INSTITUTE OF MAKERS OF EXPLOSIVES

GRC CONTROL
NO MATERIAL PRODUCTS
EXCEPTED BY PETITION RULEMAKING
WITH PORTIONS
CPSC/OFC OF THE SECRETARY
FREEDOM OF INFORMATION
2006 OCT 19 P 3:17

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The safety & security institute of the commercial explosives industry • Founded 1913

HP07-1

October 16, 2006

Office of the Secretary
U.S. Consumer Product Safety Commission
4330 East West Highway
Bethesda, MD 20814

Re: Petition for Use of the Term "detonator" at 16 CFR 1500.83(a)(35)

Dear Secretary:

The Institute of Makers of Explosives (IME) petitions the Consumer Product Safety Commission (CPSC) under the provisions at 16 CFR 1051 for rulemaking to allow optional use of the term "detonator" in place of the term "blasting cap" at 16 CFR 1500.83(a)(35).

The IME is the safety and security institute of the commercial explosives industry. Our mission is to promote safety and the protection of employees, users, the public and the environment; and to encourage the adoption of uniform rules and regulations in the manufacture, transportation, storage, handling, use and disposal of explosive materials used in blasting and other essential operations.

The IME represents U.S. manufacturers and distributors of commercial explosive materials and oxidizers as well as other companies that provide related services. Over 90 million detonators were consumed in industrial operations in the United States (US) in 2005. IME member companies produce virtually all of the detonators consumed in the US. These products are used in every state and are distributed worldwide.

Commercial explosives are the backbone of our industrial society. Metals, minerals, oil, power, construction activities and supplies, and consumer products are available today because of commercial explosives. The ability to transport and distribute commercial explosives safely and securely is critical to all industries.

The origins of the CPSC mandate at 16 CFR 1500.83(a)(35) to require warnings on detonators go back to 1962 when some explosives companies began printing "Explosives-Dangerous-Blasting Cap" on detonator shells. By 1967, the IME had adopted the policy that all detonators be marked with "Blasting Cap-Dangerous-Explosives".[1] At that time, IME was discussing an effort to seek a federal regulation on

[1] IME Through the Years, ed. by B. Hopler, Institute of Makers of Explosives, Washington, DC, 2003.

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the matter,[2] but I cannot pinpoint the date it became a federal regulation. Then in 1990, IME worked with CPSC and Canada to agree to a harmonized marking that would satisfy cross-border trade. Aside from benefits described later, allowance of the term "detonator" may help clear up some language issues raised by the Canadians at that time.[3]

This request is simply another installment in the history of IME's involvement in this issue through changing times. IME recommends that CPSC adopt the following at 16 CFR 1500.83(a)(35) (added text is underlined):

> Individual detonators or blasting caps are exempt from bearing the statement ``Keep out of the reach of children," or its practical equivalent, if:
>
> (i) Each detonator or cap bears conspicuously in the largest type size practicable the statement ``DANGEROUS--BLASTING CAPS--EXPLOSIVE" or ``DANGEROUS--DETONATOR--EXPLOSIVE" ; ***

Essentially, the terms "detonator" and "blasting cap" are generally synonymous in the explosives community. However, IME has encouraged the use of the term "detonator" instead of the term "blasting cap" whenever possible. IME publishes a list of standard terms in a document called Safety Library Publication (SLP) No. 12, Glossary of Commercial Explosives Industry Terms. This document no longer defines "blasting cap" but refers readers to the definition of "detonator".

SLP-12 defines a "detonator" as:

> Any device containing an initiating or primary explosive that is used for initiating detonation in another explosive material. A detonator may not contain more than 10 grams of total explosives by weight, excluding ignition or delay charges. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, electronic detonators, blasting caps for use with safety fuse, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires. Unless specifically classified otherwise, detonators are classified 1.1 (Class A explosives). Also see DETONATORS 1.4 (CLASS C EXPLOSIVES.)

The term "detonator" may be interpreted by some as being more inclusive than the term "blasting cap" and this is the primary reason IME recommends its use. This minimizes the possibility that an individual may not take recommended precautions when handling initiating devices (detonators). Anecdotally, the term "blasting cap" is to "detonator" what the term "ice box" is to "refrigerator".

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[2] IME memorandum from IME General Counsel to IME members dated November 13, 1967.
[3] Letter from Natural Resources Canada to IME dated April 4, 1992.

The term "detonator" is used more widely than the term "blasting cap" as evidenced by an Internet search of the two terms. Using the Google Internet search engine, the term "detonator" garners over 4 million hits while the term "blasting cap" garners only 116,000 hits.

Because the term "detonator" is more inclusive and more commonly used, its use should result in an increase in safety because more people should know what it means.

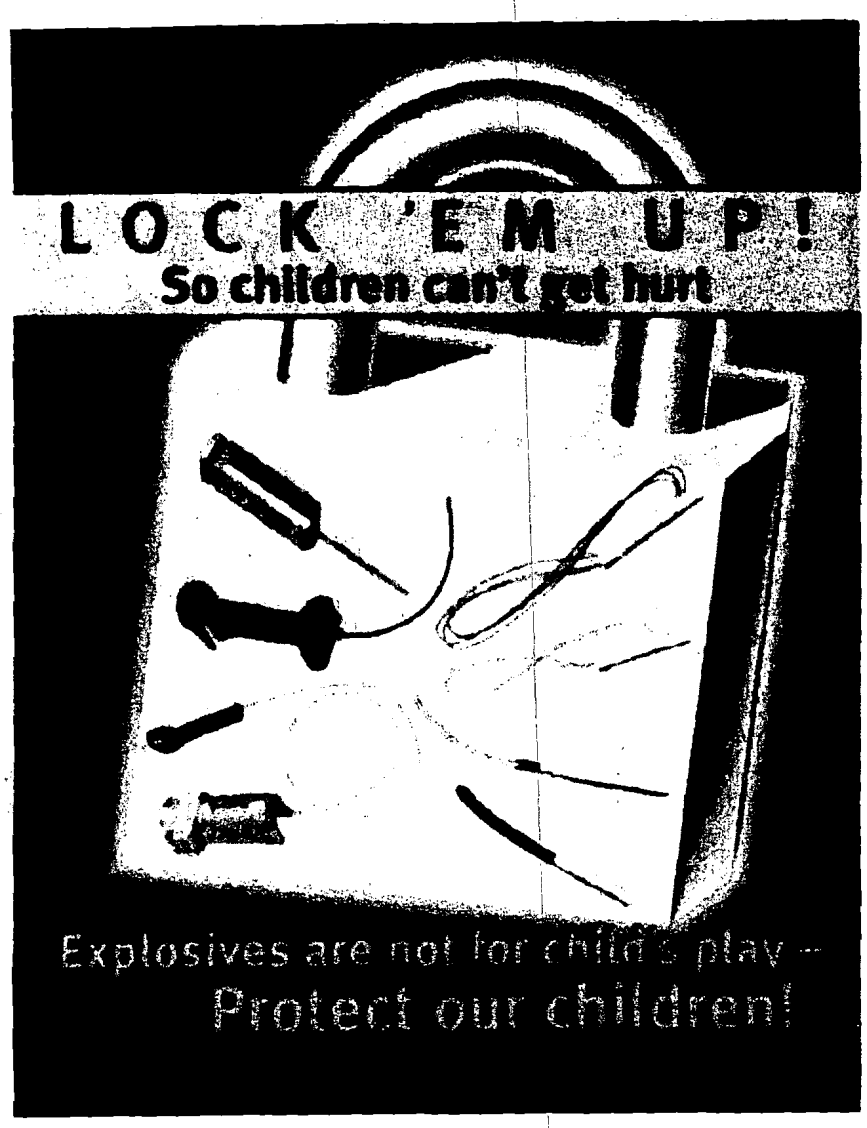
Detonators are very small, usually a metal cylinder about 0.25 inches in diameter and one to four inches long. Because of the limited space available and that printed warnings in other languages such as French and Spanish are common, IME does not believe there is practical benefit to requiring the use of both the term "detonator" and "blasting cap". Also, IME does not believe there is practical benefit to replacing the term "blasting cap" with "detonator" at 16 CFR 1500.83(a)(35) at this time.

Previous communications between IME and CPSC indicate this request should not be problematic.[4] Thank you for your attention to this matter and please contact me if you have any questions.

Sincerely,

Lon D. Santis
Manger of Technical Services

[4] Letter from CPSC to IME dated January 1990.



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12

SAFETY LIBRARY PUBLICATION NO. 12

GLOSSARY OF COMMERCIAL EXPLOSIVES INDUSTRY TERMS

November 2002

MEMBER COMPANIES

ACCURATE ENERGETIC SYSTEMS
McEwen, Tennessee

AMERICAN PACIFIC CORPORATION
Las Vegas, Nevada

AUSTIN POWDER COMPANY
Cleveland, Ohio

BAKER ATLAS
Houston, Texas

DAVEYFIRE, INC.
Walnut Creek, California

DELTA CAPS CANADA
Montreal, Quebec

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DYNO NOBEL INC.
Salt Lake City, Utah

EL DORADO CHEMICAL COMPANY
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ETI CANADA
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JET RESEARCH CENTER
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Irvine, California

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Sandy, Utah

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Allentown, Pennsylvania

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OWEN OIL TOOLS LP
Fort Worth, Texas

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San Diego, California

R&R TRUCKING
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Sugar Land, Texas

SLURRY EXPLOSIVE CORPORATION
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SENEX EXPLOSIVES, INC.
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ST. LAWRENCE EXPLOSIVES CORPORATION
Adam's Center, New York

SUMMA INSURANCE MANAGERS
Houston, Texas

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Mesa, Arizona

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TERRA DINAMICA, LLC
Granby, Connecticut

TITAN COMPLETION PRODUCTS, LTD.
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TRADESTAR CORPORATION
West Jordan, Utah

TREAD CORPORATION
Roanoke, Virginia

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Joplin, Missouri

TRW VEHICLE SAFETY SYSTEMS
Mesa, Arizona

VET'S EXPLOSIVES, INC.
Torrington, Connecticut

VIKING EXPLOSIVES & SUPPLY, INC.
Rosemount, Minnesota

W.A. MURPHY, INC.
El Monte, California

ASSOCIATE STATUS:
FEDERATION OF EUROPEAN EXPLOSIVES MANUFACTURERS
Steveson, Ayrshire, Scotland

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INTRODUCTION

The Institute of Makers of Explosives (IME) is the safety association of the commercial explosives industry in North America (the United States and Canada). IME is a non-profit, incorporated association which was founded in 1913 to provide technically accurate information and recommendations concerning explosive materials and to serve as a source of reliable data about their use.

The primary concern of IME is the safety and protection of employees, users, the public and the environment in the manufacture, transportation, storage, handling use and disposal of explosive materials used in blasting and other essential operations.

This glossary is a dictionary of terms used in the commercial explosives industry.

The words "DETONATOR" and "BLASTING CAP" shall be considered interchangeable and synonymous in this document.

Words used in the singular shall include the plural and in the plural shall include the singular.

Changes from the 1997 edition of this document are indicated by a vertical rule to the left of the new term or newly defined term.

DISCLAIMER

Definitions provided herein are solely for the purpose of general information for the commercial explosives industry. Certain terms could have other meanings in different applications and industries. They should not be substituted for technical advice about specific questions. These definitions are not necessarily intended to conform to those set forth in any governmental regulations or guidelines, nor are they intended to describe any manufacturer's particular product configuration.

GLOSSARY OF COMMERCIAL EXPLOSIVES INDUSTRY TERMS

ABORT	A deliberate termination of the charging and/or firing sequence of a blast.
AC	Alternating current.
ACCEPTOR	A charge of explosives or blasting agent receiving an impulse from an exploding donor charge.
ADOBE CHARGE	A mud-covered or unconfined charge fired in contact with a rock surface without the use of a borehole. Synonymous with BULLDOZE, MUDCAPPING, and PLASTER.
AIRBLAST	The airborne shock wave or acoustic transient generated by an explosion.
"ALWAYS AND NEVER"	List of precautions (IME Safety Library Publication No. 4) printed by the Institute of Makers of Explosives pertaining to the transportation, storage, handling and use of explosive materials. Formerly titled "DO'S AND DON'TS".
AMERICAN CHEMISTRY COUNCIL (ACC)	A non-profit chemical trade organization of companies in the U.S. and Canada who manufacture chemicals for sale. Formerly the Chemical Manufacturers Association (CMA).
AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)	A non-governmental organization concerned with developing safety and health standards for industry.
AMERICAN TABLE OF DISTANCES	A quantity-distance table, prepared and approved by IME, for storage of explosive materials to determine safe distances from inhabited buildings, public highways, passenger railways, and other stored explosive materials.
AMMONIA GELATIN	An explosive which contains nitroglycerin, nitroglycol, or similar liquid sensitizers (nitrate esters) and nitrocellulose with a portion of the liquid sensitizer replaced by ammonium nitrate.
AMMONIUM NITRATE	The ammonium salt of nitric acid represented by the formula NH_4NO_3.
AMPERE	A unit of electrical current produced by 1 volt acting through a resistance of 1 ohm.
ANFO	A blasting agent (1.5D) containing no essential ingredients other than prilled ammonium nitrate and fuel oil.

ANSI	See AMERICAN NATIONAL STANDARDS INSTITUTE.
APPROPRIATE AUTHORITY	See COMPETENT AUTHORITY.
APPROVED, AUTHORIZED APPROVAL, OR AUTHORIZED	Terms which mean APPROVED, APPROVAL, or AUTHORIZED by the authority having jurisdiction.
APPROVED STORAGE FACILITY	A facility for the storage of explosive materials conforming to the requirements of federal and local regulations.
ARTIFICIAL BARRICADE	An artificial mound or revetted wall of earth of a minimum thickness of three feet.
ARMED CHARGE	See primer.
ATF	See BUREAU OF ALCOHOL, TOBACCO AND FIREARMS.
ATTENDED	The physical presence of an authorized person within the field of vision of explosives or the use of explosives.
AUTHORIZED PERSON	An individual approved or assigned by management to perform a specific duty or duties or to be at a specific location or locations.
AUTHORITY HAVING JURISDICTION	The governmental agency, office, or individual responsible for approving equipment, an installation, or a procedure.
AVAILABLE ENERGY	The energy from an explosive material that is capable of performing useful work.
BACKBREAK	Rock broken beyond the limits of the last row of holes in a blast. Synonymous with OVERBREAK.
BALLISTIC MORTAR	A laboratory instrument used for measuring the relative power or strength of an explosive material.
BARRICADED	The effective screening of a building containing explosive materials from a magazine or other building, railway, or highway by a natural or an artificial barrier. A straight line from the top of any sidewall of the building containing explosive materials to the eave line of any magazine or other building or to a point twelve feet above the center of a railway or highway shall pass through such barrier.

BARRIER	A material object or objects that separates, keeps apart, or demarcates in a conspicuous manner such as cones, a warning sign or tape.
BASE CHARGE	The main explosive charge in the base of a detonator.
BATF	See BUREAU OF ALCOHOL, TOBACCO AND FIREARMS.
BINARY EXPLOSIVE	A blasting explosive formed by the mixing or combining of two precursor chemicals, for example, ammonium nitrate and nitromethane.
BENCH	A horizontal ledge from which holes are drilled vertically down into the material to be blasted; benching is a process of excavating where a highwall is worked in steps or lifts.
BENCH HEIGHT	The vertical distance from the top of a bench to the floor or to the top of the next lower bench.
BLACK POWDER	A deflagrating or low explosive compound of an intimate mixture of sulfur, charcoal, and an alkali nitrate, usually potassium or sodium nitrate.
BLAST, (BLASTING)	The firing of explosive materials for such purposes as breaking rock or other material, moving material, or generating seismic waves.
BLAST AREA	The area of a blast within the influence of flying rock missiles, gases, and concussion.
BLAST CONTROLLER	A firing device for electronic detonator circuits which may have functions (such as programming, communication, circuit diagnostics) in addition to charging and transmission of the firing command.
BLASTER	A qualified individual who assists with the design, loading and firing of a blast. May or may not be licensed according to local regulations. May be synonymous with SHOT FIRER.
BLASTER-IN-CHARGE	The blaster who is in charge of and responsible for the design, loading and firing of a blast at a specific job site.
BLASTHOLE	See DRILL HOLE and BOREHOLE.
BLAST PATTERN	The plan of the drill holes as laid out for blasting; an expression of the burden distance and the spacing distance and their relationship to each other. Synonymous with DRILL PATTERN.

BLAST SITE	The area where explosive material is handled during loading of blastholes, including 50 feet (15.2 m) in all directions from the perimeter formed by loaded holes. A minimum of 30 feet (9.1 m) may replace the 50 feet (15.2 m) requirement if the perimeter of loaded holes is marked and separated from non-blast site areas by a barrier. The 50 feet (15.2 m) or 30 feet (9.1 m) distance requirements, as applicable, shall apply in all directions along the full depth of the blasthole. In underground mines, at least 15 feet (4.6 m) of a solid rib, pillar, or broken rock can be substituted for the 50 foot (15.2 m) distance.
BLASTING ACCESSORIES	Non-explosive devices and materials used in blasting, such as, but not limited to, cap crimpers, tamping bags, blasting machines, blasting galvanometers, and cartridge punches.
BLASTING AGENT	An explosive material which meets prescribed criteria for insensitivity to initiation. For storage, Title 27, Code of Federal Regulations, Section 55.11 defines a blasting agent as any material or mixture, consisting of fuel and oxidizer intended for blasting, not otherwise defined as an explosive: provided, that the finished product, as mixed for use or shipment, cannot be detonated by means of a No. 8 test blasting cap (detonator) when unconfined. (ATF Regulation). For transportation, Title 49 CFR, Section 173.50, defines Class 1, Division 1.5 (blasting agent) as a substance which has mass explosion hazard but is so insensitive that there is very little probability of initiation or of transition from burning to detonation under normal conditions in transport.
BLASTING CAP	See DETONATOR.
BLASTING CREW	A group of persons who assist the blaster in loading, tying-in, and firing a blast.
BLASTING GALVANOMETER	An electrical resistance instrument designed specifically for testing electric detonators and circuits containing them. It is used to check electrical continuity. Other acceptable instruments for this purpose are Blasting Ohmmeters and Blasters' Multimeters.
BLASTING LOG	A written record of information about a specific blast as may be required by law or regulation.

BLASTING MACHINE	An electrical or electromechanical device which provides electrical energy for the purpose of energizing detonators in an electric blasting circuit (sometimes called exploder). Also used in reference to certain nonelectric and electronic systems. (Sometimes called blast controller.)
BLASTING MACHINE-CD TYPE	See CAPACITOR-DISCHARGE BLASTING.
BLASTING MACHINE - GENERATOR TYPE	A hand operated electromechanical device which provides an output current to energize electric detonators.
BLASTING MACHINE - RHEOSTAT	A graduated electrical resistance device used to simulate electric detonator resistances for the testing of generator type blasting machines.
BLASTING MAT	A mat of woven steel wire, rope, scrap tires, or other suitable material or construction to cover blastholes for the purpose of preventing flying rock missiles.
BLASTING VIBRATIONS	The energy from a blast that manifests itself in vibrations which are transmitted through the earth away from the immediate blast site.
BLOCKHOLING	The breaking of boulders by loading and firing small explosive charges in small-diameter drilled holes.
BLEND	A mixture consisting of: (a) water-based explosive material matrix and ammonium nitrate or ANFO; or (b) water-based oxidizer matrix and ammonium nitrate or ANFO.
BOOSTER	An explosive charge, usually of high detonation velocity and detonation pressure, designed to be used in the explosive initiation sequence between an initiator or primer and the main charge.
BOOTLEG	The part of a drilled blasthole that remains when the force of the explosion does not break the rock completely to the bottom of the hole. Synonymous with SOCKET.
BOREHOLE	A hole drilled in the material to be blasted, for the purpose of containing an explosive charge, also called BLASTHOLE or DRILL HOLE.
BOX	An outer packaging with complete rectangular or polygonal faces, made of metal, wood, plywood,

	fiberboard, plastic, or other suitable material and authorized by DOT for packaging and transport as Class 1 materials (explosives).
BREAKAGE	A term used to describe the size distribution of the rock fragments created by a blast.
BRIDGEWIRE	A resistance wire connecting the ends of the leg wires inside an electric detonator and which is embedded in the ignition charge of the detonator.
BRISANCE	The shattering power of an explosive material as distinguished from its total work capacity.
BULK MIX	A mass of explosive material prepared for use in bulk form without packaging.
BULK MIX DELIVERY EQUIPMENT	Equipment (usually a motor vehicle with or without a mechanical delivery device) that transports explosive materials in bulk form for mixing or loading directly into blastholes, or both.
BULK STRENGTH	The strength per unit volume of an explosive calculated from its weight strength and density.
BULLDOZE	See ADOBE CHARGE. Synonymous with MUD-CAPPING and PLASTER.
BULLET-RESISTANT	Magazine walls or doors of construction resistant to penetration of a bullet of 150-grain M2 ball ammunition having a nominal muzzle velocity of 2700 feet (823 m)per second fired from a .30 caliber rifle from a distance of 100 feet (30 m) perpendicular to the wall or door. When a magazine ceiling or roof is required to be bullet-resistant, the ceiling or roof shall be constructed of materials comparable to the side walls or of other materials which will withstand penetration of the bullet described above when fired at an angle of 45 degrees from the perpendicular. Tests to determine bullet resistance shall be conducted on test panels or empty magazines which shall resist penetration of 5 out of 5 shots placed independently of each other in an area at least 3 feet (0.9 m) by 3 feet (0.9 m).
BULLET-SENSITIVE EXPLOSIVE MATERIAL	Explosive materials that can be detonated by 150-grain M2 ball ammunition having a nominal muzzle velocity of 2700 feet (823 m) per second when the bullet is fired from a .30 caliber rifle at a distance of 100 feet (30 m) and the test material, at a

temperature of 70° to 75° F (21°-24° C), is placed against a backing material of ½inch steel plate.

BURDEN — The distance from the borehole and the nearest free face or the distance between boreholes measured perpendicular to the spacing. Also the total amount of material to be blasted by a given hole, usually measured in cubic yards or tons.

BUREAU OF ALCOHOL, TOBACCO AND FIREARMS (ATF) — A bureau of the Department of Treasury having responsibility for the promulgation and enforcement of regulations related to the unlawful use of explosive materials under 18 U.S.C. Chapter 40, Section 847.

BUREAU OF MINES — See U S. BUREAU OF MINES.

BUS WIRE — Expendable heavy gauge bare copper wire used to connect detonators or series of detonators in parallel.

CAP CRIMPER — A mechanical device for crimping the metallic shell of a fuse detonator or igniter cord connector securely to a section of inserted safety fuse. May be a hand or bench tool.

CAP SENSITIVE EXPLOSIVE MATERIAL — An explosive material which will detonate with an IME No. 8 TEST DETONATOR when the material is unconfined.

CAPACITOR-DISCHARGE BLASTING MACHINE — A blasting machine in which electrical energy, stored on a capacitor, is discharged into a blasting circuit containing electric detonators.

CARTON — An inner packaging, usually made of cardboard, pasteboard, or similar material and used for the packing of Class 1 materials (explosives). Cartons must be shipped in a DOT authorized outer packaging. See INNER PACKAGING.

CARTRIDGE — An individual closed shell, bag, or tube of circular cross section containing explosive material.

CARTRIDGE COUNT (STICK COUNT) — The number of cartridges in a case. A standard case typically contains about 50 pounds (lb) of explosive material. Unless otherwise specified it refers to the number of 1-1/4 x 8 inch cartridges in a 50 lb case.

CARTRIDGE PUNCH — A wooden, plastic, or non-sparking metallic device used to punch an opening in an explosive to accept a detonator or a section of detonating cord. Synonymous with POWDER PUNCH.

CARTRIDGE STRENGTH — Synonymous with BULK STRENGTH.

CASE — An outer shipping container used for the packaging and transport of Class 1 materials (explosives). See BOX.

CASE INSERT — A set of printed, precautionary instructions, including the IME "Instructions and Warnings" which is included in a case of explosive materials.

CASE LINER — A separate barrier inside a shipping case, used to prevent the escape of explosive materials. A liner may also restrict fumes from escaping from the case and protect the explosive materials from moisture.

CAST BOOSTER — A cast, extruded, or pressed solid high explosive which contains wells or tunnels. Number 8 strength detonator or detonating cord sensitive. May contain pentolite, TNT, composition B or similar type explosives.

CERTIFIED BLASTER — A blaster certified by a governmental agency to prepare, execute, and supervise blasting.

CFM — An abbreviation for cubic feet per minute, a measure of the volume of flow. Usually refers to air flow in mining usage.

CFR — See CODE OF FEDERAL REGULATIONS.

CIRCUIT — A completed path for conveying electrical current. See series circuit, parallel circuit, and series in parallel circuit. (Some nonelectric systems also use the word circuit.)

CLASS A EXPLOSIVES — A term formerly used by the U.S. Department of Transportation to describe explosives which possess detonating or otherwise maximum hazard. (Currently classified as Division 1.1 or 1.2 materials.)

CLASS B EXPLOSIVES — A term formerly used by the U.S. Department of Transportation to describe explosives which possess flammable hazard. (Currently classified as Division 1.3 materials.)

CLASS C EXPLOSIVES — A term formerly used by the U.S. Department of Transportation to describe explosives which contain Class A or Class B explosives, or both as components but in restricted quantities. (Currently classified as Division 1.4 materials.)

CODE OF FEDERAL REGULATIONS — A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal

Government. The Code is divided into 50 titles which represent broad areas subject to Federal regulation.

COLLAR	The mouth or opening of a borehole or shaft.
COLUMN CHARGE	A charge of explosives in a blasthole in the form of a long continuous unbroken column.
COLUMN DEPTH/ COLUMN HEIGHT	The length of each portion of a blasthole filled with explosive materials.
COMMERCIAL EXPLOSIVES	Explosives designed, produced, and used for commercial or industrial applications rather than for military purposes.
COMPATIBILITY LETTER	A letter assigned by DOT which follows an explosive's division number to specify the controls for the transportation, and storage related thereto, of explosives to prevent an increase in hazard that might result if certain types of explosives were transported together.
COMPETENT AUTHORITY	A national agency responsible under its national law for the control or regulation of a particular aspect of the transportation of hazardous materials. Also referred to as APPROPRIATE AUTHORITY (Ref. 49 CFR).
CONFINED DETONATION VELOCITY	The detonation velocity of an explosive material in a substantial container or a borehole.
CONNECTING WIRE	Wire used to extend the firing line or leg wires in an electric blasting circuit.
CONTINUITY CHECK (CIRCUIT CONTINUITY CHECK)	A determination made by instrumentation where possible, and visually in all cases, to show that an initiation system is continuous and contains no breaks or improper connections that could cause stoppage or failure of the initiation process.
CONTOUR BLASTING (SMOOTH BLASTING)	A blasting technique used to produce smooth walls and reduce overbreak in underground blasting. The trim holes have light, well distributed charges and are fired on the last delay period in the round.
CORELOAD	The explosive core of detonating cord, expressed as the weight in grains of explosive per foot.
COUPLING	The degree to which an explosive fills the cross-section of a borehole: bulk-loaded explosives are completely coupled: untamped cartridges are decoupled.

COUPLING DEVICES	An inert device used to create an electrical connection between the various components of an electric or electronic blasting circuit.
COYOTE SHOOTING	A method of blasting using a number of relatively large concentrated charges of explosives placed in one or more small tunnels driven in a rock formation.
CRIMP	The folded ends of paper explosive cartridges; the circumferential depression at the open end of a fuse cap or igniter cord connector which serves to secure the fuse; or the circumferential depression in the blasting cap shell that secures a sealing plug or sleeve into electric or nonelectric detonators.
CRIMPING	The act of securing a fuse cap or igniter cord connector to a section of a safety fuse by compressing the metal shell of the cap against the fuse by means of a cap crimper.
CRITICAL DIAMETER	The minimum diameter for propagation of a detonation wave at a stable velocity. Critical diameter is affected by conditions of confinement, temperature and pressure on the explosive.
CURRENT LEAKAGE	Portion of the firing current bypassing part of the blasting circuit through unintended paths.
CURRENT LIMITING DEVICE	An electric or electromechanical device that limits (1) current amplitude; (2) duration of current flow; or (3) total energy of the current delivered to an electric blasting circuit.
CUSHION BLASTING	A blasting technique used to produce competent slopes or smooth walls. The cushion holes, fired after the main charge, have a reduced spacing and employ decoupled charges.
CUTOFF	A break in a path of detonation or initiation caused by extraneous interference, such as flyrock or shifting ground.
DANGEROUS GOODS ADVISORY COUNCIL (DGAC)	An international organization representing shippers and carriers, container manufacturers and reconditioners, and emergency response companies for hazardous materials. Formerly the Hazardous Materials Advisory Council (HMAC).
DATE-SHIFT CODE	A code, required by Federal regulation (ATF), applied by manufacturers to the outside shipping containers, and, in many instances, to the immediate

containers of explosive materials to aid in their identification and tracing.

