



Department of Electrical and Electronics Engineering

Academic Year 2021 – 2022 (Even Semester)

Degree, Semester & Branch: VI Semester B.E. EEE

Course Code & Title: EE8602 Protection and Switchgear

Name of the Faculty member (s): Mr. D. Karthik Prabhu

Innovative Practice Description

- **Unit / Topic:** Unit I / Essential Qualities of Protection
- **Course Outcome:** CO1
- **Topic Learning Outcome:** TLO1
- **Activity Chosen:** One minute paper
- **Justification:**

Since qualities of protection is an important topic in concept wise and university exam point of view, I have chosen this topic and the reason for choosing One minute paper activity is while recollecting the concepts and hints learnt in the classroom, the students will be able to reproduce the concept in the exam.

- **Time Allotted for the Activity:** 03 Minutes
- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the concepts, I asked the students to think about the topic without writing anything for 2 minutes.

Total strength: 33

Reporter: Myself

At the end of the class (Last 4 minutes)

- ✓ I asked the students to think about essential qualities of protection, and how it is influence on the equipment protection? For 2 minutes
- ✓ Then I asked the students to write as much as they can within a short period of time(1 minute)
- ✓ Finally, I collected the papers form each students (1 Minute)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2
CO1	3	2	1	1	1	1	1	2	1	1	1

(1 – Low 2 – Moderate 3 – High)



- PO / PSO mapped:

Innovative practice	PO10
	2
Justification for correlation	Due the One minute paper activity student's written communication will be improved. So it is mapped moderately

- Images / Screenshot of the practice:



- ① Selectivity
It is the ability of a protective system to choose the faulty part of the system alone and ^{disconnect it and} not to alter any healthy/good working parts of the machine/system.
- ② Fast operation
It is defined as the ability of ^a protective system to choose and disconnect the faulty part as quickly as possible
- ③ Sensitivity
It is the sensitivity of a relay system to operate with even low value actuating quantity.

- ④ Reliability
It is the measure of how reliable a protective system is to call upon to disconnect the faulty part
- ⑤ Stability
It is the ability of a protective system to remain stable even after fault current interruption and disturbances due to them. The protective system should not be changed due to any fault current etc (It should not be unstable at any condition)



- **Reflective Critique:**

- ❖ ***Feedback of practice from students and other stakeholders:***

Students were asked me to conduct such activities for forth coming classes.

- ❖ ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

- ✓ The assessment of effectiveness of the activity was felt good when written most of the points by students.

- ✓ While conducting the activity, I understood that the students will be able to explain the essential qualities of protection.

- ❖ ***Challenges faced in implementation:***

- ✓ Time utilization for this activity

- ✓ Slow learners were not able reproduce the much points.

References:

- ❖ Sunil S.Rao, 'Switchgear and Protection', Khanna Publishers, New Delhi, 2008.
- ❖ Badri Ram, B.H. Vishwakarma, 'Power System Protection and Switchgear', New Age International Pvt. Ltd Publishers, Second Edition 2011.

Signature of Faculty Member

HOD



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Name of the Faculty member (s): Mr. D. Karthik Prabhu

Innovative Practice Description

- **Unit / Topic:** Unit I / Problems in Grounding
- **Course Outcome:** CO1
- **Topic Learning Outcome:** TLO3
- **Activity Chosen:** Think aloud pair problem solving
- **Justification:**

The topic plays vital role in power system protection. After teaching the problem solving method, I thought of conducting this activity for making the students to solve the tutorial problems on grounding which enhance the learning level and as a teacher I can judge the understanding level of the students.

- **Time Allotted for the Activity:** 30 Minutes
- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the problem solving methods, give students one or two minutes to think about the topic without solving problems.

Total Strength is 33

Reporter: Myself

During the Class (Last 30 minutes)

- Present students with a set of complex problems that require multiple steps to solve
- Pair up students and ask one student to be the problem solver, who explains their thought process in developing a solution based on what was learned out of class
- The partner(s) listens to this process and offers suggestions if there are difficulties, or expresses confusion should there be parts that are difficult to understand
- After the first problem has been solved, ask the students to switch roles and begin again



- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO6	PO7	PO8	PO9	PO10	PO12	PSO1	PSO2
CO1	3	2	1	1	1	1	2	1	1	1

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	PO3
	2
Justification for correlation	Due to this activity student's problem solving capability will be improved. So it is mapped moderately

- **Images / Screenshot of the practice:**





- **Reflective Critique:**

- ❖ ***Feedback of practice from students and other stakeholders:***

Students were asked me to conduct such activities for forth coming classes.

- ❖ ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

- ✓ The assessment of effectiveness of the activity was felt good when written most of the points by students.

- ✓ While conducting the activity, I understood that the students will be able to explain the essential qualities of protection.

- ✓ The success of the activity was evaluated by asking the question in Internal Assessment Test - I

- ❖ ***Challenges faced in implementation:***

- ✓ Time utilization for this activity

- ✓ Slow learners were not able to complete the problems.

