City of Calgary
Waste & Recycling Services

Bowtie Risk Analysis on Entry into a Collection Truck Hopper

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I. Introductions

II. What is a Bowtie?

III. Collections Background

IV. Bowtie: Entry into Hopper

V. Next Steps

VI. Questions
What is a bowtie?

Threats Side

These things
Which could be prevented by these actions

Cause this thing

Consequences Side

Which results in
Which, if it happens, can be managed/mitigated with these actions

Threats
Control
Control
Control

Top Event

Control
Control
Control

Consequence

Consequence

Consequence

Risk

Consequence Controls

Threat Controls

Controls

Controls

Controls
Collection Process Background

- Materials are dumped into the hopper.
- Compressed by a hydraulic powered packer blade.
- Perform maintenance, clear out jammed material, or remove contaminated material.
Collection Vehicles
Collection Vehicles
Recent Hopper Incidents

- October 22, 2013
- December 6, 2013
- September 23, 2015
TOP EVENT

Failure to Shut Off

Entry into Hopper
MITIGATIONS

Disciplinary Action
  MED Medium concern

Incident Investigation
  OR Organisational Factors
    + Good

CONSEQUENCES

OHS Orders
  MAJ Major concern

Employee & Family Assistance Program
  OR Organisational Factors
    + Good

Communication Strategy
  CO Communications
    + Good

Critical Incident Counseling
  TR Training
    + Good

Psychological Stress (Employee/Public)
  MAJ Major concern
Next Steps

• **Safety Signage**
  – Determine if additional safety signage is required and what the messages would be.

• **Safety Sensors**
  – Determine if the safety sensors are appropriate based on current location and style and if communication is required around the locations.

• **Hazardous Material Removal List**
  – Currently developed internal messaging regarding hopper contamination.

• **Personal Safety Device**
  – Determine if employees should carry a personal safety device in the event of an emergency when working alone.