How Operators Drive Reliability at Irving Oil
Presenter

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“At Irving Oil, we believe Operations can have a bigger impact on asset reliability than our maintenance department”
ODR Pilot History at Irving Oil

- ODR project development phase, 2009-2010
- Focused pilot, Sept 2010 until today
- Pilot area 160K bpd Crude Unit, 105K bpd Fluid Catalytic Cracking Unit
- 70 Operations personnel, supporting maintenance and engineering staff
ODR Program Overview

Operator Driven Reliability (ODR)

- Operator Rounds
- Minor Maintenance
- Operator Task List
- Asset Operating Procedures
- Housekeeping
- Effective Communications
ODR Program Objectives

- Increase asset reliability
- Increase data transparency
- Increase effectiveness of Operations work processes
- Standardize Operator work processes in all areas
- Reduce Refinery Operating costs by $0.05/bbl crude feed rate
- All support Irving Oil Refinery Safety culture in all areas and across all shifts
ODR Behaviours

- Operator “ownership” of production equipment
  - Who has primary responsibility your car’s reliability?
  - operator/owner
    - mechanic

- Operator direct involvement in equipment “basic care”
  - Equipment cleanliness
  - Early detection of potential failures
  - Equipment minor maintenance
ODR AOP’s

- Asset Operating Procedures
  - Irving Oil and Innovatia partnership
  - Drive reliability through consistent, optimal methods of asset operation
  - Alignment to the 4 “causes” of reliability
Asset Operating Procedures (Technology)

- 4 Types of AOP’s:
  - Normal Startup
  - Normal Shutdown
  - Prepare for Maintenance
  - Return from Maintenance

- 2750 Rotating Assets x 4 AOP’s
Asset Operating Procedures

AOP Version 1.14

Safety

1. **WARNING** Contains Hydrocarbon - Failure to wear the appropriate PPE and inhaling vapors of the light hydrocarbons may result in personal injury.

2. **WARNING** High Temperature Equipment - Failure to wear the appropriate PPE may result in personal injury.

☐ 3. Visual inspection: Verify maintenance tags and locks are removed, worksite is clean and work order is signed off Job Complete

☐ 4. Inform Team Leader and Console Technician that the asset has returned from maintenance activities

☐ 5. Perform a visual inspection of equipment to verify it is ready for operational service

Commission Auxiliaries

☐ 6. Commission glycol prior to opening suction and discharge valves to prevent damage to the glycol O-ring

☐ 7. Verify heat (electric or steam) tracing is on and working.

Displace Contents with appropriate medium

☐ 8. Connect all fittings and tubing as required to allow for draining/flooding, purging and flushing/steaming of asset

☐ 9. Install check valve and displace air with 150# steam to atmosphere until O2 free

☐ 10. Close heads/vents to atmosphere, while opening vent back to Atmos
Asset Operating Procedures

- API Seal Plan 32 and Gold Wrist Watches
ODR Operator Rounds

- Equipment Care & Condition Monitoring (ECCM)
  - Based on Basic Equipment Maintenance Plans (BEMP)
  - Meridium Software was the best fit for Irving Oil
- Housekeeping Surveys
- Alignment to the 4 “causes” of reliability
Operator Rounds (Technology)

AMS Mobile

Readings - Detail

Asset ID: P42008A
JET PUMPAROUND PUMP

Check lube oil system (oiler_sediment bottle) on Pump/Driver

Value:

1-Ok
2-Oil level down more than 1/2
3-Sediment bowl has water
4-Sediment bowl is milky
5-Sediment bowl has metal particles
6-Sediment bowl leaks or is cracked
ODR Work Process

Clean to Inspect
Inspect to Detect
Detect to Correct
Correct to Prevent

Housekeeping  Operator Rounds  Operations/Maintenance

+ Mean Time Between Failures
Irving Oil ODR Program

• Qualitative Benefits

  ■ Improved business decisions based on automated data collection and analysis
  ■ Reduced maintenance costs with improved safety as a result of operations assuming a portion of the maintenance activity, and performing repairs before they run to failure
  ■ Increased safety and reduced exposure to fines/litigation by adhering to PSM standards
  ■ Improved consistency of work processes based on clarity around roles, responsibilities, expectations, and accountability for all Operators across the Refinery
  ■ Improved forecasting and control of maintenance costs (MTBF)
  ■ Increased clarity around priorities, issues, and risks, based on improved communications and documentation to support shift changes
  ■ Increased Operations ownership of equipment through Operator Rounds
  ■ Blending of Reliability Engineering knowledge/principles and Operations activities
Irving Oil ODR Program

**Quantitative Benefits**

- Survey Compliance
  - 95.3%
- Exception Reports
- ~400 proactive work orders issued for Pilot Area
- $200K (12 months, in one of 7 areas) saved resulting from Operations minor maintenance activities
- Operator awareness of reliability gaps
- Improving communications between the field and the office
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