Hazard Assessment:
Mastering the Foundation of Brewery Safety

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Presented By

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Co-Chair BA Safety Subcommittee
Hazard Assessment

Understanding the hazards associated with a task so that you can:

- Implement hazard controls
- Avoid accident and injury
Key Terms

How to Talk Safety
Five Terms to Know

1. **Incident**: Opportunity for something bad ("hazard") to occur

2. **Accident**: Something bad *actually* occurred

3. **Prevention**: Avoiding hazards by changing how you behave

4. **Protection**: Reducing hazards with safety equipment

5. **Hazard Assessment**: Identifying hazards and proposing prevention and protection solutions
Hazard Assessment
Inventory Your Injury Possibilities
What Could Go Wrong?

Hazard Assessment is the Tool

Brewers Association
Safety

Safety = Freedom from Accidents and Incidents
Hazard Assessment

The Fundamental Means of Reducing the Potential for Accidents and Incidents
Hazard Controls Strategies

Let’s Get Started!
Types of Hazard Control

- PPE (Personal Protective Equipment)
- EC (Engineering Controls)
- AC (Administrative Controls)
- SWP (Safe Work Practices)
1. Safe Work Practices

- Common Sense
- No special equipment
- Most preventative
2. Administrative Controls

• Written, audible, visual information
  – Written programs
  – SOPs
  – Signage and labels
  – Alarms
  – Training
3. Engineering Controls

- Control Kinetic & Potential Energy
- Control & Move Gases
- Monitoring of Hazards
Control Power

- Electrical
- Mechanical
- Chemical
- Thermal
Control Pressure

- Fermentation
- Cleaning
- Packaging
- Cylinder security
4. Personal Protective Equipment (PPE)

- PPE is not failsafe
- When it fails you have no further defense
- Selection, use, cleaning, inspection, replacement
Eye Protection

- Standard safety glasses
- Indirect vented goggles
- Splash shield
Hand Protection

- Inexpensive disposable nitrile
- Heavy duty reusable nitrile
- Neoprene hybrid over woven or latex base

Nitrile disposable - Low hazard use

Neoprene hybrid

Heavy Nitrile - Acids, Bases, Sanitizers
Foot Protection

- Sturdy leather or synthetic work shoes/boots with steel toe/steel shank
- Knee-high rubber (PVC) with steel toe/steel shank
- Low-rise rubber (PVC) with steel toe/steel shank or rubber pullover over sturdy work boot
Other Protection

- Splash protection apron
- Fall protection harness, lanyard, and anchoring
- Hearing protection, disposable or reusable
Respiratory Protection

- Particulate protection
- Specialized: solvents, coatings, welding
Hazard Assessment Example

Caustic Washing of a Vessel
Caustic Washing of Vessel

1. Set up CIP Machine
2. Dispense Caustic
3. Run Caustic in Tank
Outline Steps in Task

1. Connect CIP to Vessel
2. Fill CIP Tanks
3. Load Caustic
4. Circulate Caustic
5. Drain Caustic
6. Load Rinse
7. Circulate Rinse
8. Drain Rinse & Air Dry
1 – List Steps in Task

1. Connect CIP to Vessel
   1. Connect pump inlet to bottom drain on vessel with hose
   2. Connect pump outlet to CIP arm on vessel
   3. Crack open manway door
   4. Open sample valve, if any
   5. Close or blank all other flanges
   6. Plug in CIP pump

2. Fill CIP with Caustic and Rinse
   1. Add warm water to left tank up to overfill tube
   2. Add hot water to right tank up to overfill tube
   3. Add caustic to right tank
1 – List Steps in Task (cont.)

3. Load Vessel with Caustic
   1. Open the caustic tank valve to the pump
   2. Close the bottom drain valve on vessel
   3. Turn on pump and dispense caustic tank contents into vessel
   4. Turn pump off when caustic is transferred

4. Circulate Caustic in Vessel
   1. Close caustic tank valve to pump
   2. Open bottom drain valve on vessel
   3. Turn pump on to circulate caustic for 20 minutes
   4. Turn pump off
1 – List Steps in Task (cont.)

5. Send Caustic to Drain
   1. Close the bottom drain valve on vessel
   2. Disconnect return hose from CIP and place hose end into floor drain
   3. Open bottom drain valve on vessel sending caustic to drain

6. Load Vessel with Rinse
   1. Open rinse tank valve to the pump
   2. Turn on pump and dispense warm rinse tank contents into vessel
   3. Turn pump off when rinse is transferred
1 – List Steps in Task (cont.)

7. Circulate Rinse in Vessel
   1. Close rinse tank valve to pump
   2. Open bottom drain valve on vessel
   3. Turn pump on to circulate rinse for 10 minutes
   4. Turn pump off

8. Send Rinse to Drain
   1. Close the bottom drain valve on vessel
   2. Disconnect return hose from CIP and place hose end into floor drain
   3. Open bottom drain valve on vessel sending rinse to drain
   4. Drain CIP tanks, disconnect all hoses and fittings, allow vessel to air dry
# 2 – Identify Hazards

