



# SEC 5 Star Safety Management System



# Contents

- Sec 5-STAR Safety and Health Management System.
- Main steps to Apply 5 star Safety Management Systems
- Contractor in Saudi Electricity Company.
- Hierarchy of process control
- Contractor on the site



# Contents

- Section 1: Premises & Housekeeping -- 10 Elements
- Section 2: Mechanical, Electrical & Personnel Safeguarding --27 Elements
- Section 3: Fire Protection and Prevention Protection -- 09 Elements
- Section 4: Accident Recording and Investigation --07 Elements
- Section 5: Safety Organization--23 Elements

Total 76 Elements are there, before it was 73.In 2018 3 more elements have been added in Section 2.

# Contents

They are as mentioned below:--

- 2.25 – Working at Heights (WAH).
- 2.26 – Confined Space Entry (CSE)
- 2.27 – Excavation and Trenching



# SEC WORK PERMITS

There are seven types of work permits in SEC. They are as mentioned below:--

- Hot Work Permit
- Cold Work Permit
- Confined Space Entry (CSE)
- Excavation and Trenching
- Electrical (Isolation) Permit
- Working at Heights (WAH)
- Lifting Operation Permit



# Section one

## 1 - Premises and Housekeeping

**1.1 Buildings and Floors**

**1.2 Lighting: Natural and Artificial**

**1.3 Ventilation**

**1.4 Workplace Hygiene Facilities**

**1.5 Pollution: Air, Ground and Water**

**1.6 Aisles and Storage, Demarcated**

**1.7 Stacking and Storage**

**1.8 Housekeeping**

**1.9 Scrap and Refuse Bins**

**1.10 Color Coding: Plant and Pipelines**

# Section Two

## 2 - Mechanical, Electrical and Personal Safeguarding

**2.1 Machine Guarding**

**2.2 Lock-Out System and Usage**

**2.3 Labeling of Switches, Isolators and Valves**

**2.4 Ladders (Registers), Stairs, Walkways and  
Scaffolding**

**2.5 Lifting Gear and Records**

**2.6 Compressed Gas Cylinders: Pressure Vessels and  
Records**

**2.7 Hazardous Substances Control**

**2.8 Risk Assessment (HIRA)**

**2.9 Motorized Equipment: Checklist, Licensing**

**2.10 Portable Electrical Equipment**

**2.11 Electrical Equipment Maintenance**

**2.12 General Electrical Installation and Flameproof**

**2.13 Hand Tools**

**2.14 Ergonomics**

**2.15 Head Protectors**

**2.16 Eye and Face Protection**

**2.17 Footwear**

**2.18 Protective Clothing**

**2.19 Respiratory Equipment**

**2.20 Hearing Conservation**

**2.21 Safety Harness**

**2.22 Hand Protection**

**2.23 Control of Usage, Issue Maintenance and  
Record of Personal Protective Equipment**

**2.24 Notices and Signs: Electrical, Mechanical,  
Protective Equipment, Symbolic Safety Signs**



# Section Two

## 2 - Mechanical, Electrical and Personal Safeguarding

**2.25 Working at Heights (WAH)**

**2.26 Confined Space Entry (CSE)**

**2.27 Excavation and Trenching**



# Section three

## 3 - Fire Protection and Prevention Protection

**3.1 Fire Extinguishing Equipment/System Risk Assessment.**

**3.2 Locations Marked, Floor Clear**

**3.3 Maintenance of Equipment**

**3.4 Storage of Flammable and Explosive Material**

**3.5 Alarm System**

**3.6 Fire-Fighting Drill and Instruction**

**3.7 Security System**

**3.8 Emergency Planning**

**3.9 Fire Prevention and Protection Coordinator**



# Section four

## 4 - Accident Recording and Investigation

**4.1 Occupation Injury, Disease and Properties Damage Records**

**4.2 Internal Accident Reporting and Investigation (Occupational Injury and Near Miss Incident)**

**4.3 Occupational Injury/ Disease Statistics**

**4.4 Internal Accident Reporting and Investigation (Property Damage and Business Interruption)**

**4.5 Accident Statistics Kept**

**4.6 Insurance: Apportioning of Costs**

**4.7 Accident / Near Miss Recall**



# Section five

## 5 - Safety Organization

**5.1 Manager/ Managers Designated as Responsible for Safety and