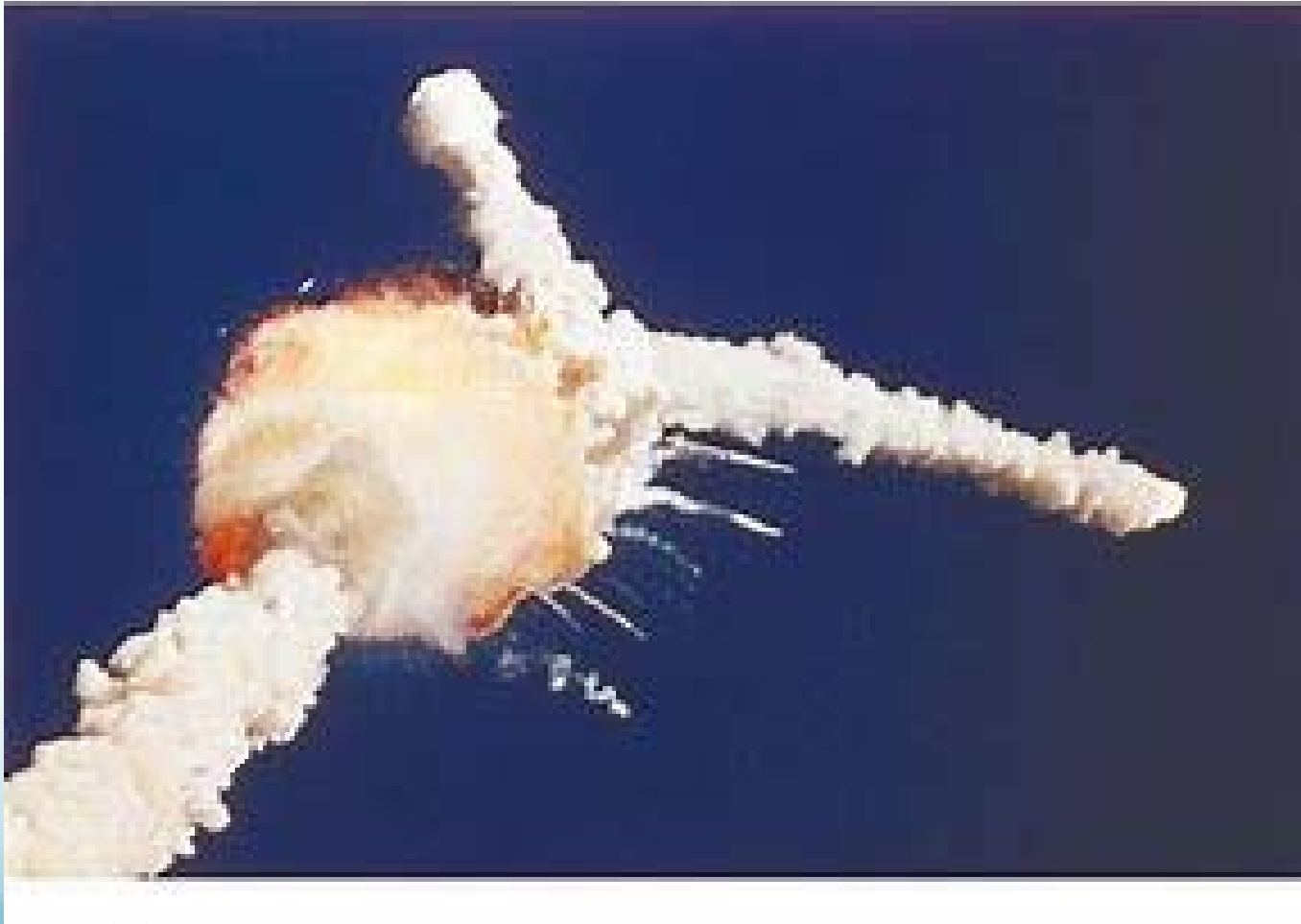


Industrial Wastewater Conference

November 3, 2017

Challenger...Predictable Outcomes?



Known O Ring Issues



Chemical Handling and Storage

- Do we know how to handle and store chemicals at our facilities?
- How do we know?
- Are the procedures being followed?
- Known shortcuts being taken with predictable outcomes?
- How far do we push the limits?
- Ever ask? Ever look? Ever verify?



Well Organized?



Reality for Some?



More Reality for Some?



Nightmares on the Shelf?



Proper Chemical Storage

- Sources of Information
 - Chemical Knowledge
 - Safety Data Sheets (SDS)
 - Other information from manufacturer



Chemical Knowledge

- Fundamentals
- Formulas, Equations and Reactions
- Solutions
- Acids and Bases

The Basics of Handling and Storage

- Store acids and bases separately
- Store oxidizers and reducers separately
- No smoking, drinking or eating when working with chemicals
- Store carbon in a clean, dry place in single or double rows with access around every stack for inspections
- Store chlorine in secure areas with leak detection equipment
- Handle cylinders and containers carefully, insure cylinders and containers are secured (chained) to prevent tipping/rolling
- First aid kits, safety showers and eyewash stations should be available and easy to access

Other Manufacturer Information

- Non-standard concentrations
- Additives that change the character
- Up-to-date advisories with current issues

For Instance

- Sodium Hydroxide
 - Sodium hydroxide is a very strong chemical. It is also known as lye and caustic soda.



