U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

FEB 24 1998

Mr. Steven Charles Hunt
Shipmate, Inc.
2615 Voorhees Avenue
Suite 6
Redondo Beach, CA 90278

Dear Mr. Hunt:

This is in response to your letter, telefax, and telephone conversation with a member of my staff on behalf of your client who would like to transport a device, described as an "ignition cartridge," under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). You state that the device does not meet the definition of an explosive substance. The device is used to preheat a cutting torch used for underwater rescue, and for military and law enforcement operations. You also stated that if the device ruptured and the iron strips uncoiled, the device would probably heat to ignition in air.

Based on the information you submitted and information available to us, it is our opinion that this device should be described as "Pyrophoric metals, n.o.s., 4.2, UN 1383, I", and is subject to the HMR for the following reasons:

1. The device contains a pyrophoric form of iron.

2. The Hazardous Materials Regulations and the International Civil Aviation Organization Technical Instructions for the Safe Transportation of Dangerous Goods by Air provide no exceptions for pyrophoric metals.

3. Your letter provided little detail about how testing was conducted on the device. Therefore, we assume that the 0.003" metal foil was punctured and the device was allowed to stand under ambient conditions. Under these conditions, the rate of heating would be so slow that a temperature rise of about 10°F would be noted. However, if the device is ruptured and the iron strips are uncoiled, the device would probably heat to ignition in air.

101 Ignition

98-0401

Your client can submit an application for exemption from § 173.124(b), if it can be demonstrated that the completed device does not meet the criteria for a Division 4.2, and will not meet this division under any reasonable conditions occurring during transportation.

I hope this information is helpful. if you need additional assistance, do not hesitate to contact us.

Sincerely,

Hattie L. Mitchell

Hattie L. Mitchell, Chief
Regulatory Review and Reinvention
Office of Hazardous Materials Standards

Karim
File: 173.124
SC: 333

ShipMate, Inc.

1810 Green Lane
Redondo Beach, CA 90278-3618
310-798-4200 phone
310-798-4339 fax
800-506-7984 pager
shipmate @ shipmate.com internet

Hazardous Materials Transportation Training
Software & Information Systems
Civil Penalty Case Review & Appeal
Compliance Inspections & Audits
Hazardous Material Incident Response
Container & Portable Tank Inspections
CD ROM Reference Products
IMDG, IATA, DOT, OSHA & EPA Specialists

To: Jennifer Karim		**From : Steven Charles Hunt**
Fax Number : 1-202-366-8700		**Company : ShipMate Inc**
Date : 12/24/97	**Time : 12:05:58 PM**	**For Information Call: 1-310-798-4200**
Subject : ADDITIONAL INFO FOR LTR OF INTERPRETATION (RESUBMISSION)		**Fax Number : 1-310-798-4339**

Dear Ms. Karim:

Attached, please find a letter which I had addressed to Mr. Schultz.

I sincerely appreciate your assistance in expetiting this request. my client is concerned and desperately needs your guidance because the HMR are not clear on this particular issue.

Again, if I may be of assistance, please call me.

Thanks and Best Regards,

Steven Charles Hunt
ShipMate, Inc.

ALLOY SURFACES
A SUBSIDIARY OF CHG GROUP, INC.

RAPID FIRE CUTTING ROD IGNITION CARTRIDGE TEST RESULTS

TESTS PERFORMED ON FEBRUARY 5, 1997

Two (2) Rapid Fire Cutting Rod Ignition Cartridges were tested to determine the case temperature rise in degrees F over a time period of thirty (30) minutes from initiating the cartridge.

Two type K thermocouples, designated TC1 and TC2 were attached to the cartridges. TC1 - 12mm from the bottom and TC2 - 24mm from the bottom. Temperature measurement was provided by a Leeds & Northrup Model 2300 digital recorder.

