

Molloy

Central Engineering Department

PROCEDURE 602

SAFETY AND PROPERTY PROTECTION

Effective: January 31, 1965

New Project Safety Review

Attachment 1

GUIDE FOR NEW PROJECT SAFETY REVIEW

This outline has been prepared as a reference and guide for completing new project safety reviews.

1. PROVIDE BRIEF DESCRIPTION OF HAZARDS OF PROCESS
2. ANALYSIS OF RAW MATERIALS

A. Flammability:

What are the flammability properties?

What is the flash point, fire point, explosive range, auto-ignition temperature?

What is the susceptibility to spontaneous heating?

What is the specific gravity, vapor density, melting point, boiling point?

Is material miscible with water?

What is the viscosity?

B. Stability:

What are the stability properties according to the following definition and classification?

(1) Definition:

Stability is the quality of a material to resist exothermic chemical change. Stability implies resistance to decomposition, polymerization or condensation, auto-oxidation-reduction, changes which involve the material alone, or in the presence of catalysts, autoreaction.

(2) Classification:

- a. Normally stable and not reactive with water.
- b. Will undergo chemical change slowly at elevated temperatures or pressures.

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- c. Will react with water with release of significant quantities of energy.
- d. Will undergo chemical change violently at elevated temperatures and pressures or rapidly at ordinary temperatures and pressures. Shock sensitive under confinement or at elevated temperatures and pressures.
- e. Is capable of detonation or explosive decomposition or reaction under normal temperatures and pressures.

C. Materials Handling:

How are raw materials received and transferred from storage to process equipment?

What safety design is included?

Is there adequate control of raw material identification and quality?

Is there proper control of storage conditions?

Do any toxic raw materials create exposure hazard?

Are flammable or unstable raw materials properly handled?

Do the operators have emergency instructions in case of a spill?

What provisions have been made for fire control in the areas where raw materials are stored?

Will water employed in fire control create toxic or other problems?

3. MATERIALS IN PROCESS AND INTERMEDIATES

A. What happens in each piece of process equipment?

(1) Reaction:

What type of reactions: endothermic, exothermic, unstable, others?

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What is the effect of foreign contamination on the violence of reaction?

Are side products or gasses formed during accidental contamination with water, solvents, acid, others?

Are facilities adequate for handling such side reactions?

What are the consequences of a wrong proportion of reactants?

Are process piping and controls properly installed to prevent a mixture of wrong chemicals?

What means are provided to control the reaction?

What means are there of disposing of reactants in the event of an emergency?

What would be the hazard of sewered materials during normal operations or during an emergency?

Are the limits of safe handling of unstable materials known?

Are there data on the rate of heat evolution during decomposition?

(2) Temperature:

Is temperature critical?

How is it controlled?

Are alarms needed?

Should excess temperature cut-out switches be provided?

What happens if cooling water is lost?

Are dual temperature controls needed?

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(3) Pressure:

Is pressure critical?

What pressure relief devices are provided; number and size?

Does the exposure to an outside fire dictate emergency venting?

Are barricades needed?

How is the pressure controlled?

(4) Agitator:

Would stoppage of the agitator increase the hazard of the reaction?

If yes, what means are provided to control the reaction in event of agitator stoppage?

Is the stoppage of agitator indicated by an alarm?

If yes, is the alarm audible, visible, or both?

Do all critical controls fail safe upon loss of electricity or loss of instrument air?

Are the necessary safety interlocks provided?

Are there any other controls necessary to prevent

If sight glasses are used, are they the high pressure type?

(6) Operating Instructions:

Do instructions exist on the operating floor for emergency action in case of power failure, steam failure, heating failure, water failure, bad analysis, others?

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What has been done to insure that operators are trained for emergency action?

Are emergency items such as gas masks, fire extinguishers, others, readily available?

B. Are there toxic or otherwise hazardous off-gases formed?

(1) If yes, how are they handled to prevent an air pollution problem?

(2) Has adequate ventilation been provided to prevent the accumulation of an explosive or toxic mixture?

4. FINISHED GOODS OR INTERMEDIATES

A. What are the flammability properties? (See Item A under Raw Materials.)

B. What are the stability properties? (See Item B under Raw Materials.)

C. Packaging and Handling:

How are finished goods packaged, stored, shipped?

Is the packaging of finished goods hazardous from a toxic or fire point of view?

Are there any special handling instructions for toxicity,

flammability, or other hazards?

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5. FIRE PROTECTION

A. Are there any special fire fighting facilities

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- B. If manufacturing equipment is in open structure, is equipment protected by automatic water spray and/or deluge systems?
- C. Is hydrant protection adequate?
- D. Are special hazards protected by foam or carbon dioxide systems?
- E. Does electrical equipment in hazardous areas conform to National Electrical Code, Article 500?
- F. Has grounding and bonding for static electricity been provided?
- G. Have combustion safeguards been installed on all gas or oil fired burners?
- H. Are combustible solids handled that create a dust explosion hazard? If so, has protection been provided?
- I. Does the explosion hazard of operation justify the installation of an explosion suppression system?
- J. Have established standards and recommended fire protection practices been followed?

6. UTILITIES

- A. Would the failure of any utility shut down manufacturing operation?

Steam
Air
Electricity
Water
Other

- B. If yes, is there an emergency supply available?

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