HONEYWELL ENHANCED OVERFILL PREVENTION SOLUTION
December 2015
Agenda

• Overview

• Description of components:
  - Risk and Safety Assessment;
  - AOPS Selection, Design & Implementation;
  - Enhanced AOPS – Honeywell Profit® Movement Suite.

• Summary of Benefits
Enhanced Overfill Prevention Solution - Motivation

• Three recent incidents due to overfills have had significant consequences:
  - CAPECO, October 2009
  - Jaipur, October 2009
  - Buncefield, December 2005

• Significant fines, as well as additional costs of $50+M for environmental cleanup, production loss, and facility repair

• Key recommendations from these incidents:
  - Equip bulk aboveground storage containers/tanks with automatic overfill prevention systems;
  - Regularly inspect and test automatic overfill prevention systems;
  - Overfill prevention needs to be in place through awareness of available tank capacity and inventory, careful monitoring, product movement control, reliable instrumentation and sensors and systems.
  - Robust arrangements, based on a risk assessment of local circumstances, must be made to identify ‘unauthorized’ movements.

• Honeywell’s Enhanced Overfill Prevention Solution addresses a number of these key recommendations
Overview

• There is no single ‘best’ Automated Overfill Prevention System (AOPS)
• Depends on many factors:
  - Existing automation
  - Size and location of the facility
  - Other safety systems planned or in place, etc.
• Honeywell designs each AOPS to meet the unique needs of a site
• Honeywell is able to deliver additional overfill prevention capabilities that go beyond the scope of traditional AOPS
• Honeywell’s Enhanced Overfill Prevention Solution consists of the following 3 components:
  - Risk and Safety Assessment;
  - AOPS Selection, Design & Implementation;
  - Enhanced AOPS – Honeywell Profit® Movement Suite.
Risk and Safety Assessment

• First step to implementing any safety system

• Approaches include:
  - Process hazard analysis;
  - Risk analysis;
  - Hazard studies including HAZOP (HAZard and OPerability) and PHA (Process Hazard Analysis);
  - Quantitative Risk Analysis (QRA);
  - Layers of Protection Analysis (LOPA);
  - Safety Integrity Level (SIL) Reviews.

• Leverage a pool of specialists within UOP and across Honeywell Process Solutions (HPS)

• Recommendations are used to recommend an AOPS to meet best engineering practices and safety standards
Automatic Overfill Prevention System

A system which helps prevention of overfill

Solution components:

• Shall have an Overfill Prevention Sensor (OPS)
  - Radar Type continuous sensor
  - Servo Type continuous electronic sensor
  - Radar type (TDR/GWR) continuous sensors
  - ……

• Shall have a logic Solver (Safety logic Solver)
  - Honeywell Safety Manager, HC900 Safety Logic Solver

• Shall have a final element (a Valve)
  - Generally a Remote Operated Shutoff Valve (ROSOV)
  - SIL 3 capable ROSOVs are typically used
  - Honeywell supplies from customer-approved vendors

Terminating the operations safely, independent of any other system.
AOPS Services

• A site survey on OPS selection
  - A site survey is a must to select the type of sensor to be used.
    (Nozzles/Manholes/Height and dia of nozzles/Stilling wells/ Distance from shell/Product)

• Design of AOPS
  - Overall design including safety logic solver and valve.

• Installation & commissioning
  - I&C of OPS, Logic solver and interfacing with the valve.

• Honeywell has a global team with proven experience who can design, install and commission all of the elements of an AOPS
Enhanced AOPS – Profit® Movement Suite

• Part of the Profit Blending and Movement (PBM) family of applications and services
• Comprehensive inventory and movement management solution for refineries, terminals or other tank farms
• As part of Honeywell’s enhanced overfill prevention solution, provides earlier detection and notification of potential overfill events
• Consists of:
  - Profit Inventory Monitor
  - Movement Monitor
  - Movement Control
• Integrated with Experion® PKS, and also supports integration with other DCS systems
Profit Movement Suite

• Tools for operations staff to accept, create and validate material movement plans, control and track movements and inventories

• Profit Inventory Monitor
  - Monitor and alarm storage inventories

• Profit Movement Management
  - Movement Monitor
    ▪ Receipt of movement instructions
    ▪ Monitoring and logging of movements
    ▪ Movement alarms can be used to indicate and avoid potential overfill events earlier
  - Movement Control
    ▪ Movement setup and control
    ▪ automated path selection which enables additional prevention of potential overfill events
    ▪ Automated and correct tank and pump isolation reduces possibility of overfill of tanks not directly associated with a movement

Provides prevention and detection of overfill events
Enhanced Overfill Prevention Solution Architecture

- 1002 Safety Logic
- Diverse technology for AOPS & ATG

- Additional Safety alarm in control room HMI.

Profit® Movement Suite
Earlier detection and notification of overfill events.
Enhanced Overfill Prevention Solution Benefits

• Design and implementation of the appropriate AOPS that meets your site’s unique needs;
• Improved safety through an AOPS designed to meet the latest safety standards;
• Enhanced AOPS reliability using a robust safety system architecture that includes internal redundancy;
• Safer operation through earlier warning of potential overfill situations through integration with a movement management solution;
• Improved AOPS performance by leveraging accurate and reliable level measurements;
• Maximized storage utilization due to accurate and reliable level measurements and inventory monitoring;
• Improved accuracy of record keeping of inventories and movements based on automated data collection and reporting;
• Improved AOPS reliability through support and maintenance of the entire system by Honeywell experts.

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Questions?