The tests were conducted in a temperature stable (71°F), draft free room with the rods placed on one (1) inch of insulating material to eliminate any external temperature influences. Cartridge #1 experienced a rise of 10°F and cartridge #2 a rise of 8°F over the 30 minute test period.

Please see the attached data sheet and graph.

ShipMate, Inc.
2615 Voorhees Avenue, Suite 6
Redondo Beach, CA 90278
Phone: 310-370-1237
Fax: 310-370-1397
E-mail: chemtrans@aol.com

ShipMate

July 3, 1997

Mr. Edward Mazzullo
Chief, Standards Branch
U.S. Department of Transportation
Research and Special Programs Administration
400 Seventh Street, SW
Washington, DC 20590-0001

Subj: Interpretation, Request for Written Interpretation

Dear Mr. Mazzullo:

I am submitting this written request for interpretation on behalf of a client who would like to offer into transportation a device which is described as an "ignition cartridge."

The device does not meet the definition of an explosive substance. It is a device which is used to pre-heat a cutting torch which is used for underwater rescue, and military and law enforcement operations.

The device can best be described as a steel rod, approximately 5/8" in diameter, which has been bored. An activated iron foil is coiled and pressed into the annulus under an inert atmosphere and the foil is encapsulated beneath a metal seal which is then set in place with epoxy. Above the metal seal are two plastic bushings which are pressed into the annulus. To operate the device, an ultrathermic cutting rod is forced through the bushings and into the metal foil. Pure oxygen is then introduced into the metal foil and the resulting oxygen/activated iron foil superheats the end of the ultrathermic cutting rod, thus igniting the cutting rod. A diagram follows.

Normally, electricity is used to pre-heat the ultrathermic cutting rod. However, the use of electricity takes time for the rod to pre-heat. By using the "ignition cartridge," the operator does not need electricity and can pre-heat the rod almost instantly. This "ignition cartridge" is ideal for underwater rescues and for clandestine forced entry situations (i.e. hostage rescues). This system eliminates the need for costly explosive entry systems which can cause collateral damage.

ShipMate

My client is naturally concerned about the shipping requirements. The supplier of the metal foil is currently declaring the metal foil as a pyrophoric solid. My client then uses the metal foil and manufacturers the final product which, in operational tests, does not result in an article which presents any degree of danger during transportation. Further, the devices are sealed in a hermetically sealed foil pouch. Additionally, the foil pouch is sealed in an atmosphere of nitrogen.

Essentially, my question is this:

<u>If a hazardous material is used in a manufactured article in such a way that the resulting finished product does not present a hazard in transportation and does not meet the criteria for a hazardous material, hazardous substance, hazardous waste or marine pollutant, as defined in Title 49, Code of Federal Regulations, subchapter C, would the finished article be regulated as a hazardous material?</u>

Practical tests have shown that, in normal atmospheres, the temperature of the device increases approximately 10-15 °F over ambient when the metal seal is punctured. It is unlikely, even in enriched atmospheres, that the resulting temperature rise would cause this device to be classified as a Division 4.2 hazardous material.

Your written opinion is of great interest to my client as he would, naturally, like to transport the material. He currently has a number of purchase orders from various governmental law enforcement agencies, but he is unable to fulfill them because of the present issue which is interpretive in nature. We respectfully request your written opinion. If necessary, my client is prepared and willing to file any exemption or Competent Authority Approvals may be necessary to offer this device into transportation.

Your immediate review and response would be most appreciated. We look forward to your favorable response.