D'AUTRICHE METHOD-DETONATION VELOCITY — A method of determining the detonation velocity of an explosive material by employing detonating cord and a witness plate.

DAY BOX — A box which is not approved as a magazine for the unattended storage of explosives. Such box may be used for the storage of explosives during working hours on a job site, provided that it shall always be guarded against theft, and shall be locked and secured against outright lifting. Day boxes shall meet the construction requirements of a Type 3 magazine.

DC — Direct current.

DEALER — Any person engaged in the business of distributing explosive material at wholesale or retail.

DECIBEL — A unit of air overpressure commonly used to measure air blast.

DECK LOADING (DECKING) — A method of loading blastholes in which the explosive charges, called decks or deck charges, in the same hole are separated by stemming or an air cushion.

DECK — An explosive charge that is separated from other charges in the blasthole by stemming or an air cushion.

DECOUPLING — The use of cartridged explosive products significantly smaller in diameter than the diameter of the blasthole. Decoupling or the use of decoupling charges is designed to reduce the charge concentration in the blasthole and minimize stresses exerted on the walls of the blasthole.

DEFLAGRATION — An explosive reaction such as a rapid combustion that moves through an explosive material at a velocity less than the speed of sound in the material.

DELAY — A distinct pause of predetermined time between detonation or initiation impulses, to permit the firing of explosive charges separately.

DELAY BLASTING — The practice of initiating individual explosive decks, boreholes or rows of boreholes at predetermined time intervals using delay detonators, or other delaying means, as compared to

instantaneous blasting where all holes are fired essentially at the same time.

DELAY DETONATOR — An electric, electronic or nonelectric detonator used to introduce a predetermined lapse of time between the application of a firing signal and the detonation of the base charge.

DELAY ELEMENT — The device in a delay detonator that produces the predetermined time lapse between the application of a firing signal and detonation.

DELAY INTERVAL — The nominal time between the detonations of delay detonators of adjacent periods in a delay series; the nominal time between successive detonations in a blast.

DELAY PERIOD — A designation given to a delay detonator to show its relative or absolute delay time in a given series.

DELAY SERIES — A series of delay detonators designed to satisfy specific blasting requirements. There are basically two types of delay series: millisecond (MS) or short period (SP) with delay intervals on the order of milliseconds and long period (LP) with delay time on the order of seconds.

DELAY TAG — A tag, band, or marker on a delay detonator that denotes the delay series, delay period and/or delay time of the detonator.

DELAY TIME — The lapse of time between the application of a firing signal and the detonation of the base charge of a delay detonator.

DEMIL (DEMILITARIZED) EXPLOSIVES — Explosive products that contain certain types of military explosives as major ingredients or components.

DENSITY — The mass of an explosive per unit of volume, usually expressed in grams per cubic centimeter or pounds per cubic foot. (Also see SPECIFIC GRAVITY).

DEPARTMENT OF TRANSPORTATION (DOT) — A cabinet-level agency of the Federal Government. It has the responsibility for the comprehensive regulation of transportation safety and issues regulations governing interstate shipments of explosives and other hazardous materials.

DETONATING CORD — A flexible cord containing a center core of high explosive which may be used to initiate other high explosives.

DETONATING CORD DOWNLINE	The section of detonating cord that extends within the blasthole from the ground surface down to the explosive charge.
DETONATING CORD MS CONNECTORS	Nonelectric short-interval (millisecond) delay devices for use in delaying blasts which are initiated by detonating cord.
DETONATING CORD TRUNKLINE	The line of detonating cord that is used to connect and initiate other lines of detonating cord.
DETONATION	An explosive reaction that moves through an explosive material at a velocity greater than the speed of sound in the material.
DETONATION PRESSURE	The pressure produced in the reaction zone of a detonating explosive.
DETONATION VELOCITY	The velocity at which a detonation progresses through an explosive.
DETONATOR	Any device containing an initiating or primary explosive that is used for initiating detonation in another explosive material. A detonator may not contain more than 10 grams of total explosives by weight, excluding ignition or delay charges. The term includes, but is not limited to, electric blasting caps of instantaneous and delay types, electronic detonators, blasting caps for use with safety fuse, detonating cord delay connectors, and nonelectric instantaneous and delay blasting caps which use detonating cord, shock tube, or any other replacement for electric leg wires. Unless specifically classified otherwise, detonators are classified 1.1 (Class A explosives). Also see DETONATORS 1.4 (CLASS C EXPLOSIVES.)
DETONATORS 1.4 (CLASS C EXPLOSIVE)	Initiating devices which will not mass explode when packaged for shipment. (See MASS EXPLODE)
DIAMETER	The cross-sectional width of a borehole or an explosive cartridge.
DITCH BLASTING	The formation of a ditch by the detonation of a series of explosive charges.
DITCHING DYNAMITE	A nitroglycerin type explosive especially designed to propagate sympathetically from hole to hole in ditch blasting.
DONOR	An exploding charge producing an impulse that impinges upon an explosive "acceptor" charge.

DOPE	Individual, dry, nonexplosive ingredients that comprise a portion of an explosive formulation.
DO'S AND DON'TS	Former name of a list of precautions (IME Safety Library Publication No. 4) printed by the Institute of Makers of Explosives pertaining to the transportation, storage, handling and use of explosive materials and included in cases of explosive materials. Also known as the "ALWAYS AND NEVERS."
DOT	See DEPARTMENT OF TRANSPORTATION.
DOWNLINE	A line of detonating cord or plastic tubing in a blasthole which transmits the detonation from the trunkline or surface delay system down the hole to the primer.
DRILL HOLE	A hole drilled in the material to be blasted for the purpose of containing an explosive charge, also called BLASTHOLE or BOREHOLE.
DRILLING PATTERN	The location of blastholes in relationship to each other and the free face.
DUMMY	A cylindrical unit of clay, sand, or other inert material used to confine or separate explosive charges in a borehole.
DYNAMITE	A high explosive used for blasting, consisting essentially of a mixture of, but not limited to nitroglycerin, nitroglycol, or similar liquid sensitizers, nitrocellulose, ammonium nitrate, sodium nitrate, and carbonaceous materials.
ELECTRIC BLASTING CIRCUIT	An electric circuit containing electric detonators and associated wiring. Also see PARALLEL SERIES, and SERIES IN PARALLEL BLASTING CIRCUITS.
ELECTRIC DETONATOR	A detonator designed for, and capable of, initiation by means of an electric current.
ELECTRICAL STORM	An atmospheric disturbance characterized by intense electrical activity producing lightning strikes and strong electric and magnetic fields. Synonymous with THUNDERSTORM and LIGHTNING STORM.
ELECTRONIC DETONATOR	A detonator that utilizes stored electrical energy as a means of powering an electronic timing delay element/module and that provides initiation energy for firing the base charge.

EMERGENCY PROCEDURE CARD	Instructions carried on a vehicle transporting explosive materials and giving specific procedures in case of emergency.
EMULSION	An explosive material containing substantial amounts of oxidizer dissolved in water droplets, surrounded by an immiscible fuel, or droplets of an immiscible fuel surrounded by water containing substantial amounts of oxidizer.
ENERGY	A measure of the potential for an explosive to do work.
EXPLODE	To react chemically in a rapid manner to produce heat and pressure. The term encompasses both deflagration and detonation.
EXPLODING BRIDGEWIRE DETONATOR (EBW)	A detonator bearing a close resemblance to standard electric detonators but containing no primary explosives. They require high electric current delivered in a very short period that explodes the bridgewire. The resulting shock or pressure wave initiates a low-density secondary explosive.
EXPLOSION	A chemical reaction involving an extremely rapid expansion of gases usually associated with the liberation of heat.
EXPLOSIVE	Any chemical compound, mixture or device, the primary or common purpose of which is to function by explosion.
EXPLOSIVE-ACTUATED DEVICE	Any tool or special mechanized device which is actuated by explosives. The term does not include propellant-actuated devices. (Also see PROPELLANT-ACTUATED POWER DEVICE.) Examples of explosive-actuated devices are jet-tappers and jet perforators.
EXPLOSIVE CHARGE	The quantity of explosive material used in a blasthole, coyote tunnel, or explosive device.
EXPLOSIVE LOADING FACTOR	The amount of explosive used per unit of rock. Also called POWDER FACTOR.
EXPLOSIVE MATERIALS	These include explosives, blasting agents and detonators. The term includes, but is not limited to, dynamite and other high explosives; slurries, emulsions, and water gels; black powder and pellet powder; initiating explosives; detonators (blasting caps); safety fuse; squibs; detonating cord; igniter cord; and igniters.

(continued next page)

A list of explosive materials determined to be within the coverage of *18 U.S.C. Chapter 40, Importation, Manufacture, Distribution and Storage of Explosive Materials*, is issued at least annually by the Director of the ATF of the Department of the Treasury.

The U.S. Department of Transportation classifications of explosive materials used in commercial blasting operations are not identical with the statutory definitions of the Organized Crime Control Act of 1970, Title 18 U.S.C., Section 841. To achieve uniformity in transportation the definitions of the U.S. Department of Transportation in Title 49 Code of Federal Regulations parts 1-999 subdivides these materials into:

DIVISION 1.1-	Mass exploding (Class A explosives)
DIVISION 1.2-	Projection hazard (Class A or Class B explosives)
DIVISION 1.3-	Fire hazard, minor blast (Class B explosives) or projection hazard
DIVISION 1.4-	Minor explosion (Class C explosives) hazard - not mass exploding
DIVISION 1.5-	Insensitive explosives. (Blasting Agents) Very little probability of initiation or transition from burning to detonation during transport.

EXPLOSIVE OILS	Liquid explosive sensitizers for explosive materials. Examples include nitroglycerin, ethylene glycol dinitrate, and metriol trinitrate.
EXPLOSIVE STRENGTH	The amount of energy released by an explosive upon detonation which is an indication of the capacity of the explosive to do work. (See also ENERGY.)
EXTRA (AMMONIA) DYNAMITE	A dynamite in which part of the nitroglycerin is replaced by ammonium nitrate in sufficient quantity to result in the same weight strength.
EXTRANEOUS ELECTRICITY	Electrical energy, other than actual firing current or the test current from a blasting galvanometer, that is present at a blast site and that could enter an electric blasting circuit. It includes stray current, static

electricity, RF (electromagnetic) waves and time-varying electric and magnetic fields.

FAST	Fully activated sequential timing.
FERTILIZER GRADE AMMONIUM NITRATE	A grade of ammonium nitrate as defined by The Fertilizer Institute.
FIRE EXTINGUISHER RATING	A rating set forth in the National Fire Code which may be identified on an extinguisher by a number (5, 20, 70, etc.) indicating the extinguisher's relative effectiveness followed by a letter (A, B, C, etc.) indicating the class or classes of fires for which the extinguisher has been found to be effective.
FIRE-RESISTANT	Construction designed to provide reasonable protection against fire. (For exterior walls or magazines constructed of wood, this shall mean fire resistance equivalency provided by sheet metal of not less than 26 gauge [0.0179 inches] [0.45 mm].)
FIREWORKS	Combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects.
FIRING CURRENT	An electric current of recommended magnitude and duration to sufficiently energize an electric detonator or a circuit of electric detonators.
FIRING DEVICE	A device capable of charging and transmitting a fire command to an electronic detonator circuit. Also, a device capable of detonating an electric or nonelectric detonator.
FIRING LINE	The wire(s) connecting the electrical power source with the electric or electronic blasting circuit.
FLAGS-DANGER	Flags, usually red, which may or may not be imprinted with a warning and used to caution personnel around explosives operations, or displayed on trucks transporting explosives.
FLAMMABILITY	The ease with which an explosive material may be ignited by flame and heat.
FLARE	A pyrotechnic device designed to produce a single source of intense light.
FLASHOVER	The sympathetic detonation between explosive charges or between loaded blastholes.
FLASH POINT	The lowest temperature at which vapors from a volatile combustible substance ignite in air when

exposed to flame, as determined in an apparatus specifically designed for such testing.

FLYROCK	Rocks propelled from the blast area by the force of an explosion.
FORBIDDEN OR NOT ACCEPTABLE EXPLOSIVES	Explosives which are forbidden or not acceptable for transportation by common, contract, or private carriers, by rail freight, rail express, highway, air or water in accordance with the regulations of the U.S. Department of Transportation.
FRAGMENTATION	The breaking of a solid mass into pieces by blasting.
FREE FACE	A rock surface exposed to air or water which provides room for expansion upon fragmentation; sometimes called OPEN FACE.
FUEL	A substance which may react with oxygen to produce combustion.
FUME CLASSIFICATION	See IME FUME CLASSIFICATION.
FUMES	The gaseous products of an explosion. For the purpose of determining the fume classification of explosive materials, only poisonous or toxic gases are considered.
FUSE	See SAFETY FUSE.
FUSE CAP	A detonator which is initiated by a safety fuse; also referred to as an ordinary blasting cap. Synonymous with BLASTING CAP, also see DETONATOR.
FUSE CUTTER	A mechanical device for cutting safety fuse clean and at right angles to its long axis.
FUSE LIGHTERS	Pyrotechnic devices for the rapid and certain lighting of safety fuse.
GAGE (WIRE)	A series of standard sizes such as the American Wire Gage (AWG), used to specify the diameter of wire.
GALVANOMETER	See BLASTING GALVANOMETER.
GAP SENSITIVITY	The maximum length of gap across which detonation wave will travel and initiate a second or receptor cartridge. Both primer and receptor cartridge should be of the same composition, diameter, and weight. Usually refers to gap in air but other media may be used.

GASSING AGENT — Chemicals used to introduce gas bubbles to impart sensitivity and reduce density of explosive compositions.

GELATIN DYNAMITE — A type of highly water-resistant dynamite characterized by its gelatinous or plastic consistency.

GEOLOGY — A description of the types and arrangement of rock in an area; the description usually includes the dip and strike, the type and extent of pre-existing breaks in the rock, and the hardness and massiveness of the rock, as these affect blast design.

GRAINS — In the avoirdupois system of weight measurement 7000 grains are equivalent to one standard, 16-ounce, pound (0.45 kg.). A grain is 0.0648 grams in both the avoirdupois and the troy system.

GROUND FAULT — An electrical path between parts of the blasting circuit and earth.

GROUND VIBRATION — Shaking the ground by elastic waves emanating from a blast; usually measured in inches per second of particle velocity.

GVW — Gross vehicle weight.

HANGFIRE — The detonation of an explosive charge at some non-predictable time after its normally designed firing time.

HARDWOOD — Red oak, white oak, hard maple, ash or hickory, free from loose knots, wind shakes, or similar defects.

HERTZ (Hz) — Synonymous with "cycles per second."

HIGH EXPLOSIVES — Explosives which are characterized by a very high rate of reaction, high pressure development, and the presence of a detonation wave in the explosive.

HIGHWALL — A nearly vertical face at the edge of a bench, bluff, or ledge on a surface excavation.

HIGHWAY — Highway means any road, street, or way, whether on public or private property, open to public travel. "Open to public travel" means that the road section is available, except during scheduled periods, extreme weather or emergency conditions, passable by four-wheel standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight, or class of

registration. Toll plazas of public toll roads are not considered restrictive gates.

HOLE DIAMETER — The cross-sectional width of the borehole.

IGNITER CORD — A small-diameter pyrotechnic cord that burns at a uniform rate with an external flame and used to ignite a series of safety fuses.

IME — See INSTITUTE OF MAKERS OF EXPLOSIVES.

IME-22 CONTAINER — A container (portable), or a compartment (permanently affixed to a vehicle), which is constructed in accordance with IME SLP-22 specifications and is authorized by the Department of Transportation for the transport of certain types of detonators on the same vehicle with other explosives.

IME FUME CLASSIFICATION — A classification indicating the amount of carbon monoxide and hydrogen sulfide produced by an explosive or blasting agent. Explosives with positive oxygen balances are not considered as being acceptable in these classifications. (Only Fume Class 1, 2, or 3 explosives should be used as the main charge in underground operations.)

Fume Class	Amount of poisonous gases per 1-1/4 x 8" (32mm x 203mm) cartridge of explosive Material
1	Less than 0.16 cu.ft. (4.53 liters)
2	0.16 to 0.33 cu.ft. (4.53 to 9.35 liters)
3	0.33 to 0.67 cu.ft. (9.35 to 18.98 liters)

Calculations by the manufacturer are acceptable for determining IME fume Class.

INCENDIVITY — The property of an igniting agent (e.g. spark, flame or hot solid) which indicates it is of sufficient intensity to ignite flammable material or explosive gases.

INHABITED BUILDING — A building regularly occupied in whole or part as a habitation for human beings, or any church, schoolhouse, railroad station, store, or other structure where people are accustomed to assemble, except any building or structure occupied in connection with the manufacture, transportation, storage or use of explosive materials.

INITIATION — The start of deflagration or detonation in an explosive material.

INITIATOR	A detonator, detonating cord or similar device used to start detonation or deflagration in an explosive material.
INNER PACKAGING	A packaging for which an outer packaging is required for transport.
INSTANTANEOUS DETONATOR	A detonator that has a firing time of essentially zero seconds as compared to delay detonators with firing times of from several milliseconds to several seconds.
INSTITUTE OF MAKERS OF EXPLOSIVES (IME)	A non-profit, safety-oriented trade association representing producers of commercial explosive materials in the U.S. and Canada and dedicated to safety in the manufacture, transportation, storage, handling, and use of explosive materials.
INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR	An IME No. 8 test detonator has 0.40 to 0.45 grams PETN base charge pressed to a specific gravity of 1.4 g/cc and primed with standard weights of primer, depending on manufacturer.
INVENTORY	A listing of all explosive materials stored in a magazine.
ISSUING AUTHORITY	The governmental agency, office, or official vested with the authority to issue permits or licenses.
KELLY BAR	A hollow bar attached to the top of the drill column in rotary drilling; also called grief joint, kelly joint, kelly stem.
LEAD-IN-LINE	The shock tube connecting the firing device with a nonelectric blast pattern.
LEADING (LEAD) LINES OR WIRES	The wire(s) connecting the electrical power source with the circuit containing electric or electronic detonators. See FIRING LINE.
LEAKAGE RESISTANCE	The resistance between the blasting circuit (including lead wires) and the ground.
LEGWIRES	The two single wires or one duplex wire extending out from an electric detonator.
LIGHTNING STORM	See ELECTRICAL STORM.
LINES OR WIRES	The wire(s) connecting the electrical power source with the circuit containing electric or electronic detonators. See FIRING LINE.
LIQUID FUELS	Fuels in a liquid state. They may be used with oxidizers to form explosive materials.

LOADING	Placing explosive material in a blasthole or against the material to be blasted.
LOADING DENSITY	The weight of explosive loaded per unit length of borehole occupied by the explosive, expressed as pounds/foot or kilograms/meter of borehole.
LOADING POLE	A nonmetallic pole used to assist the placing and compacting explosive charges in boreholes.
LOW EXPLOSIVES	Explosive which are characterized by deflagration or low rate of reaction and the development of low pressure. See DEFLAGRATION.
MAGAZINE	Any building, structure, or container, other than an explosives manufacturing building, approved for the storage of explosive materials.
MAGAZINE DISTANCE	The minimum distance permitted between any two storage magazines which is expected to prevent propagation of an explosion from one magazine to another.
MAGAZINE KEEPER	A person responsible for the inventory and safe storage of explosive materials, including the proper maintenance of explosive materials, storage magazines and areas.
MAGAZINE, SURFACE	A specially designed and constructed structure for the storage of explosive materials on the surface of the ground.
MAGAZINE, UNDERGROUND	A specially designed and constructed structure for the storage of explosive materials underground.
MAIN EXPLOSIVE CHARGE	The explosive material that performs the major work of blasting.
MANUFACTURING CODES	Code markings stamped on explosive materials packages, indicating among other information, the date of manufacture.
MANTRIP	A trip on which personnel are transported to and from a work area.
MASS DETONATE	See MASS EXPLODE.
MASS DETONATION	When a unit or any part of a quantity of explosive material detonates and causes all or a substantial part of the remaining material to detonate.
MASS EXPLODE (MASS EXPLOSION)	An explosion which affects almost the entire load or quantity of explosives virtually instantaneously.

MAXIMUM RECOMMENDED FIRING CURRENT	The highest electric current which will result in the safe and effective performance of an electric detonator.
METALLIC SLITTER	A device containing a sharp edge, such as a safety razor blade, used for slitting open fiberboard cases.
MILLISECOND	One thousandth part of a second (0.001 or 1/1000 sec.)
MINE SAFETY AND HEALTH ADMINISTRATION (MSHA)	An agency of the Department of Labor concerned with promulgation and enforcement of health and safety regulations in the mining field.
MINIATURIZED DETONATING CORD	Detonating cord with a coreload of 5 grains or less of explosives per foot (16 grains or less per meter).
MINIMUM RECOMMENDED FIRING CURRENT	The lowest recommended electric current to ensure reliable performance of an electric detonator.
MINIMUM GAP SENSITIVITY	An air gap, measured in inches or centimeters, which determines whether the explosive material is within specific tolerances for gap sensitivity. Also see GAP SENSITIVITY.
MISFIRE	A blast or specific borehole that failed to detonate as planned. Also, the explosive materials that failed to detonate as planned.
MOTOR VEHICLE	A vehicle, machine, tractor, trailer, or semitrailer propelled or drawn by mechanical power. Does not include vehicles operated exclusively on rail.
MS CONNECTORS	Nonelectric, short-interval (millisecond) delay devices for use in delaying blasts which are initiated by detonating cord. Same as DETONATING CORD MS CONNECTORS.
MSHA	See MINE SAFETY AND HEALTH ADMINISTRATION.
MSHA APPROVAL	A document issued by MSHA which states that an explosive or explosive unit or a blasting galvanometer or blasting machine has met MSHA requirements for use in underground coal or other explosive dusty or gassy mines and which authorizes an approval marking identifying the explosive or explosive unit or blasting galvanometer or blasting machine as approved as permissible.
MUCKPILE	The pile of broken material resulting from a blast.

MUDCAPPING (MUDCAP)	See ADOBE CHARGE. Synonymous with BULL-DOZE, MUDCAP AND PLASTER.
MULTIPLE PATH TRUNKLINE SYSTEM	Duplication or repetition of trunkline elements in a blast initiation system to provide alternate paths of initiation.
MUNROE EFFECT	The concentration of explosive action through the use of a shaped charge.
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	An independent, non profit association organized to promote the science and improve the methods of fire protection and prevention, electrical safety and other related safety goals.
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS	Standards for explosive materials and ammonium nitrate issued by the National Fire Protection Association.
NATIONAL SAFETY COUNCIL (NSC)	A non-profit organization charged by Congress to provide a regular information service on the causes of accidents and ways to prevent them.
NFPA	See NATIONAL FIRE PROTECTION ASSOCIATION.
NATURAL BARRICADE	Natural features of the ground such as hills, or timber of sufficient density that the surrounding exposures which require protection cannot be seen from the magazine when the trees are bare.
NITROGLYCERIN	An explosive chemical compound used as a sensitizer in dynamite and represented by the formula $C_3H_5(ONO_2)_3$.
NO. 8 TEST CAP	See INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR.
NOLIGHT (NOLITE)	Failure of fuse igniter to ignite safety fuse.
NONELECTRIC DETONATOR	A detonator that does not require the use of electric energy to function.
NONFERROUS	Metals and compounds not containing appreciable quantities of iron.
NONSPARKING METAL	A metal that resists producing a spark when impacted with tools, rock, or hard surfaces.
NSC	See NATIONAL SAFETY COUNCIL.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA)	An agency of the Department of Labor active in eliminating occupational hazards and promoting employee health and safety.
OFFICE OF SURFACE MINING (OSM)	An agency of the Department of the Interior regulating surface coal mining and the surface effects of underground coal mining.
OVERBREAK	See BACKBREAK.
OVERBURDEN	Material of any nature laying on top of a deposit of material which is to be mined.
OXIDIZER OR OXIDIZING MATERIAL	A substance, such as a nitrate, that readily yields oxygen or other oxidizing substances to promote the combustion of organic matter or other fuel.
OXYGEN BALANCE	The percentage of oxygen in an explosive material or ingredient thereof in excess of (+) or less than (-) that which is needed to produce ideal reaction products.
PARALLEL BLASTING CIRCUIT	An electric blasting circuit in which one leg wire of each detonator is connected to one of the wires from the source of firing current and the other wire from the firing current source. (Can also be used to refer to certain nonelectric systems.)
PARALLEL-SERIES BLASTING CIRCUIT	See SERIES IN PARALLEL BLASTING CIRCUIT.
PARTICLE BOARD	A composition board made of small pieces of wood, bonded together.
PARTICLE VELOCITY	A measure of the intensity of ground vibration, specifically the velocity of motion of the ground particles as they are excited by the wave energy.
PARTING	A rock mass located between two seams of coal; a joint or crack in rock.
PASSENGER RAILWAY	Any steam, electric, or other railroad or railway which carries passengers for hire.
PAST	Partially activated sequential timing.
PELLET POWDER	Black powder pressed into cylindrical pellets 2 inches in length and 1-1/4 inches in diameter.
PERMANENT MAGAZINES	Magazines that are permanently fastened to a foundation or immobilized by removing tires. May be left unattended.

PERMISSIBLE DIAMETER (SMALLEST)	The smallest allowable diameter of a particular permissible explosive, as approved by the Mine Safety and Health Administration (MSHA).
PERMISSIBLE EXPLOSIVES (MSHA) APPROVED EXPLOSIVES	Explosives that are approved by the Mine Safety and Health Administration for use in gassy and dusty atmospheres. Permissible explosives must be used and stored in accordance with certain conditions specified by the Mine Safety and Health Administration (MSHA).
PERSON	Any individual, corporation, company, association, firm, partnership, society, or joint stock company.
PETN	An abbreviation for the name of the explosive pentaerythritol tetranitrate.
PLACARDS	Signs placed on vehicles transporting hazardous materials (including explosive materials) indicating the nature of the cargo.
PLASTER	See ADOBE CHARGE. Synonymous with BULLDOZE and MUDCAPPING.
PRECURSOR CHEMICALS	Two or more unmixed, commercially manufactured, prepackaged chemical ingredients (including oxidizers, flammable liquids or solids, or similar ingredients) which are not classified as explosives but which, when mixed or combined, form an explosive.
PLYWOOD	Exterior construction-grade plywood.
PNEUMATIC LOADING	The loading of explosive materials into a borehole using compressed air as the loading or conveying force.
PORTABLE MAGAZINES	Magazines that are not permanently fastened to a foundation or immobilized by removing tires. May be left unattended.
POWDER	A common synonym for explosive materials.
POWDER PUNCH	See CARTRIDGE PUNCH.
POWDER FACTOR	The amount of explosive used per unit of rock. Also called EXPLOSIVE LOADING FACTOR.
POWER SOURCE	The source of power for energizing electric or electronic blasting circuits; e.g., a blasting machine, blast controller, or power line.

PREBLAST SURVEY	A documentation of the existing condition of structures near an area where blasting is to be conducted.
PREMATURE FIRING	The detonation of an explosive charge before the intended time.
PRESPLITTING (PRESHEARING)	A smooth blasting method in which cracks for the final contour are created by firing a single row of holes prior to the initiation of the rest of the holes in the blast pattern.
PRILLED AMMONIUM NITRATE	Ammonium nitrate in a pelleted or prilled form.
PRIMARY BLAST	A blast used to fragment and displace material from its original position to facilitate subsequent handling and crushing.
PRIMARY EXPLOSIVE	A sensitive explosive which nearly always detonates by simple ignition from such means as spark, flame, impact, friction, or other primary heat sources of appropriate magnitude.
PRIMER	A unit, package or cartridge of explosives used to initiate other explosives or blasting agents, and which contains: (1) a detonator: or (2) detonating cord to which is attached a detonator designed to initiate the detonating cord.
PROGRAMMER OR PROGRAMMING UNIT	A device for entering digital information into an electronic detonator or electronic detonator system.
PROPAGATION	The detonation of an explosive charge by an impulse received from an adjacent or nearby explosive charge.
PROPELLANT EXPLOSIVE	An explosive material that normally functions by deflagration and is used for propulsion purposes. It may be Division 1.1, 1.2, or 1.3 material, depending upon its susceptibility to detonation.
PROPELLANT-ACTUATED POWER DEVICE	Any tool or special mechanized device or gas system which is actuated by a propellant or which releases and directs work through a propellant charge.
PUBLIC CONVEYANCE	Any railroad car, streetcar, ferry, cab, bus, aircraft, or other vehicle which is carrying passengers for hire.