Sodium Hydroxide

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Prevent spilling, skin and eye contact. Use only with adequate ventilation. Observe occupational exposure limits and minimize the risk of inhalation of dust.

7.2. Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well-ventilated place.
Stored containers should be routinely inspected for damage and/or leakage.

7.3. Specific end use(s)

For industrial use only.

Sodium Hydroxide

- Keep in tightly closed container
- Protect from physical damage
- Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibles
- Always add the caustic to water while stirring; NEVER the reverse.

Sodium Hydroxide

- “Empty” containers may be hazardous since they retain residue
- Observe all warnings
- Do not store with aluminum or magnesium
- Do not mix with acids or organic materials

Interaction

- What are some of the other chemicals?
- Any issues or concerns with those chemicals?
- What do you do to ensure safe handling and storage?
 - Procedures?
 - Policies?
 - Validation and verification efforts?



But What IF?



Santa Clara Waste Water Company

- On August 19, 2015, Green Compass Environmental Solutions LLC (Green Compass), the Santa Clara Waste Water Company (SCWWC), and nine SCWWC officials/employees were indicted by the Ventura County Superior Court, Ventura, California. The charges were conspiracy to dispose of hazardous waste, impeding enforcement, failure to warn of a serious concealed danger, disposal of hazardous waste, handling a hazardous waste with a reckless disregard, withholding information regarding a substantial danger to public safety, filing a false or forged instrument, causing great bodily injury or death by emitting an air contaminant, and dissuading a witness from reporting a crime.

Accident or Predictable Outcome?

- Do you know if chemical storage and handling is meeting manufacturers directions?
 - Regulations?
 - Best practices?
- Is there an up-to-date policy and procedure on-site?
 - Is it being followed?
 - How do you know?
- Is there a cavalier attitude that is part of the culture?
- Should there be incident are you ready to respond and recover?

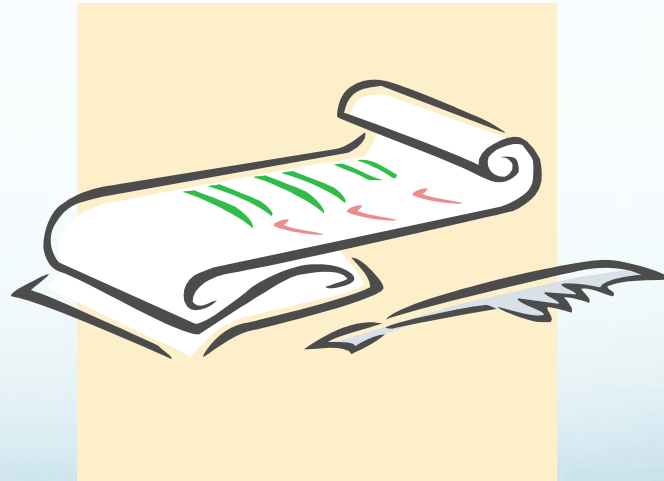
Emergency Action Plan

- Describes actions that must be taken to ensure employee safety in emergencies
- Includes floor plans or maps which show emergency escape routes
- Tells employees what actions to take in emergency situations
- Covers reasonably expected emergencies, such as fires, explosions, toxic chemical releases, hurricanes, tornadoes, blizzards, and floods



Business Continuity

- **Our Critical Operations**
 - Prioritized list of our critical operations, staff and procedures needed to recover from a disaster.
 - What is on the list?
 - Why is it on the list?



Response and Recovery

- Imagine....
 - Detectors and alarms are alerting
 - Occupants at the facility are looking confused
 - Staff are running and yelling
 - You look out...fire...people are screaming for help...you see staff members stumbling and falling...
 - What do you do???



Response and Recovery

- Per your plan what do you do?
- What do you expect to happen?
 - Anyone fighting the fire?
 - Rescue needed...by whom?
 - Accountability
 - Medical aid to the injured?
- How long before professional help arrives?
- Are your expectations real? How do you know?

Response and Recovery

- Assess the damage
 - What will it look, smell and taste like?
 - How long will it take to repair
 - Is there the potential for litigation?
- Reactions and performance discussion
- Insurance and liability discussion
- Counseling /emotional concerns

Response and Recovery

- Facility / plant damage
 - Business continuity
 - Facility restoration
- Business interruption
- Employee replacement
 - Key staff and others
- Interface with emergency responders
- Interface with regulatory agencies

Summary

- Assessment of reality
 - Do you have clear policies and procedures?
 - Are they being followed?
 - Do you know what could happen...and are you willing to take the risk?
 - What are you willing to do...to avoid disaster?

