

64th Annual Safety in Ammonia Plants and Related Facilities Symposium 2019

AIChE Technical Manual 2019 Volume 60

San Francisco, California, USA
8 - 12 September 2019

ISBN: 979-8-3313-0306-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571

Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2019) by AIChE
All rights reserved.

Printed with permission by Curran Associates, Inc. (2025)

For permission requests, please contact AIChE
at the address below.

AIChE
120 Wall Street, FL 23
New York, NY 10005-4020

Phone: (800) 242-4363
Fax: (203) 775-5177

www.aiche.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Major Fire Due to Synthesis Compressor Oil Tank Rupture	1
<i>Svein Hansen</i>	
Advances in HTHA NDE, FFS in API 941, API 579, and Impact to Ammonia Producers	7
<i>Phil Prueter</i>	
Mechanical Integrity of an Ammonia Plant: An Assessment Based on Bow-Ties	17
<i>Peter Schmitz</i>	
Uptime Improvement Journey Through Systematic Root Cause Analysis	29
<i>Ashutosh Shukla, Marc Hermus, Venkat Pattabathula</i>	
Causes for Process Gas Cooler (PGC) Tubesheet Thermal Disintegration and Mitigating Actions	41
<i>Daniel Sponseiler, Daniel Sparr</i>	
A Smart Combustion™ Approach to Improve Operation and Efficiency of Steam Methane	53
<i>Rayford Forest</i>	
Successful Repair of a HP Scrubber Sphere Due to Undetected Carbamate Corrosion	61
<i>Alex Scheerder</i>	
Damage of the Combustion Air Ducting of a KBR Ammonia Primary Reformer	71
<i>Shawn Sankarsingh, Teresa Martinez, Dan Barnett</i>	
Secondary Reformer Burner Tip Failure	81
<i>Daniel Shelley, Jenni Dickson</i>	
Inconel Weld Damage and Metal Dusting in Ammonia Plant Front End Equipment	87
<i>Chris Butlin, Samuel Okulaja</i>	
Safe Startup with Topsoe Furnace Manager System: Case Study for World-Scale Hydrogen Plants	95
<i>Ken Wohlgeschaffen, Scott Sexton</i>	
Rationalizing Safety Critical System	105
<i>Usman Ali, Ahsan Sarfraz</i>	
Optimizing SIS for Lifecycle Objectives, with Extension to non-SIS Equipment	115
<i>Peter Herena</i>	
Damage to Molecular Sieve Filters and Fouling of Purifier Following Bed Desiccant Change Out	121
<i>Rajan Sinha, Neel Lalchan</i>	
Pre-Commissioning, Commissioning, and Initial Start-Up Experience of Ammonia-1B Plant	131
<i>Sebastian Nababan</i>	
Inspection for High Temperature Hydrogen Attack	143
<i>Charles Thomas, Chris Jones, David Keen</i>	
Yara's Experience with Primary Reformer Revamp at Its Ammonia Plant in Saskatchewan	153
<i>Waseem Haider, Klaus Noelker</i>	
Damage Mechanism Assessment and Methodology for Ammonia Equipment, Vessels, and Piping	165
<i>Daniel Benac</i>	

Rupture of Piping and Fire in Synthesis Loop of an Ammonia Plant.....	177
<i>J Sondhi, M Sharma</i>	
Ammonia Terminal Case Study: Achieving SIS/SIL Compliance to ISA61511 Via SharePoint.....	191
<i>Curt Miller</i>	
Improving Energy Efficiency of IFFCO's Ammonia-Urea Plants	203
<i>A.K. Singh, Piyush Misra</i>	
Accidental Releases Across the Ammonia Supply Chain.....	213
<i>Kathryn Lawrence, Gary Smith, Jerry Jones</i>	
Lessons Learnt in Emergency Shipments of Catalysts.....	221
<i>John Brighting, Dave Hawkes, Charlie Peters</i>	
Reformer Incident Caused by Carry-Over of Dust from Desulphurisation Unit.....	245
<i>Abrar Muhammad Rafiq, Klaus Noelker</i>	
Methanator Vessel Overheating – Why Still a Hot Topic ?	251
<i>M. Warzee, R. Babwah, G. Franceschini</i>	
Cracked Field Welds in Outlet Headers of a Primary Reformer After 34 Years of Operation.....	265
<i>M. Grooten, R. Dubois, J. Stoffels, S. Schepers, F. Raeymakers, M. Keltjens, R. Gommans</i>	
Improving Ammonia Plant Reliability and Safety with Island Mode Operation.....	275
<i>Alan Smith, Neel Lalchan</i>	
Tunnel Optimization Performance.....	283
<i>Joe Price</i>	
Let's Be Safer by Making Process Safety Feel More Like Personal Safety	289
<i>Angus Keddie</i>	
Check Lists: The Low Hanging Fruit of Process Safety.....	301
<i>Angus Keddie, Dan Cojocar</i>	
The Expansion of Tubes' Life on a Top Fired Primary Reformer: A Greek Case Study	311
<i>Th. Kouloura, Em. Siopis</i>	
Prereduced Catalysts HT	321
<i>Bo Hartvigsen</i>	

Author Index