

UN/OECD seminar in follow-up to the 2020 Beirut port explosion

- Industry initiatives, codes and guidance

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Safety Expectations - Solid Ammonium Nitrate (AN)

The Industry associations represented in this presentation are united in:

- Consistently improving and implementing best AN safety practices.
- Actively working with UN bodies, national regulators and other key actors to support the development of effective regulatory instruments that underpin best practice AN safety.
- Developing and publishing codes and guides for safe storage, handling and transportation throughout the supply chain.
- Implementing management tools to improve compliance with legislation and safe practices, e.g., product stewardship.

Ammonium nitrate in fertilizer industry

Kishore Shah

Fertilizers Europe

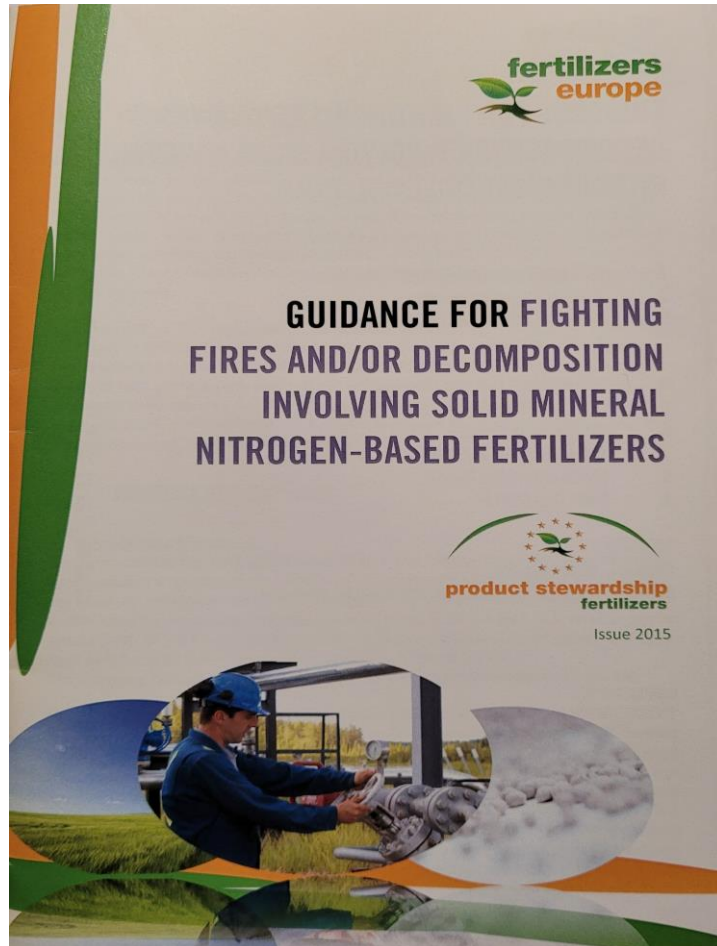
Fertilizers Europe

- Association of fertilizer manufacturers, based in Brussels.
- Plays an important consultancy role with most regulatory bodies: EU Commission, UN bodies, IMO, etc.
- Members produce 16 million tonnes of FGAN + CAN annually and give safety a high priority.
- Commissioned much research work to improve understanding and develop safe systems. For example, large scale (28 tonnes) detonation tests were carried out with FGAN.

Efforts by fertilizer industry worldwide

- **Fertilizers Europe** running a **Product Stewardship** program for several years to establish and enhance **safety, security, health and environment** performance throughout the value chain. Mandatory implementation in all member companies, audits by independent third party.
- **International Fertilizer Association (IFA: >430 members)** has also established a product stewardship programme to enhance safety.
- **Fertilizers Europe** has published many guidance documents for implementation of best practices in the whole value chain. Freely available to download. **Website: www.fertilizerseurope.com**

Examples of Guidance Documents



Examples of topics covered by **Fertilizers Europe**:

- Storage, Handling and Transportation of Solid Mineral Fertilizers.
- Compatibility of Fertilizer Blending Materials.
- Safe Handling and Utilization of Non-conforming Solid Fertilizers and Related Materials.

From **The Fertilizer Institute (USA)**:

Safety and Security Guidelines for the Storage and Transportation of Fertilizer Grade Ammonium Nitrate at Fertilizer Retail Facilities.