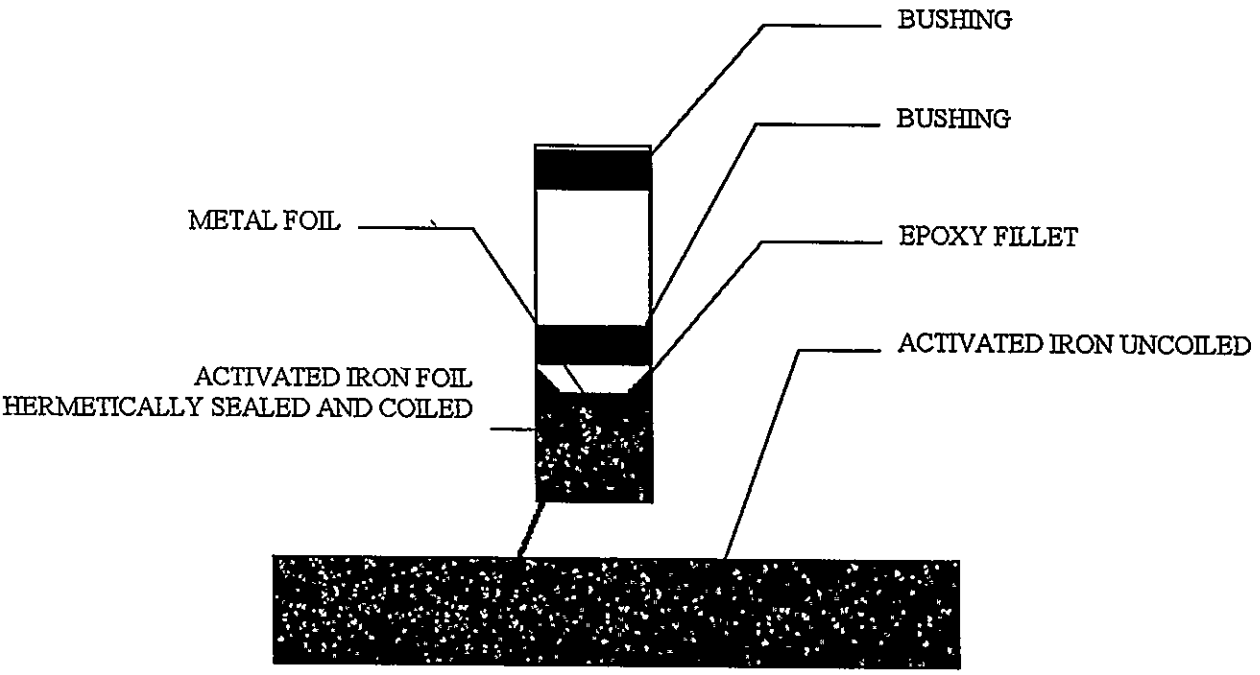
Respectfully,

Steven Charles Hunt
ShipMate, Inc.

cc: Mr. Tom Joos

ShipMate

Figure 1 Schematic of Igniter Cartridge (not to scale)



Facsimile Cover Sheet

E-Systems
A Raytheon Company
Joint Operations Group
5749 Briar Hill Road
Lexington, KY 40516
Tel 606.293.4236
Fax 606.293.3550

Date: September 8, 1997	Message No.	
To: Tom Jose	Phone # 909-483-3222	Location/Dept.
Organization: Broco Inc.	Fax # 909-483-3233	
From: Bruce Lawrence	Subcontracts Admin.	

Message: Contents: Total Pages Transmitted ____6____ Including Cover Page

DO NOT TRANSMIT CLASSIFIED INFORMATION OVER UNSECURED TELECOMMUNICATIONS SYSTEMS. OFFICIAL DOD TELECOMMUNICATIONS SYSTEMS ARE SUBJECT TO MONITORING AT ALL TIMES. USE OF DOD TELECOMMUNICATIONS SYSTEMS CONSTITUTES CONSENT TO MONITORING.

Reference: Purchase Order 968119

Tom.

The following is information that will assist in completing the shipment of the igniters. It should also assist with the shipments to Japan.

