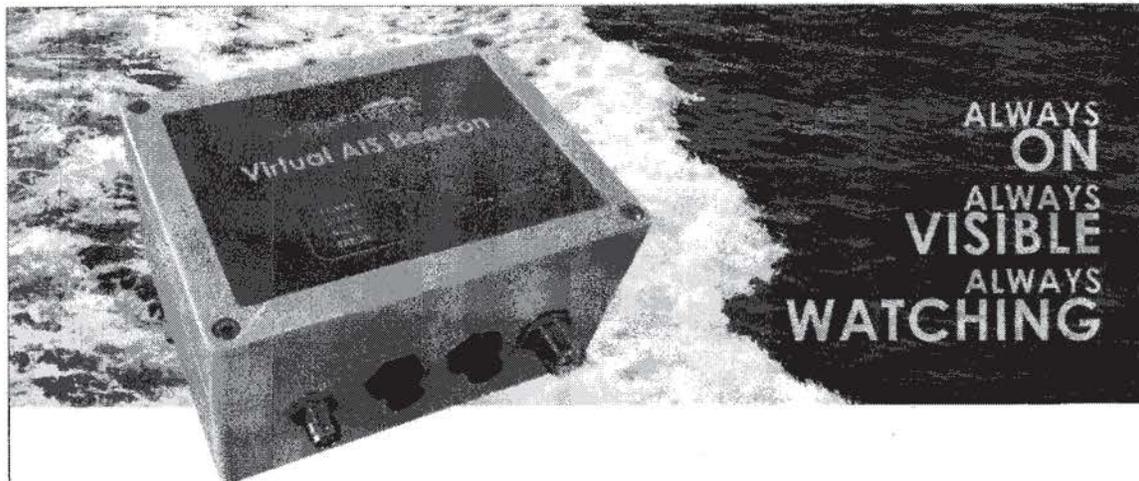
IHS Safety at Sea Award 2012

WINNER OF THE  
NZ HI-TECH  
AWARDS 2012

Lloyd's List Awards  
Global 2012  
Finalist

vespermarine

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## Virtual AIS Beacon

Remotely transmits multiple Aids to Navigation (AtoN)

Create AtoNs at the push of a button

### Easily Make Hazards Visible

The world's first Virtual AIS Beacon™ makes hazards at sea visible when costly physical infrastructure is not appropriate or is impossible to deploy. These electronic virtual markers are recognized by the International Maritime Organization (IMO) as a Virtual Aid to Navigation (VAtoN).

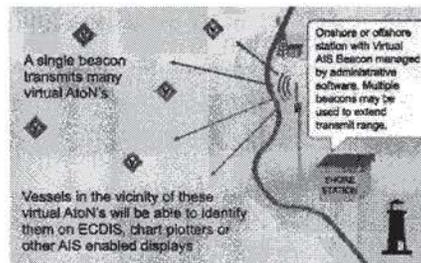
When a Virtual AIS Beacon electronically marks hazards they become visible on ECDIS, chart plotting and other AIS systems and can be used to prevent collisions and other marine accidents.

- Easy to install and maintain with very little user training
- Allows AtoN marks to be placed in locations where it is impossible to install physical markers
- A fast and cost-effective way to place numerous AtoN's
- Add, remove or change positions of markers according to changing conditions such as tide, wrecks or temporary safety zones
- Much lower cost than AIS base stations or multiple physical AIS AtoN's

Port authorities, companies and organizations with Oil & Gas, Offshore Fishing, Aquaculture or Marina operations can enhance safety and marine communications in a fast, efficient and cost-effective way.

### Use Case Examples

- Mark shipping channels to "join the dots" between physical buoys to improve shipping lane visibility
- Mark areas where navigation conditions change frequently. For example, overhead clearance, ice or water levels
- Mark both visible and invisible hazards, including platforms, bridges, piers, reefs or shellfish beds
- Mark moving hazards such as sand bars to regularly provide changes in location and provide alerts and warnings
- Create temporary cordons around hazardous spills, wrecks, marine protected areas, boat or yacht races and swim events



vespermarine

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