TUESDAY 1 → 4 PM

UEENEE G007 - SELECT AND ARRANGE EQUIPMENTS FOR GENERAL ELECTRICAL INSTALLATIONS

E011+E017

UEENGE E0178 - IMPLEMENT AND MONITOR OHS POLICIES AND PROCEDURES

G007

(UEENEEE011B - MANAGE RISKS IN ELECTRO TECHNOLOGY ACTIVITIES)

E011 + E017

HAZARDS OF ELECTRICITY

ELECTRICITY IS DANGEROUS BECAUSE IT CAN NOT BE SEEN.

THERE ARE THREE MAJOR HAZARDS CONNECTED WITH THE USE OF ELECTRICITY.

(1) SHOCK HAZARDS FROM DIRECT AND INDIRECT CONTACT WITH ELECTRICITY

(2) EXCESSIVE HEAT WHICH CAN CAUSE BURNS & FIRE

(3) INDUCTIONS HAZARDS WHICH CAN CAUSE DIELECTRIC HEATING

ELECTRICITY CAN HAVE THE FOLLOWING EFFECTS ON HUMAN BODY

- TISSUE BREAK DOWN
- HEART STOPPAGE
- ELECTRIC BURNS, FLASH BURNS, CONTACT BURNS
- MUSCLE SPASM
- DEATH.

EFFECTS OF THE ELECTRICITY PASSING THROUGH BODY

1000mA - DEFIBRILLATION
250mA - TISSUE BURNING
150mA - FIBRILLATION
100mA - CARDIAC REACTION
75mA - RESPIRATION STOPS
50mA - PARALYSIS OF ARMS

15mA - UNBEARABLE PAIN
10mA - PAIN
5mA - MILD DISCOMFORT
1mA - PERCEPTION

RISK ASSESSMENT

LEVEL OF VOLTAGE

50 V AC / 120 V DC RIPPLE FREE VOLTAGE

(OR) BELOW ⟶ ELV (EXTRA LOW VOLTAGE)

ABOVE 50V AC / 120 V dc ⇒ LOW VOLTAGE (OR) ABOVE

(ELECTRICIAN LICENCE (OR) CERTIFICATE) IS REQUIRED TO WORK WITH)

(1) ELIMINATE ALL RISKS ASSOCIATED WITH THE DANGER GIVEN BY THE HIGH VOLTAGE OF ELECTRICITY

41.5V 3ϕ, 24V 1ϕ (INSTEAD OF USING 415V, WE USE 41.5V IN LAB ROOM)

(2) ISOLATE THE RISK

(USE OF APPROPRIATE SAFETY DESIGN, BARRIER SO THAT THE PEOPLE CAN NOT ACCIDENTIALLY TOUCH THE HIGH VOLTAGE)

(3) MINIMIZE THE RISK

(USE OF APPROPRIATE INDICATOR TO WARN THE PEOPLE OF DANGER)

APPLY APPROPRIATE ENGINEERING DESIGN TO MINIMIZE THE DAMAGE CAUSED BY MALFUNCTIONING. (USE OF CONTROL SYSTEM, USE OF PROTECTION SYSTEM).

(4) DAMAGE CONTROL

THE RISK OF DANGER GIVEN BY IMPROPERLY MAINTAINED ELECTRICAL EQUIPMENTS

- IMPROPERLY MAINTAINED ELECTRICAL EQUIPMENT IN ELECTRICAL ROOM ADJACENT TO FUEL STORAGE CAN CAUSE EXPLOSION DUE TO ARC GENERATED BY FAULTY EQUIPMENT. THIS EXPOSES WORKERS TO THE EFFECTS OF ELECTRICAL BLAST AND ELECTRIC ARC

(FOR EXAMPLE, ALL CONTACT POINTS BETWEEN FIXED AND MOVING PARTS IN ELECTRICAL MACHINE NEED TO BE REGULARLY INSPECTED. ANY IMPURITIES NEED TO BE REMOVED BY ELECTRO-CLEANER. PROPER TIGHTENING OF SCREW NEEDS TO BE DONE)

- IF CURRENT CARRYING CONDUCTORS ARE WEATHERED, IT WILL RESULT IN OVER HEAT CAUSING INSULATION TO DETERIORATE, EXPOSED CONDUCTOR ELECTRIC SHOCK, FIRE, ELECTRIC ARC AND BLAST.

- BREAK DOWN IN ELECTRICAL INSULATION EXPOSES THE ENERGIZED CONDUCTORS AND ALLOW THEM TO CONTACT THE WORKER OR MAGNETIC TOOL THE WORKER IS USING RESULTING IN SHOCK

- UN MAINTAINED PROTECTIVE DEVICE CAN FAIL WHEN INTERRUPTING AN OVER CURRENT.

ELECTRICAL EQUIPMENTS MAINTENANCE PROGRAM

PROPER MAINTENANCE PROGRAM CAN REDUCE THE RISK OF EQUIPMENTS MALFUNCTIONING.

8 STEPS IN MAINTENANCE PROGRAM

1. PLAN
2. INSPECT
3. CLEAN
4. TIGHTEN
5. LUBRICATE
6. RECORD
7. EVALUATE
8. KEEPING THE RECORDS.

RISK REDUCTION

RISK MANAGEMENT IS A PROCESS USED TO AVOID, REDUCE (OR) CONTROL RISKS.

RISK IMPACT

HEALTH AND SAFETY OF EMPLOYEES
REPUTATION
FINANCIAL POSITION
PLANT, EQUIPMENTS AND ENVIRONMENT