Ammonium nitrate in the explosives industry

Richard Bilman
AEISG

Noël Hsu
IME, SAFEX & NFPA

AEISG

- An incorporated association
- Represents all significant Australasian manufacturers and suppliers of explosives and explosive precursors

- Primary role to:

- ‘Continuously improve the level of safety and security throughout the entire life-cycle of explosives and associated precursors, as well as their use and handling in Australasia’; and
- ‘Improve the legislative controls on explosives and their associated precursors, and their effective administration throughout Australasia.’



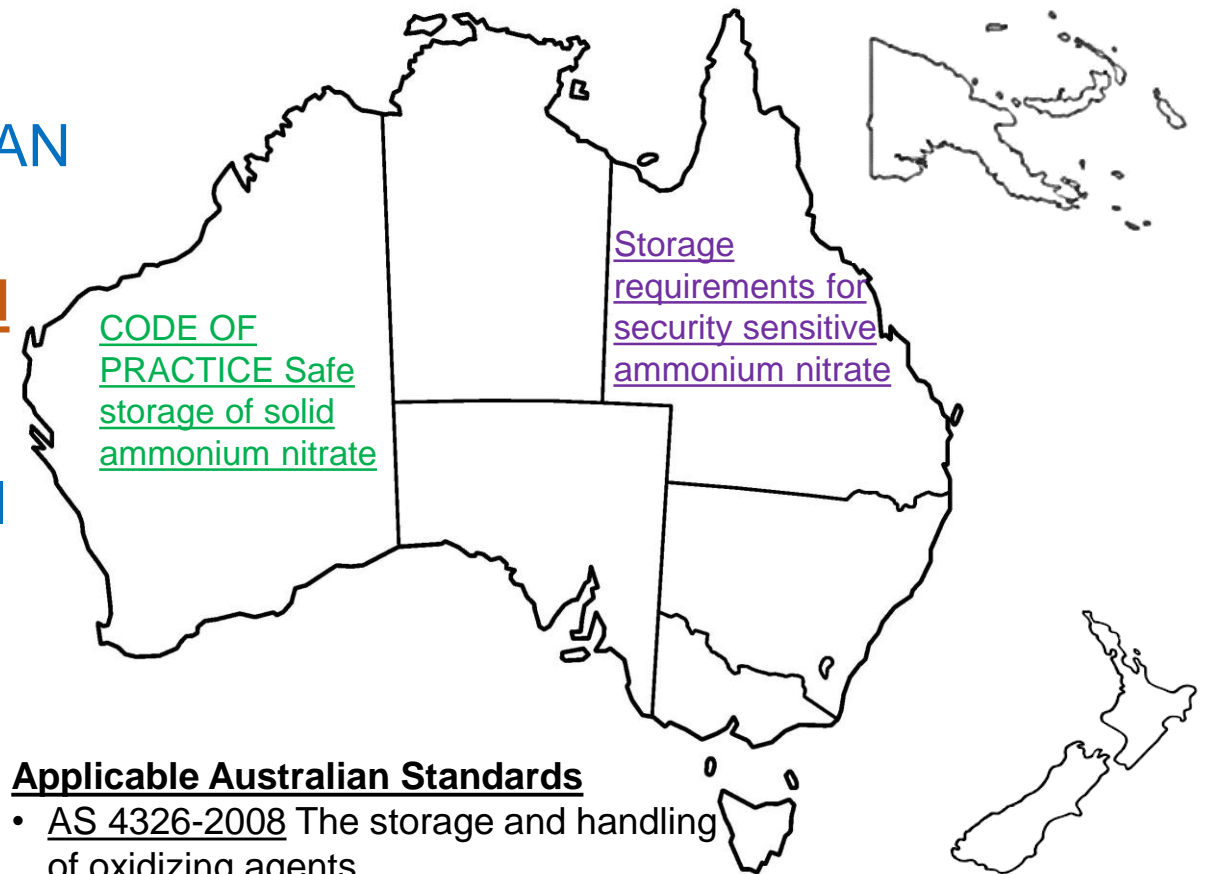
AEISG Codes of Practice [\(free download at https://www.aeiscg.org.au/\)](https://www.aeiscg.org.au/)

Australasian explosives industry:

- Utilises approx. 3 Mtepa of AN
- Manufactures approx. 2.5 Mtepa of AN
- Imports approx. 0.5 Mtepa of AN

