Adopting API RP 1173 at National Grid: Building from Strength and Recognizing the Gaps

Northeast Gas Association
2017 Spring Operations Conference
April 6, 2017
Timothy Woycik – Director, Process Safety
Agenda

- History of Process Safety Management at National Grid
  - Commitment to Process Safety
  - The Beginning: National Grid’s Risk Control Standards
  - A New Focus: Expanding Controls to All Gas Assets
- The Roadmaps
  - Internal / External Audits
  - Internal / External Maturity (Gap) Assessments
  - Gas Business Enablement Project
- Building from Strength
- Minding the Gaps
History of Process Safety Management at National Grid

- UK legislation required Safety Report to be developed for all companies managing major accident hazards (Control of Major Accident Hazards, 1999, revised 2015)

- Safety Reports were required for National Grid UK’s construction, operation, and maintenance of high pressure pipelines and LNG storage facilities
History of Process Safety Management at National Grid

- Similar operations in the US led to Leadership Commitment supporting process safety risk management across National Grid.

Process Safety

Our Commitment

- Safety is paramount. We will protect people and the environment from the risk of major accidents through our Process Safety Management System and the right safety-focused culture.

Our belief

- To be an industry leader in managing the process safety risks from all our assets.

Our objective

- Will be achieved through visible leadership, regular performance monitoring and consistent implementation of our Process Safety Framework:
  - Ensuring all changes are implemented effectively and performance is regularly monitored.
  - Ensuring all new assets, modifications or repairs are safe before they are operated.
  - Using clear, concise operating procedures which are understood by everyone.
  - Ensuring our people are competent.
  - Ensuring our assets and implementing them fit for purpose.
  - Using systems to detect and prevent third party damage.
  - Continuously improving through regular auditing and implementing learning from incidents.

Our strategy

- John Pettigrew, Chief Executive

- Our beliefs:
  - sight is paramount. We will protect people and the environment from the risk of major accidents through our Process Safety Management System and the right safety-focused culture.
  - To be an industry leader in managing the process safety risks from all our assets.

Will be achieved through visible leadership, regular performance monitoring and consistent implementation of our Process Safety Framework:

- Ensuring all changes are implemented effectively and performance is regularly monitored.
- Ensuring all new assets, modifications or repairs are safe before they are operated.
- Using clear, concise operating procedures which are understood by everyone.
- Ensuring our people are competent.
- Ensuring our assets are fit for purpose.
- Monitoring work with effective permit systems.
- Maintaining accurate records and data for our assets.
- Using systems to detect and prevent third party damage.
- Continuously improving through regular auditing and implementing learning from incidents.

John Pettigrew
Chief Executive
In 2011, Twelve Risk Control Standards were established to provide framework for managing all National Grid Major Accident Hazards in UK and US, including:

- **Power Generation**
- **CNG Filling Stations**
- **LNG Storage**
- **LNG Transport**
- **Pipelines > 125 psi**

1. **Leadership and organisational change**
   - We are all leaders and have to take responsibility for making sure that things are done properly.

2. **Asset design, modification and Operational readiness**
   - Make sure assets are fit for purpose.
   - Ensure assets are inspected, drawings are updated and protective devices are checked.

3. **Operational procedures**
   - Operational procedures easily understood.
   - Procedures must be reviewed and updated.

4. **Workforce competency**
   - Ensure capability of workforce.
   - Managing these people effectively.

5. **Human factors**
   - People inevitably make mistakes.
   - Assets and procedures need to be designed to minimise human error.

6. **Emergency arrangements**
   - Effective emergency procedures that are tested regularly.

7. **Protective devices and alarms**
   - Protective devices and alarms installed on assets to ensure they operate within safe limits.

8. **Inspection and maintenance**
   - Regular inspection and condition monitoring is vital to ensure the asset remains safe to use.

9. **Permit to work**
   - Permits are designed to protect us all. Don’t cut corners!

10. **Asset records and data quality**
    - If you change an asset or notice an error then it’s your duty to report it so the record can be updated.

11. **3rd party protection**
    - We can reduce the risk of asset damage by marking them clearly and using indicators on drawings.

