

## RISK CONTROL FRAMEWORK (55-1)

### EO 1. RISK CONTROL:

#### A. DEFINITION:

**Risk control** includes any conscious action or non-action intended to reduce the frequency, severity, and/or unpredictability of accidental loss.

Risk control preserves resources by focusing on actual harm, whereas risk financing pays for the recovery from actual harm.

(An **accident** is an unplanned outcome or event that causes loss.)

**There are three key aspects to risk control:**

1. Risk control focuses on actual harm, *not* on funds needed to recover from harm.  
A sprinkler system reduces the amount of damage from fire, but does *not* provide the funds to pay for the damage that does occur.
2. The impact of a single risk control technique differs for each affected entity.  
An office building's security system reduces the tenants' burglary losses *and* reduces the landlord's liability losses for stolen property.
3. A specific risk control measure only treats specific exposures.  
A security system protects against burglary, but *not* against fire.  
Some measures may increase other exposures or create new ones.  
A sprinkler system reduces most fire loss, but increases fire loss involving oils that float and spread on water, and creates the new hazard of water damage from sprinkler leakage.

#### B. IMPORTANCE:

**Risk control**

1. **preserves resources**--for both organizations and society,
2. **maintains productivity**--in the organization, *and*
3. **reduces risk financing costs**--whenever benefits exceed costs.

### EO 2. THEORIES OF ACCIDENT CAUSATION AND CONTROL:

#### A. DOMINO THEORY--accidents result from human failings.

**Each accident is a chain of five events (dominos):**

1. **Ancestry and social environment**--A person's genetic background and/or environment cause undesirable character traits (recklessness, stubbornness).
2. **Fault of a person**--A person's undesirable character traits cause him to commit unsafe acts or create physical or mechanical hazards.
3. **Unsafe act or physical/mechanical hazard**--The unsafe act (horseplay, ignoring safety requirements) or hazard (open flames near flammable substances, lack of proper lighting) causes an accident.
4. **Accident**--The accidental event (falling persons, uncontrolled fire) causes injury.
5. **Injury**--the undesirable final event (fractures, lacerations).

Each event is caused by the previous event and may cause the next event to happen, forming a reaction similar to a series of falling dominoes.

To prevent injury, break the chain, especially by applying control measures to the third event--unsafe acts and hazards.

H. W. Heinrich, who developed the domino theory, believed that unsafe *human* acts are more frequent than unsafe conditions, making the correction of unsafe *human* acts the most efficient way to prevent accidents.

**Because this theory focuses on human failings**, it applies best to accidents directly involving human activity (employee injuries).

The domino theory does *not* apply as well to accidents in which the injured party is a victim of events (crime losses, natural disasters).

B. **GENERAL METHODS OF (INDUSTRIAL HYGIENE) CONTROL--Accidents result from unsafe physical conditions.**

**Use eleven general methods to control industrial accidents and illnesses:**

1. Substitute less harmful materials for hazardous materials.
2. Alter processes to minimize worker contact.
3. Isolate operations to reduce the number of exposed people.
4. Use water to reduce dust.
5. Disperse exhaust and contaminants at their point of generation.
6. Ventilate clean air into workplaces.
7. Use personal protection devices.
8. Keep workplace clean.
9. Use special control methods for specific hazards.
10. Use medical tests to detect toxin intake.
11. Train and educate workers.

**Those eleven general methods apply to**

1. **the source of a hazard** (methods 1, 2, 3, 4, 5, 9),
2. **the path between the source and the exposed employee** (methods 6, 8, 9), *or*
3. **directly to the employee** (methods 7, 9, 10, 11).

Some methods can apply in more than one way.

The absence of one or more controls causes workplace accidents.

This theory applies best to accidents caused by physical forces and conditions (chronic coughs from dust or exhaust inhalation).

This theory doesn't apply well to accidents caused by human failure (dropping tools on feet).

C. **ENERGY TRANSFER THEORY--Accidents result from uncontrolled energy.**

**This theory uses ten original strategies** (methods of controlling energy or reducing harm caused by energy):

1. **Prevent the marshaling of energy in the first place**--Ban powerful weapons, high-powered vehicles, the production of anything harmfully powerful.
2. **Reduce the amount of energy marshaled**--Reduce weapon size and speed of vehicles.
3. **Prevent release of built-up energy**--Keep warmongers from weapons, and reckless drivers from vehicles.
4. **Modify the rate of released energy**--Reduce ski slopes; erect explosion-absorbing walls.
5. **Separate, in space or time, energy from susceptible objects**--Erect tall buildings away from airports; allow time between takeoffs and landings.
6. **Erect barriers between energy and susceptible objects**--Use protective clothing, fire-doors, and building walls.
7. **Modify structures to absorb impact**--Use padded dashboards and dull scissors for children.
8. **Strengthen structures susceptible to energy damage**--Erect stronger bridges in high-wind areas; vaccinate people exposed to illness.
9. **Detect, evaluate, and respond to damage rapidly**--Use hospital emergency rooms and burglar alarm systems.
10. **Take long-term action to reduce further damage**--Rehabilitate injured persons, install better alarm systems.