Health**

**5.2 Safety and/or Occupational Hygiene Coordination**

**5.3 5-Star Safety Representatives**

**5.4 Safety Committees**

**5.5 Other Communication Systems**

**5.6 First-aid/ Responder and Facilities**

**5.7 First-aid Training**

**5.8 Publicity, Bulletins, Newsletters, Safety Films and Internal Competitions, etc**

**5.9 The 5-Star Safety System Board**

**5.10 Suggestion Scheme**



# Section five

**5.11 Safety Reference Library**

**5.12 Annual Report – Loss Control Achievements**

**5.13 Orientation and Job Safety Training**

**5.14 Approved Safety Training Courses**

**5.15 Medical Examinations**

**5.16 Workplace Inspections**

**5.17 Management Self-Audits**

**5.17.2 Safety Performance Indicators (SPI's)**

**5.18 Safety Specifications: Purchasing and Engineering Control, New Plant, and Contractors**

**5.19 Written Safe Work Procedures**

**5.20 Planned Job Observations**

**5.21 Work Permits**

**5.22 Off-The-Job Safety**

**5.23 SEC Safety and Health Policy**

# Star ratings

- **40% - 50%**
- **51% - 60%**
- **61% - 74%**
- **75% - 90%**
- **91% - 100%**



# Safety Representatives

2.1. Safety Representatives are appointed to identify hazards within their work area. Unsafe acts and conditions are the immediate causes of accidents and, if identified, reported and eliminated, can lead to a reduction of risk in the workplace.

2.2. Safety Representatives also assist in maintaining the momentum of the safety program as a result of their on-going inspections, and co-operation with employees.



# Safety Representatives

- **3.1. Who are Safety Representatives? (Safety reps)**
- Safety Representatives are Employees appointed to:
- 3.1.1. Act as the eyes and ears for Management by identifying and reporting hazards.
- 3.1.2. Assist and participate in the on-going SEC 5-Star Safety System.
- 3.1.3. Assist in the promotion of safety to ensure a safer work area for all.

## 3.2. Who should be appointed as Safety Representatives?

- 3.2.1. Any employee, excluding managers and supervisors, (dependent on the discretion of the Manager) can be appointed as a Safety Representative. They are selected from a work area, and represent that area. They are the people most familiar with the equipment and the processes of their particular area, and are therefore ideal candidates to identify hazards within that work place.

### 3.2. Who should be appointed as Safety Representatives?

- 3.2.2. The person appointed as a Safety Representative should ideally come from within a work area and he should be thoroughly familiar with the following in that area:
  - 3.2.2.1. Machinery / equipment.
  - 3.2.2.2. Processes and procedures.
  - 3.2.2.3. Office layout.
  - 3.2.2.4. Hazards.
  - 3.2.2.5. People within the area.

# ELECTRICAL HAZARD DEFINITION

**Arc Flash** – A rapid release of electrical energy due to an arcing fault between electrical phases, neutral or ground, resulting in a plasma arc through the adjacent surrounding air. An arc flash is sometimes inappropriately called a “flashover.”

**Arc Flash Hazard** – A dangerous condition associated with the release of energy caused by an electric arc. An arc flash hazard may exist when energized electrical conductors or circuit parts are exposed or when they are within equipment in a guarded or enclosed condition, provided a person is interacting with the equipment in such a manner that could cause an electrical arc

**Arc Thermal Performance Value (ATPV)** – ATPV is defined in ASTM F1959-06 as the incident energy on a material or a multi-layer system of materials that results in a 50 percent probability that sufficient heat transfer through the tested specimen is predicted to cause the onset of a second degree skin burn injury based on the Stoll curve, cal/cm<sup>2</sup>.