Thanks,

Bruce Lawrence

Notes:
1. *If message is not received completely or not received by intended party, please contact sender.*
2. *No classified information shall be sent via facsimile.*
3. *No technical data related to defense articles or services shall be transmitted out of the United States.*
4. *No "Company Private" material shall be sent to an unattended machine and transmission to an attended machine requires telephone confirmation from intended recipient upon receipt.*

ATTENDANCE LIST
WEAPON SYSTEM EXPLOSIVES SAFETY REVIEW BOARD
BROCO RAPID FIRE IGNITER
19 May 1997 1230 Session

BOARD MEMBERS

P.S. WRIGHT	NAVORDCEN	N713	(301) 743-6081
C. WAKEFIELD	NAVORDCEN	N7133	(301) 743-6081
J. GERBER	NAVORDCEN	N7133	(301) 743-6081
C.W. POWERS	NAVORDCEN	N7134	(301) 743-6081
S.B. ANDREWS	NAVORDCEN	N7135	(301) 743-6081
J. WASEL	NAVSEA	03P3	(703) 602-8818
R. USKIEVICH	NAVFAC	151RU	(703) 325-7345
W. HAMMER	NSWC INDIAN HEAD	044D	DSN 354-4932
M. BROWN	NSWC DAHLGREN	G71	DSN 249-7734
W. BOVENSCHEN	NSWC CRANE	4022	DSN 482-1801
E. LUTHER	NAVSAFECEN	43	DSN 564-3342
A. STANTON	WPNSTA EARLE	503	DSN 449-2859
DR. T. ENGLISH	COASTSYSTA	E055	DSN 436-5401

OTHERS

GYSGT DETRICK	MARINE CORPS		(703) 784-5396
J. BARNETTE	MARCORSYSCOM	PSE	(703) 784-4531
G. KLAUS	AOT		(703) 413-6262
M.E. CARO	AOT		(703) 413-6262

Enclosure (1)

Subj: WEAPON SYSTEM EXPLOSIVES SAFETY REVIEW BOARD MEETING ON THE BROCO RAPID FIRE IGNITER

Copy to:
COMNAVSEASYSCOM (SEA 00)
NAVSURFWARCENDIV Dahlgren (C71 SAFEORD)
NAVSURFWARCENDIV Indian Head (Code 041B)
AOT (Attn: G. KLAUS)
WSESRB Members (electronic copy)

DEPARTMENT OF THE NAVY
WEAPON SYSTEM EXPLOSIVES SAFETY REVIEW BOARD
NAVAL ORDNANCE CENTER
FARRAGUT HALL BLDG D-323
23 STRAUSS AVENUE
INDIAN HEAD MD 20640-5518

8020
Ser N7133/440
11 JUL 97

From: Chairman, Weapon System Explosives Safety Review Board
To: Commander, Marine Corps Systems Command
(Attn: J. BARNETTE, Code PSE)

Subj: WEAPON SYSTEM EXPLOSIVES SAFETY REVIEW BOARD MEETING ON THE BROCO RAPID FIRE IGNITER

Encl: (1) Attendance List Weapon System Explosives Safety Review for The BROCO Rapid Fire Igniter
(2) NAVSURFWARCEN IH ltr 8020HC Ser 041B/370 of 19 Jun 97

1. The Weapon System Explosives Safety Review Board (WSESRB) met 19 May 1997 to review the design of the BROCO Rapid Fire Igniter (BRFI). Attendees are listed in enclosure (1).

2. A presentation was given by a representative of Applied Ordnance Technology, Inc. The presentation highlighted the design and hazards associated with the BRFI.

3. Based upon the presentation, the WSESRB concurred with the storage of the BRFI aboard ship in accordance with the storage regulations for Hazard Division 4.2 "Spontaneously Combustible" materials in accordance with Naval Sea Systems Command Ordnance Publication (OP) 4. If the BRFI igniters are planned to go aboard submarines, they will need the approval of the Submarine Atmosphere Control Board.

4. Enclosure (2) provides a Navy reevaluation of the appropriate hazard class for the subject item. Based on this finding, the Marine Corps/Navy program manager for the subject item may elect to remove the existing hazard class 4.2 markings and store and transport Marine Corps/Navy stocks as non-regulated items that are exempt from DOT marking. Use of this DoD hazard classification does not eliminate the need for Submarine Atmosphere Control Board approval prior to transport aboard submarines.