AEISG Code of Practice - Storage and Handling of Solid Ammonium Nitrate

- To be published 2022
- Focus is AN intended for commercial explosives
- Risk-based
- Learnings from other codes
- Unambiguous
- Transparent
- Excludes ports, manufacturing & transport



Applicable Australian Standards

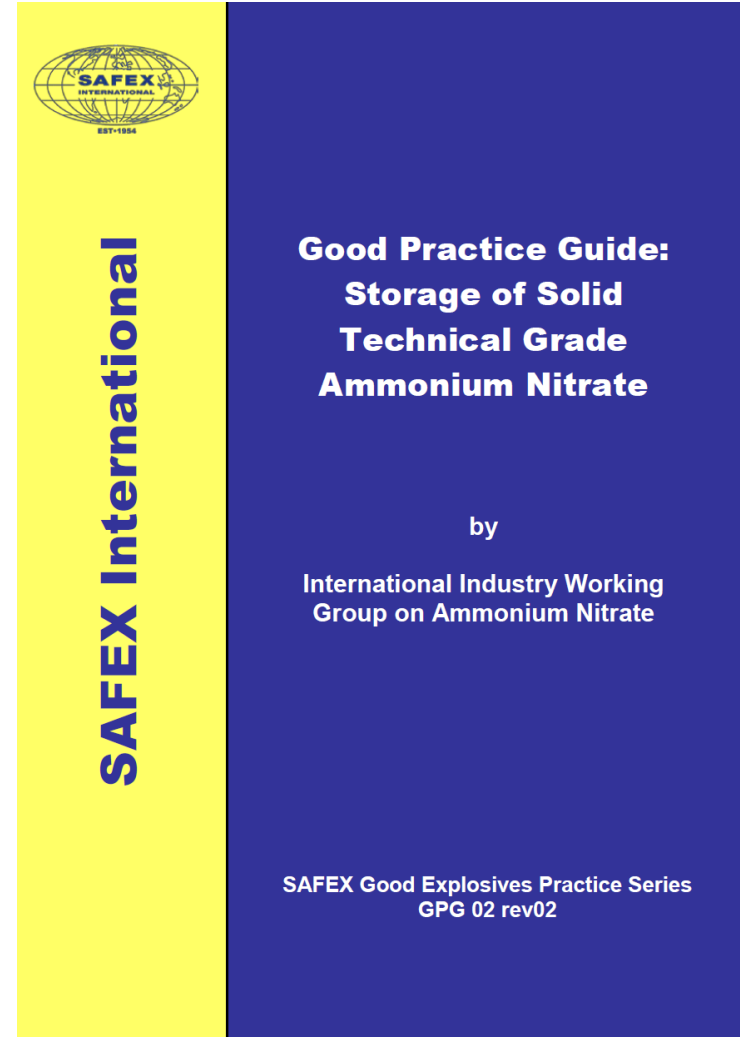
- AS 4326-2008 The storage and handling of oxidizing agents
- AS 3846-2005 The handling and transport of dangerous cargoes in ports



Founded in 1953

Objective: the promotion internationally of health, safety and environment in life cycle of commercial and military explosives, explosives accessories and pyrotechnic products

- Safety incidents are shared
- Good Practice Guides generated by members' subject matter experts



