Engineering a safer ‘Fatima Group’ by introducing STAMP into our Fertilizer Manufacturing Businesses

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1. Fatima Group: Business Growth Roadmap

2. Process Safety Excellence
   • 5-Year Safety Performance, Certifications and Awards

3. Introducing STAMP into FG’s Fertilizer Manufacturing Businesses
   • FG’s Commitment to Operational Excellence
   • Proposed STAMP Implementation Process
   • Approach to STAMP Introduction into FG
Fatima Group: Business Growth Roadmap
Pakistan
Country in South Asia

Pakistan, officially the Islamic Republic of Pakistan, is a country in South Asia and on the junction of West Asia, Central Asia and East Asia. It is the fifth-most populous country in the world.
Ammonia: 270,000 MTPA
Fertilizer: 450,000 MTPA
Ammonia: 316,000 MTPA
Fertilizer: 854,500 MTPA
Ammonia 545,000 MTPA
Fertilizer 1,280,000 MTPA
<table>
<thead>
<tr>
<th>Investment</th>
<th>$3.0 Billion</th>
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<tbody>
<tr>
<td>Ammonia</td>
<td>760,000 MTPA</td>
</tr>
<tr>
<td>Urea (G)</td>
<td>400,000 MTPA</td>
</tr>
<tr>
<td>UAN</td>
<td>1,400,000 MTPA</td>
</tr>
<tr>
<td>NA</td>
<td>500,000 MTPA</td>
</tr>
<tr>
<td>DEF</td>
<td>300,000 MTPA</td>
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Process Safety Excellence
“Consistently demonstrates exceptionally capable practices. All aspects of PSM are documented, fully in place, consistently applied and generally recognized to be among the better examples of safety programs.”
Salient PSM Milestones

- Internal Gap Analysis
- PSM Rollout

Complete Implementation

OSHA PSM Compliance

DuPont PSM Excellence Level 4


PSM Training & Capability Building

- System Maturity
- Direction Checks
- Gap Analyses

PSM Training & Capability Building

- Gap Analyses

World Class
5-Year Safety Performance

Fatima Fertilizers Limited

TRIR

Million Safe Man-hours

2013 2014 2015 2016 2017

14 22 30 36 42

0.12 0.08 0.2 0.21 0.1

Million Safe Man-hours and the journey continues...
# Certifications and Awards

<table>
<thead>
<tr>
<th>Certification</th>
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<tbody>
<tr>
<td>ISO 9001</td>
<td>OHSAS 18001</td>
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<td>ISO 22000</td>
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<tr>
<td>ISO 14001</td>
<td>SGS</td>
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<td>HACCP</td>
<td>ISO 27001</td>
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![ISO 17025](image1.png)

![Protect & Sustain](image2.png)

![ROSPA Gold Award](image3.png)

![BRITISH SAFETY COUNCIL](image4.png)

![International Safety Award](image5.png)

![NFEH National Forum for Environment & Health](image6.png)

![atd USA Best Award Winner](image7.png)
Introducing STAMP into FG’s Fertilizer Manufacturing Businesses
In our quest to achieve Operational Excellence, we have:

- Implemented OSHA/DuPont Process Safety Management System
- Brought improvement in operating discipline and practices
- Ensured competency and professional development of our people
- Strived to achieve excellence in functional performance
- Ensured learning from internal and external lessons
FG’s Commitment to Operational Excellence

Typical process safety hazards encountered at a fertilizer manufacturing facility:
• high pressure and temperature,
• flammable and toxic fluids,
• runaway exothermic reactions, etc.

These have a potential for large scale accident or injury, resulting in loss of life, loss of production and prolonged downtime.

“FG’s leadership believes that identifying and mitigating process safety hazards require expert knowledge of the processes involved and use of innovative safety concepts and techniques such as STAMP. This is a logical step to keep the organization abreast with the global advancement in systems and operations design.”
Proposed STAMP Implementation Process

(STAMP) Self-Proposed STAMP Implementation Process

Awareness
- STAMP Introduction into Fatima Group

Pilot Projects
- Accidents reassessed and actions implemented.
- HMI operator errors minimized.
- Vulnerabilities and hazards in software-controlled systems identified.
- Gaps in existing and new designs addressed.

Quick Wins
- Lessons Learned and Success Stories
- STAMP STECA | STPA | CAST
  - Workshop Tutorials
  - Experts & Practitioners
  - Networking
  - Tools
- Right Areas for Implementation
  - FFL MFC PFL FF
  - STECA & STPA CAST
- Training & Capability Building
- Operational Excellence

Go back to:
- STAMP STECA | STPA | CAST
- Self
- Lessons Learned and Success Stories
- Operational Excellence

FFL: Fatima Fertilizer
MFC: Midwest Fertilizer
PFL: Pakarab Fertilizer
FF: Fatimafert

(Not a Control Structure)
Approach to STAMP Introduction into FG

STAMP Introduction

Corporate HSE Steering Committee

Executives

Existing DuPont/OSHA PSM

STECA, STPA, STPA-Sec, SpecTRM, CAST

Training and Testing

Corporate HSE Professionals

Site HSE Professionals

Site Engineers

Operators and Technicians

Implementation on the plant

PHASE-1

STAMP at working level

Improved safety constraints and reliability

Treating the process as a system instead of individual components

Reduction in injuries and process safety incidents

PHASE-2

Practicing STECA, STPA, etc. and CAST

Embedding STAMP in PSM modules (PHA and Incident Investigation)

Improved org culture, risk management, system-specific leading Indicators
Approach to STAMP Introduction into FG

PHASE-1 (2018)

• Introduce STAMP and create awareness in a simple and easy-to-understand manner as initial explaining and buy in can be a barrier to successful implementation.

• Build local capability through training and networking.

• Identify and lead pilot projects and quick wins:
  
  o **STECA and STPA**: To be deployed at FFL and MFC, in parallel with PHA (HAZOP, What-If) of selected systems and draw a comparison of the findings, recommendations and HSE constraints.

  o **CAST**: Reinvestigate one high severity incident each at PFL and FF sites to identify and analyze weak systems and compare with the existing RCA action items.

• Gage the value addition through STAMP and bridge gaps.

• Share lessons learned and success stories.
Embed STAMP into the existing PSM framework and HSE systems:

- Apply STAMP concepts to remodel the HSE organization and the techniques being used to analyze risks.
- Understand and improve the interactions between cultural and risk-based PSM elements.
- Identify areas where PSM treats safety as a component and subsequently apply the STAMP process control model.
- Identify systems and analyze unsafe behavior hazards at each system level and propose safety requirements and constraints for each system level.
- Improve safety control structure (both system and human controllers) to cover roles and responsibilities of HSE teams as well as line management.