5. The Board reiterates that, whichever hazard classification is used, the items must be stored in areas appropriate to the assigned and marked hazard class, i.e. the Marine Corps/Navy program manager may elect to use either the commercial hazard classification and mark, store or transport the items as Class Division 4.2 or use the DoD hazard classification and store or transport the items as unmarked, non-regulated items.

PAUL S. WRIGHT
Acting

6055
PSE
21 Jul 97

From: Head, Systems Engineering Branch
To: Director, Ground Weapons Directorate (CBG)

Subj: SAFETY RELEASE FOR BROCO RAPID FIRE IGNITER

Encl: (1) WSESRB ltr 8020, Ser N7133/440 of 11 Jul 97
(2) Naval Surface Warfare Center Indian Head Division ltr 8020HC Ser 0413/370 of 19 Jun 97

1. We have conducted a system safety analysis for the subject igniter.

2. As a result of our analysis, and based upon the information in enclosures (1) and (2), we concur with a Safety Release for production for the Broco Rapid Fire Igniter.

2. The point of contact at this branch is Mr. J.W. Barnette, PSE-S, 784-4531.

G. N. GEORGEADIS

6 August 1997

MEMORANDUM FOR THE RECORD

From: PM, Infantry Weapons

Subj: ASSAULT BREACHER TORCH KIT SYSTEM SAFETY

Ref: (a) COMMARCORSYSCOM ltr Ser PAE93.151 dtd 31 March 93
(b) Mtg btwn M. Halloran/PA&E, T. Parker and J. Barnett/PSE, and L. Vanerka/PSL-CBG of 6 Jun 97

Encl: (1) Safety Assessment Report for the Assault Breacher Torch Kit, Ser 895-072 dtd 29 Aug 95
(2) Program Support ltr Ser PSE dtd 21 Jul 97

1. The subject program was a FY 94 Marine Enhancement Program which received Milestone III approval per reference (a). System Safety Assessment was completed by PSE per enclosure (1) and MSE&RE review was conducted on the igniter portion of the system per enclosure (2).

2. Per reference (b), PSE concurrence with the safety of the subject system coupled with the reference (a) Milestone III decision authorizes PM, Infantry Weapons to field the subject system.

3. In accordance with the MSE&RE review of the igniter, PM, Infantry Weapons elects to remove the hazard class 4.2 and redesignate this item as non-regulated items for the purpose of DoD handling and storage.

D. G. HAYWOOD

Copy to:
PA&E (M. Halloran)
PSE (T. Parker)

MARINE CORPS SYSTEMS COMMAND

Captain Jeffery B. Wilson
Reconnaissance Equipment Project Officer
703-784-2006 ext 2728
Fax 703-784-5842
DSN 278
wilsonj3@quantico.usmc.mil

To: John Baker Date: 9/4/97

Agency: E Systems # of Pages: 7

Fax: DSN 745 3055

Comments:

John,

The igniters are certified. They can be shipped. Enclosed find the info that Brock may use to get the DOT class changed. This will help w/ Japan.

Jeff

DEPARTMENT OF THE NAVY
INDIAN HEAD DIVISION
NAVAL SURFACE WARFARE CENTER
101 STRAUSS AVE
INDIAN HEAD MD 20640-5035

9020HC
Ser 041B/370
19 JUN 1997

From: Commander, Indian Head Division, Naval Surface Warfare Center
To: Commander, Marine Corps System Command, Attn: PSE, 3089 Roan Street, Quantico, VA 22134-5060