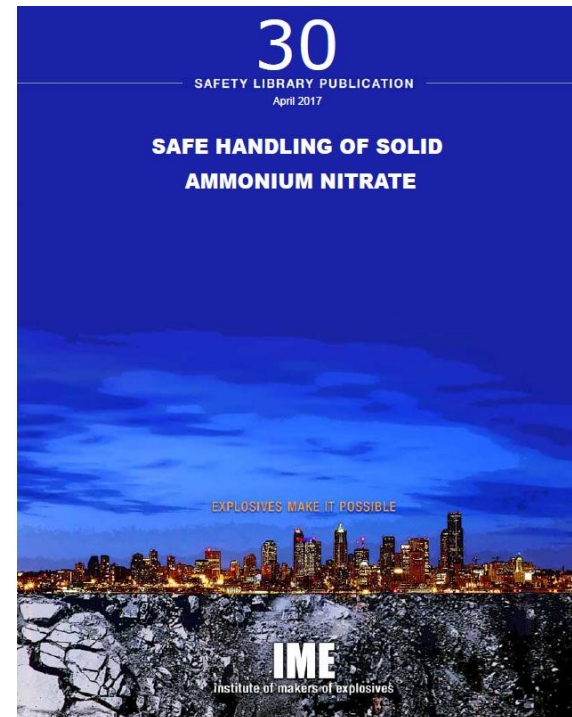
IME

institute of makers of explosives

Founded in 1913

To Promote the Safety and Security of the Commercial Explosives Industry

- Represents all aspects of the commercial explosives industry:
Manufacture, storage, transportation, use, handling, and disposal
- Promotes safety and protection of employees/users, the public and the environment through publications (e.g. Safety Library Publications), advocacy and outreach
- Advocates at all levels of government for the adoption of uniform rules and regulations consistent with the industry's safety and security best practices



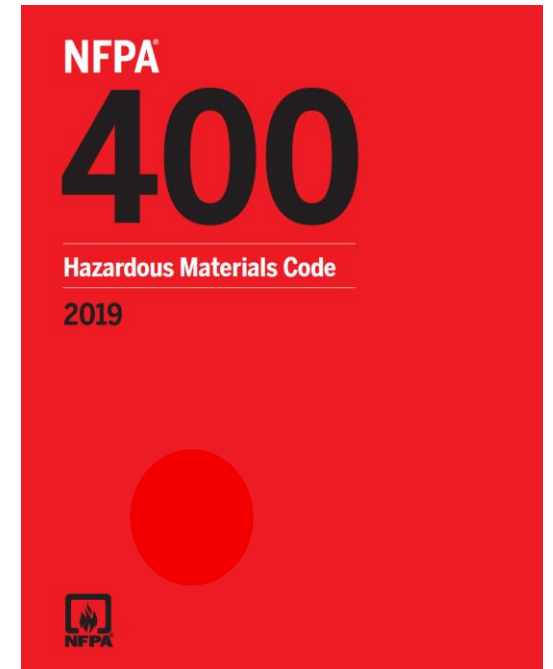


NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

Established in 1896

- The NFPA is a global self-funded nonprofit organization devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.
- Chapter 11 in Code 400 is exclusively Ammonium Nitrate and its mixtures.



Ammonium Nitrate (AN) – Conditions to Avoid and Controls (examples)

	SAFEX	IME	NFPA
Heat/Fire	<ul style="list-style-type: none"> No combustible materials of construction No combustible substances in proximity 	<ul style="list-style-type: none"> Buildings should be of non-combustible materials. If combustible materials used water-based sprinkler system installed Facilities must implement a 'hot work' program providing safe usage protocols 	<ul style="list-style-type: none"> Buildings shall be of non-combustible materials. Fire protection system shall be provided if combustible materials of construction used. Flammable and combustible materials must be separated from AN.
Contamination	<ul style="list-style-type: none"> Incompatible materials must be segregated and separated from AN 	<ul style="list-style-type: none"> Incompatible organic and inorganic materials must be kept away from AN 	<ul style="list-style-type: none"> Organic chemicals, acids, pyrophoric materials, fuels, etc. (detailed list provided) must be separated from AN
Shock	<ul style="list-style-type: none"> Dedicated storage site Proper separation from potential explosion sites 	<ul style="list-style-type: none"> When stored with explosives mandatory separation distances required as per regulation 	<ul style="list-style-type: none"> Explosives and blasting agents shall not be stored with AN, unless otherwise permitted by NFPA 495 (Explosives Materials Code).

Analysis of AN Global Codes / Standards / Guides

- Most existing AN codes / standards / guides stipulate similar safety expectations, which include but are not limited to:
 - Separation to protected land uses
 - Segregation to incompatible material, e.g., fuels / combustibles
 - Avoid contamination
 - Non-combustible building design
 - Fit-for-purpose fire protection
 - Mandated standard of housekeeping and maintenance
- Had one or more of these Codes been made available and implemented at Beirut, the event would have very likely not have eventuated.

Summary

- Large and mature industry (>100 years).
- Ammonium nitrate is a very efficient nitrogen fertilizer.
- Ammonium nitrate is an essential raw material for the explosives industry, which in turn serves the mining, quarrying and construction industries.
- It is a very stable substance and its hazards are well known and understood.
- Many readily available industry publications prescribe controls required for the safe storage of ammonium nitrate.

Thank you for your
attention!