PYROTECHNICS	Any combustible or explosive compositions or manufactured articles designed and prepared for the purpose of producing audible or visible effects. Also see FIREWORKS.
QUANTITY-DISTANCE TABLE	A table listing minimum recommended distances from explosive materials stores of various weights to a specific location.
RADIO FREQUENCY ENERGY (RF)	The energy radiated as electromagnetic waves in the radio frequency spectrum.
RADIO FREQUENCY TRANSMITTER	An electronic transmitting device which radiates radio frequency waves. The transmitting device may be fixed (stationary) or mobile, and includes car telephones, citizens band radios, AM and FM radio transmitters, television transmitters and radar transmitters.
RADIO REMOTE FIRING DEVICE	A radio controlled blast firing system. Radio Remote Firing Devices can safely initiate nonelectric shocktube, electric, or electronic detonators by utilizing a controller device, one or more firing devices or shock tube starters, and a digitally encoded radio signal to prevent accidental initiation.
RAILWAY	Any steam, electric or other railroad or railway.
RECEPTOR (ACCEPTOR)	A charge of explosive materials receiving an impulse from an exploding donor charge.
REGULATIONS - FEDERAL, STATE, LOCAL	Regulations promulgated by federal, state or local regulatory agencies governing the manufacture, transportation, storage, sale, possession, handling and use of explosive materials.
RELIEF	The effective distance from a blasthole to the nearest free face. (Synonymous with BURDEN.)
RELIGHT (RELITE)	A nonrecommended practice of attempting to light safety fuse when it apparently did not ignite on a previous attempt.
RESISTANCE	The measure of opposition to the flow of electrical current, expressed in ohms.
ROTATIONAL FIRING	A delay blasting system used so that the detonating explosives will successively displace the burden into the void created by previously detonated explosives in holes which fired at an earlier delay period.

ROUND	A group of boreholes fired or intended to be fired in a continuous sequence with the application of initiating energy.
SAFETY FUSE	A flexible cord containing solid flammable material by which fire or flame is conveyed at a continuous and uniform rate from the point of ignition to a cut end. A fuse detonator is usually attached to that end, although safety fuse may be used without a detonator to ignite material such as deflagrating explosives.
SAFETY STANDARD	Suggested precautions relative to the safety practices to be employed in the manufacture, transportation, storage, handling and use of explosive materials.
SCALED DISTANCE	A factor relating similar blast effects from various weight charges of explosive material at various distances. Scaled distances referring to blasting effects are obtained by dividing the distance of concern by a fractional power of the weight of the explosive materials.
SEAM	A stratum or bed of coal or other material. May also refer to a crack or joint in a blast area which may be filled with mud or other material. A seam may be in any orientation.
SECONDARY BLASTING	Blasting to reduce the size of boulders resulting from a primary blast.
SEISMOGRAPH	An instrument, useful in monitoring blasting operations, which records ground vibration. Particle velocity, displacement, or acceleration is generally measured and recorded in three mutually perpendicular directions.
SEMI-CONDUCTIVE HOSE	A hose, used for pneumatic conveying of explosive materials, having an electrical resistance high enough to limit flow of stray electric currents to safe levels yet not so high as to prevent drainage of static electric charges to ground. Hose of not more than 2 megohms resistance over its entire length and of not less than 1,000 ohms per foot (3,280 ohms per meter) meets the requirement.
SEMIGELATIN DYNAMITE	An explosive that is a cross between ammonia dynamite and ammonia gelatin.
SENSITIVENESS	A measure of an explosive's cartridge-to-cartridge propagating ability under certain test conditions. It is expressed as the distance through air at which a primed half-cartridge (donor) will detonate an unprimed half-cartridge (receptor). Also see GAP SENSITIVITY.
SENSITIVITY	A physical characteristic of an explosive material classifying its ability to be initiated upon receiving an external impulse such as impact, shock, flame, friction or other influence which can cause explosive decomposition.
SEPARATION DISTANCES	Minimum recommended distances from explosive materials accumulations to other specified locations.
SEQUENTIAL BLASTING MACHINE	A blasting machine designed to actuate separate series of detonators at accurately timed intervals. Also called SEQUENTIAL TIMER.
SEQUENTIAL TIMER	See SEQUENTIAL BLASTING MACHINE.
SERIES BLASTING CIRCUIT	An electric blasting circuit that provides one continuous path for the current through all caps in the circuit.
SERIES-IN-PARALLEL BLASTING CIRCUIT	A circuit in which electric detonators are divided into two or more balanced groups being connected together in series and the groups being connected together in parallel.
SHAPED CHARGE	An explosive with a shaped cavity, specifically designed to produce a high velocity cutting or piercing jet of product reaction; usually lined with metal to create a jet of molten liner material. Also see MUNROE EFFECT.
SHEATHED CHARGE (MSHA APPROVED SHEATHED EXPLOSIVE UNIT)	A device consisting of an approved or permissible explosive covered by a sheath encased in a sealed covering and designated to be fired outside the confines of a borehole.
SHELF LIFE	The maximum storage period during which an explosive material retains adequate performance or physical characteristics.
SHOCK TUBE	A small diameter plastic tube used for initiating detonators. It contains only a limited amount of reactive material so that the energy that is transmitted through the tube by means of a detonation wave is guided through and confined within the walls of the tube.
SHOCK TUBE STARTER	A device used to initiate shock tube.
SHOCK WAVE	A transient pressure pulse that propagates at supersonic velocity.

SHORT DELAY BLASTING	The practice of detonating blastholes in successive intervals where the time difference between any two successive detonations is measured in milliseconds.
SHOT ANCHOR	A device that anchors explosive material charges in the borehole so that the charges will not be blown out by the detonation of other charges or, in seismic work, cannot be pulled out of the borehole by the legwires.
SHOT BREAK	A space consisting of an undrilled or drilled area which may include loaded or unloaded blast holes to separate two individual blasts located on the same bench.
SHOT FIRER	See BLASTER. (A shot firer usually refers to an underground coal mine blaster).
SHUNT (SHUNTING)	The shorting together of the free ends of (1) electric detonator leg wires, or (2) the wire ends of an electric blasting circuit or part thereof. The term also applies to an electrical shorting device applied to the free ends of electric detonators by the manufacturer.
SIGNS - EXPLOSIVE (PLACARDS)	Signs, called placards, placed on vehicles transporting explosives denoting the character of the cargo, or signs placed near storage areas as a warning to unauthorized personnel.
SILVER CHLORIDE CELL	A special battery of relatively low current output used in some blasting galvanometers.
SLURRY	An explosive material containing substantial portions of a liquid, oxidizers and fuel, plus a thickener.
SMALL ARMS AMMUNITION	Any cartridge for a shotgun, rifle, pistol, revolver, and cartridges for propellant-actuated power devices and industrial guns. Military-type ammunition containing explosive bursting charges or any incendiary, tracer, spotting, or pyrotechnic projectile is excluded from this definition.
SMALL ARMS AMMUNITION PRIMERS	Small percussion-sensitive explosive charges cased in a cap or capsule and used to ignite propellant powder.
SMOKE	The airborne suspension of solid particles from the products of detonation or deflagration.

SMOKELESS PROPELLANT (SMOKELESS POWDER)	Solid propellant, commonly called smokeless powder in the trade, used in small arms ammunition, cannons, rockets, propellant-actuated power devices. etc.
SMOOTH BLASTING	See CONTOUR BLASTING.
SNAKEHOLE	A borehole drilled in a slightly downward direction from the horizontal into the floor elevation of a quarry face. Also, a hole driven under a boulder.
SOCKET	See BOOTLEG.
SOFTWOOD	Douglas fir or other wood of equal bullet resistance and free from loose knots, wind shakes or similar defects.
SPACING	The distance between boreholes. In bench blasting, the distance is measured parallel to the free face and perpendicular to the burden.
SPECIFIC GRAVITY	The ratio of the weight of any volume of substance to the weight of an equal volume of pure water.
SPRINGING	The practice of enlarging the bottom of a blasthole by firing a relatively small charge of explosive material. Typically used in order that a larger charge of explosive material can be subsequently loaded in the same borehole.
SQUIB	A firing device that burns with an external flash. Used for igniting black powder or pellet powder.
STABILITY	The ability of an explosive material to retain chemical and physical properties specified by the manufacturer when exposed to specific environmental conditions over a particular period of time.
STATIC ELECTRICITY	Electric charge at rest on a person or object. It is most often produced by the contact and separation of dissimilar insulating materials.
STEADY STATE VELOCITY	The characteristic velocity at which a specific explosive at a given charge diameter will detonate.
STEEL	General purpose (hot or cold rolled) low-carbon steel such as specification ASTM A366 or equivalent.
STEMMING	Inert material placed in a borehole on top of or between separate charges of explosive material. Used for the purpose of confining explosive

materials or to separate charges of explosive material in the same borehole.

STORAGE	The safekeeping of explosive materials usually in specially designed structures called magazines.
STRAIGHT GELATIN	An explosive which contains nitroglycerin, nitroglycol, or similar liquid sensitizers and sodium nitrate, mixed with nitrocellulose.
STRAY CURRENT	A flow of electricity outside an insulated conductor system.
SUBDRILLING	The practice of drilling boreholes below floor level or working elevation to insure breakage of rock to working elevation.
SUBSONIC	Less than the speed of sound in air at the elevation in question.
SUPERSONIC	Greater than the speed of sound in air at the elevation in question.
SYMPATHETIC DETONATION	The detonation of an explosive material as the result of receiving an impulse from another detonation through air, earth or water. Synonymous with SYMPATHETIC PROPAGATION. (See also FLASHOVER.)
SYMPATHETIC PROPAGATION	See SYMPATHETIC DETONATION.
TABLE OF RECOMMENDED SEPARATION DISTANCES OF AMMONIUM NITRATE AND BLASTING AGENTS FROM EXPLOSIVES OR BLASTING AGENTS	A quantity distance table designed to prevent explosion of ammonium nitrate and ammonium nitrate-based blasting agents by propagation from nearby stores of high explosives or blasting agents. It is based on a "donor-receptor" relationship developed by the U.S. Bureau of Mines.
TACHOGRAPH	A recording device in a truck that indicates on a time basis the running and stopping times of a vehicle.
TAMPING	The action of compacting the explosive charge or the stemming in a blasthole. Sometimes refers to the stemming material itself.
TAMPING BAGS	Cylindrical bags containing stemming material and used in boreholes to confine the explosive material charge.
TAMPING POLE	A wooden or plastic pole used to compact explosive charges or stemming. (See also LOADING POLE.)

TEMPORARY STORAGE	Storage of explosives for less than 24 hours.
TEST BLASTING CAP NO. 8	See INSTITUTE OF MAKERS OF EXPLOSIVES NO. 8 TEST DETONATOR.
THEFT-RESISTANT	Construction designed to deter illegal entry into facilities used for the storage of explosive materials.
THUNDERSTORM	See ELECTRICAL STORM.
TOE	In bench blasting, excessive burden measured at the floor level of the bench.
TRUNKLINE	See DETONATING CORD TRUNKLINE. (Certain shock tube or gas-initiated nonelectric initiating systems also use the term TRUNKLINE).
TWO-COMPONENT EXPLOSIVE	See BINARY EXPLOSIVE.
UL	See UNDERWRITERS LABORATORY.
UNBARRICADED	The absence of a natural or artificial barricade around explosive storage areas of facilities.
UNCONFINED DETONATION VELOCITY	The detonation velocity of an explosive material fired without confinement; for example, a charge fired in the open. (Paper tubes are generally not considered as confinement.)
UNDERWRITERS LABORATORY INC. (UL)	A nationally recognized incorporated testing laboratory qualified and equipped to conduct the necessary tests to determine compliance with appropriate standards and the satisfactory performance of materials or equipment in actual usage.
USBM	See U.S. BUREAU OF MINES.
U.S. BUREAU OF MINES (USBM)	A former bureau of the Department of Interior active in promoting safety in coal mines and in carrying out broad programs in mining and related fields.
VOLT	The unit of electromotive force. It is the difference in potential required to make a current of one ampere flow through a resistance of one ohm.
VOLUME STRENGTH	Synonymous with CARTRIDGE STRENGTH. See BULK STRENGTH.
WARNING SIGNAL	A visual or audible signal which is used for warning personnel in the vicinity of the blast area of the impending explosion.

WASTE ACID	Residual or spent acid from a nitration process.
WATER GEL	An explosive material containing substantial portions of water, oxidizers and fuel, plus a cross-linking agent.
WATER RESISTANCE	The ability of an explosive to withstand the desensitizing effect of water penetration.
WATER STEMMING BAGS	Water filled plastic bags with a self-sealing valve which meet the requirements of the Mine Safety and Health Administration (MSHA) as specified in 30 CFR Parts 75. (See also TAMPING BAGS.)
WATT	A unit of electrical power equal to one joule per second.
WEATHER-RESISTANT	Construction designed to offer reasonable protection against weather.
WEIGHT STRENGTH	The energy of an explosive material per unit of weight. Often expressed as a percentage of the energy per unit of weight of a specified explosive standard.
WIRING HARNESS	A term denoting specifically configured wire assemblies for connecting electronic detonator and/or firing circuits.

DESTRUCTION OF COMMERCIAL EXPLOSIVE MATERIALS

At times it may be necessary to destroy commercial explosive materials. These may consist of explosives or blasting agents from containers which have been broken during transportation or may be materials that have exceeded their recommended shelf life or are believed to be overage or are no longer needed.

Due to the many developments in explosive technology over the past few years the appearance and characteristics of products have undergone marked changes. To be sure that you are familiar with the properties of the product that you plan to destroy, the manufacturer of that product should be consulted for the most current product information and the recommended method of disposal and/or destruction.

The member companies of the Institute of Makers of Explosives have agreed to supply advice and assistance in destroying explosives. If the manufacturer is known, seek his assistance. If the manufacturer is not known, a member company of the Institute of Makers of Explosives will provide advice or assistance.

The above policy of the IME member companies relates only to commercial explosive materials. It does not include handling improvised explosive devices of bombs, military ordnance, military explosives or homemade explosive materials.

IME member companies also cannot become involved in destroying explosive materials which have been used for illegal purposes, are reportedly stolen property, or are considered as evidence in any potential civil litigation or criminal prosecution.

U.S. CONSUMER PRODUCT SAFETY COMMISSION

WASHINGTON, D.C 20207

RECEIVED

I.M.E.

Thomas P. Dowling, Manager
Technical Services
Institute of Makers of Explosives
1120 Nipeteenth St. N.W., Suite 310
Washington, DC 20036-3605

Dear Mr. Dowling:

This is to confirm our telephone conversations and respond to your June 2, 1989 letter regarding the labeling of detonators (blasting caps) under the Federal Hazardous Substances Act (FHSA).

The labeling to which you refer, "DANGEROUS - BLASTING CAPS - EXPLOSIVE", under 16 CFR 1500.83(a)(35)(i) is not a requirement under the FHSA, but rather a condition of an exemption from the full labeling requirements. The labeling requirements of the FHSA are predicated on the condition that the product is a hazardous substance intended, or packaged in a form suitable, for use in the household. With all the restrictions which have been placed on the distribution and possession of detonators (blasting caps) in recent years we doubt that any would be subject to the labeling requirements of the FHSA. However, in the event that a manufacturer or distributor of detonators (blasting caps) did distribute them for household use we would not object to the alternative language, "DANGER - BLASTING CAPS - DETONATEUR - EXPLOSIVE", you have suggested.

THIS INTERPRETATION IS BASED SOLELY ON THE INFORMATION CURRENTLY AVAILABLE TO THE STAFF AND THE ENFORCEMENT POSTURE THE CPSC CURRENTLY HAS IN EFFECT. IT COULD BE CHANGED IF THE FACTS CHANGE, AND COULD BE CHANGED OR SUPERSEDED BY THE COMMISSION.

Sincerely,

Charles M. Jacobson
Division of Regulatory Management
Directorate for Compliance and
Administrative Litigation

Energy, Mines and Resources Canada
Énergie, Mines et Ressources Canada

Ottawa, Canada
K1A 0E4

Explosives Division
580 Booth St.

Division des explosifs
580, rue Booth

RECEIVED
MAY 6 1992
I.M.E.

1992.04.28

Institute of Makers of Explosives
1120 Nineteenth Street, N.W.
Suite 310
Washington, D.C. 20036-3605
USA

ATTENTION: T.P. Dowling

Dear Sir:

RE: Markings on Detonators

Thank you for your letter of 21 April 1992 which embarrasses me somewhat. I was sure I had replied to your letter of 20 September last year.

You will recall that I had agreed the marking **BLASTING CAP - EXPLOSIVE - DANGER - EXPLOSIF** would be, in my opinion, satisfactory. The traditional Canadian marking is **EXPLOSIVE - DANGER - EXPLOSIF** and your proposed marking included this complete marking.

However, a colleague of mine later pointed out that the inclusion of the words **BLASTING CAP**, since it meant that more information was given in English than in French, could be held to breach the regulations unless the French equivalent was also included.

Hence your final suggestion of **EXPLOSIVE - EXPLOSIF - DANGER - DÉTONATEUR - BLASTING CAP** is the best suggestion of all. It is difficult to see how anyone could object to it. It contains the full usual Canadian warnings plus the word détonateur and retains the words blasting cap around which the IME has built its so successful public awareness safety program. I might make one suggestion to ward off the super-critic. If the detonator shell will accommodate it and printing clarity allow it, there should be an acute accent over the first e of détonateur like this **DÉTONATEUR**.

Yours sincerely,

Richard Shaw

R. Shaw
Chief Inspector of Explosives
RS/myl

(EXHIBIT "A")

INSTITUTE OF MAKERS OF EXPLOSIVES

T. T. [illegible]
President

L. W. [illegible]
Vice President

HARRY L. [illegible], JR.
Secretary-Treasurer

420 LEXINGTON AVENUE, NEW YORK, N. Y. 10017 • (Area Code 212) MUrray Hill 3-4520

G-327

November 13, 1967

To: All Committee Representatives
All IME Members

From: IME Counsel

This is a summary of the report which I made to the Annual Meeting concerning the submission to Mr. Dale Miller of the U.S. Dept. of Health, Education and Welfare on October 5, 1967.

At the request of Mr. Miller I met with him in his office in Washington to describe both the practices of IME members in labeling blasting caps and their containers, and the Institute's program of blasting cap safety education. I was assisted by Morris Lore, Esq., of the Du Pont Legal Department.

Discussion of the history of the existing IME program was divided into three categories, with presentation of samples appropriate to each:

1) Safety education for children, including posters, bookmarks, cap display boards, and films with pertinent statistics;

2) Safety education for users aimed at keeping blasting caps locked up and away from children, including posters and magazine ads, with pertinent statistics;

3) Labeling of blasting caps and sleeve wrappers.

In connection with the third category Mr. Miller was informed that IME was of the opinion that the words "BLASTING CAPS - DANGEROUS - EXPLOSIVE" should alone appear on cap bodies. He was told that we had experimented with additional warning messages and could add them, if desirable, but that we felt that extra words would make the writing smaller and would dilute the force of the warning.

The recommendations of IME's Public Safety Committee concerning package markings were next discussed. Mr. Miller was told that the Public Safety Committee recommended that 3/4 of the top of

each box containing blasting caps, that is, the immediate container, should be devoted to the warning:

"DANGEROUS - EXPLOSIVES
KEEP FROM CHILDREN
LOCK UP BLASTING CAPS"

The remaining 1/4 could be used for company identification. (See Appendix A.) Description of the caps and precautions for storage would be up to each company and could be placed as desired on the remainder of the box (sides and ends). It was pointed out that this was not a "display" item, so that the top was the place for the warning to keep from children. Mr. Miller was also told that it was recommended that the words KEEP FROM CHILDREN be reproduced on the inside, for example on the ears, or on the inside of the lid, so that it would serve as a reminder. During the discussion, it was suggested that the sleeve wrappers on electric caps should read: "EXPLOSIVE - DANGEROUS - KEEP FROM CHILDREN."

The meeting concluded on friendly terms. I stated that we desired approval by DHEW of our labeling practices and that, should an exemption be required, we be permitted to draft the request in our own language. This was agreed to.

We have not yet received any ruling, although Mr. Miller has made an inquiry by telephone to clarify some of the information.

Based upon the foregoing, I recommended at IME's Annual Meeting on November 3, 1967, and repeat the recommendations, that the member companies concerned with the manufacture or distribution of blasting caps institute the following practices based upon the Public Safety Committee's deliberations, as soon as reasonably possible:

1) Change the printing on box tops (not the large outer or shipping cartons, but the immediate containers) to comply with the sample, Appendix A; and repeat "KEEP FROM CHILDREN" on the inside to be visible as a reminder when the box is opened;

2) Reexamine their caps to insure that the color of the ink of the warning message, "BLASTING CAP - DANGEROUS - HIGH EXPLOSIVE," makes as great a contrast as possible with the color of the cap body.

3) Consider removal of any extra wording on cap bodies, such as trade names or type of cap so that there appears only "BLASTING CAP - DANGEROUS - EXPLOSIVE" (the order of words is not vital);

4) Print on the sleeve wrapper or shunt cover the words "DANGEROUS - EXPLOSIVE - KEEP FROM CHILDREN" and make such lettering as prominent or more prominent than the manufacturer's name; and

5) Add a featured warning on the "DO'S and DON'TS" insert to read: "Lock up Blasting Caps - Keep From Children."

In my opinion, these measures will be approved by DHEW and I believe them to be legally permissible and consistent with accepted safety practices.

Sincerely,

Frank H. Gordon

FRANK H. GORDON
Counsel

FHG:dg
Enc. - Appendix A

IME Through the Years

INSTITUTE OF MAKERS OF EXPLOSIVES

Robert B. Hopler, Editor

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Institute of Makers of Explosives, 1120 Nineteenth Street, N.W., Suite 310, Washington, D.C. 20036

Introduction

In 2003 the Institute of makers of Explosives will celebrate its 90th anniversary, making it one of the oldest organizations in America whose primary concerns are safety and security.

This is a new and revised edition of a booklet which was initially prepared in 1988 to commemorate the growth and development of the IME since its founding on July 15, 1913. With this new edition we hope to continue this documentation of progress in fostering safe and secure practices in the manufacture, transportation, storage, handling, and use of commercial explosives and related energetic materials.

This booklet is dedicated to member companies both past and present and to those people whose commitment to safety and whose countless hours of work have enabled the IME to be recognized as the leader in explosives safety in North America.

While we reflect on the many accomplishments of the past, we are aware of the challenges facing the explosives industry in the future and rededicate ourselves to the principal purpose of the IME, which is to remain at the forefront of explosives safety and security.

J. Christopher Ronay

President

2003

The IME acknowledges and expresses sincere appreciation for the efforts of the following individuals presently or formerly associated with Ireco/Dyno Nobel, without whom this publication would not have been possible: Robert B. Hopler, for his hundreds of hours of research through over 15,000 pages of IME minutes on microfiche and hard copy; Debbie Merriman, for her seemingly-endless hours of typing from dictated audio tapes; and John Anderson, for his outstanding artistic and publishing skills which turned it all into this final product. Also deserving much credit is Theresa Schneider, former IME Secretary-Treasurer, who coordinated the job for the IME for the initial 1988 edition.

Table of Contents

1 Founding of the IME

3 Historical List of Member Companies

11 List of Officers

13 Year-by-Year Highlights

29 Open-Price Association

31 Blasting Cap Safety Education Program

33 Movies, Videos and Television Spots

35 Safety Library Publications

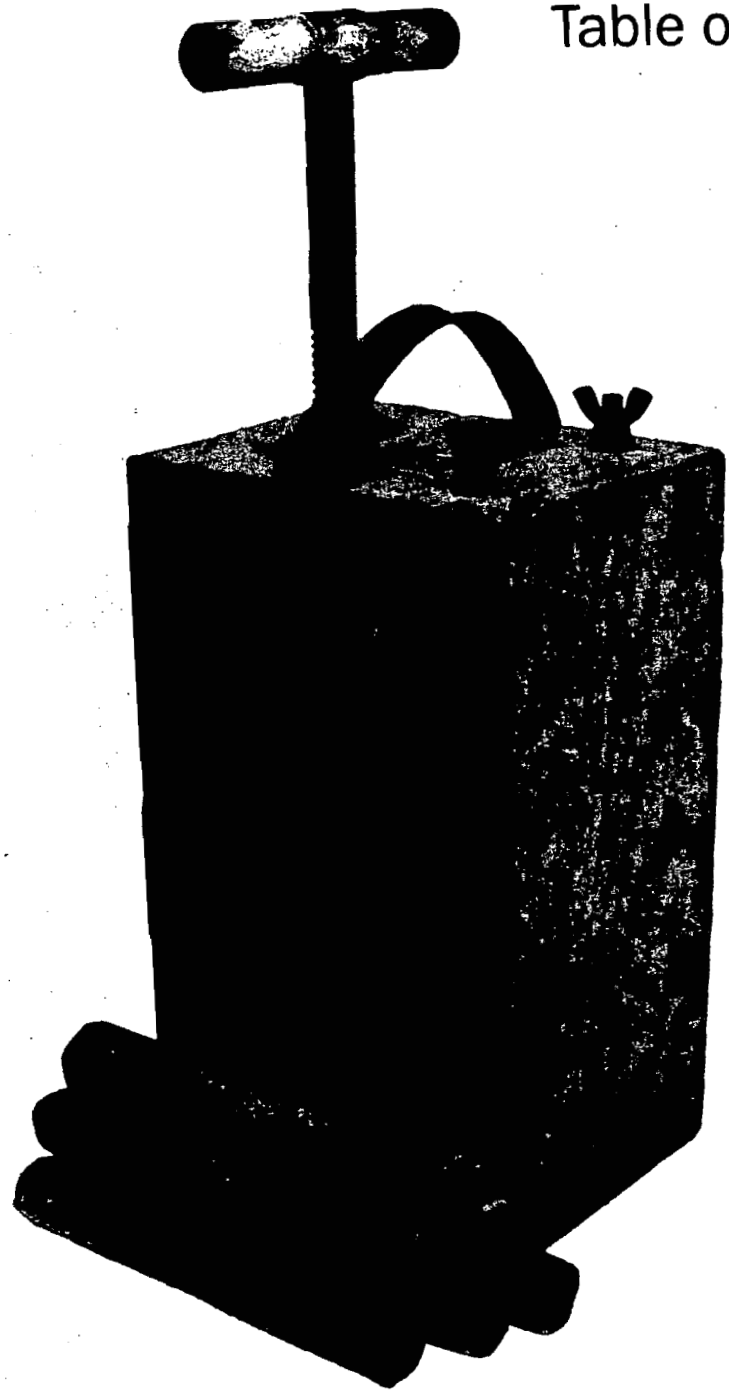
36 Maps and Charts

37 Hardbound Books

39 Evolution of Dynamite Boxes and Black Powder Kegs

41 Tonnage Reporting

43 Standardization Efforts



"Competition Is War, and 'War Is Hell'"

THE NEW COMPETITION

AN EXAMINATION OF THE CONDITIONS UNDERLYING THE RADICAL CHANGE THAT IS TAKING PLACE IN THE COMMERCIAL AND INDUSTRIAL WORLD—THE CHANGE FROM A *COMPETITIVE TO A COÖPERATIVE BASIS*

BY

ARTHUR JEROME EDDY

AUTHOR OF "THE LAW OF COMBINATIONS," ETC.

NEW EDITION

CHICAGO
A. C. McCLURG & CO.
1913

CONSTITUTION

OF

INSTITUTE OF MAKERS OF EXPLOSIVES

ARTICLE I.

NAME.

The name shall be Institute of Makers of Explosives.

ARTICLE II.

OBJECTS.

The objects of the Institute are as follows:

A. To promote publicity in the transaction of business, and to promote cordial and friendly relations among members, by means of stated meetings, and to correct unfair and pernicious practices and customs.