<table>
<thead>
<tr>
<th>NO.</th>
<th>STEP</th>
<th>HAZARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CIP to Vessel</td>
<td>Slips &amp; Trips, Electrical</td>
</tr>
<tr>
<td>2</td>
<td>Fill CIP Tanks</td>
<td>Slips &amp; Trips, Temperature, Corrosive (alk)</td>
</tr>
<tr>
<td>3</td>
<td>Load Caustic</td>
<td>Slips &amp; Trips, Temperature, Corrosive (alk)</td>
</tr>
<tr>
<td>4</td>
<td>Circulate</td>
<td>Slips &amp; Trips, Temperature, Corrosive (alk)</td>
</tr>
<tr>
<td>5</td>
<td>Drain Caustic</td>
<td>Slips &amp; Trips, Temperature, Corrosive (alk)</td>
</tr>
<tr>
<td>6</td>
<td>Load Rinse</td>
<td>Slips &amp; Trips</td>
</tr>
<tr>
<td>7</td>
<td>Circulate</td>
<td>Slips &amp; Trips</td>
</tr>
<tr>
<td>8</td>
<td>Drain Rinse</td>
<td>Slips &amp; Trips</td>
</tr>
</tbody>
</table>
### 3 – Specify Hazard Controls

#### SLIPS & TRIPS

<table>
<thead>
<tr>
<th>PREVENTION (SWP &amp; AC)</th>
<th>PROTECTION (EC &amp; PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avoid walking in puddles</td>
<td>Textured surfaces</td>
</tr>
<tr>
<td>Keep eyes on the floor</td>
<td>Slotted drain covers (not open)</td>
</tr>
<tr>
<td>Walk like a duck (lower ctr. of grav.)</td>
<td>Waterproof, slip resistant boots</td>
</tr>
<tr>
<td>Organize hoses, cords with aisles</td>
<td></td>
</tr>
<tr>
<td>Put away unneeded hoses, cords</td>
<td></td>
</tr>
</tbody>
</table>
### ELECTRICAL

<table>
<thead>
<tr>
<th>PREVENTION (SWP &amp; AC)</th>
<th>PROTECTION (EC &amp; PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch off equip. before plugging in</td>
<td>Grounded circuits</td>
</tr>
<tr>
<td></td>
<td>Waterproof housings, fixtures</td>
</tr>
<tr>
<td></td>
<td>Equipment in good repair</td>
</tr>
</tbody>
</table>
3 – Specify Hazard Controls (cont.)

TEMPERATURE, hot solutions

<table>
<thead>
<tr>
<th>PREVENTION (SWP &amp; AC)</th>
<th>PROTECTION (EC &amp; PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand back when filling, recirc’ing</td>
<td>Thermostatic temp. control</td>
</tr>
<tr>
<td>Disconnect tri-clamps carefully</td>
<td>Long pants, long sleeved shirt</td>
</tr>
<tr>
<td></td>
<td>Rubber boots, rubber gloves</td>
</tr>
<tr>
<td></td>
<td>Eye protection</td>
</tr>
</tbody>
</table>
3 – Specify Hazard Controls (cont.)

CORROSIVE, concentrated caustic

<table>
<thead>
<tr>
<th>PREVENTION (SWP &amp; AC)</th>
<th>PROTECTION (EC &amp; PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read, understand SDS; Observe labels &amp; placards</td>
<td>Appropriate pumps, non-reactive</td>
</tr>
<tr>
<td>Trained in chemical handling</td>
<td>Long pants, long sleeved shirt</td>
</tr>
<tr>
<td>Good housekeeping</td>
<td>Rubber boots, gloves, apron</td>
</tr>
<tr>
<td>Rinse affected surfaces</td>
<td>Goggles &amp; splash shield</td>
</tr>
<tr>
<td>Dispense where/when others will not be affected</td>
<td></td>
</tr>
</tbody>
</table>
3 – Specify Hazard Controls (cont.)

CORROSIVE, dilute caustic

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<thead>
<tr>
<th>PREVENTION (SWP &amp; AC)</th>
<th>PROTECTION (EC &amp; PPE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read, understand SDS</td>
<td>Appropriate pumps, non-reactive</td>
</tr>
<tr>
<td>Label working solutions if transferring to next shift</td>
<td>Long pants, long sleeved shirt</td>
</tr>
<tr>
<td>Trained in chemical handling</td>
<td>Rubber boots, gloves, apron</td>
</tr>
<tr>
<td>Good housekeeping; safety signage</td>
<td>Goggles or safety glasses with side shields</td>
</tr>
<tr>
<td>Dispense where/when others will not be affected</td>
<td></td>
</tr>
</tbody>
</table>
4 – Do Task with Controls

Step 1 - CIP to Vessel

– Electrical
– Slips & Trips
  • Organize hoses, cords with aisles
  • Slotted drain covers (not open)
2. Fill CIP Tanks
   – Corrosives
     • PPE & work clothes
     • Labels, placards
     • Cautious action
   – Temperature
     • PPE & work clothes
   – Slips & Trips
HA Results in Improvements

Before

After
4 – Do Task with Controls (cont.)

3 & 4 – Load Caustic and Circulate
– Corrosives
– Slips & Trips
– Temperature
4 – Do Task with Controls (cont.)

5. Drain Caustic
   – Corrosives
   – Slips & Trips
   – Temperature
Repeat for Steps:
6. Load Rinse
7. Circulate
8. Drain Rinse
4 – Wrap Up Task
-5-

Summary
Foundation of Safety

• Outline the task in steps (creating SOPs)
• Evaluate hazards at each step
• Identify best hazard control strategies
  – PREVENTION (SWP & AC)
  – PROTECTION (EC & PPE)
• Do the work safely
• Engage staff & document choices
• Keep expanding to include other tasks
Contact

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