Subj: MILITARY STORAGE HAZARD CLASSIFICATION OF BROCO RAPID FIRE IGNITERS

Ref: (a) WSESRB Brief of 19 May 97
(b) PHONCON btwn AOT G. Klaus/IHDIVNAVSURFWARCEN (Code 041B) E. Walseman of 3 Jun 97
(c) Mtg btwn NAVORDCEN (Code 66511) E. Klinghoffer/ IHDIVNAVSURFWARCEN (Code 041B) E. Walseman of 6 Jun 97

1. Based on references (a) through (c), the military storage hazard classification assigned to the Broco Rapid Fire Igniters (BRFI) is non-regulated. This classification is based on the test reported by Garry Klaus, representative of MARCORSYSCOM, where no significant temperature rise resulted from exposure of the activated iron foil to air. This classification is valid only for the BRFI described in the Weapons Systems Explosive Safety Review Board (WSESRB) brief of 19 May 1997.

2. For further information or assistance regarding hazard classification, please contact Ed Walseman, Code 041B, on DSN 354-4383 or commercial (301) 743-4383.

I. BRUCE DALTON
By direction

Copy to:
NAVORDCEN (N713, N7112)

Encl (2)

Comments on letter from SHIPMATE dated 07/03/97

More information is needed to try and arrive at a proper hazard class for this device.

How large is the bored hole-i.e. what is the wall thickness of the tube containing the iron foil?

How long is the device?

What is the weight of the iron foil in the device?

How thick is the metal foil covering the iron foil, and what kind of metal is it?

How is the oxygen introduced?

"Practical tests have shown that,in normal atmospheres, the temperature of the device increases approximately 10-15 F over ambient when the metal seal is punctured." How were these tests conducted?

CWS
11/20/97

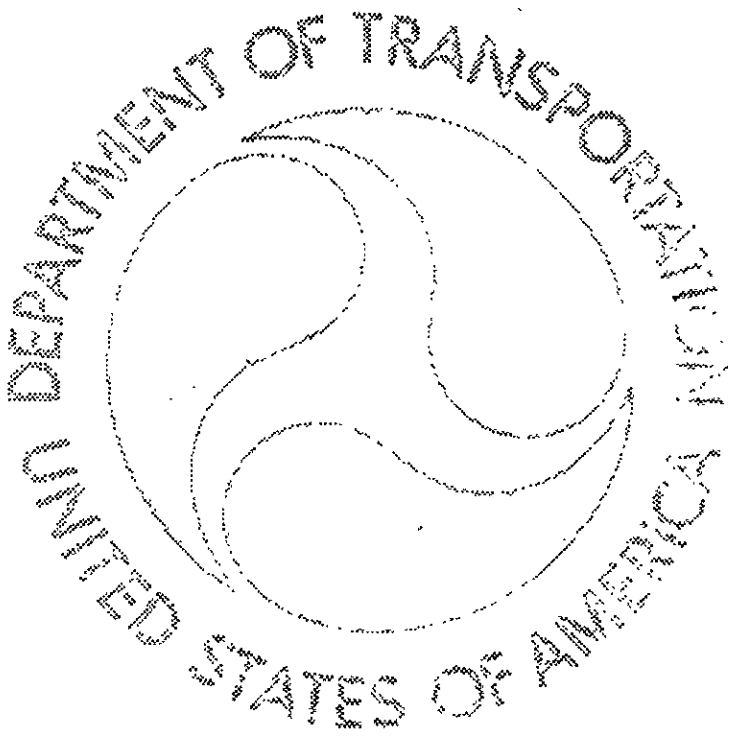
Mr. Hunt, the above mentioned items need to be clarified before we can provide you with a response to your letter. If you have any questions please call (800) 467-4922.

JK
11/24/97

You are receiving a FAX from

OHMS

Office of Hazardous Materials Standards



310
798-4250
4339 fax

Return FAX Number (202) 366-3753

Number of Pages (Including Cover) 2

Date 11/24/97 Time _____

Addressee Steven Hunt

FAX Number _____ Initiator J Karim

Phone _____ Phone 1-800-467-4922

Message _____