B. To gather accurate information regarding operating conditions, to the end that each member, however small his or its output, may be placed, in so far as data for the intelligent conduct of his or its business go, on a footing of equality with other manufacturers having larger facilities, it being one of the underlying convictions of the Institute that intelligent competition is far better for the industry than ignorant competition. In this connection it is

After the disbanding of the Gunpowder Trust Associati 1904, the Association of Indepenc Powder and Dynamite Manufact was formed, followed in May of 1 by the formation of the Associatic of Manufacturers of Powder and I Explosives. Due to a lack of succe attracting all manufacturers to m ship, these organizations did not

In the spring of 1913, a meeting w by explosive manufacturers to dis *"many serious problems effecting their p industry (such as legislation, transport storage). After deliberation, a committe appointed to confer with Mr. Arthur J. E attorney in Chicago, whose experience a utation was known to many of those pres Mr. Eddy formulated a draft of a Constit setting forth objects which seemed to con with the ideas of the manufacturers. Subs the manufacturers of blasting powder me New York City. Mr. Eddy was present at meeting and explained the scope and mea of the constitution he prepared. The bene to be derived were so apparent that the c tion was enlarged in order that it might all manufacturers of explosives in the Un States."* [2]

On July 15, 1913, the first organizat meeting of the Institute of Makers Explosives took place at the Congr Hotel in Chicago, Illinois. One of t stated objectives of the original co tion was *"to promote cordial and frien tions among members."*

Founding of The IM

According to an IME pamphlet entitled "Organization and Purposes of the Institute of Makers of Explosives",

"The Institute was organized to promote publicity in the transaction of the explosives business; to gather and distribute accurate information regarding the industry; to maintain high and uniform standards in the manufacture of explosives; to devise ways and means for promoting the use of explosives, and informing the public regarding the proper use of same; to take up and discuss all traffic questions arising with public carriers; to deal intelligently and fairly with the many conflicting laws affecting the manufacture and transportation of explosives; to co-operate with the Bureau for the Safe Transportation of Explosives and other Dangerous Articles, in devising rules and regulations that will adequately protect the public; to co-operate with the public authorities in solving the problem of safe storage of explosives; to deal intelligently and scientifically with insurance problems; to consider and adopt sanitary, hygienic and safe measures and appliances and to consider the insuring and pensioning of employees; to compile and exchange accident and near accident data in the experience of each member for the purpose of reducing explosives accidents thereby reducing personal injury and loss of life; and to distribute accurate credit information."

Attending the meeting were representatives of the following companies: The Aetna Explosives Company; American Powder Mills; Atlas Powder Company; Austin Powder Company; Burton Powder Company; E.I. du Pont de Nemours & Co.; The Equitable Powder Manufacturing Company; Fort Pitt Powder Company; Hercules Powder Company; Illinois Powder Company; Independent Powder Co. of Missouri; Jefferson Powder Co.; Keystone National Powder Company; The King Powder Company; Miami Powder Company; Senior Powder Company; Standard Powder Company; and United States Powder Company. (See the Historical List of Member Companies for the names of founding members.)

The first officers of the Institute were: Addison G. Fay, Aetna, President; Charles L. Patterson, DuPont, Vice President; A. Lent, Austin, Treasurer; and C.C. Quincy, Secretary (the first staff officer).

The first Executive Committee, in addition to the officers, were: George G. King, The King Powder Company; Adolphus C. Blum, Keystone National Powder Company; Russell H. Dunham, Hercules Powder Company; and A.G. Cummings, United States Powder Company.

Five committees were formed: Committee on Trade Conditions and Promoting the Use of Explosives; Committee on Traffic and Storage Conditions; Committee on Welfare of Employees; Committee on Uniform Legislation; and Committee on Standardization.

[1] Mr. Eddy was the author of *The New Competition*.

[2] From correspondence dated June 9, 1913 signed by Addison G. Fay, IME's first President, to powder manufacturers.

Member Companies

(Unless otherwise specified, Companies are Regular members)
(*Founding Company)

A.E. Sibley, Inc.	Nov 1986- Oct 1991	Associate member. Acquired by IRECO
Accurate Energetic Systems	Oct 1996-present	Associate member
Aetna Explosives Company	Nov 1914-1921	Absorbed Aetna Powder Co., Keystone National Powder Co., Pluto Powder Co., Jefferson Powder Co., Miami Powder Co., and F.K. Brewster.
*Aetna Powder Co.	Sept 1913-Nov 1914	Acquired by Aetna Explosives.
Alliant Techsystems, Inc.	Nov 1994-Feb 2000	Assumed associate membership of Hercules upon acquisition of propellant business. Resigned.
American Cyanamid Co.	Sept 1934-Nov 1969	Ceased manufacture of explosives.
American Powder Co.	Nov 1933-Sept 1934	Acquired by American Cyanamid.
*American Powder Mills	July 1913-Jan 1915, May 1923-?	Represented as late as Mar 1925 by A.E. Sibley. Actual termination date unknown.
Amos L. Dolby Co.	Apr 1987-1998	Associate member. Resigned.
Angus Chemical Co.	Aug 1982-Dec 1983	Sold explosives business.
Apache Nitrogen Products	Apr 1990-Nov 1991, Jan 1999-May 1999	Resigned, then rejoined and resigned again.
Apache Powder Co.	May 1949-April 1990	Changed name to Apache Nitrogen Products.
Atlas Oil Field Services	May 1987-June 1987	Associate member. In June 1987 changed name to Atlas Wireline Services. Prior to 1987 was Dresser Atlas.
*Atlas Powder Co.	Jul 1913-May 1992	Changed name to ICI Explosives USA Inc.
Atlas Wireline Services	Jun 1987-Aug 1995	Associate member. Changed name to Western Atlas International.

*Austin Powder Co.	Jul 1913-Present	
Baker Atlas	Aug 1999-present	Associate member. Formerly Western Atlas International.
Baker Hughes INTEQ	Apr 1993-Feb 1997	Former name Baker Sand Control. Resigned due to leaving explosives business.
Baker Sand Control	Oct 1991-Apr 1993	Associate member. Changed corporate name to Baker Hughes INTEQ.
H.L. & A.G. Balsinger, Inc.	Apr 1987-Feb 1992	Changed name to Senules Explosives, Inc.
Black Diamond Powder Co.	July 1920-Oct 1930	Consolidated into Peerless Union.
Burton Explosives Corp.	Sept 1931-Sept 1934	Acquired by American Cyanamid.
*Burton Powder Co.	Jul 1913-Nov 1917	Acquired by Grasselli Powder Company.
California Cap Co.	Jun 1937-May 1948	Company dissolved.
Cellulose Products, Inc.	No record of joining, but appears on Apr 1927 listing.	A.E. Sibley represented this company, December 1926 and up to March 1927.
C-I-L, Inc.	May 1980-1990	Changed name to ICI Explosives Canada.
Coast Fuse, Inc.	Nov 1966-May 1968	Acquired by Apache Powder Company.
Columbia Powder Co.	Nov 1951-Dec 1951	Acquired by Olin.
Daveyfire, Inc.	Mar 1997-Present	Associate member.
Douglas Explosives, Inc.	Oct 1991-Present	Associate member.
Dow Chemical Co.	May 1966-Sept 1975	Acquired by Energy Sciences and Consultants, Inc.
Dresser-Atlas	Dec 1984-May 1987	Visiting participant until Jul 1986. Associate member until firm changed name to Atlas Oil Field Services.
*E.I. duPont de Nemours & Co. Inc.	July 1913-Dec 1993	Converted to associate membership in Feb 1988 when explosives product line sold to ETI. Resigned when firm ceased all manufacture of explosives.

Dyno Nobel, Inc.	July 1993-Present	Result of name change from IRECO.
Econex Inc.	Oct 1986-Dec 1987	Associate member. Acquired by IRECO.
Egyptian Powder Co.	May 1915-Dec 1951	Acquired by Olin.
El Dorado Chemical Co.	Jan 1988-Present	Associate member, converted to regular membership Dec 1990.
Energetic Solutions Inc.	Jan 1999-Feb 2000	Represented Orica Explosives in the U.S. and Canada. Dissolved by Orica in February 2000.
Energy Sciences and Consultants	Nov 1976-Feb 1982	Changed name to Nitrochem Energy Corp.
Ensign-Bickford Co.	Feb 1922-Present	Joined as associate member, converted to regular member May 1952.
Equitable Powder Manufacturing Co.	Oct 1913-Dec 1951	Acquired by Olin.
ETI Canada, Inc.	Apr 1997-Apr 2000	Formerly Explosives Technologies International. Reorganized into America East and America West.
Excelsior Powder Co.	Oct 1915-Apr 1919	Resigned.
Explosives Supply Co.	May 1987-Dec 1989	Associate member. Acquired by IRECO.
Explosives Technologies International (ETI)	Feb 1988-Apr 1997	Acquired explosives business of E.I. duPont de Nemours & Co. Became ETI Canada in 1997.
Federation of European Explosives Manufacturers (FEEM)	Apr 1992-present	Associate member. IME formalized relationship with FEEM. Each organization holds associateship or associate status in the other.
*Fort Pitt Powder Co.	July 1913-Dec 1913	Resigned.
Gearhart Industries, Inc.	Dec 1984-Apr 1987	Visiting participant until June 1986. Associate until resignation.
Gearhart-Owen Industries	May 1975-1976	Firm dissolved.
General Dynamics OTS	Feb 2001-present	Purchased Hitech, Inc.

General Explosives Corp.	Apr 1919-Aug 1924	Resigned because an affiliate, American Powder Company, was a member.
	Sept 1933-Jan 1934	Acquired by American Cyanamid.
Giant Powder Co.	June 1916-June 1932	Acquired by Atlas Powder Company in 1915 but operated as a separate corporation. Resigned in 1932.
Goex International, Inc.	Dec 1990-Feb 1998	Associate member. Acquired by Ensign-Bickford.
Goex, Inc.	1997-present	
Grasselli Powder Co.	Nov 1917-Nov 1927	Formed by the merger of Cameron, Burton, and Grasselli. Acquired by duPont.
D.C. Guelich Explosives Co.	July 1990-present	Associate member.
Halliburton Energy Services	May 1995-Apr 1999	Associate member. Changed name to Jet Research Center.
Harrison Explosives, Inc.	July 1988-Jan 1989	Associate member. Ceased manufacture of explosives.
Hercules Incorporated	Feb 1962-Aug 1985	Successor to Hercules Powder Company.
	Aug 1985-July 1986	Visiting participant upon selling explosives division to IRECO, but retaining smokeless powder production.
	July 1986-Nov 1994	Associate member until smokeless powder business sold to Alliant Techsystems.
*Hercules Powder Co.	July 1913-Feb 1962	Changed name in 1962 to Hercules Incorporated.
High Energy International, Inc.	July 1993-Apr 1995	Associate member.
Hitech, Inc.	Oct 1996-Feb 2001	Acquired by General Dynamics.
ICI Explosives Canada	1990-June 1991	Name change from C-I-L. Converted to Associate member, 1991.
	June 1991-Dec 1998	Resigned after purchase by Orica International and becoming represented by regular member Energetic Solutions, a subsidiary of Orica, in Jan 1999.
ICI Explosives Environmental Co.	May 2001	Affiliate member.

ICI Explosives USA Inc.	May 1992 - Dec 1998	Formerly Atlas Powder Company. Bought by ICI Explosives PLC (UK). Sold most of explosives interests to Orica in May, 1998. Resigned after purchase by Orica International and becoming represented by Energetic Solutions, a subsidiary of Orica, in Jan 1999.
*Illinois Powder Co.	July 1913-Oct 1957	Acquired by American Cyanamid.
Independent Explosives Co. of Pennsylvania	May 1980-May 1988	Acquired by IRECO.
*Independent Powder Co. of Missouri	July 1913-Mar 1914	Acquired by Hercules Powder Co.
Ingersoll-Rand Co.	April 1999-Dec 2000	Affiliate member.
International Minerals & Chemical Corp.	Jan 1982-Jun 1982	
IRECO Chemicals	Nov 1965-Dec 1984	Changed name to IRECO Incorporated.
IRECO Incorporated	Jan 1985-July 1993	Changed name to Dyno Nobel.
*Jefferson Powder Co.	July 1913-Nov 1914	Acquired by Aetna Explosives Co.
Jet Research Center, Inc.	May 1985-Jun 1986 Jun 1986-present	Visiting participant. Associate member. Halliburton Energy Services changed name to Jet Research Center in April 1999. Present Jet Research Center is not the same company as the one existing in 1985.
*Keystone National Powder Co.	July 1913-Nov 1914	Acquired by Aetna Explosives Co.
*King Powder Co.	July 1913-Dec 1958	Company dissolved.
LaRoche Industries, Inc.	Jan 1993-Dec 1999	First company to join under new definition permitting membership for ammonium nitrate manufacturers.
Liberty Powder Co.	Nov 1951-Dec 1951	Acquired by Olin.
Maynes Explosives Co.	May 1989-Mar 1997	Associate member.
G. R. McAbee Powder & Oil Co.	Nov 1919-1922	Acquired by Atlas Powder Company.
*Miami Powder Co.	July 1913-Nov 1914	Acquired by Aetna Explosives Company.

Mining Services International (MSI)	Apr 1981-present	
Monongahela Powder Co.	Dec 1917-Feb 1932	
Monsanto Company	Nov 1965-May 1968 Jan 1969-Dec 1982	Resigned and rejoined, then sold explosives business to El Dorado Chemical Company.
MP Associates, Inc.	Dec 1992-present	Associate member.
Mt. State Bit Service	Oct 1986-Apr 1992	Associate member.
W.A. Murphy, Inc.	Mar 1988-present	Associate member.
National Powder Co.	July 1938-Mar 1946 Oct 1953-Nov 1969	
Nelson Brothers, Inc.	Apr 1988-Dec 2000	
Nitro Powder Co.	Mar 1914-1916	
Nitrochem Energy Corporation	Apr 1982-Jun 1990	Formerly Energy Sciences & Consultants. Sold explosives business to IRECO.
Nitrochem, Inc.	Feb 1991-present	
Nobel Insurance Services	Aug 1999-present	Affiliate member.
Olin Industries, Inc.	Jan 1952-Jun 1954	
Olin Mathieson Chemical Corporation	Feb 1955-Nov 1963	Explosives business sold to Commercial Solvents Corp.
Orica Americas	Feb 2000-present	Became regular member upon dissolution of Energetic Solutions.
Orica Canada, Inc	1988-Dec 1998	New name for ICI Explosives Canada upon acquisition by Orica. Resigned when Energetic Solutions took over representation.
Owen Oil Tools, Inc.	May 1985-present	Visiting participant to June 1986, thereafter an associate member.
Pacific Powder Co. **	Jan 1953-Dec 1963	Acquired by Hercules Incorporated.
Pacific Powder Co. **	Nov 1986-Feb 1988	Acquired by IRECO.

** Different Companies

Peerless-Union Explosives Corporation	Oct 1930-1931	Formed by consolidation of Black Diamond Powder Co. and Union Explosives Co. Acquired by Atlas Powder Company.
Pluto Powder Co.	Oct 1913-Nov 1914	Acquired by Aetna Explosives Company.
R & R Trucking, Inc.	Apr 2000-present	Affiliate member.
*Rand Powder Co.	Aug 1913-1914	Acquired by Hercules Powder Company.
Schlumberger Perforating Center, Inc.	May 1985-present	Visiting participant to July 1986. Thereafter an associate member.
Senex Explosives, Inc.	Apr 1993-present	Name change from Senules Explosives, Inc.
*Senior Powder Co.	July 1913-Aug 1928	
Senules Explosives, Inc.	Feb 1992-Apr 1993	Name change from H.L. & A.G. Balsinger, Inc.
Sierra Chemical Co.	May 1971-Mar 1998	Left explosives business.
Slurry Explosives Corporation (SEC)	Feb 1992-present	Associate member.
Southeastern Energy, Inc.	Apr 1987-Mar 1990	Associate member. Acquired by IRECO.
Southern Explosives Corp.	Sept 1979-Dec 1988	Acquired by ETI.
St. Lawrence Explosives Corp.	Jan 1989-present	
*Standard Powder Company	Sept 1913	Acquired by Atlas Powder Company in 1920.
Summa Insurance Managers	Nov 2000-present	Affiliate member.
Talley Defense Systems, Inc.	Dec 1990-present	Associate member.
Terra Dynamica, LLC	May 2000-present	Affiliate member.
Titan Completion Products	Oct 2001-present	Associate member.
Trace-X Chemical	May 1976-Nov 1977	
Tradestar Corporation	Apr 1999-present	Affiliate member.
Tread Corporation	Oct 1998-present	Affiliate member.

Tri-State Motor Transit Co.	Aug 2000-present	Affiliate member.
Trojan Corporation	Apr 1982-Jan 1996	Regular member until May 1987, then associate member until becoming a division of the Ensign-Bickford Company.
Trojan Division, Commercial Solvents Corp.	July 1967-July 1968	Formerly Trojan Powder Company.
Trojan Division, IMC Chemical Group, Inc.	Oct 1975-Jan 1982	Formerly Trojan-U.S. Powder Division, Commercial Solvents Corporation.
Trojan Powder Co.	Mar 1966-Jul 1967	Acquired by Commercial Solvents Corporation.
Trojan-U.S. Powder Division, Commercial Solvents Corp.	July 1968-Oct 1975	Name change from Trojan Division, Commercial Solvents Corporation. Acquired by IMC Chemical Group.
TRW Vehicle Safety Systems	May 1998-present	Associate member.
Union Explosives Co.	Nov 1922-Jul 1926 Sept 1927-Oct 1930	Consolidated into Peerless-Union Explosives Corporation.
*United States Powder Co.	July 1913-Dec 1951	Acquired by Olin.
U.S. Powder Company, Division Commercial Solvents Corporation	Nov 1963-July 1968	Acquired by Olin.
Vet's Explosives, Inc.	Oct 1998-present	Associate member.
Viking Explosives & Supply Inc.	Mar 1990-present	
West Coast Powder Co.	Feb 1939-Dec 1962	
Western Atlas International	Aug 1995- Aug 1999	Associate member. Changed name to Baker Atlas.
Western Cartridge Co.	Sept 1944-Oct 1954	Associate member.
Woodward Companies, Inc.	May 1989-Jan 1992	Acquired by Atlas Powder Company.

Officers

IME 25th Anniversary Banquet, December 8th, 1938, Hotel Roosevelt, New York

YEAR	PRESIDENT	VICE PRESIDENT
1913 - 1916	A. G. Fay (Aetna)	C. L. Patterson (DuPont)
1917 - 1920	C.L. Patterson	G. G. KIng (Egyptian)
1921 - 1936	G. G. King	J. T. Skelly(Hercules)
1937 - 1942	G. G. King	E. Frost (Atlas)
1943	G. G. King	P. J. Kimball (DuPont)
1944 - 1946	H. E. Mabry (Egyptian)	P. J. Kimball
1947 - 1958	V. E. Moorehouse (Austin)	P. J. Kimball
1959	J. M. Martin (Hercules)	P. J. Kimball
1960 - 1961	N. A. Hamilton (Olin)	M. E. Colson (Atlas)
1962 - 1963	M. E. Colson	R. L. Henderson (Apache)
1964	R. L. Henderson	F. R. Wilson (DuPont)
1965 - 1966	F. R. Wilson	T. T. Cooke (National)
1967 - 1968	T. T. Cooke	L. W. Towle (Apache)
1969 - 1970	L. W. Towle	G. L. Griffith (Trojan/US Powder)
1971 - 1972	G. L. Griffith	R. G. Sailer (Hercules)
1973 - 1974	R. G. Sailer	B. J. Calder, Jr. (Austin)
1975 - 1976	B. J. Calder, Jr.	P. E. Graybeal (Hercules)
1977 - 1978	P. E. Graybeal	L. T. Marks (Atlas)
1979 - 1980	D. M. Gleason (Austin)	H. J. Burchell (Atlas)
1981	D. M. Gleason	W. R. Davidson (DuPont)
1982 - 1983	W. R. Davidson	B. W. Carr (Ensign Bickford)

In April 1984, a reorganization of the IME resulted in the establishment of three officer positions: President (formerly Executive Director), Chairman (formerly President) and Vice Chairman (formerly Vice President).

YEAR	CHAIRMAN	VICE CHAIRMAN
1984 - 1985	B. W. Carr (EBCo)	H. J. Burchell (Atlas)
1986 - 1987	H. J. Burchell	M. G. Cook (Ireco)
1988 - 1989	M. G. Cook	F. T. Dainese (Independent)
		R. W. Spraggs (EBCo)
1990	R. W. Spraggs	E. E. Woodacre (ETI)
1991 - 1992	E. E. Woodacre	W. H. Nelson III (Nelson Brothers)
1993 - 1994	W. H. Nelson III	D. P. True (Austin)
1995	G. R. Lindsay (Dyno)	P. H. Rydland (El Dorado)
1996 - 1997	P. H. Rydland	J. M. Feasler (EBCo)
1998 - 1999	J. M. Feasler	M. A. Gleason (Austin)
2000 - 2001	M. A. Gleason	R. A. Bingham (Dyno Nobel)
2002	R. A. Bingham	J. Ghirardelli (ETI Canada)

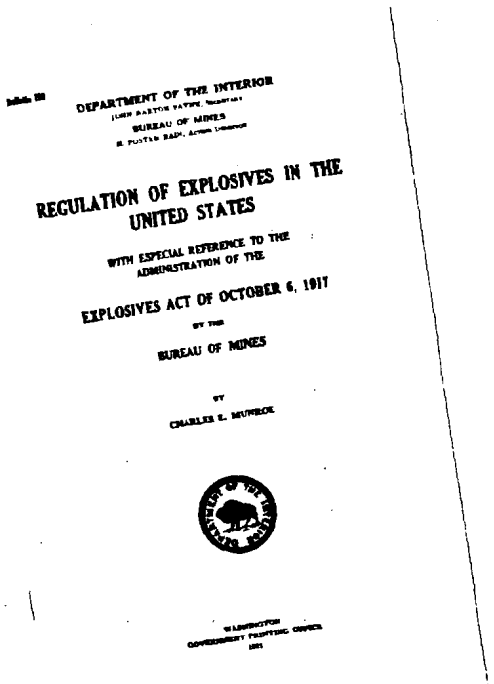
STAFF OFFICERS

C.C. Quincy	Secretary 1913 to 1915
C. Stewart Comeaux	Secretary 1916 to 1952
Richard F. Webster	Secretary-Treasurer 1952 to 1961
Harry L. Hampton, Jr.	Secretary-Treasurer 1961 to December 31, 1979. Executive Director 1974 to September 1, 1979
Frederick P. Smith, Jr.	Executive Director September 1, 1979 to April 4, 1984. President April 4, 1984 to October 1, 1994. Secretary-Treasurer January 1, 1980 to April 22, 1982 and February 24, 1989 to October 1, 1994.
Theresa A Schneider	Secretary-Treasurer April 22, 1982 to February 24, 1989
J. Christopher Ronay	President October 1, 1994 to present. Secretary October 1, 1994 to November 2, 2000. Treasurer October 1, 1994 to present.
Gilbert Sperling	Secretary November 2, 2000 to present.

GENERAL COUNSEL

Arthur J. Eddy	1913 to June 1920
William J. Matthews	October 1920 to April 1943
Frank H. Gordon	January 1953 to December 1981
Alan B. Mollohan	January 1981 to February 1982
C. Howard Hardesty, Jr.	Acting General Counsel February 1982 to April 1982. General Counsel April 1982 to December 1995.
Gilbert Sperling	December 1995 to present

Year-by-Year Highlights


DEPARTMENT OF THE INTERIOR

BUREAU OF MINES

REGULATION OF EXPLOSIVES IN THE UNITED STATES

WITH ESPECIAL REFERENCE TO THE ADMINISTRATION OF THE

EXPLOSIVES ACT OF OCTOBER 6, 1917

BY THE

BUREAU OF MINES

BY

CHARLES E. MUNROE

1913 The first formal meeting of the Institute of Makers of Explosives was held at the Annex Hotel in Chicago on July 15, 1913. The Headquarters was established at 1640 Otis Building, 10 South LaSalle Street, Chicago.

The founders agreed that only manufacturers east of the Rocky Mountains would be considered as members.

In December, consideration began on carrying blasting caps on the same vehicle with other explosives. This was the first of a series of discussions which ultimately led to the adoption of the IME 22 box.

1914 A credit bureau was established to share customer credit experience among members.

One company adopted the practice of marking all cartridges with the word DANGER and the IME recommended that all members follow this practice.

Some items on the agenda this year were the possible production of a film about the use of explosives, the increasing use of coal mining machines and the decreasing quantity of powder used per ton of coal mined.

Standardization of the quality and type of dynamite case lining paper was discussed.

SLPs No.1, "Standard Storage Magazines", No.2, "American Table of Distances", No. 3, "Suggested State Law on Explosives," and No. 4, "Suggested City Ordinance on Explosives", were first published. The first operating budget was $10,800 plus $10,000 for General Counsel's fee.

1915 The bylaws were amended to permit Canadian manufacturers to join as non-voting members.

A map showing the location of powder mills was produced for the first time.

The IME recommended that caps with less strength than number 6 be discontinued.

The first list of "Do Not's" was issued in poster format.

SLP No. 5, "Rules for Storing, Transporting and Shipping Explosives" was first published.

A proposal was made to begin compil price statistics on high explosives anc black powder, effective January 1916. T was the beginning of the Open-Price Association function of IME.

1916 The attorney for the Federal T Commission (FTC) advised the IME tl he believed "Open-Price Societies" wer good idea.

The IME office was relocated to 1402-C St. James Building, 26th and Broadway New York. The monthly rent was $40.

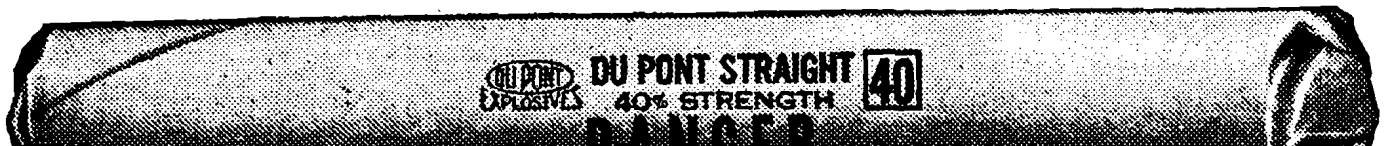
Membership in the Institute was extended to include manufacturers throughout the entire United States.

1917 The IME stated its position tha all demonstrations which included dor tion of explosives be discontinued. *"An customer wishing to try any explosives should willing to pay for the same."*

The first regulations on licensing explo sives purchases were implemented as a result of the Federal Explosives Act of which was passed after the U.S. entere the First World War.

In May, the office was moved to 103 Pa Avenue in New York.

1918 Placing a steel box in front of the driver of an explosives hauling way as a receptacle for blasting caps was di cussed. This was a continuation of the evolution toward the IME 22 box.



1919 The Bureau of Mines removed the requirement for having a license to use explosives for agricultural purposes.

Comparative merits of methods of testing detonation rates and the definition of "bullet proofing" in magazine specifications were discussed.

1920 A motion was made to compile sales figures on blasting caps, electric blasting caps and safety fuse in a similar form as the monthly tonnage report on blasting powder and dynamite.

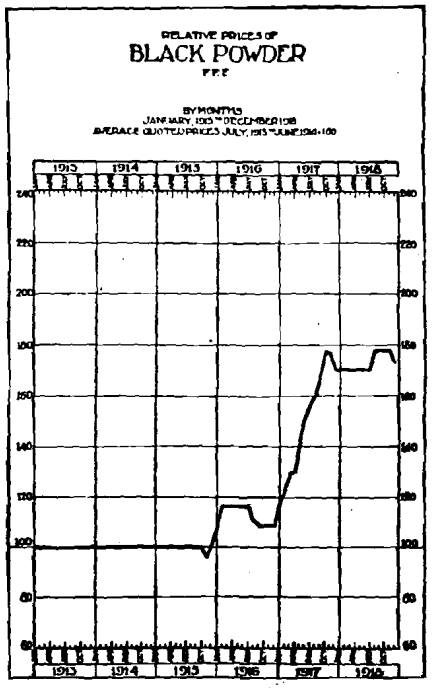
1921 The motion proposed in 1920 to include data on cap sales was rejected.

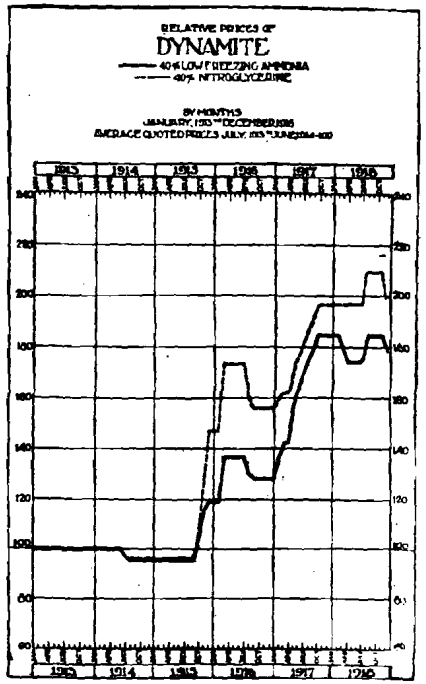
The first discussions on publishing a history of the explosives industry were held.

