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Presents Six Specific FIORDA
Case Studies at the
International Fertilizer Society
2019 in Brussels



On June 4 & 5, 2019, IFS organised its yearly Technical Conference, this year in Brussels. The conference was well attended by some 50+ participants from all over the world.

On the first day just after the first break, Mark Brouwer presented "THE PRINCIPLES AND APPLICATIONS OF A DIRECTORY OF UREA SAFETY INCIDENTS, WITH CASE STUDIES".

In September 2018, AmmoniaKnowHow.com and UreaKnowHow.com introduced FIORDA to the fertiliser industry. FIORDA is the Fertiliser Industry Operational Risks Database (www.fiorda.eu), a cloud based set of risk registers for ammonia and urea plants.

FIORDA's mission is to improve the safety and reliability performance of fertiliser plants by collecting and exchanging process safety data among participating companies and acting as a focal point for the coordination and management of process safety data collection within the fertiliser industry.

FIORDA includes a Risk Register 'Safety Hazards in Urea Plants'. This presentation and related paper provide a detailed analysis of these safety risks: the plant sections in which these safety risks occur, the risks which have the highest risk factor, and an overview of the most critical safety risks is provided.

Most safety risks in a urea plant involve a release of toxic ammonia of which 90% can occur suddenly, without any pre-warning. Other major safety risks are crystallisation risks, vibration risks, backflow risks, hydrogen explosion risks, ammonium carbamate corrosion risks and corrosion under insulation / atmospheric corrosion risks. The paper includes the most important prevention and mitigation measures for each of these main safety risks.

Even if all recommended prevention and mitigation measures are implemented, a significant number of safety risks would still remain as high-risk factors. This means that continuous attention and



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awareness of these high risk safety risks, including prevention and mitigation measures, is very important for all people working in a urea plant.

The presentation and related paper highlight six specific case studies to show how FIORDA, as a directory of urea safety incidents, can help a urea producer to realise higher safety standards and reliability figures:

1. Safety risks of carbon steel ammonia pipelines in urea plants: More Attention Required.
2. Safety risks during cleaning of prilling towers and granulators: Share for Safety.
3. Risk Register of a 316L UG urea reactor: Learn Why, not just 'What'.
4. High conductivity in a falling film high pressure carbamate condenser: Shut Down the plant?
5. Should a leak detection circuit be flushed with steam or condensate?
6. Protect urea synthesis equipment from corrosion under insulation: A Company has no Memory!

These six specific case studies clearly show the added value of FIORDA. All ammonia and urea plants are welcome to join FIORDA and to contribute together to a more safe and reliable industry.



The paper is available via IFS (www.fertiliser-society.org) as Proceedings 830.