# ENGINEERING CONTROL TOOLS

**Energy Reducing Maintenance Switch (ERMS):** Reduces arc flash incident energy by temporary reducing clearing time during maintenance or live work activities

**Zone Selective Interlock (ZSI):**-- Reduces arc flash incident energy by • reducing clearing time when fault occurs at the bus side (feeder/tie cubicles) of low voltage switchgears.

**Remote Racking Device (RRD):** Reduces level of risk exposure to the arc flash incident energy by increasing working distance during racking operations. •

**Remote Switching Capability (RSC):** Reduces level of risk • exposure to the arc flash energy by increasing working distance during switching operations.

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# ADMINISTRATIVE CONTROL TOOLS

1. Training .
2. Qualification requirements •
3. Work Practices •
4. Planning tools •
5. Lockout/Tagout •
6. Auditing Procedures •
7. Maintenance and Reliability Improvement Programs •



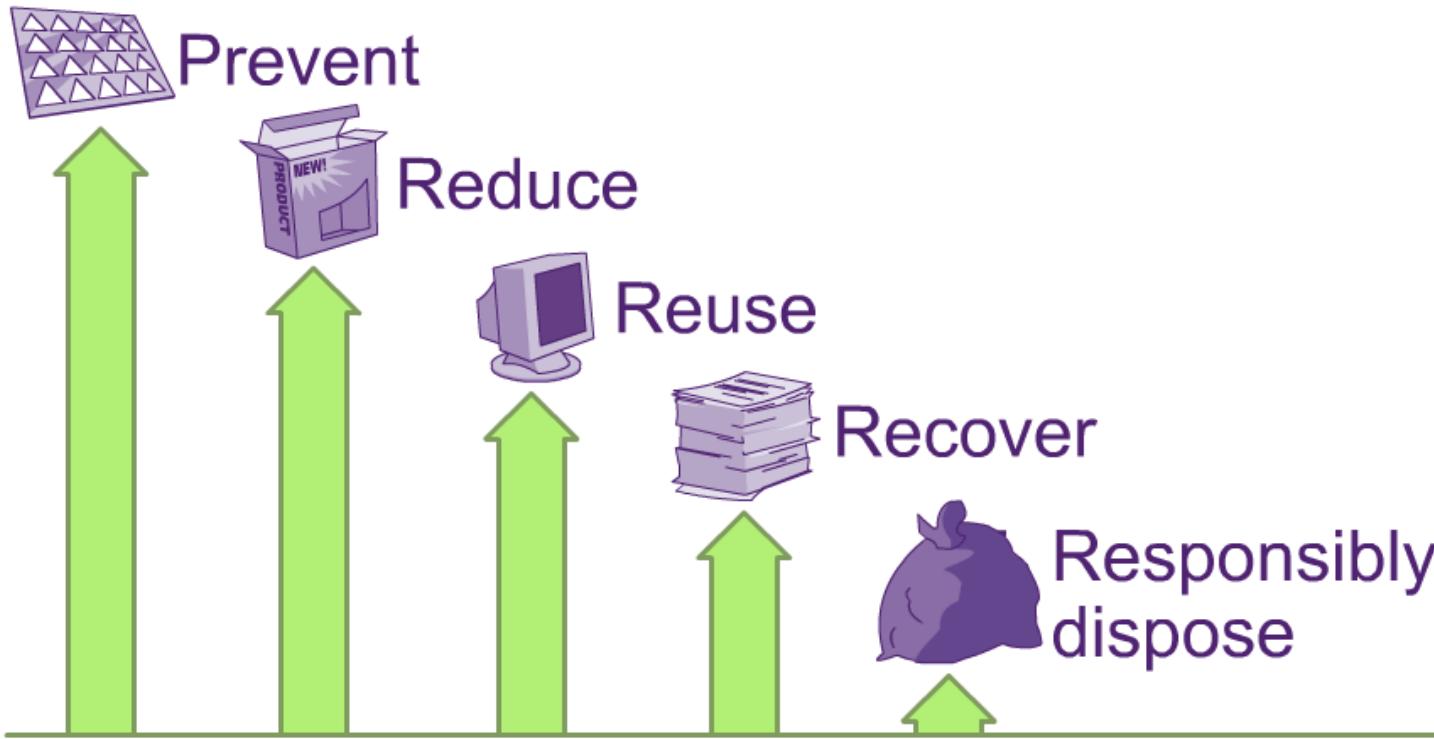
## RISK ASSESSMENT METHOD

*Follow the five steps as mentioned below:--*

- Identify the hazards
- Decide who might be harmed and how
- Evaluate the risks and decide on precautions
- Record your findings and implement them
- Review your assessment and update if necessary



# HIERARCHY CONTROL FOR ENVIRONMENTAL ISSUES





# RISK RATING SYSTEM

**Consequences x Likelihood= Risk Ranking**

CONSEQUENCES	LIKELIHOOD	RISK RATING	RISK LEVEL
INSIGNIFICANT 1	RARE--1	16 to 25	EXTREME
MINOR 2	UNLIKELY--2	12 to 15	HIGH
MODERATE--3	POSSIBLE--3	8 to 10	MEDIUM
MAJOR--4	LIKELY -- 4	1 to 6	LOW
CATASTROPHIC--5	ALMOST CERTAIN -- 5	RED	EXTREME
		ORANGE	HIGH
		YELLOW	MEDIUM
		GREEN	LOW



# INCIDENT REPORTING SYSTEM

**Step 1 - Immediate action •**

**Step 2 - Plan the investigation..**

**Step 3 - Data collection. •**

**Step 4 - Data analysis. •**

**Step 5 - Corrective actions. •**

**Step 6 - Reporting. •**



# ACCIDENT, NEAR MISS INCIDENT REPORTING AND INVESTIGATING



Notify your Contracts Manager and the SEC Contract Manager immediately.