The IME opposed as unnecessary the installation of lightning protection devices on explosives buildings.

1922 The IME cooperated with the National Academy of Sciences in an investigation of the properties of ammonium nitrate. This investigation was a result of the 1921 explosion at Oppau, Germany, which aroused a widespread distrust of the material.

Due to the government's reexamination of the right of trade associations to collect and distribute price statistics, the IME ceased collecting such information in May. (See Open-Price Association section for further details.)





1923 A release form to protect explosive companies from claims when their representatives worked with customers on large blasts was drafted for members' use.

Dr. Charles E. Munroe, Chief Explosives Chemist, U.S. Bureau of Mines, Washington, D.C., addressed the Institute in August on the use of the word "detonators" in place of the words "blasting caps".

The first Institute meeting outside the United States was held, in Montreal.

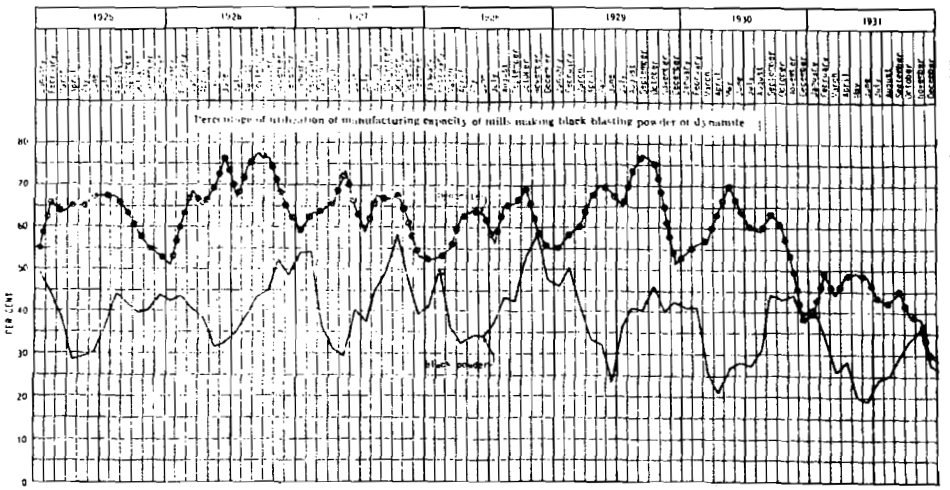
A program to increase the use of explosives by publicity through newspapers and magazines was discussed. Also discussed was using radio as a medium, although *"a radio message cannot be bought. No advertising is permitted – but radio stations like interesting material to use as a public service."*

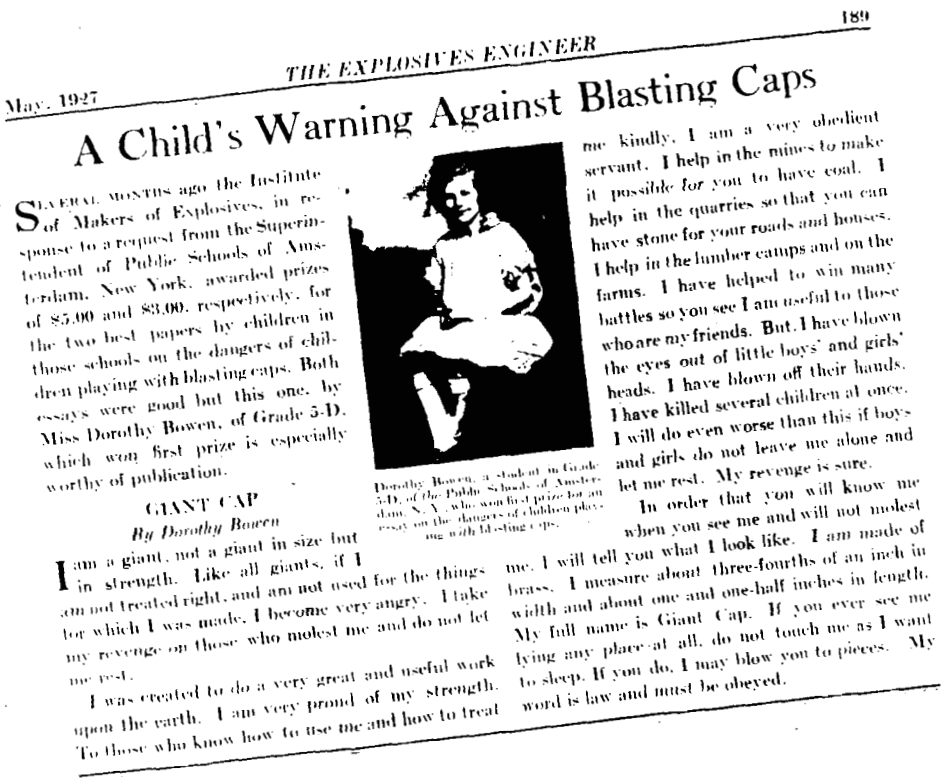
PRICES OF EXPLOSIVES.

PRICES OF EXPLOSIVES, BY MONTHS, QUARTER
1916–1918.

	Commercial.					Mili		
	FFF black powder.	95 per cent sodium nitrate.	40 per cent N. G. dynamite.	Dynamite glycerin.	40 per cent L. F. Amer. dynamite.	Ammonium nitrate.	20 per cent aqua ammonia market price.	2
Market	Md., Ohio, and Pa.	New York.	Del., D. C., Md., N. J., Pa.	New York.	Del., D. C., Md., N. J., Pa.	Gen. U. S.	New York.	
Unit	25-lb. kegs.	Cwt.	Pound.	Pound.	Pound	Pound.	Poun	
Base price	$1.1500	$2.3183	$0.1125	$0.1938	$0.1075	$0.0675	$0.03	
1916—Year	1.3005	3.1792	.1821	.5008	.1402	.1235	.0	
Quarters—								
First	1.3100	3.4167	.1750	.5017	.1342	.1200	.0	
Second	1.3500	3.3000	.1950	.5367	.1475	.1275	.0	
Third	1.2920	3.0667	.1850	.5300	.1417	.1225	.0	
Fourth	1.2500	2.9333	.1750	.5150	.1375	.1239	.0	
Months—								
January	1.2300	3.2500	.1650	.4800	.1275	.1200		
February	1.3500	3.4000	.1650	.4750	.1275	.1200		
March	1.3500	3.6000	.1950	.5500	.1475	.1200		
April	1.3500	3.4000	.1950	.6000	.1475	.1275		
May	1.3500	3.4000	.1950	.5600	.1475	.1275		
June	1.3500	3.1000	.1950	.5100	.1475	.1275		
July	1.3500	3.1000	.1950	.4500	.1475	.1275		
August	1.2500	3.1000	.1803	.3900	.1402	.1200		
September	1.2500	3.0000	.1750	.4500	.1375	.1200		
October	1.2500	2.9000	.1750	.5000	.1375	.1150		
November	1.2500	2.9000	.1750	.5000	.1375	.1270		
December	1.2500	3.0000	.1750	.5450	.1375	.1316		
1917—Year	1.7333	4.0509	.2002	.6088	.1742	.1883		
Quarters—								
First	1.4200	3.4246	.1791	.5317	.1457	.1530		
Second	1.6187	3.8558	.1922	.5867	.1664	.1883		
Third	1.8610	4.2079	.2005	.6667	.1870	.2075		
Fourth	2.0133	4.6462	.2200	.6500	.1975	.2075		
Months—								
January	1.3500	3.2175	.1750	.5200	.1375	.1500		
February	1.4100	3.3250	.1797	.5350	.1470	.1500		
March	1.5000	3.6700	.1825	.5100	.1525	.1500		
April	1.5000	3.7500	.1825	.5600	.1525	.1500		
May	1.6660	3.8000	.1911	.6000	.1692	.2000		
June	1.7500	3.9800	.2000	.6000	.1775	.2000		
July	1.7900	4.1500	.2010	.6500	.1815	.2000		
August	1.8500	4.2400	.2100	.6500	.1875	.2000		
September	1.9100	4.5017	.2116	.7000	.1921	.2000		
October	2.0500	4.7313	.2200	.7000	.1975	.2000		
November	2.0100	4.6000	.2200	.6000	.1975	.2000		
December	1.9500	4.5338	.2200	.6500	.1975	.2000		
		[illegible]	.2253	.5850	.1934			

The explosives industry was strongly affected by the business downturn in the 1930's.





May, 1927 THE EXPLOSIVES ENGINEER 189

A Child's Warning Against Blasting Caps

SEVERAL MONTHS ago the Institute of Makers of Explosives, in response to a request from the Superintendent of Public Schools of Amsterdam, New York, awarded prizes of $5.00 and $3.00, respectively, for the two best papers by children in those schools on the dangers of children playing with blasting caps. Both essays were good but this one, by Miss Dorothy Bowen, of Grade 5-D, which won first prize is especially worthy of publication.

Dorothy Bowen, a student in Grade 5-D, of the Public Schools of Amsterdam, N. Y., who won first prize for an essay on the dangers of children playing with blasting caps.

GIANT CAP

By Dorothy Bowen

I am a giant, not a giant in size but in strength. Like all giants, if I am not treated right, and am not used for the things for which I was made, I become very angry. I take my revenge on those who molest me and do not let me rest.

I was created to do a very great and useful work upon the earth. I am very proud of my strength. To those who know how to use me and how to treat me kindly, I am a very obedient servant. I help in the mines to make it possible for you to have coal. I help in the quarries so that you can have stone for your roads and houses. I help in the lumber camps and on the farms. I have helped to win many battles so you see I am useful to those who are my friends. But I have blown the eyes out of little boys' and girls' heads. I have blown off their hands. I have killed several children at once. I will do even worse than this if boys and girls do not leave me alone and let me rest. My revenge is sure.

In order that you will know me when you see me and will not molest me, I will tell you what I look like. I am made of brass. I measure about three-fourths of an inch in width and about one and one-half inches in length. My full name is Giant Cap. If you ever see me lying any place at all, do not touch me as I want to sleep. If you do, I may blow you to pieces. My word is law and must be obeyed.

1924 The IME began placing articles in various newspapers and magazines to promote the use of explosives. Some radio stations were using a talk on "Ditching with Dynamite."

The possible standardization of lengths and varieties of electric blasting caps was discussed.

The Bureau of Mines began considering allowing only permissible explosives for blasting coal.

A member reported it had started using a warning placard on trucks and wagons that came to its mills or magazines for explosives. The placard simply said "Explosives."

The subject of the hazards of powerful radio broadcasting stations to electric firing devices was discussed for the first time.

1925 The industry began investiga the use of fiberboard boxes for shippi explosives.

Tests run to determine the potential hazards of powerful radio stations to tric caps led to the conclusion that th were no serious hazards.

Hundreds of newspapers were using I produced articles on explosives.

1926 The Blasting Cap Safety Education Program, an effort to elimi accidents to children by blasting caps was launched. (See the Blasting Cap Safety Education section for further details.)

The Department of Agriculture, with technical assistance from the IME, pr duced a film entitled "Dynamite - Concentrated Power" on the use of ex sives for agricultural purposes.

Printing the word DANGER on caps v discussed but not adopted as an IME policy at this time.

1927 The book ***History of the Explosives Industry in America*** was published. (See the separate section or Hardbound Publications.)

The first blasting cap poster for use by schools was published.

The first IME movie, "How Jimmie W the Game," was produced.

A list of "Don'ts" was agreed upon for as dynamite case inserts.

1928 The Executive Committee approved the publication of a book tabulating the data on which the American Table of Distances was based. (see the separate section on Hardbound Publications.)

1929 The use of Cardox as a replacement for explosives was discussed for the first time.

Tests using dummy cartridges were run to determine if fiberboard boxes for dynamite would be acceptable.

The IME recommended that dynamite boxes be permitted to be used for other purposes after explosives were removed, as long as the boxes were not stained with nitroglycerin.

A Credit Committee was formed to assume the credit bureau functions first established in 1914.

1930 During the past year, the film "Dynamite – Concentrated Power" was exhibited to approximately 14,000 persons, while the IME film "How Jimmie Won the Game" was shown to 268,000 persons.

The book ***History of Explosions on Which the American Table of Distances was Based*** was published.

The IME began issuing a small newspaper to promote explosives usage, called ***Explosives Progress***.

Over 1000 newspaper clippings were received by the publicity committee. Most were of IME-generated articles.

1931 The use of fiberboard boxes for shipping dynamite by rail was approved by the Interstate Commerce Commission (ICC) under Specification 23-F.

SLP No. 11, "Explosives in Agriculture" was first issued.

Explosives Progress ceased publication after a total of eleven issues.

1932 "Safety in the Handling and Use of Explosives", SLP No. 17, was first published.

A series of 50 major articles were provided to the media this year on uses of explosives.

1933 Cardox replaced 795,000 pounds of dynamite, and liquid oxygen explosives (L.O.X.) replaced 4.3 million pounds.

The first discussions about blast vibrations were held.

A discussion on transporting explosives in trailers came to the conclusion that trailers were not acceptable.

WATER STORAGE PONDS REDUCE FIRE LOSSES

Explosives Essential to Building Nation's Transportation Systems

Tonnage Used a Significant Index of Progress as Gauged by Construction of Railroads and Highways

ENGINEERS STRIVE TO IMPROVE AGRICULTURE

Activities Include Various Phases of Betterment of Conditions

EXPLOSIVES PROGRESS

Explosives Progress

Oak Orchard Creek Straightened by Blasting With Dynamite

Explosive Excavates New Channel to Prevent Flooding of 11,000 Acres of Rich Land Near Elba, New York

Explosives Progress

PUBLISHED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES

Volume 2 New York, February, 1911 Number 1

Dynamite Aids in Developing Better Farms

Farmers Learn Uses of Explosives for Wide Diversity of Purposes

Blasts Rid Pennsylvania Fields of Outcropping Limestone Ledges

Ditching with Dynamite Practiced to Reclaim Flooded Lands in Many Sections

STUMPS BLASTED

Explosive Effectively Used to Clean Surface Tanks for Watering Cattle

State College Seeks to Determine Best Way of Removing the Obstructions

SNAKE HOLE METHOD

Effective Shooting Done Without Drilling Holes for Explosive Charges

124 The Explosives Engineer April, 1930

Blasting Caps Cause Needless Suffering for Many Children

MINERS, quarrymen, and other users of explosives, do your share to prevent children from being injured by playing with blasting caps. The average man does not want to harm a child.

DON'T PLAY WITH BLASTING CAPS!

Yet, thoughtlessness or carelessness on the part of men who handle explosives is indirectly responsible for practically all the blasting cap accidents which annually injure — and, in some cases, kill — several hundred children.

Almost wholly, the accidents are due to the fact that the users of blasting caps neglect to put these articles in safe places where they cannot get into the hands of children, or because the caps are lost where children find them.

Too often the boy who picks up a blasting cap throws it into a bonfire, strikes it with a hammer or a rock, or uses a pin, a nail or a bit of wire to penetrate the highly sensitive fulminate of mercury— an extremely powerful explosive—with which the copper shell is loaded.

Again, this year, blasting caps will cause needless suffering for hundreds of children. Fingers will be blown off, hands and arms will be made useless, one or both eyes will be destroyed, faces will be disfigured for life, and some of the children will lose their lives.

How many will suffer or be killed depends on the number of blasting caps children find. Do not be among the thoughtless and careless. Do everything you can to keep blasting caps from getting into the hands of your children or the children of others.

HOW YOU CAN HELP PROTECT CHILDREN

Institute of Makers of Explosives

103 Park Avenue, New York, N. Y.

University Women to Explain Dynamite Cap Dangers to Children

The above group of ladies will deliver a during the next two weeks in 26 public ar in Butte on "The Danger of Dynamite Ca sponsored by the Butte branch of the Am University Women. In the picture are:

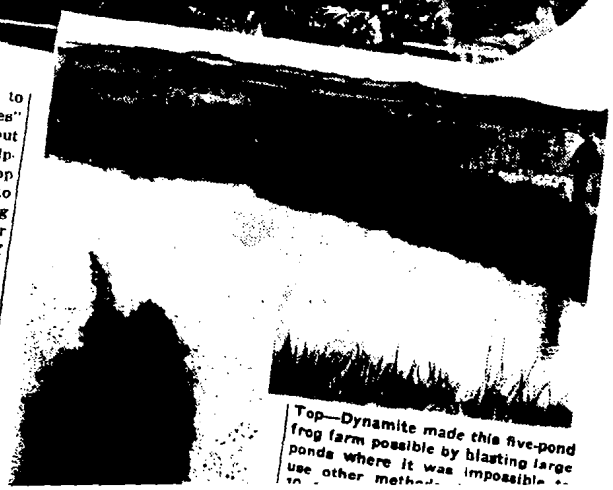
An example of the publicity committee's promotional campaign.

DYNAMITE HELPS BUILD BIG FROG RANCH AND CONSTRUCTS PONDS TO FIGHT MOSQUITOES

DYNAMITE has been used to create synthetic "earthquakes" to locate oil deposits; to rough out massive figures for heroic sculptures on mountain sides; to stop floods and break up ice jams; to save navigation by removing wrecks; and in a great many other ways—in addition to its big job of getting out coal, rock and metals so that the country can go about its work of building roads, erecting skyscrapers and constructing automobiles.

Now come reports of new uses. This time they are of blasting ponds for a frog ranch and of building reservoirs for fish so they can survive long droughts and continue to eat larvae in mosquito control work.

Ponds ranging in length from forty to seventy-five feet, two- feet in width



Top—Dynamite made this five-pond frog farm possible by blasting large ponds where it was impossible to use other methods

1934 Price list reporting and actu selling prices of high explosives, "B" l ing powder and blasting supplies resi after an analysis of government fair ti policies.

1935 Radio stations were beginnin "news talks" which included public service spots. One hundred fourteen st tions were taking part in the blasting program.

The U.S. Geological Survey (USGS) de oped a machine to measure vibrations caused by blasting. The cost of the machine was approximately $25,000.

1936 The California Industrial Commission included in proposed reg tions a paragraph about fumes produc per pound of explosives. The Bureau o Mines and the IME agreed to draft reg ulations which could be implemented. This was the beginning of the IME Fu Classes, I, II, and III.

Three thousand, one hundred and seve clippings were received this year on th Institute's publicity program releases.

1937 The IME published a booklet entitled "Dynamite – A Useful Explos for Mining and Quarrying – Not a Munition of War."

A recommendation was made for a sta dard IME blasting cap that would be of number 7 strength. This was never accepted by the industry.

The Bureau of Mines proposed that black blasting powder be prohibited in coal mines but this was not promulgated into regulations.

Three thousand, seven hundred and thirteen clippings were received from the clipping bureau this year, most referring to articles the Institute had written.

1938 Standardization of grade strength markings on high explosives shipped into certain states began.

The film "How Jimmie Won the Game" had been shown to nearly five million children since its release in 1927.

1939 Other states began to enforce regulations on fume classifications.

The Bureau of Mines began working on vibration measurement standards for blasting.

All references in IME publications to freezing of dynamite were deleted since all companies now made only nonfreezing grades.

Five hundred separate publications used material sent out by the Institute.

1940 Many states required that each case or cartridge be marked with a percent strength. The IME finalized standards for determining strength by setting a strength number for each ingredient.

The subject of sheathed permissibles was discussed for the first time.

1941 The IME worked with the Bureau of Mines to determine how to administer the Federal Explosives Act of 1917, which was reactivated upon declaration of war.

The work of the publicity committee on producing articles to promote the use of explosives virtually ceased, not to be resumed.

1942 The Federal Explosives Act of 1917, administered by the Bureau of Mines, became effective March 17, 1942.

1943 Since 1926, over 2.2 million pieces of literature had been distributed under the Blasting Cap Safety Program.

The Bureau of Explosives recommended to the ICC that regulations provide a method for transporting high explosives and caps in the same motor vehicle at the same time. A specification for a box to hold caps in less than case quantities was recommended. Case lots could be put in the vehicle in their original case without being in a separate box.

SLP No. 21, "Destroying Explosives," was published.

1944 The IME supported the Bureau of Mines proposal to change the limit from 1-1/2 pounds to 3 pounds of permissible explosives per hole.

The first blasting cap poster, circa 1934.

1945 The new blasting cap movie "Blasting Cap!" was released.

The Bureau of Mines required using a permissible blasting machine with permissible explosives, but since such a machine was not commercially available, waivers to this requirement were granted.

The Bureau of Mines recommended that the Federal Explosives Act of 1917 be perpetuated. The Institute opposed this recommendation.

1946 The Bureau of Mines gave tentative approval for the use of delay electric blasting caps in coal mines.

The ICC allowed the shipment of high explosives in 23-G packaging. This packaging did not require an outer case.

In May, the office was moved to 343 Lexington Avenue (Between 39th and 40th Streets) in New York, occupying the top two floors of a five story building.

1947 The first blasting cap display board was produced, with four examples of blasting caps and electric blasting caps attached .

The IME participated in the investigation of the Texas City, Texas, explosion of ammonium nitrate.

The Federal Explosives Act of 1917 was cancelled by President Truman.

The Bureau of Mines made the 3 pounds per hole permissible limit permanent.

1948 Pennsylvania issued regulati limiting the amount of ground vibrati in blasting.

The ICC allowed fiberboard boxes for transporting electric blasting caps.

1949 The movie "Blasting Cap!" wa shown on television for the first time.

The requirement for sawdust in packa of semi-gelatin explosives was elimina

1950 A color folder entitled the "AB of Blasting" was produced for distribu to the occasional user of dynamite, suc farmers.

1951 The IME confirmed its positio that lightning protection for explosive manufacturing facilities was not neede

1952 New Jersey issued regulations seismic effects and airblast.

1953 Polyethylene was allowed as a case liner as a substitute for paper.

The packing of gelatin dynamite in 23 containers was incorporated into ICC ulations.

The first edition of SLP No. 20, "Radio Frequency Energy – Potential Hazard the Use and Transportation of Electri Blasting Caps," was issued.

The office moved in March to 250 East 43rd Street, New York.

1954 Special Blasting Cap Posters were displayed in 41,000 post offices.

1955 Two short television films were produced under the Blasting Cap Safety Education Program.

A Congressman proposed marking all blasting caps with "Danger" or "Danger High Explosives." This proposal was later withdrawn.

1956 A new blasting cap film "Blasting Cap – Danger!" was produced.

The radio frequency energy pamphlet was revised because of the widening use of mobile radio systems.

A proposal by the National Safety Council and American Airlines to place radioactive materials in explosives for detection purposes at airports was studied but rejected as unsafe and impractical.

Ammonium nitrate sales were added to the tonnage report.

1957 Tonnage reports were expanded to include blasting caps.

The IME contributed $25,000 to the Bureau of Mines to conduct tests on the use of salt in permissible explosives. The result was issued in 1960 as USBM RI 5683.

Special "Do's and Don'ts" were written for seismograph explosives.

The IME provided the ICC with a definition for nitro-carbo-nitrate.

The first blasting cap display board – 1947.

1958 An episode in the television series "Danger Is My Business" was about explosives, with one segment devoted to warning children not to play with blasting caps.

1959 The Bureau of Mines published final approval for the use of delay blasting caps in coal mines, and also approved the use of a 20-shot permissible blasting machine.

Tonnage reporting was expanded to include unprocessed grained or prilled ammonium nitrate.

The IME proposed ending the reporting of black powder consumption but the Bureau of Mines requested its continuance.

A vigorous program of educating jobbers, distributors and haulers on explosives usage, storage and transportation was initiated as a result of a fire and explosion in Roseburg, Oregon.

"DO'S AND DON'TS"

INSTRUCTIONS AND WARNINGS

DOPTED BY THE INSTITUTE OF MAKERS OF EXPLOSIVES, SEPTEMBER 30, 1955

hese instructions and warnings are not to be construed as superseding federal, ate, corporation or municipal laws, ordinances or regulations. Particular attention called to the fact that permissible explosives are not permissible unless they e used in the manner specified by the United States Bureau of Mines.

For Consumers

In Transporting, Storing, Handling and Using

HIGH EXPLOSIVES AND PERMISSIBLE EXPLOSIVES

WDER

CAPS AND BLASTING CAPS

S OF EXPLOSIVES

D STREET
, N.Y.

RADIO FREQUENCY ENERGY A POTENTIAL HAZARD IN THE USE AND TRANSPORTATION OF ELECTRIC BLASTING CAPS

EPTEMBER 30, 1955

Published by
INSTITUTE OF MAKERS OF EXPLOSIVES
250 East Forty-third Street
New York 17, New York

REDUCING THE INCENDIVITY
OF PERMISSIBLE EXPLOSIVES
BY SODIUM CHLORIDE

By N. E. Hanna, G. H. Damon,
and R. W. Van Dolah

report of investigations 5683

UNITED STATES DEPARTMENT OF THE INTERIOR
Fred A. Seaton, Secretary

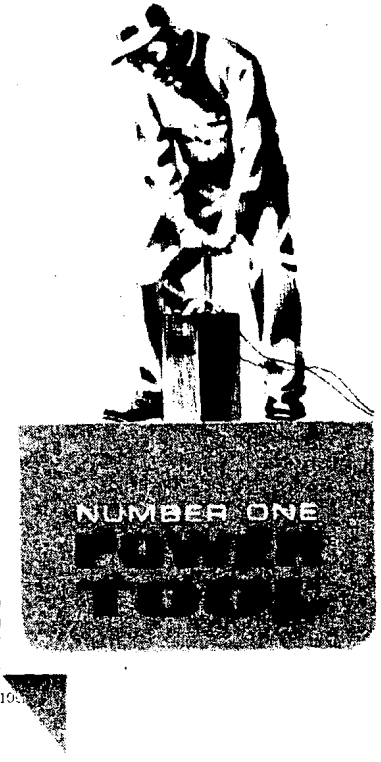
BUREAU OF MINES
Marling J. Ankeny, Director

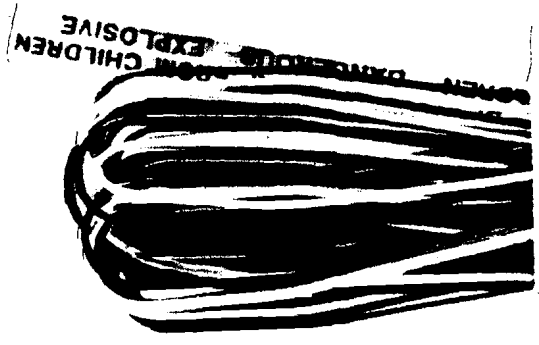
The work upon which this report is based was done under a cooperative agreement between the Bureau of Mines, United States Department of the Interior, and the Institute of Makers of Explosives.

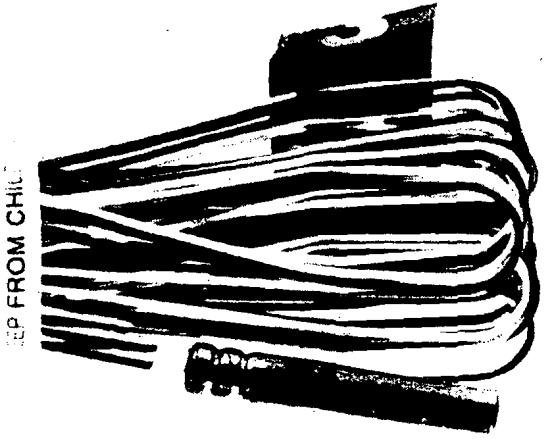
standards, based on long experience
knowledge that explosives can be
ported safely by rail, water or high
With the exercise of common sense,
are as safe as any other powerful
COMBINED with safety is on-
effectiveness that makes expl
indispensable in the modern
For the many tasks that they do
explosives have no substitute. Wi
explosives available when and
they're needed, the pace of progress
slacken and costs would climb. In a
that is built on and by the use of
power, explosives have a unique
to provide it.

For further information about explos write

INSTITUTE OF MAKERS OF EXPLOSIVES
420 Lexington Avenue, New York, New York 10
MUrray Hill 4-4229







1960 The Credit Committee was dissolved but credit reporting activiti continued with the IME Secretary res sible for collection and dissemination data. (The Minutes do not reflect whe this practice was discontinued.)

SLP No. 6, "Recommended Industry Standards" was first published.

1961 The largest percentage drop ev in blasting cap accidents was reported the first nine months of 1961. There we 45 accidents as opposed to 83 for the fi nine months of 1960.