12. **Audit, investigation and review**
    - We must learn from previous accidents and identify areas of improvement before failure occurs.
# Process Safety Risk Control Standards

<table>
<thead>
<tr>
<th>ID Number</th>
<th>RCS Title</th>
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<tbody>
<tr>
<td>PS-1</td>
<td>Leadership and Organizational Change</td>
</tr>
<tr>
<td>PS-2</td>
<td>Asset Design, Modification, and Operational Readiness</td>
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<td>PS-3</td>
<td>Operational Procedures</td>
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<td>Asset Records and Data Quality</td>
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<td>PS-11</td>
<td>3rd Party Protection</td>
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<td>PS-12</td>
<td>Audit, Investigation, and Review</td>
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A New Focus: Expanding the Applicability of our RCS

In 2015, it became apparent that application of Risk Control Standards for all Gas Pipeline assets and operations made sense.

- Common law theories of negligence dictate a formal management of risk as best practice
- Public knowledge of and familiarity with management system standards, including the introduction of API RP 1173
- Safety management system requirements may be imposed through enforcement actions
- A safety management system (or lack thereof) would likely be used as a reference point when judging performance and liability
- Existing Risk Control Standards clearly align with API RP 1173 elements
The Roadmaps

- Mapping our RCS to API RP 1173
- Audits
- Maturity Assessments
- Gas Business Enablement Project
Leveraging Our Current Process
Safety Management System

Elements of API RP 1173

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“In cases where an operator is already operating under its own comprehensive PSMS, this framework serves as a basis of comparison and review between the industry recommended practice and the operator’s system” - API RP 1173

National Grid
Risk Control Standards

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✓ Integrity Management Programs (DIMP/IMP)
✓ Public Awareness Program
✓ Control Room Management
✓ Operator Qualification
✓ Compliance Assessment Program (CA/QA)
## Leveraging Our Existing Programs

<table>
<thead>
<tr>
<th>API RP 1173</th>
<th>Process Safety 12 Risk Control Standards</th>
<th>Other Programs</th>
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### Legend
- **Integrity Management Programs (DIMP/IMP)**
- **Public Awareness Program (PAP)**
- **Emergency Response Program (ERP)**
- **Control Room Management (CRM)**
- **Operator Qualification (OQ)**
- **Compliance Assessment Program (CA/QA)**
Audit Results

- Annual Internal Audit Plan has included at least one (usually more) Process Safety-focused audits since 2008
  - Findings and Corrective actions tracked and reported
  - ‘Lessons Learned’ shared beyond scope of audit
- Contractor Audit of Risk Control Standards (2013)
  - Gaps identified across all 12 Standards
  - Corrective Action Work Plan on-going
Maturity Assessments

- Formal and informal tools used to measure conformance with API RP 1173 standards
  - CCBS Maturity Model
  - Internal Business Gap Assessment
- External gap assessment conducted in 2016 to provide comprehensive measure of maturity specifically for gas pipelines business

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<th>API 1173 Element Title</th>
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Framework

RCS1  
RCS2  
RCS3  
RCS4  
RCS5  
RCS6  
RCS7  
RCS8  
RCS9  
RCS10 
RCS11 
RCS12
Gas Business Enablement: Embedding Pipeline Safety & Compliance

National Grid’s Gas Business Enablement Project Objective:

Fundamentally change the processes used to deliver safe and reliable gas service to our customers

- Consistency across regions
- API RP 1173 integrated within all process / technological enhancements
  - Asset / Records Management
  - Work Management
  - Technical Training and Workforce Competency
- Additional benefits recognized
  - Better customer experience
  - Improved compliance
  - Enhanced efficiency / productivity
Building from Strength

- Management Commitment
- Mature Audit Program
- Well Developed Emergency Arrangements
- Process Excellence - Focus on End-to-End Performance
  - KPIs and Reporting Mechanisms
  - Continuous Improvement
- Established asset management programs and corresponding policies, procedures, work practices (i.e., DIMP/TIMP)
- Incident Analysis for Personal Safety Incidents and Near Misses
Minding the Gaps

- Workforce Competence
- Human Factors
- Process Safety Incident Reporting, Analysis, and Lessons Learned
- Risk Management Activities (variety of inputs and outputs)
- Coordinated Management Review and Continuous Improvement