- Seek medical attention as directed.
- Follow all the instructions issued by the medical attendant concerning ongoing treatment.
- Investigate the accident so those steps to prevent a recurrence can be taken.

## Report Near Misses



*Checking a **near thing** can prevent the **real thing**!*

## A SAFE WORK ENVIRONMENT

- A safe work area is where certain safety items and safety standards are in order and under control. Control of the following items will provide for a safer environment. The SEC Safety and Health Management System (5-STAR) lists safety standards that are the basics for control. Here are a few of them:
- Housekeeping – Element (1.8).
- Personal Protective Equipment - Element (2.15-2.23).
- Machine Guarding – Element (2.1).
- Hazard Communication – Element (5.5).
- Lock out, tag out, try out – Element (2.2).
- Work permit – Element (5.21 -5.21.1).

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  - Ladders – Element (2.4).
  - Electrical safety – Element (2.12).
  - Hand tools – Element (2.13).
  - Compressed gasses – Element (2.6).
  - Cranes and lifting safety – Element (2.5).
  - Forklifts and motorized vehicles – Element (2.5 / 2.9).

## BE AWARE OF THESE COMMON HAZARDS IN YOUR AREA

- Uneven floors
- Moving machinery
- Vehicles
- Chemicals
- Electricity
- Heavy Loads
- Elevated work platform
- Confined spaces
- Fall hazards



## BE AWARE OF THESE COMMON HAZARDS IN YOUR AREA

- Fire and explosion hazards
- Noise, dusts, fumes
- Loose ground and in surface
- Floor openings
- Damaged equipment
- Suspended loads
- Repetitive motion tasks
- Dusts containing, silica or other hazardous substance



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# Hierarchy of process control