1962 Monthly tonnage reports were discontinued and replaced with quarte reports.

Manufacturers began printing warning on cap cartons about locking up blastir caps. Some companies began printing EXPLOSIVES - DANGEROUS - BLASTING CAP on cap shells.

1963 Special television spots featuri well-known persons warning about th dangers of blasting caps were produce

The IME began cooperating with the Federal Aviation Administration (FAA and the Air Transport Association on ways to detect explosive materials in baggage or freight. The proposal to see blasting caps with radioactive material continued to be discussed.

The office moved in June to 420 Lexing Avenue, New York.

1964 The use of dromedary trucks to haul explosives was approved by the ICC.

The IME contracted with the Franklin Institute to conduct a study of ultra-high frequency radio energy hazards to blasting caps.

1965 The "Tire Fire" poster was first distributed.

For the fourth consecutive year, blasting cap posters were mailed to all elementary and secondary schools in the United States – an audience of over 42 million children.

1966 Tonnage reports began including slurries and water gels.

A new cabinet level Department of Transportation was created, assuming many regulatory responsibilities of the ICC.

"Number One Power Tool" was first published.

1967 The IME recommended that all blasting caps be marked BLASTING CAP – DANGEROUS – EXPLOSIVE and that all cartons be marked DANGEROUS – EXPLOSIVES - KEEP FROM CHILDREN - LOCK UP BLASTING CAPS. Also recommended was marking sleeve wrappers or shunts to warn children.

1968 A test program was funded to determine the bullet-proof integrity of various field storage magazines.

Approval was given for production of "Explosives – Tool for Progress," a 25-minute film depicting the importance of explosives to the nation's economy and progress.

The "Civil Strife" card and "Emergency Instructions" posters were first published.

1969 There were one million blasting cap safety education posters printed and distributed this year.

The Secretary was authorized to discuss membership with Canadian companies.

1970 A major component of the blasting cap program was the "Lock 'Em Up" campaign directed at users of blasting supplies.

The Organized Crime Control Act of 1970, transferring many explosives regulations to the Bureau of Alcohol, Tobacco and Firearms of the Department of the Treasury, was passed. (The bill became effective in 1971.)

The IME approved a voluntary plan to mark cartridges and cases of explosives for the purpose of identification, effective January 1, 1971. It was in two parts: product identification marking and transaction record keeping. The shipping case would bear the same number as the individual units in the case.

An elbow-to-elbow crowd jams the hearing room during the testimony of explosives industry's representatives.
Photo: The Washington Star

UNIFORM EXPLOSIVES USE REGULATIONS

Industry officials appear before Congress, outlining suggestions for sensible nationwide program to halt misuse of explosives.

By Charles A. Steinback, Editor
THE EXPLOSIVES ENGINEER

The chairman of the public safety committee representing major explosives manufacturers appeared in four Congressional committees requesting uniform regulations on the control of explosives "from the powder works to the consumer."

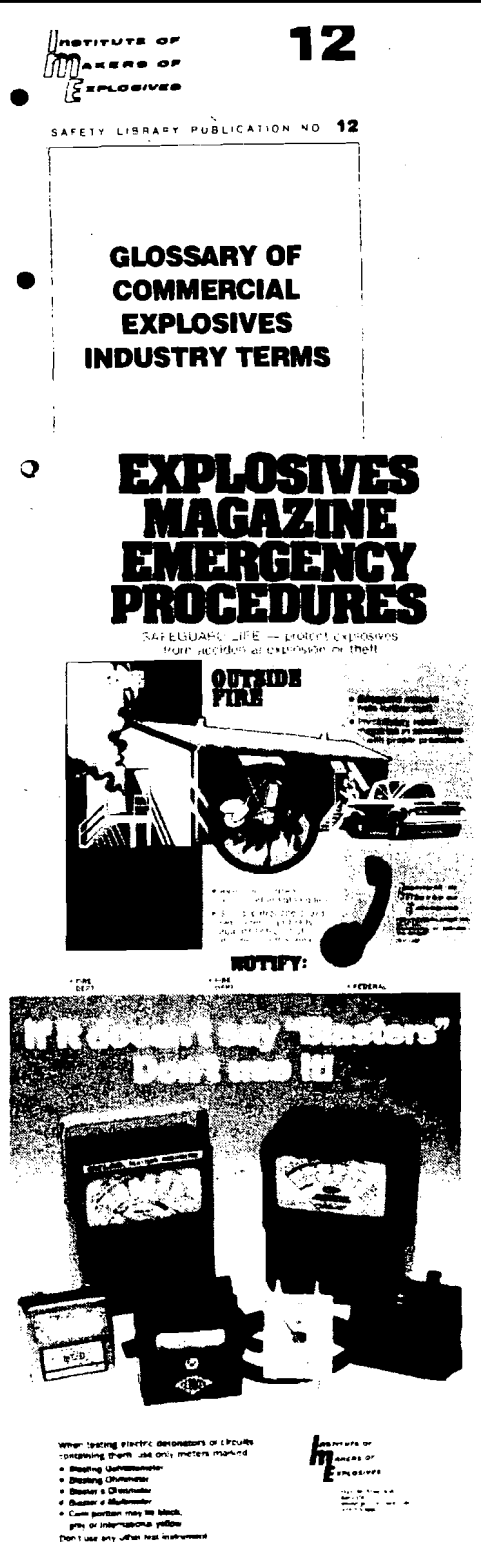
Richard J. Roth, general manager, Explosives & Chemical Propulsion Department of Hercules Incorporated, speaking for the Institute of Makers of Explosives, addressed the Senate Permanent Subcommittee on Investigations and the House of Representatives Judiciary Subcommittee at their request.

While agreeing that legislation was needed to assure the proper and use of explosives, Mr. Roth pointed with pride to the explosives energy industry's role in providing "the muscle for much of man's constructive energies and efforts," and cited the safety record which "ranks among the very best of all industries."

The eleven member companies comprising the IME manufacture about 85 percent of the commercial explosives consumed in the United States.

In discussing the role of the IME in self-regulating, Mr. Roth said the code of regulations for the manufacture, transportation, storage and use of explosives is ready for immediate application at all levels of government.

"We believe its promulgation and enforcement offer the best hope of curtailing the improper use of products of our industry. In this suggested code of regulations we



1971 A major project was producing a new blasting cap film to replace "Blasting Cap – Danger!" made in 1956.

The 3M Company began developing technology to trace explosives using glass microspheres. The IME objected to this program for safety and practical reasons.

A recommendation was developed for the design and construction of boxes for combined shipments of caps and other explosives.

Paid advertising was used for the first time in connection with the Blasting Cap Safety Education Program.

"Explosives – Tool for Progress" to date had 260 telecasts reaching an estimated audience of 7.7 million people.

1972 The first edition of SLP No. 22, "IME Standard for the Safe Transportation of Electric Blasting Caps in the Same Vehicle with Other Explosives" was published and was the culmination of 59 years of discussions and studies of containers for shipping caps with other explosives.

The IME petitioned the DOT to create a new hazard class called "Blasting Agents".

1973 The IME worked with the Hazardous Materials Regulations Board of the DOT which subsequently adopted regulations requiring labels on all explosives packages by January 1, 1974.

1974 IME representatives attended the first public hearings sponsored by the BATF on explosives tagging.

The "Explosives Magazine Emergency Procedures" poster was first published.

1975 Two top BATF officials spoke on the explosives tagging programs at the Spring meeting.

General Counsel reported that *"rumors to the effect the IME is a defunct organization are exaggerated and should be disregarded."*

1976 The Federal Bureau of Investigation (FBI) volunteered to participate in the IME's Blasting Cap Safety Education Program. FBI Director Clarence Kelley appeared in a television spot, and a special notice on this production was sent to 40,000 law enforcement agencies. Another mailing was sent to 5,000 police units with bomb disposal responsibilities.

1977 The IME presented testimony before a Senate Subcommittee in opposition to legislation mandating a tagging program.

1978 The Mine Enforcement and Safety Administration (MESA) of the Department of the Interior became the Mine Safety and Health Administration (MSHA) of the Department of Labor.

SLP No. 12, "Glossary of Commercial Explosives Industry Terms" was published.

1979 Formal Antitrust Compliance Guidelines were approved as was the policy for distributing the guidelines a each IME meeting. Prohibited subjects included pricing and agreements restricting sales areas or customers.

There was unanimous support among the Board of Governors for opposition t explosives tagging.

The institute relocated in October to Washington D.C. (818 Connecticut Avenue, NW) after 63 years in New Yo City.

1980 The Bylaws were amended to permit admission of Canadian manufac turers.

The Explosives Manufacturers' Politica Action Committee (EMPAC) was formed.

The Office of Technology Assessment (OTA) of the U.S. Congress issued "Taggants in Explosives", an assessment of the taggant proposal.

The Senate Governmental Affairs Committee voted to delete tagging provisions from pending legislation, S. 333.

The policy of copyrighting Safety Library Publications was adopted.

The office was moved in March to 1575 Eye Street NW, Suite 550, Washington, D.C.

1981 The IME incorporated in the District of Columbia as a Not-For-Profit Corporation.

1982 The blasting cap poster and bookmark were revised. Total distribution of safety materials in 1982 was 156,500 items.

1983 A blasting cap newspaper ad was placed in 1,272 newspapers and a public service television spot was shown on 59 stations.

A joint IME and FAA project to develop a system for the detection of electric detonators commenced.

The "Blasting Meter" poster was first published.

1984 Manufacturers of oil well specialty products were invited to join as non-voting "Visiting Participants" for two years. (See 1986 entry)

The Bylaws were amended, changing titles of officers.

1985 The Institute voted to approve the "Trade Name Loading Guide for IME Container" as an insert with SLP No. 22.

SLP No. 14, "Handbook for the Transportation and Distribution of Explosive Materials" was published.

The "Emergency Routing" poster (an update of the "Civil Strife" card) was issued.

1986 The category of "Visiting Participant" was abolished when a new class of membership, Associate Member, was created.

A new nine-minute blasting cap safety video entitled "Don't Touch" was produced.

The IME moved in February to its present location at 1120 Nineteenth Street, NW, Suite 310, Washington, D.C.

1987 A standard date-plant-shift code was adopted.

The IME's first training video was produced. Entitled "Emergency Instructions" and directed toward drivers and first responders, it described what to do when an accident or incident occurs involving a vehicle transporting explosive materials.

1988 As of April, IME membership was at an all-time high.

An Environmental Matters Ad Hoc Committee undertook a major project directed at overcoming problems caused by an Environmental Protection Agency (EPA) rulemaking pertaining to the disposal of explosive waste by open burning/open detonation. This included the preparation of a Permit Writers' Guidance Manual.

The IME celebrated its 75th anniversary at the spring meeting in Florida. A booklet entitled "*IME Anniversary 75 - Institute of Makers of Explosives*" covering the IME's history, was produced for the occasion. Another publication, entitled "*Publicity Through the Institute of Makers of Explosives to Increase the Use of Explosives - 1923-1942*," was also written for the anniversary.

96TH CONGRESS, 2d Session } SENATE { R No.

AN ACT TO COMBAT INTERNATIONAL TERRORISM

REPORT

OF THE

COMMITTEE ON GOVERNMENTAL AFFAIR
UNITED STATES SENATE

TO ACCOMPANY

S. 333

TO EFFECT CERTAIN REORGANIZATION OF THE FEDERAL GOVERNMENT TO STRENGTHEN FEDERAL PROGRAMS AND POLICIES FOR COMBATING INTERNATIONAL AND DOMESTIC TERRORISM

together with

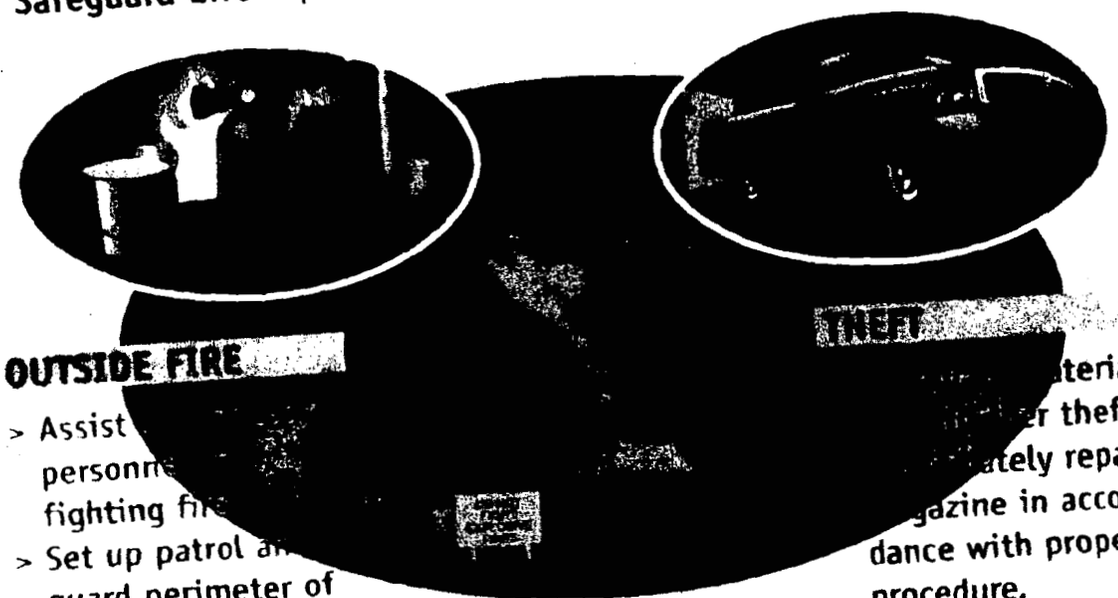
ADDITIONAL VIEWS

JUNE 25 (legislative day, JUNE 12), 1980.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON : 1980
★(Star Print)

EXPLOSIVE MAGAZINE EMERGENCY PROCEDURES

Safeguard Life – protect explosives from accidental explosion or theft



OUTSIDE FIRE

> Assist
personn
fighting fi
> Set up patrol a
guard perimeter of
property against
entrance of anyone
into area.

THEFT

terial
r theft.
ately repair
azine in accor-
dance with proper
procedure.

INSIDE FIRE

> Do not fight fire.
> Evacuate all personnel from area for at least a 2500 foot radius.
> Set up patrol and guard perimeter against entrance of anyone into area.

INSTITUTE OF MAKERS OF EXPLOSIVES
1120 Nineteenth Street, NW
Suite 310
Washington, DC 20036-3605
(202) 429-9280
www.ime.org

FOR OUTSIDE FIRES:		FOR INSIDE FIRES:		FOR THEFTS:	
FIRE DEPT.		FIRE DEPT.		BATF	
POLICE		POLICE		POLICE	
COMPANY		COMPANY		COMPANY	

1989 A warning sign was approve
for magazine sites, with wording
DANGER/NEVER FIGHT MAGAZI
FIRES/_____ (telephone number t
call in emergency)

An ad hoc committee met with person
from the U.S. Bureau of Mines regardi
a program of testing fumes from non c
sensitive explosives.

A video on safe storage of explosives,
cosponsored by Nobel Insurance and t
BATF, was produced and copyrighted

The Safety Regulations Committee wa
discontinued and the Environmental
Affairs Committee was established.

The name of the political action commi
tee changed from EMPAC to IMEPAC.

1990 At the urging of the IME, the
Consumer Product Safety Commission
and Canadian authorities agreed on st
dardized detonator markings, as follov

EXPLOSIVE-EXPLOSIF-DANGER-
DETONATEUR-BLASTING CAP

An ad hoc committee was established
review the pumping of bulk, water-bas
explosive materials.

IME guidelines for preloading of blasti
agents in a vehicular magazine were
approved and published.

"Regular" membership was expanded
to include manufacturers of industrial
grade ammonium nitrate, while associ
membership was expanded to include
firms that "store/distribute/sell" comn

cial explosives and non-North American manufacturers of commercial explosives in a special category.

1991 The IME began work in cooperation with MSHA on studying the use of used oil in field-mixed ANFO.

SLP 21 was approved, covering safety warnings and instructions relative to disposal of commercial explosives materials.

The American Society of Association Executives (ASAE) awarded the IME the *Advance America* Award for the Blasting Cap Safety Education Program.

1992 The IME formalized relations with the Federation of European Explosives Manufacturers (FEEM). The IME was granted associate member status in FEEM and FEEM was granted the status of associate in the IME. The IME President and FEEM Secretary General will participate with each organization on reciprocal basis.

Detonator markings noted as activity in 1990 were approved as the official IME position.

The issuance of the American Table of Distances (ATD, SLP-4) in English and metric units was approved.

The organization distributed 31,500 pieces of safety education materials in the first ten months of the year. This is considered as typical volume.

1993 The Board approved a proposal that all SLP's include both English and metric units.

A "White Paper" on the IME position on the use of used oil in ANFO was approved.

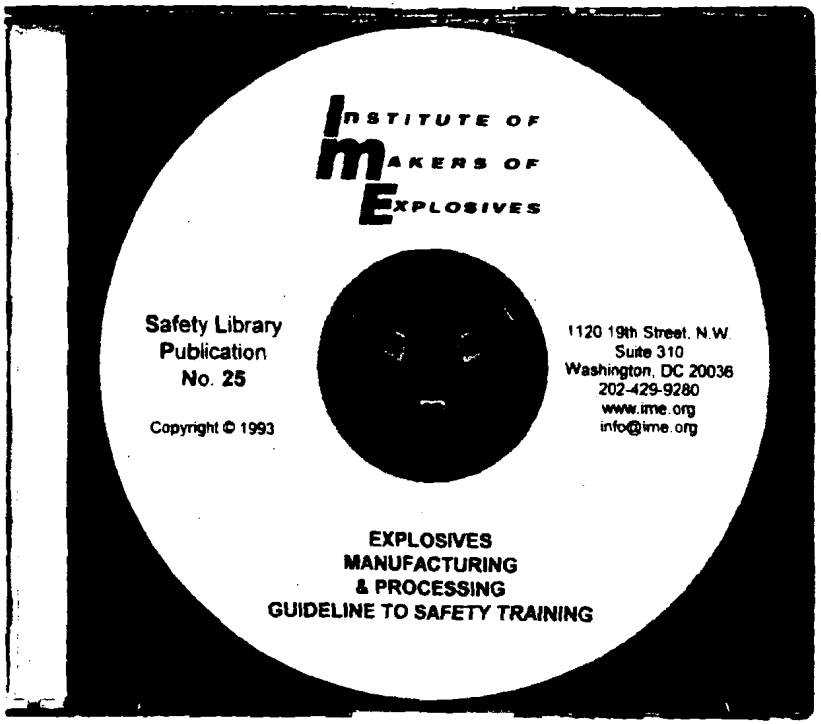
The Board approved a document entitled "Fumes From Blasting Operations," which was instituted as a result of reported incidents of toxic gases entering dwellings at blast sites.

The *Safety Education Committee* changed its name to the *Safety & Health Committee*.

1994 Due to renewed Congressional interest in taggants (see 1980 activities) as a result of the World Trade Center bombing of February 1993, the IME sponsored field tests of taggant materials.

In order to avoid litigation by the IME, MSHA agreed to appropriate corrective action relative to the use of the IME-22 container, and to certain aspects of the use of plastic borehole liners.

Frederick P. Smith, Jr. retired as the President of IME and James C. Ronay was hired as successor.



SLP's began to be available on CD-ROM in 2002

1995 The IME actively encouraged Federal licensing for explosives purchases, but key members of the Senate and House were opposed. The IME efforts continued with the BATF.

The Oklahoma City Federal Building was bombed in April, increasing Congressional interest in taggants for explosives. In June, IME President J.C. Ronay testified before the House Judiciary Committee on the issue.

Containing the Threat from Illegal Bombings

An Integrated National Strategy for Marking, Tagging, Rendering Inert, and Licensing Explosives and Their Precursors

NATIONAL RESEARCH COUNCIL

1996 The Board approved broader categories for the collection of tonnage data from all participants, both IME members and nonmembers, on an annual basis. This was done with the expectation of collecting more comprehensive and accurate information.

Congress passed the *Anti-Terrorism and Effective Death Penalty Act*, which called for a comprehensive study of controls on the availability of explosives, explosive precursors (oxidizers, etc.), and on the inclusion of detection and identification taggants in explosives. The study was assigned to the Department of the Treasury, and then delegated to the BATF. The BATF then funded a parallel study to be conducted by the National Research Council.

A new staff position of Administrative Assistant was created, with assigned duties to include those of Receptionist and Legislative Analyst.

1997 IME President J.C. Ronay presented the IME position on taggants in explosives to a committee of the National Research Council of the National Academy of Sciences.

The Board approved presenting the IME guidelines on blast site fall protection ("tethering") to MSHA.

The decision was made to revise SLP 20 to include recommended safe distances from cellular telephones and cellular transmission towers.

A seven-year extension of the office lease was negotiated, doubling space to 5000 square feet, in order to accommodate tl growth in staff size and provide space for committee functions and for meetin with agency representatives often held IME Headquarters.

1998 The document "Safety Recommendations When Working Near the Crest of a Free Face" was approved by tl Board.

NIOSH completed testing of a No. 8 strength test detonator at the urging of the IME. This detonator is necessary for compliance with DOT tests, but was ou of production in the U.S. One company agreed to manufacture it as a special product.

The Board approved the addition of a new category of Affiliate Membership, t include manufacturing and service companies that are closely affiliated with th manufacture of explosives.

Tom Dowling, Manager of Technical Service for 12 years, retired and Lon Santis, formerly with the USBM and NIOSH at the Pittsburgh Research Center, was hired as his successor.

In March, the report of the *Committee on Marking, Rendering Inert, and Licensing of Explosive Materials* of the National Research Council of the National Academy of Sciences recommended that "identification tagging of explosives should not be required at the present time," but "a research program should be carried out to identify, evaluate, and develop a taggant system that meets several technical criteria," essentially

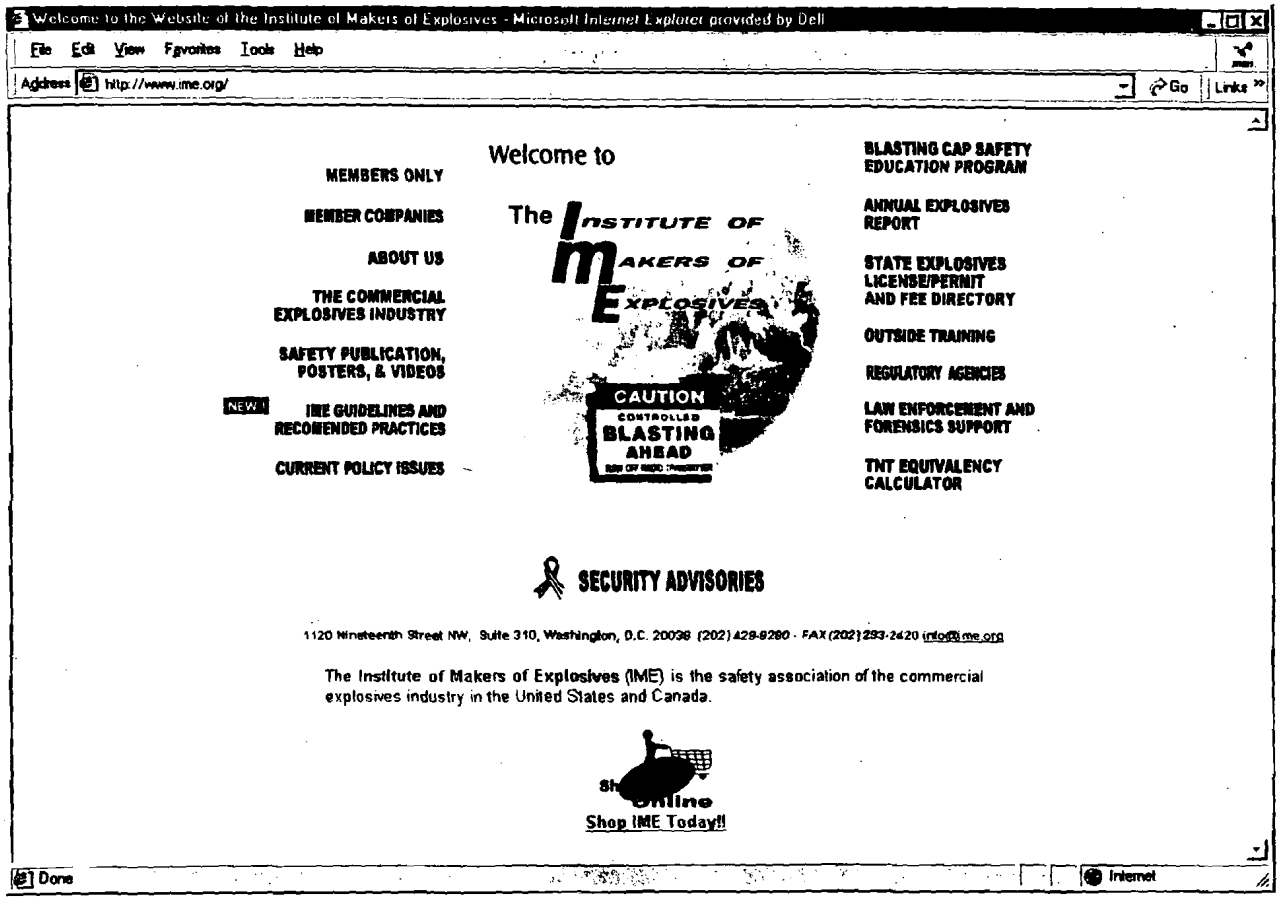
stating that taggants were not the answer to counter the illegal use of explosives and that such a program was not recommended as cost effective.

The IME established an Internet web site to facilitate its ability to communicate and provide services to members, distribute safety publications, and respond to inquiries about commercial explosive products.

1999 The Board approved a bylaw change to clarify the fact that eligibility for membership is restricted to companies that manufacture explosive products in the United States or Canada, or handle such products.

2000 The Board approved the addition of a new section in SLP 17 covering demilitarized explosives, a new section in SLP 20 on low-power, hand-held radio-frequency sources, and an initiative with the BATF on date/shift/plant coding of all imported high explosives.

2001 The terrorist attacks of September 11th on the World Trade Center and the Pentagon, along with the hijack-related airplane crash in Pennsylvania, greatly emphasized security concerns of industry members. This concern led to the development of a document entitled *IME Enhanced Security Guidelines*. This document emphasized security concerns of industry members and endorsed increased efforts to work with government agencies to develop security recommendations for industry.



2002 The IME supported legislation to require a Federal permit to purchase explosives. The enactment of the Safe Explosives Act in November closed the "intrastate permit loophole." Henceforth all explosives purchasers must have a Federal permit. Also, all persons possessing explosives must submit to a background check.

The newly created Office of Homeland Security developed recommendations for industry to follow to assure the security of their operations and products against potential terrorist threats.

The FBI's National Infrastructure Protection Center established a cooperative program with industry to coordinate responses to the threat of terrorism.

Open Price Association

Minutes of the August 1914 meeting first record discussions on how to collect price information and what products would be involved.

In 1915, collection of price statistics on black powder began, with high explosives added shortly thereafter.

A letter written by one of the major member powder companies to all of its sales representatives in September 1917 is copied on these pages. It explains the purpose of the Open-Price function.

The Institute continued as an Open-Price Association for many years. Minutes of a meeting in 1922 indicated price statistics collection had ceased; reporting was resumed in late 1934. The minutes of April 1936 show that the concept of the Open-Price Association was still a useful and legal procedure used by the industry and encouraged by the federal government.

"The theory of open-price reporting is that such publicity tends to deter one from making discriminatory prices. That seems to be obvious and that is what the court had in mind when it sanctioned such methods, even though such publicity itse might tend to prevent one from granting a sec rebate or making a discriminatory price to o customer and not to others similarly situatec which was held to be lawful. This Institute wc organized in 1913 and the basic principle whic prompted its organization was publicity of pr It is gratifying to note, more than 20 years after the organization of this Institute, that Ji Mack, of the Federal District Court, and the U.S. Supreme Court, unanimously (7 judges c participated) approved the open-price princip which brought this Institute into existence, ar now urge its use as helpful and stabilizing to c industry, without detriment to the public, anc that, too, even though it might tend to result i uniform prices at a fairer level. The court, in saying these things, of course was not oblivio to the fact that the reporting of low prices mig have a depressing effect on a market and, brin all prices made out into the open, might tend t prevent promiscuous cutting of prices."

September 1917

Dear Sir:

The Institute of Makers of Explosives is an association to which most manufacturers of black powder and dynamite belong. There are fifteen members.