*[Those ten strategies have been further simplified into five accidental control points:*

1. *Control built-up energy.*
2. *Control the release of built-up energy.*
3. *Separate released energy from susceptible persons and objects.*
4. *Create an environment that minimizes energy's harmful effects.*
5. *Counteract energy's harmful effects.]*

D. **TECHNIQUE OF OPERATIONS REVIEW (TOR) SYSTEM--accidents result from management failures.**

**There are five basic principles of risk control:**

1. Accidents and unsafe acts/conditions reveal management system failures.
2. Certain controllable circumstances produce severe injuries.
3. Management should manage safety like any other function, by setting and achieving goals.
4. Management procedures for accountability produce effective line safety.
5. Safety's function is to locate and define accident-causing operational errors by tracing accidents to their root causes and controlling them.

The TOR system applies mainly to industrial injuries and illnesses (personnel losses), but applies equally well to accidents causing property, liability, and net income losses.

**Any of these losses is traceable to one or more of the seven categories of management faults:**

1. **Inadequate coaching**--workers not trained correctly or effectively.
2. **Failure to take responsibility**--managers and workers unclear about their duties.
3. **Unclear authority**--too many bosses, conflicting orders, workers unsure of who should do what.
4. **Inadequate supervision**--workers unable and/or unwilling to follow a poor supervisor.
5. **Workplace disorder**--inefficient or hazardous conditions.
6. **Inadequate planning/organization**--work proceeds awkwardly and inefficiently.
7. **Personal deficiencies**--manager may be personally unsuited to the job or may assign jobs to unsuitable workers.

E. **SYSTEM SAFETY APPROACH--Accidents result from organizational system disruptions.**

**Systems** include the parts of a working machine, the human body, a highway system, and factory operations (both individual procedures and the factory as a whole).

**System safety uses a four-step process to forecast and control possible system disruptions:**

1. Identify potential hazards.
2. Incorporate safety-related design and operational procedures.
3. Evaluate design and procedures for compliance with safety requirements.
4. Continue safety surveillance throughout the system's lifetime and disposal.

**System safety**

1. is the *most* comprehensive accident control theory *and*
2. has the *widest* application.

EO 3. **THERE ARE FIVE RISK CONTROL TECHNIQUES:**

A. **EXPOSURE AVOIDANCE--**

1. **Definition**--Abandon an asset or never undertake a specific activity associated with a certain exposure, reducing loss probability to zero.
2. **Application**--Avoidance has limited applications to narrow exposures. Avoidance sometimes creates other, equally dangerous, exposures.  
***Example:*** If you send products overseas by sea to avoid loss by airplane crashes, you may lose them in a sinking ship.  
Exposure avoidance applies best to product liability exposures ... by not manufacturing or by not selling a specific product.  
The *only* way to *avoid* personnel and property loss exposures is to hire *no* employees and own *no* property--a difficult option for most organizations.

B. **LOSS PREVENTION--**

1. **Definition**--Reduce loss frequency for a given exposure.
2. **Application**--Study how a particular loss is caused and apply control methods to break the chain of causation.  
This relates to the domino theory [*See EO 2, #1*].

C. **LOSS REDUCTION--**

1. **Definition--Loss reduction** reduces loss severity for a given exposure.  
**Pre-loss measures** apply to losses before they happen.  
**Post-loss measures** apply after the loss has occurred.
2. **Application--**Use energy transfer strategies to reduce losses [*See EO 2, #3.*].  
Many reduction techniques reduce loss frequency as well as severity and so qualify as prevention techniques.

- D. **SEGREGATION--**a distinct type of loss reduction; segregation increases the number of independent, exposed units to reduce loss severity.  
Each unit is still exposed to the same loss severity, but because each unit is less important overall, loss severity decreases.

**There are three types of segregation:**

1. **Separation--**
  - a. **Definition--**Divide one exposure unit into two or more independent units (store finished products in several warehouses instead of one to decrease fire loss). Separation exposes more units to loss, but decreased loss severity outweighs increased loss frequency.
  - b. **Application--**Separation applies to units that can work well separately and can continue to work after some units are lost.  
(Send school busses home with drivers instead of keeping them in a single garage.) Separation is usually a by-product of other managerial decisions.
2. **Duplication--**
  - a. **Definition--**Keep duplicate or standby assets or activities, to be used when primary assets and activities suffer loss (spare keys, cross-trained employees). Duplication reduces severity without increasing frequency (duplicates are in safe storage).
  - b. **Application--**Because duplication is often costly, it applies to the most important assets and activities.  
Duplicate valuable papers, accounts receivable, and computer data and programs. Duplication is usually a managerial decision on its own, to safeguard essential assets and activities.
3. **Diversification--**
  - a. **Definition--**Spread loss exposures over many projects, products, markets, and/or regions to prevent a single event from destroying a large percentage of the organization's assets.  
(Sell five products instead of one so that a sharp decrease in sales of one product doesn't jeopardize the company.)
  - b. **Application--**Diversification deals primarily with *business* risk.  
Separation and duplication deal primarily with *hazard* risk.

LAST EO, every assignment. The Burnham System defines and/or explains each assignment's Key Words and Phrases in context.

So you can find them easily, they are both **bolded and underlined** and they are **CAPITALIZED** if they're also used in an educational objective.

They are defined separately in a separate section of The Burnham System.

It's *much* better to learn them in context as you study my responses to your educational objectives than to try to learn them as discrete bits of separate information.