Associations of this kind representing many large industries are now in existence and new ones are constantly being formed. In connection with this work as a member of the Federal Trade Commission, Mr. Edward F. Hurley, said in one of his speeches that the government wishes to rely more on organizations of this nature for the elimination of unfair competition, bad working conditions for employees, and other abuses, than on legislation. In other words, the government wants to depend on the businessmen of the country to clean their own houses, and it believes they are better able to do this than anyone else.

The idea underlying associations such as ours, is that mutual understanding among businessmen will do away with the suspicions and bitter trade rivalries which are responsible for many of the abuses which have characterized American business in the past. As you are aware price-cutting ha been the subject of more disputes and recriminations in business than anything else. The extent to which it can be fairly practiced is limited by federal statute. The Institute only aims to prevent unfair and illegal price-cutting and it does this only through the interchange of the data which will enable everyone to figure costs correctly, and through making public quoted prices ***after they are quoted***. It would be illegal to tell the competitor what price we propose to quote on any piece of trade, but after we have put in our quotation, we are at liberty to publish the figures to the world. By exchanging prices after they are quoted, members of the Institute protect themselves against unfair methods sometimes employed by purchasing agents to tell salesmen that their competitors have quoted lower prices when this is not true. An association whose members exchange data of this kind is known as an Open-Price Association. All members of the Institute do not take advantage of the Open-Price feature, but those who send in their quotations to the secretary receive from him quotations sent in by others. However, everyone is at full liberty to cut or raise prices and quote as he sees fit.

A misapprehension concerning the function of the Institute and our relations to other manufacturers, has been created in the minds of some of our salesmen as a result of an incomplete understanding of this price exchange feature. As Open Price Associations are a comparatively new development in our commercial life, it is not unnatural that their function should be misunderstood by anyone with only a partial knowledge of their workings. Some of our men have written letters to the branch offices based on this misunderstanding. They have written as though they thought it were possible for us to control, in some measure, the acts and practices of our competitors, and have requested us to exert an influence which we do not possess, and to make requests or suggestions to competitors, which would be both presumptuous and useless. We have no way of influencing or controlling the acts of any of our competitors, nor any disposition to do so, and it would be improper for us to make the attempt if we were so disposed. If it comes to our attention the competitors are employing methods which do not seem legitimate, we can, and will, bring the matter up for discussion in the Institute meetings. Such discussion will bring out the majority opinion on the matter, as to its fairness and legality, and we believe most members of the Institute are earnestly trying to make their selling methods harmonize with the Law. However, no one is bound by the Institute to do so, and, without resorting to the courts, we have no way of forcing our conception of what is legal and proper on anyone else. We cannot go further than to state our views in open meeting, and leave it to others to be governed by them, if they see fit. We hope this explanation will serve to dissipate all misunderstanding concerning our relation to other manufacturers of explosives, and that in the future we shall hear no suggestions from salesmen based on the misapprehension to which we have referred.

Blasting Cap Safety Education Program

In 1926, the IME began the sponsorship of a Blasting Cap Safety Education Program which remains in operation today. This nationwide program was designed to educate children to the dangers of blasting caps (detonators) and to reduce accidents involving blasting caps.

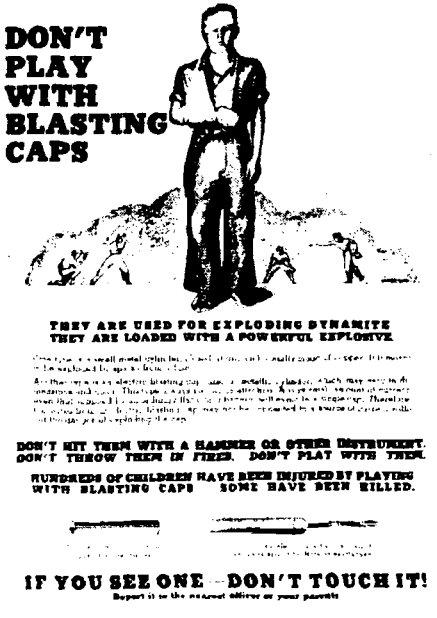
Over the years, this educational campaign has used a variety of safety education materials, including ads in magazines, such as "Boy's Life," and newspapers; at least 30 posters for children and adults; TV spots; teacher and instructor kits; presentations in schools; and blasting cap display boards.

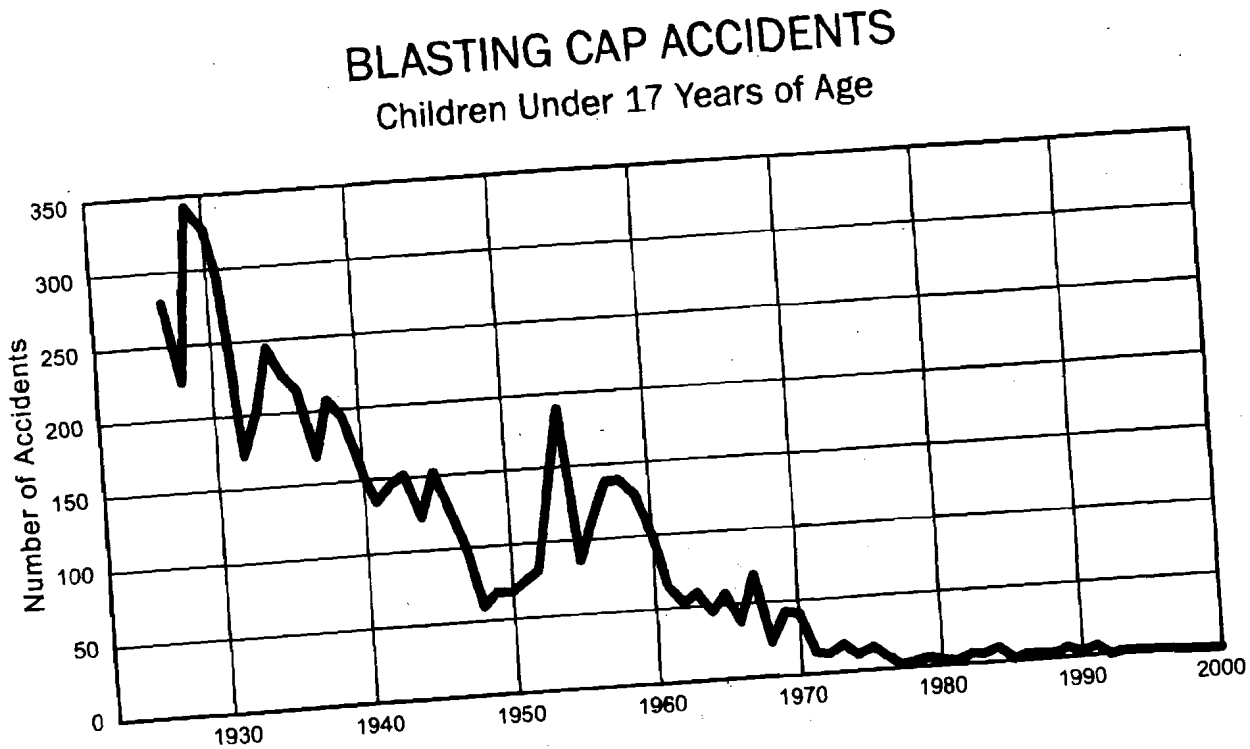
The Boy Scouts of America, in connection with their participation in the program, proposed that it would be helpful if actual examples of blasting caps were available for Scoutmasters to show to the boys in their troops. This led to the production of the first display board in 1947. The illustrations on these pages show some of the boards and posters that have been produced.

The TV spots included Chuck Connors; Willie Mays; Clarence Kelley, Director of the Federal Bureau of Investigation; and Walt Disney's "Flipper."

The present program centers around a video, posters and a display board on which are mounted various nonelectri and electric blasting caps.

When the program began, hundreds o children were being injured or killed e year. After a long period of decline, the accident rate increased during the 195(probably as a result of the Interstate Highway Program. However, since the the injury rate has been drastically reduced as indicated in the accompany chart. 1985 was the first year in the prc gram's history in which no injuries wei reported.



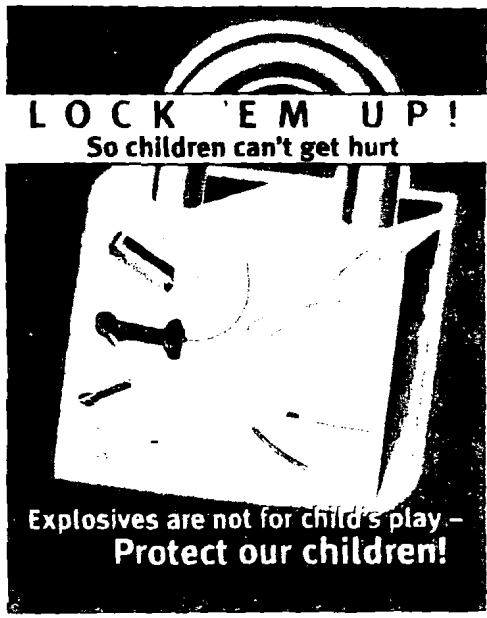

BLASTING CAP ACCIDENTS
Children Under 17 Years of Age
Number of Accidents
350
300
250
200
150
100
50
0
1930
1940
1950
1960
1970
1980
1990
2000

DANGER
BLASTING CAPS
EXPLOSIVE
DON'T TOUCH
5

DON'T
BLASTING
FUSE CAP
CAP FUSE
ELECTRIC CAP
ELECTRIC CAP

DETONADORES
EXPLOSIVOS PELIGROSOS
SI ENCUENTRA CUALQUIER OBJETO QUE SE PAREZCA A ESTOS NO LO TOQUE
NO TOCAR

LOCK'EM UP!
SO CHILDREN CAN'T GET HURT
BLASTING CAPS ARE EXPLOSIVES
NOT TOYS!


LOCK 'EM UP!
So children can't get hurt
Explosives are not for child's play –
Protect our children!

Movies, Videos and Television Spots

IME Secretary Hampton presenting a gift to baseball star Willie Mays for his part in the 1968 safety video.

1926 "Dynamite – Concentrated Power" – Produced by the Department of Agriculture witl technical assistance from the IME.

1927 "How Jimmie Won the Game" – The IME's first blasting cap movie. Filmed at Camp Caesar Rodney, Wilmington, Delaware

1945 "Blasting Cap!" – "This movie reveals a hair–raising story of three boys and the "joke" planned to play with the blasting cap to scare their little sister. The terrible consequei of setting off such a cap are shown, the near-disaster is avoided, and an Army Air Forc pilot, the older brother, tells them emphatically that a blasting cap can be as dangerou an enemy machine gun." *(Description taken from The Explosive Engineer, June 1946.)*

1955 "Don't Touch It" and "Don't Touch Blasting Caps" – Two television shorts on blasting c

1956 "Blasting Cap – Danger!" – 13-minute blasting cap film.

1960 "Don't Touch It" – One-minute blasting cap television spot.

1962 Mickey Mantle – One-minute blasting cap television spot.

1963 Chuck Connors and "Flipper" blasting cap television spot.

1964 Gus Grissom blasting cap television spot.

1868 Willie Mays blasting cap television spot.

1969 "Explosives – Tool for Progress" – A 25-minute film on the vital role of explosives in modern society.

1970 "To Be Fully Alive" – Blasting cap television spot.

1971 "Don't Touch" – A seven-minute blasting cap film.

1973 Two 30-second blasting cap television spots.

1976 Clarence Kelley, FBI Director, blasting cap television spot.

1986 "Don't Touch" – A nine-minute blasting cap film.

1987 "Emergency Instructions" – A 24-minute training video for truckers and first responde on what to do if an accident occurs involving commercial explosives.

1989 "Safe Storage of Explosives Materials" – 29 -minute video.

1997 "Explosives: The Power Tool" – 19-minute video depicting the positive uses of explosive

1999 "Emergency Instructions" – 26-minute video on first response to commercial explosive trucking accidents.

1999 "Safe Storage of Explosives Materials" – 29-minute video.

2002 "Responding to Trucking Incidents Involving Commercial Explosives" – A video, co-sponsored by the IME and the U.S. Department of Transportation.

"How Jimmie Won The Game"

A One-Reel Motion Picture Play

which depicts boyhood in all its innocence and beauty, —and at the same time gives vivid warning of the danger of using the blasting cap as a plaything.

This is "Jimmie", the hero of the one-reel film, "How Jimmie Won The Game", designed to demonstrate the dangers to children of playing with blasting caps. The film was prepared by the Institute of Makers of Explosives.

A fascinating story of how a 12-year-old lad saved the star pitcher of his home team from being maimed or killed, so that he could win the championship game. A lesson in every scene. A heart-throb in every move. If there were more Jimmies in the world there would be fewer blasting cap accidents. This one-reel play is designed to spread the gospel of safety wherever blasting caps are used. Your school or community may have a copy of this wonderful film for the mere asking. It is packed with entertainment and holds a lesson that is obvious to all.

For further information concerning the showing of this film communicate with

C. STEWART COMEAUX, *Secretary*

INSTITUTE OF MAKERS OF EXPLOSIVES

103 Park Avenue New York, N. Y.

Blasting Cap–Danger!

A 16 mm. sound motion picture in color — running time 15 minutes—produced by the Institute of Makers of Explosives, the trade association of America's leading producers of commercial explosives and blasting supplies.

What to do when an accident or incident occurs involving a vehicle transporting commercial explosive materials.

The Institute of Makers of Explosives now has available the latest in its growing series of safety videos. "Emergency Instructions" is a detailed view of how public safety personnel should respond to fires and accidents when commercial explosives-carrying vehicles are involved.

Please send me the "Emergency I

Name _____

Organization _____

Street Address _____

City _____

☐ Please send information on ark

EXPLOSIVES

...TOOL FOR PROGRESS

22½ minutes
Color and Sound
Free-loan 16mm film

What have explosives done for you lately . . . or did the question never cross your mind?

There are such obvious things as enlarge Grand Coulee Dam, widen the Panama Canal, and dig foundations for New York City skyscrapers.

Then there are the rail and roadways carved and straightened with the help of explosives to make Americans the best-traveled people on earth. Pipelines dug and irrigation channels trenched—not by pick and shovel, but by explosives. And the mining or quarrying of countless minerals that are the building blocks of 20th century life.

Nearly everything that shelters, warms, clothes, or feeds has origins requiring the energies of commercial explosives in its extraction, processing or delivery for mankind's use.

This wide-ranging film demonstrates the essentiality of explosives to the nation's life. It illustrates how our daily living is touched by explosives constructively, efficiently, economically and safely.

Prints of this outstanding film are now in circulation throughout the United States. In some instances, the 7½-minute blasting cap *SAFETY EDUCATION* film DON'T TOUCH! is spliced as a trailer-supplement to the longer film EXPLOSIVES—Tool for Progress to provide a double-header, one-reeler industry information/public safety picture.

If you do not have the name and address of the film circulation agency nearest you that gives distribution service to the IME film EXPLOSIVES —Tool for Progress, and you wish to request its booking, please complete and return the form at the right to

INSTITUTE OF MAKERS OF EXPLOSIVES
420 LEXINGTON AVENUE
NEW YORK, N.Y. 10170

Give five to six weeks advance notice of your preferred showing date. Your request will be forwarded by IME to the film outlet serving your locale; this agency may bill its postage costs and charge a nominal handling fee.

ORDER FORM

Please send me the 16mm. free-loan color film "Explosives—Tool For Progress" on:

_____ FIRST CHOICE **OR** _____ SECOND CHOICE

☐ If film is not available on above dates, please reschedule for the first open date and advise

NAME _____

TITLE _____

SCHOOL/ORGANIZATION _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

USER PAYS RETURN POSTAGE

Safety Library Publications

1914

Pamphlet No. 2

AMERICAN TABLE OF DISTANCES

SPECIFYING DISTANCES TO BE MAINTAINED BETWEEN

STORAGE MAGAZINES FOR EXPLOSIVES

AND

INHABITED BUILDINGS

PUBLIC RAILWAYS

PUBLIC HIGHWAYS

AMERICAN TABLE OF DISTANCES

SPECIFYING DISTANCES TO BE MAINTAINED BETWEEN
STORAGE MAGAZINES FOR EXPLOSIVES
AND
INHABITED BUILDINGS
PUBLIC RAILWAYS
PUBLIC HIGHWAYS

BASED ON STATISTICS COMPILED FOR
SPECIAL COMMITTEE

Chairman: H. M. Barksdale, Vice-Pres't E. I. duPont deNemours Powder Co.
A. C. Blum Gen'l Manager Keystone National Powder Co.
A. G. Fay . . . President Aetna Powder Co.
F. W. Olin . . President Equitable Powder Mfg. Co.
G. E. Potts . Vice-President The Potts Powder Co.

APPOINTED BY
THE MANUFACTURERS OF POWDER AND HIGH EXPLOSIVES
OF THE UNITED STATES

COMPILED BY
RALPH ASSHETON AND EDMUND B. COY
WILMINGTON, DELAWARE

ISSUED BY
INSTITUTE OF MAKERS OF EXPLOSIVES, U. S. A.
1914

COPYRIGHTED, 1914

Since 1914, the IME's recommendations on a wide variety of safety issues relating to the manufacture, transportation, storage, handling and use of commercial explosive materials have been published in the form of Safety Library Publications.

These booklets are reviewed and upda as appropriate, by member company pe sonnel serving on IME Committees.

At present, there are eleven publicatio which are distributed on a nationwide basis to individuals and firms involved with all aspects of commercial explosi

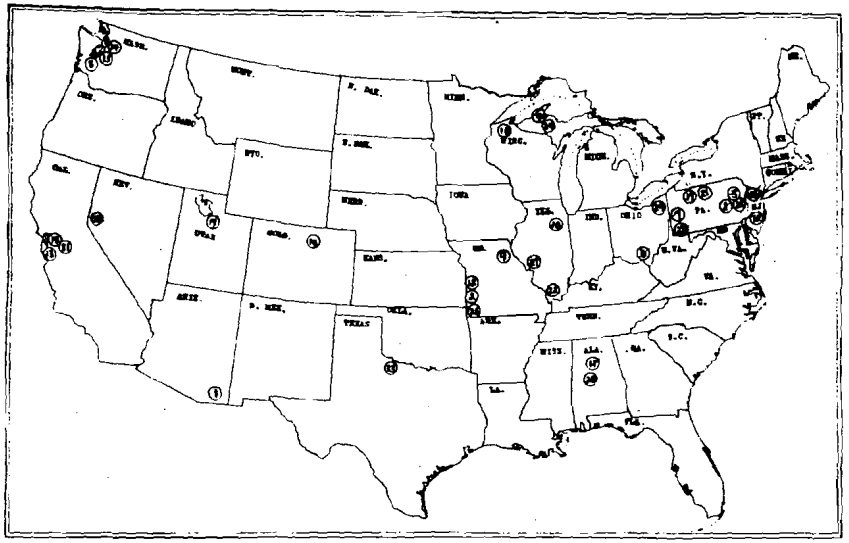
For many years, these publications hav been recognized by government and industry as an authoritative source of safety data.

Maps and Charts

The first map of the United States mentioned which had locations of all powder mills and dynamite plants with a table showing the name of the company owning each plant, the capacity of each and the amount of dynamite and black powder consumed in each state as shown by the Government Report of 1913 was mentioned at the meeting in December 1914. It was recommended that a blueprint of this map be sent to the Institute and posted for the benefit of members.

Shown here is a reduced copy of a typical chart produced by the IME. These were published for over 50 years, in at least three varieties. Some of these showed dynamite mills only (as the one illustrated here, from 1934), some showed dynamite and black powder combined, and others showed magazine sites. Tables were always printed on a part of the large sheet. The tables showed the capacity of each mill, or the owner of the magazines shown.

CHART SHOWING OWNERSHIP LOCATION AND CAPACITIES OF DYNAMITE MILLS IN THE UNITED STATES, AND SALES, BY STATES, ACCORDING TO RECORDS OF INSTITUTE OF MAKERS OF EXPLOSIVES AND UNITED STATES BUREAU OF MINES.

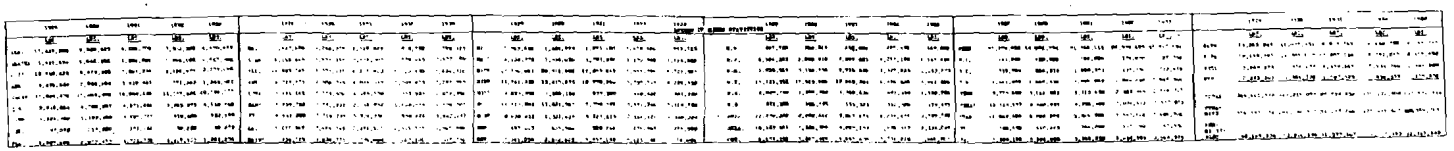


COMPILED BY
INSTITUTE OF MAKERS OF EXPLOSIVES.
C. STUART CORBAIN, SECRETARY
100 PARK AVENUE, NEW YORK, N. Y.
MARCH 30, 1934.

JANUARY 1, 1934

DYNAMITE

MAP NUMBER	NAME OF COMPANY	LOCATION OF MILL		YEARLY CAPACITY LBS.
1	APACHE	BISBEE,	ARIZ.	19,000,000
2	ATLAS	ATLAS,	MC.	30,000,000
3	"	REYNOLDS,	PA.	24,000,000
4	"	SEMPER,	MICH.	23,100,000
5	"	WHITE HAVEN,	PA.	23,000,000
6	AUTUM	RED DIAMOND,	OHIO	12,000,000
7	BONFOR	COVENT. STA.,	PA.	19,000,000
8	DEER PER.	LACEY,	WASH.	7,400,000
9	DU PONT	ASHBURN,	MO.	18,000,000 INACTIVE
10	" "	BARKSDALE,	WISC.	30,000,000
11	" "	BIRMINGHAM,	ALA.	21,000,000
12	" "	CARL JCT.,	MO.	15,000,000
13	" "	DU PONT,	WASH.	42,000,000
14	" "	LAWRENCE,	COLO.	10,000,000
15	" "	REPAUNO,	N.J.	60,000,000
16	" "	SENECA,	ILL.	16,000,000
17	GERMAN	HERCULES,	PA.	12,000,000
18	GIANT	GIANT,	CAL.	30,000,000
19	HERCULES	BACCHUS,	UTAH	15,000,000
20	"	BESSEMER,	ALA.	15,000,000
21	"	HERCULES,	PA.	18,000,000 INACTIVE
22	"	PAWTILE,	ILL.	18,000,000 INACTIVE
23	"	HERCULES,	CAL.	42,000,000
24	"	IRONWOOD,	MICH.	10,500,000
25	"	JOPLIN,	MO.	13,000,000
26	"	KENVIL,	N.J.	19,000,000
27	ILLINOIS	GRAFTON,	ILL.	12,000,000
28	LIBERTY	MT. BRADDOCK,	PA.	8,000,000
29	REPUBLIC	AMHERST,	OHIO	1,500,000
30	ROCKY MOUNTAIN	REND,	NEV.	3,600,000
31	TRUJAN	ROBERTS STA.,	CAL.	12,000,000
32	"	SKYPLE,	PA.	20,000,000
33	U.S. TORPEDO	ELECTRA,	TEXAS	450,000
34	WEST COAST POW.	EVERETT,	WASH.	3,750,000
	CAPACITY OF ACTIVE MILLS,			576,000,000
	CAPACITY OF INACTIVE MILLS,			54,000,000
	TOTAL			630,000,000



Hardbound Books

"History of the Explosives Industry in America"

At a 1921 meeting, the subject of the potential publication of a history of the explosives industry in the U.S. was discussed. The minutes stated: "As a number of the gentlemen are now living who were connected with the development of the industry in the early days, and who, owing to advancing years, may not be available a few years hence, it is deemed advisable to have a questionnaire drawn up and submitted to these gentlemen by an interviewer, with an idea that in this manner valuable data may be collected that may be available at any time such a history as suggested may be written."

It was not felt at that particular time that the Institute was able to undertake the expense of writing a history, so they decided merely to begin to accumulate information. By December 1921, interest had grown to the point where discussion was held about the actual publication of a book. By November 1922, arrangements had been made with Mr. A.P. Van Gelder, who was retired from Hercules, to gather the data for the book. The December 1923 meeting minutes noted that Mr. Hugo Schlatter had been helping Mr. Van Gelder. Mr. Schlatter, who had worked for both Hercules and Atlas, specialized on the subject of smokeless powder.

Two thousand copies were published in 1927 by Columbia University Press. The total cost of publishing the book was $26,000. Final distribution of unsold copies took place in 1942.

As early as 1934, discussion began on p lication of a second volume. The subje continued to be debated and some ma rial was compiled; however, a second volume was not published.

Article by John Hale Stutesman, "American Historical Review", XXXIV, January 1929

Book Review on "THE HISTORY OF THE EXPLOSIVES INDUSTRY IN AMERIC

"History of the Explosives Industry in America" by Arthur Pine Van Gelder and Hugo Schlatter irrespective disinclination one may have to admit it or to acknowledge the logical deductions to be made therefrom, the bruta remains that our civilization has been gained, protected, expanded, and sustained by force. The struggle against n neighbor, overlord, and nature has been continuous in the past and will endure, modified in type, as conditions change new needs arise, but based always on the fundamental urge to overcome the obstacles that separate us from our des

"Explosives have earned an honorable place in peace and war by the assistance they have given to the advancement of ideals of democracy and of the legal equality of men, and by what they have done to facilitate man's efforts to obtain basic raw materials on which civilized life depends and to bend nature to his needs.

"This history of the explosives industry in America is a record made by competent hands of these explosives agents and the accessories of the organizations which are, or have been, engaged in their production and of the men directing them, that have done and are doing their part - a very important part it is and has been - in the winning, holding, and development of this continent and nation.

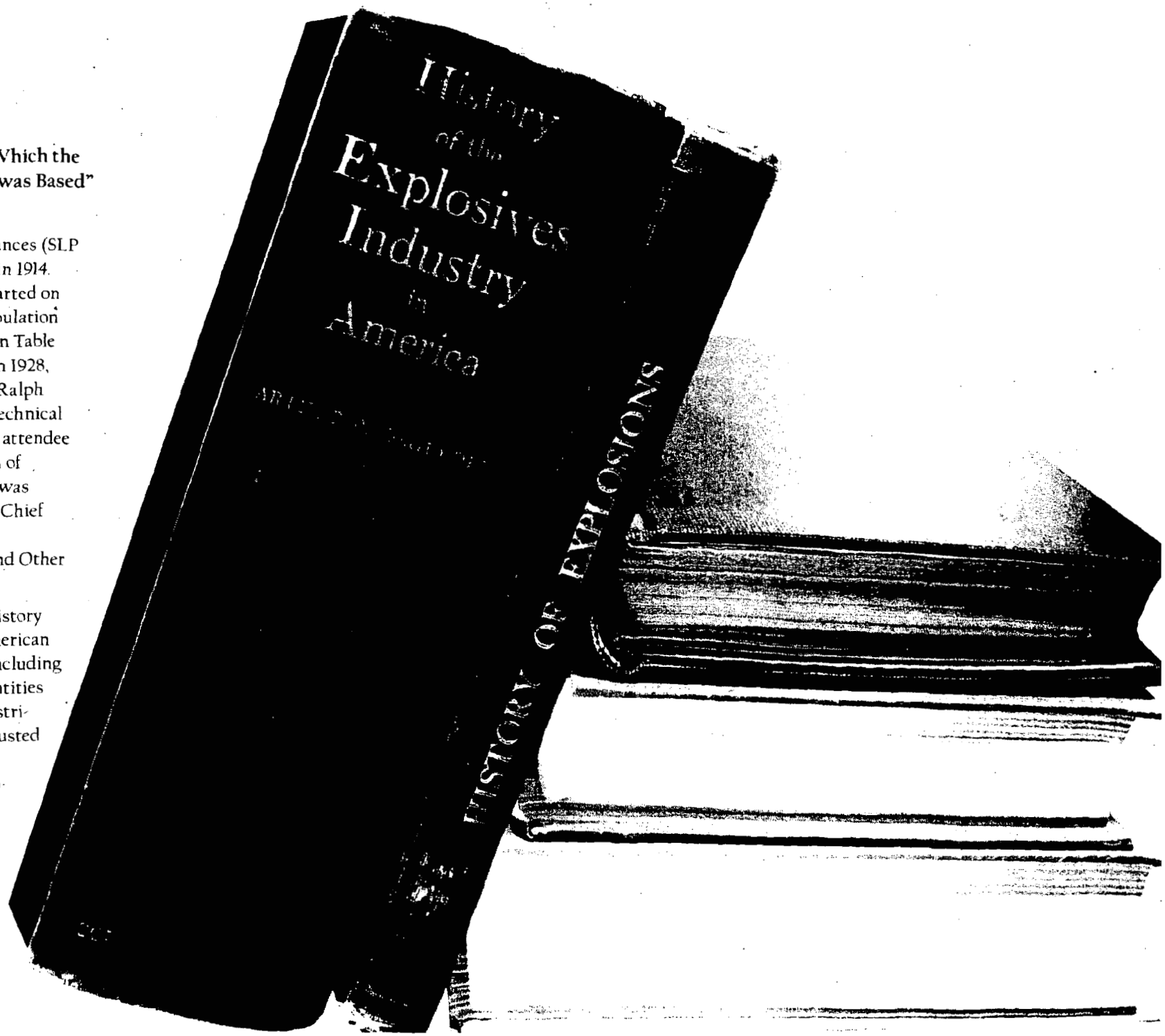
"There are so many interesting things discussed - or better, so many things interestingly discussed - that to attempt to comment on any of them within the space limits available would be unfair and most unsatisfactory. Let it suffice to say that the form, scope, and content of this work leave little, if anything to be desired.

"Any appraisal of this book cannot be better expressed than has been done by Dr Charles E. Munroe in his excellent and most interesting introduction: 'The authors have written with such frankness and enthusiasm, and with such evident knowledge of their subject, that the narrative arouses the interest of the reader and continues throughout to hold his attention. The result is a book of permanent value and abiding interest'."

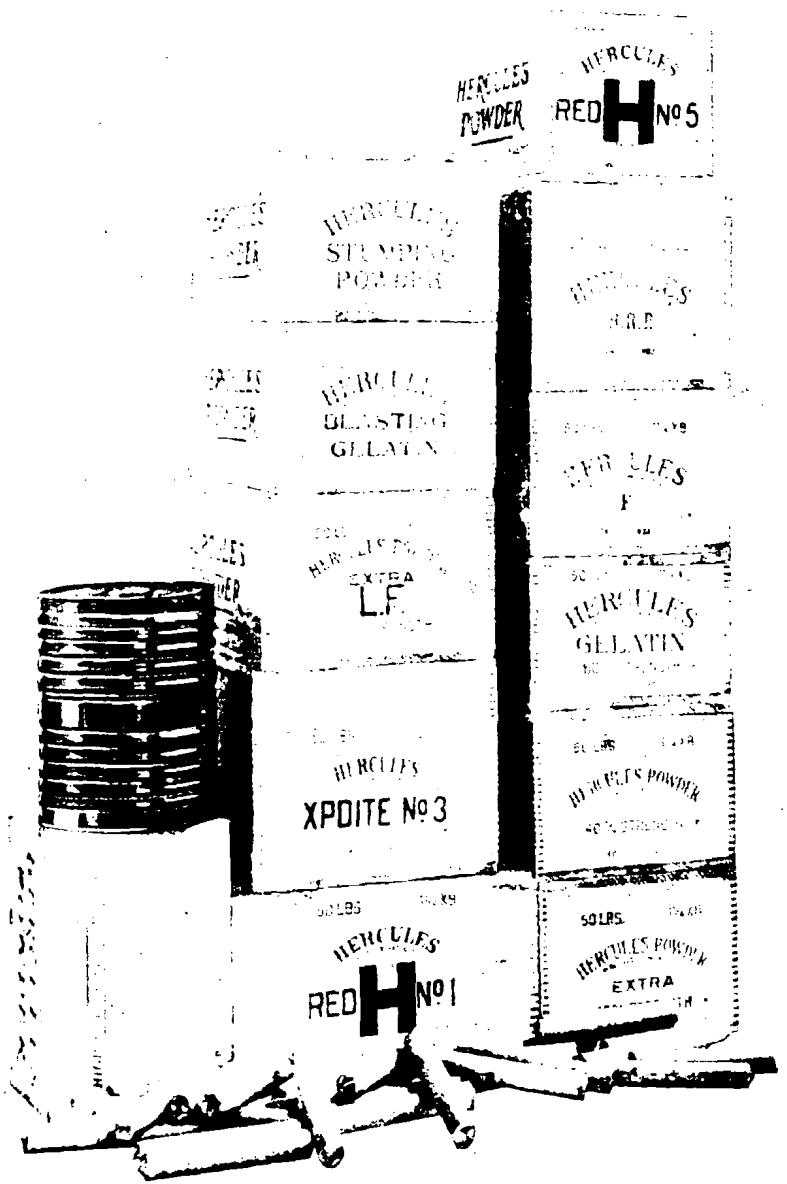
"History of Explosions on Which the American Table of Distances was Based"

The American Table of Distances (SLP No. 2) was first published in 1914. In October 1927, discussions started on publishing a book entitled "Tabulation of Data on Which The American Table of Distances is Based." In March 1928, the data had been prepared by Ralph Assheton, who was a DuPont Technical Representative and a long term attendee of IME meetings and Chairman of Committees. The introduction was written by Colonel B.W. Dunn, Chief Inspector, Bureau for the Safe Transportation of Explosives and Other Dangerous Articles.

By April 1930, 1000 copies of "History of Explosions on Which the American Table of Distances was Based, including Other Explosions of Large Quantities of Explosives" were ready for distribution. The inventory was exhausted by 1957 and the Executive Committee decided against publishing a revised edition.

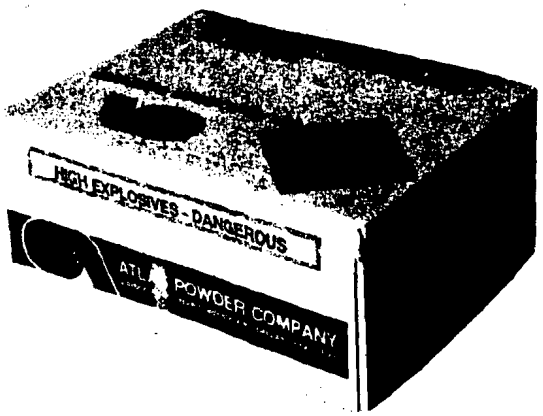


Evolution of Dynamite Boxes and Black Powder Kegs



DYNAMITE BOXES

1907	Box made of 1/2" thick lumber, with "nailed and lock-cornered construction," is app standard.
1914	The IME studies standardization of lining paper.
1926	The IME arranged tests of:
	1. Style one box with 1/2" pine ends, 3/8" pine tops and bottoms and 1/4" plywood si
	2. Style two box with 3/8" ends, 3/8" x 1-1/4" cleats and 3/8" sides, tops and bottoms.
	3. If the 3/8" ends with 3/8" cleats do not stand up, Forest Products Laboratory prop to test 3/8" ends with 1/2" x 1-1/4" cleats in 3/8" sides, tops and bottoms.
	4. If the 3/8" ends with 1/2" cleats do not stand up, Forest Products Laboratory prop to test 1/2" ends, 3/8" x 1-1/4" cleats and 3/8" sides, tops and bottoms.
1927 (May)	Cleated box, with 1/2" x 1-1/2" cleats, approved by ICC.
1927 (Sep.)	Cleated box in use by at least two companies.
1928	The ICC authorized a lock-cornered box with 3/8" top and bottom.
1931	Fiberboard boxes for dynamite approved by ICC.
1948	Fiberboard boxes for electric caps approved by ICC.
1953	Polyethylene or other efficient materials allowed as a replacement for paper case line
	IME member companies were active in all of the tests and petitions which were requ in order to achieve the above changes in regulations.



BLACK POWDER KEGS

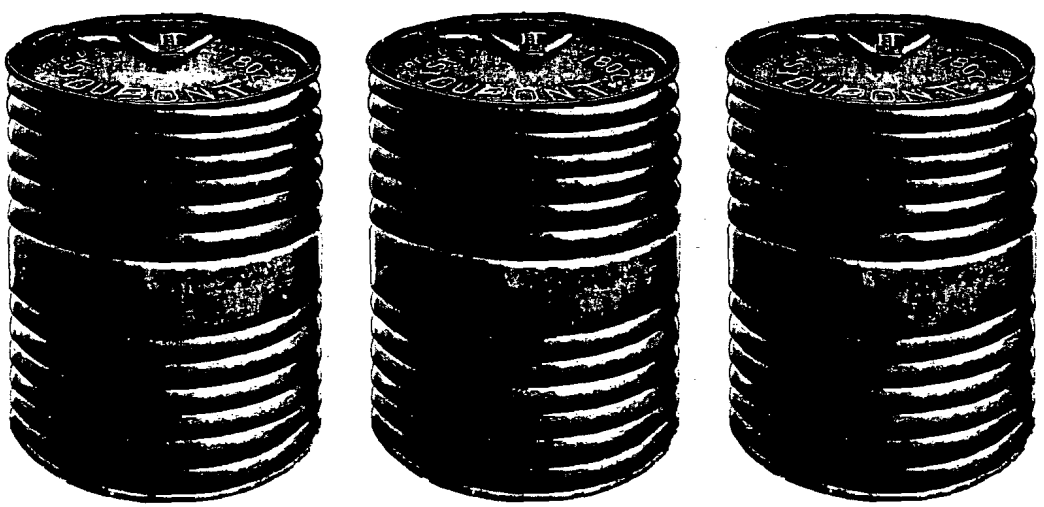
Since the beginning of the Institute, a continuing subject in almost every meeting was concerned with defective kegs and the number of kegs that were damaged in transportation.

In 1929 there were discussions about new and better kegs being needed and different bungs and caps being desirable. It was always felt that miners frequently would open black powder kegs with a pick rather than use the bung and also that the location of the bung in the kegs would not allow all of the black powder to be emptied without a great deal of trouble.

There were tests run on paperboard kegs in 1930. In 1933, the ICC and the Bureau of Explosives approved the use of a paper bag for black powder with the paper bag inside a wooden box or fiber container. The requirements were that the individual bag could not contain more than 25 lbs., and the amount per container not exceed 50 lbs. Container testing continued through the 1930's.

The second World War brought about the need to substitute some other material for steel which was the normal material of the kegs. In December 1942, the ICC issued approval 13-A which allowed a keg of chipboard and kraft construction.

In early 1946, the Bureau of Explosives asked the IME whether it would have objections to the cancellation of approval 13-A. This approval was cancelled in May of that year. Probably due to the small market for black powder, from that time on there was no further discussion on the subject of kegs in the IME minutes.



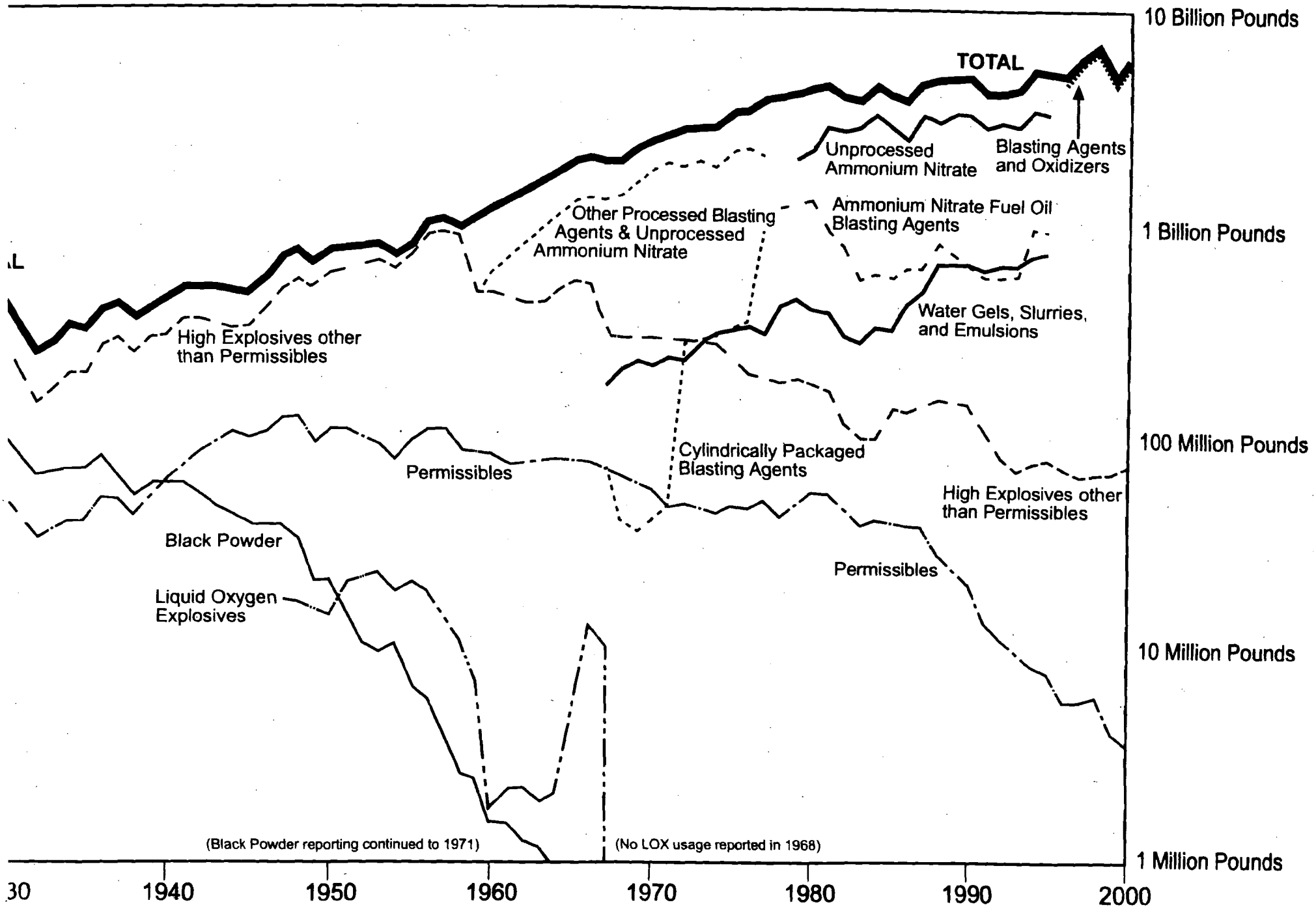
Tonnage Reporting

From the beginning, the Institute cooperated with the U.S. Bureau of Mines in providing statistical information on the quantities of explosives consumed in the United States. With the demise of the Bureau of Mines by act of Congress in 1996, the U.S. Geological Survey was assigned this function. Over the years the reportable products list has been modified as the complexion of the industry changed. This explains the multiplicity of lines and labels on the graph.

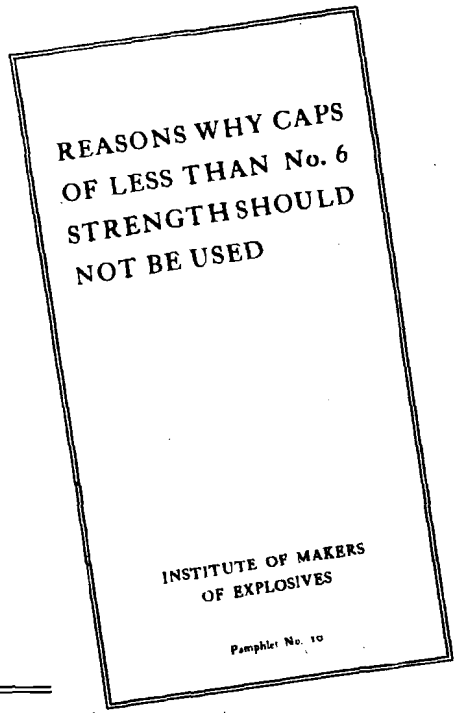
This graph was compiled from U.S. Bureau of Mines and U.S. Geological Survey data, and includes input from all U.S. producers, not only IME members. Even so, IME member companies produced by far the major portion of the volume shown.

Note that the graph is plotted on a *logarithmic* scale. This is so that the huge volume items, such as unprocessed ammonium nitrate, (3.2 billion pounds in 1984, for example), do not cause other important items such as permissibles (at 40 million pounds in 1984), to completely disappear from the graph.

Consumption of Commercial Explosives in the United States



Standardization Efforts


REASONS WHY CAPS OF LESS THAN No. 6 STRENGTH SHOULD NOT BE USED

INSTITUTE OF MAKERS OF EXPLOSIVES

Pamphlet No. 10

FIRST: Because the United States D ment of the Interior, Bureau of Mines, permits nothing less than No. 6 caps to be used with permissible explosives.

SECOND: Because the Bureau of Mines, in Miners Circular No 6, page 5, states:

"Don't use detonator (blasting caps) or electric detonators of less efficiency than prescribed by this Bureau, (No. 6)." The explosive may not explode completely, thus reducing the work done by the shot and causing the same dangers that come from the use of frozen explosives. In either case the amount of poisonous gasses will be greater than it ought to be.

THIRD: In bulletin No. 59, "Investigation of Detonators and Electric Detonators," page 6, it is stated that with certain explosives used under adverse conditions, their efficiency was greatly increased when No. 6 detonators were used in place of the lower grades.

FOURTH: Because the Assistant Director of the Bureau of Mines addressed the Institute, May 8th, 1914, stating:

"Reply to your letter of April 28th advising the bureau of the action taken by the Institute in regard to the use with high explosives of detonators of less strength than No. 6 grade:

"The Bureau is pleased to know of the definite and advanced stand taken by the Institute with reference to the use of low grade detonators and will cooperate most heartily with you in every way possible with a view to promoting the safe and efficient use of explosives and blasting supplies.

"In issuing further publications on the subject of explosives and blasting supplies, the Bureau will bear in mind the recommendations of the Institute and will give even more emphasis to the advisability of using high grade detonators in connection with high explosives in such manner as then seems most desirable."

FIFTH: Because reports on tests made by manufacturers indicate greater economy, greater satisfaction and greater safety where caps of No. 6 or greater strength are used

A major undertaking throughout the entire history of the IME has been to standardi on products, sizes, containers, and procedures used in the industry.

Many of these subjects resulted in actual publications, while others resulted only in informal recommendations or suggestions to member companies. However, *all* of the items listed were major efforts made by the Institute and its committees. Some of these items were subjects of discussion at almost every meeting over a period of many years. I most cases, the date shown is the first mention of the subject in the minutes:

1914
Standardization of specifications for storage magazines.
Standardization of sizes of cartridges and strengths of high explosives.
Standardization of spark arresters for locomotives entering explosive plants.
Standardization of case liner paper.
Standardization of color of vehicles for transporting explosives, and marking with "Explosives – Dangerous."
Standardization of marking all explosives cartridges with the word "Danger."
Standardization of Table of Distance recommendations.

1915
Effort to standardization on caps of at least No. 6 Strength.
Standardization of blasting powder granulations.
Standardization of "Do Not's."

1918
Discussed standardization of automobile trucks. (This subject was finally considered to be beyond the capability of the Institute to influence.)

1919
Standardization of using the outside diameter of a cartridge to determine size.
Standardized definition of the term "bulletproof" for magazines.
Standardization of methods of measuring detonation velocity.

1920
Standardization of burning rate of fuse.

1923
Standardization of lengths and varieties of electric blasting caps.
Standardization of release form to be used by all companies.
Standardization of terminology for artificial barricades.

1925
Standardization of dimensions, openings, etc. of steel barrels and drums used for shipping of glycerine.
Standardization of markings on packages and containers of explosives.

1926 Standardization of sizes of shipping containers. (Although discussions began prior to 1919, it was not until 1926 that a standard size of wooden box was decided upon.)

1927 Standardization of method of measuring strengths of explosives. (After it was determined that an investigation of coordinating the methods of the various companies would cost $60,000 to $80,000, the idea was shelved.

1936 Standardization of fume class ratings.

1937 Standardization of IME cap strength as a No. 7, equivalent to 1.5 gm. of fulminate/chlorate mixture. (This was never accepted by the industry.)

1938 Standardization of the method of calculating strengths of explosives. ("IME Weight Strength")

1957 Standard definition for nitro-carbo-nitrate.

1958 Standardization of the IME test cap as No. 8 strength, equivalent to 2.0 gm. of fulminate/chlorate mixture.

1962 Standardization of warnings to appear on cap cartons.

1970 Industry agreement to mark cartridges and containers to enable identification and tracing. The exact method of doing this was not set as standard.

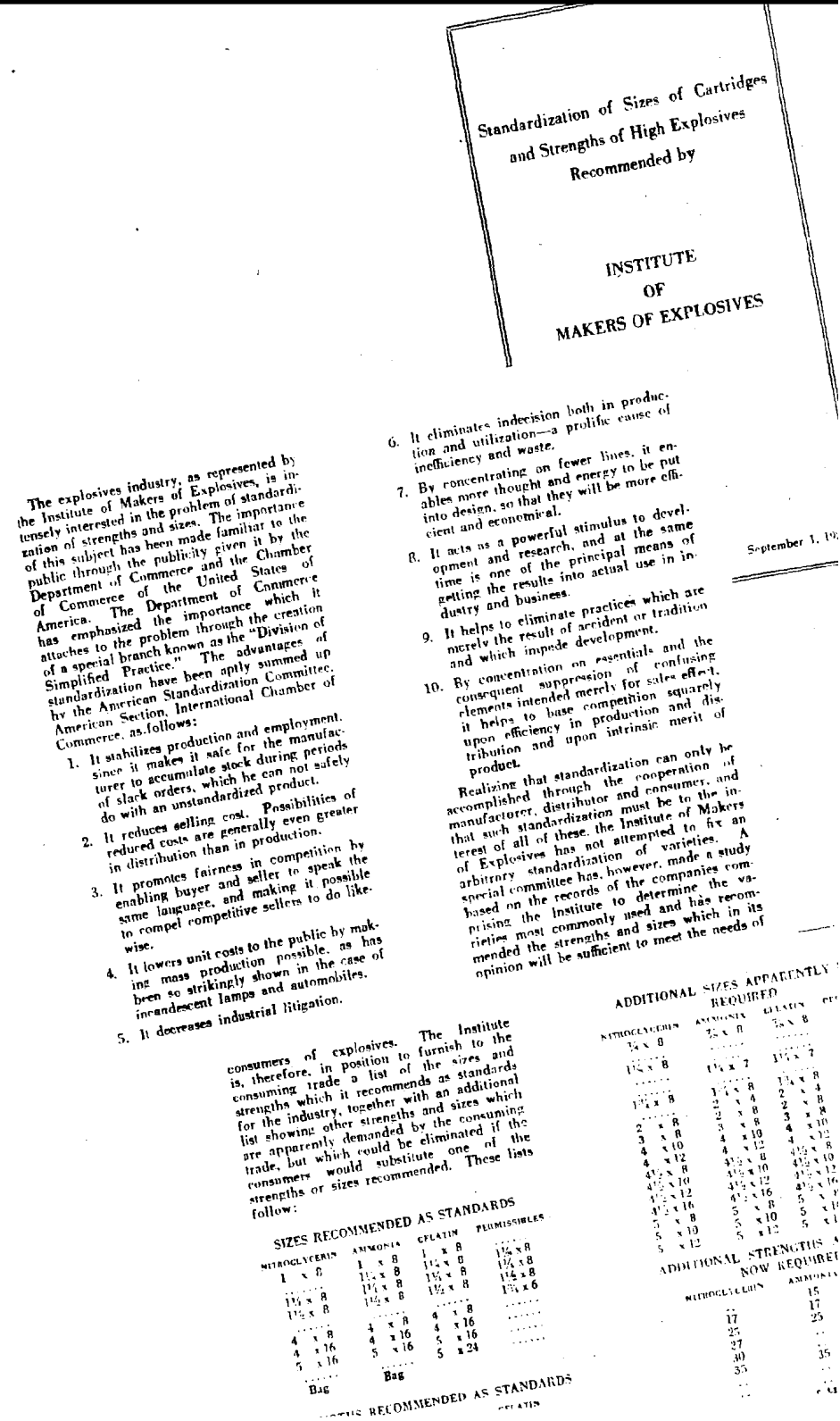
1971 Standardization of a box for combined shipments of caps and explosives in the same vehicle. (IME 22) (Discussion on this subject began in 1913).

1987 Standardization of Date/Shift/Plant Codes.

1992 Standardized warning markings on detonators.

In the above, the continuing efforts to create standardized state and local laws are not mentioned.

Two booklets issued as a result of specific standardization efforts are illustrated here.



Standardization of Sizes of Cartridges and Strengths of High Explosives Recommended by

INSTITUTE OF MAKERS OF EXPLOSIVES

September 1, 19

The explosives industry, as represented by the Institute of Makers of Explosives, is intensely interested in the problem of standardization of strengths and sizes. The importance of this subject has been made familiar to the public through the publicity given it by the Department of Commerce and the Chamber of Commerce of the United States of America. The Department of Commerce has emphasized the importance which it attaches to the problem through the creation of a special branch known as the "Division of Simplified Practice." The advantages of standardization have been aptly summed up by the American Standardization Committee, American Section, International Chamber of Commerce, as follows:

1. It stabilizes production and employment, since it makes it safe for the manufacturer to accumulate stock during periods of slack orders, which he can not safely do with an unstandardized product.
2. It reduces selling cost. Possibilities of reduced costs are generally even greater in distribution than in production.
3. It promotes fairness in competition by enabling buyer and seller to speak the same language, and making it possible to compel competitive sellers to do likewise.
4. It lowers unit costs to the public by making mass production possible, as has been so strikingly shown in the case of incandescent lamps and automobiles.
5. It decreases industrial litigation.
6. It eliminates indecision both in production and utilization—a prolific cause of inefficiency and waste.
7. By concentrating on fewer lines, it enables more thought and energy to be put into design, so that they will be more efficient and economical.
8. It acts as a powerful stimulus to development and research, and at the same time is one of the principal means of getting the results into actual use in industry and business.
9. It helps to eliminate practices which are merely the result of accident or tradition and which impede development.
10. By concentration on essentials and the consequent suppression of confusing elements intended merely for sales effect, it helps to base competition squarely upon efficiency in production and distribution and upon intrinsic merit of product.

Realizing that standardization can only be accomplished through the cooperation of manufacturer, distributor and consumer, and that such standardization must be to the interest of all of these, the Institute of Makers of Explosives has not attempted to fix an arbitrary standardization of varieties. A special committee has, however, made a study based on the records of the companies comprising the Institute to determine the varieties most commonly used and has recommended the strengths and sizes which in its opinion will be sufficient to meet the needs of consumers of explosives. The Institute is, therefore, in position to furnish to the consuming trade a list of the sizes and strengths which it recommends as standards for the industry, together with an additional list showing other strengths and sizes which are apparently demanded by the consuming trade, but which could be eliminated if the consumers would substitute one of the strengths or sizes recommended. These lists follow:

SIZES RECOMMENDED AS STANDARDS

NITROGLYCERIN	AMMONIA	GELATIN	PERMISSIBLES
1 x 8	1 x 8	1 x 8	1¼ x 8
.....	1½ x 8	1½ x 8	1¾ x 8
1½ x 8	1¾ x 8	1¾ x 8	1¾ x 8
1½ x 8	1½ x 8	1½ x 8	1¾ x 6
.....	.....	.....	.....
4 x 8	4 x 8	4 x 8	.....
4 x 16	4 x 16	4 x 16	.....
5 x 16	5 x 16	5 x 16	.....
.....	.....	5 x 24	.....
Bag	Bag		

ADDITIONAL SIZES APPARENTLY REQUIRED

NITROGLYCERIN	AMMONIA	GELATIN
7/8 x 8	7/8 x 8	7/8 x 8
.....	.....	.....
1⅛ x 8	1¼ x 7	1¼ x 7
.....	.....	.....
1¼ x 8	1¼ x 8	1¼ x 8
.....	2 x 4	2 x 4
2 x 8	2 x 8	2 x 8
3 x 8	3 x 8	3 x 8
4 x 10	4 x 10	4 x 10
4 x 12	4 x 12	4 x 12
4½ x 8	4½ x 8	4½ x 8
4½ x 10	4½ x 10	4½ x 10
4½ x 12	4½ x 12	4½ x 12
4½ x 16	4½ x 16	4½ x 16
5 x 8	5 x 8	5 x 8
5 x 10	5 x 10	5 x 10
5 x 12	5 x 12	5 x 12

ADDITIONAL STRENGTHS NOW REQUIRED

NITROGLYCERIN	AMMONIA
..	15
17	17
25	25
27	..
30	35
35	..
..	..

STRENGTHS RECOMMENDED AS STANDARDS

GELATIN

Continuing the Tradition . . .

As the IME approaches its 90-year anniversary, we have the opportunity to reflect upon and appreciate the multitude of accomplishments of the past...accomplishments which have advanced the safety of the industry and the people it serves. These achievements are the result of thousands of hours of hard work by dedicated people committed to a common goal.

Entering the new millennium also provides us with the opportunity to renew our commitment to meeting the challenges of the future. By doing this as successfully as we have in the past, the IME will continue its role as

. . . The Leader in Explosives Safety