References:

- ❖ Sunil S.Rao, 'Switchgear and Protection', Khanna Publishers, New Delhi, 2008.
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Name of the Faculty member (s): Mr. D. Karthik Prabhu

Innovative Practice Description

- **Unit / Topic:** Unit II / Electromagnetic Relays
- **Course Outcome:** CO2
- **Topic Learning Outcome:** TLO4
- **Activity Chosen:** Pro and Con Grid
- **Justification:**

The topic plays vital role in power system protection. Since, the electromagnetic relay initiates the protection process. After teaching the concept, I thought of conducting this activity for making the students to understand the pros and cons of electromagnetic relays which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 5 Minutes

- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the concept, give students one or two minutes to think about the topic without writing anything.

Total Strength is 33

Reporter: Myself

At the end the Class (Last 5 minutes)

- ✓ I asked the students to think about pro and con of electromagnetic relays for 1 minute.
- ✓ Then I told them to create a grid with pros and cons of electromagnetic relay in white board (4 minute)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	2	1	1	1	1	2	1	1

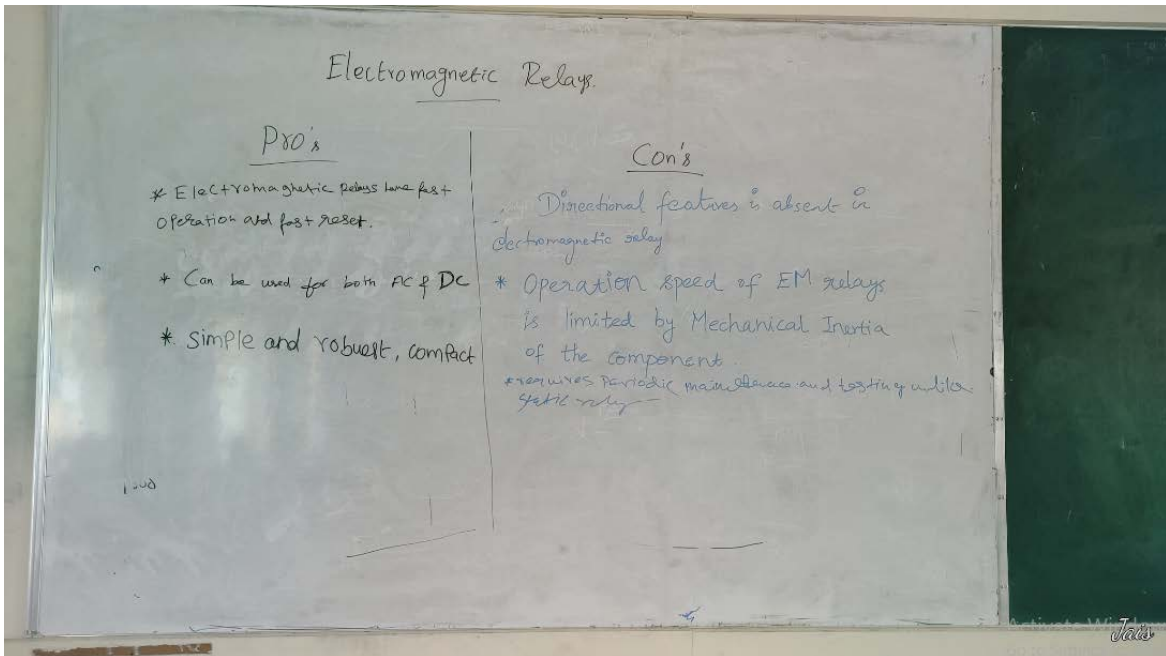
(1 – Low 2 – Moderate 3 – High)



• **PO / PSO mapped:**

Innovative practice	PO12
	2
Justification for correlation	Due to this activity student's lifelong learning will be improved. So it is mapped moderately

• **Images / Screenshot of the practice:**



• **Reflective Critique:**

❖ **Feedback of practice from students and other stakeholders:**

Students were asked me to conduct such activities for forth coming classes.

❖ **Benefit of the practice:** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

- ✓ The assessment of effectiveness of the activity was felt good when written most of the points by students.
- ✓ While conducting the activity, I understood that the students will be able to recollect the points about electromagnetic relays.

❖ **Challenges faced in implementation:**

- ✓ Time utilization for this activity



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Innovative Practice Description

- **Unit / Topic:** Unit III / Current Transformer and Potential Transformer
- **Course Outcome:** CO3
- **Topic Learning Outcome:** TLO7
- **Activity Chosen:** Pro and Con Grid
- **Justification:**

The topic plays vital role in power system protection. Since, the CTs and PTs are acts as sensors for initiate the protection process. After teaching the concept, I thought of conducting this activity for making the students to understand the pros and cons of CTs and PTs which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 5 Minutes

- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the concept, give students one or two minutes to think about the topic without writing anything.

Total Strength is 33

Reporter: Myself

At the end the Class (Last 5 minutes)

- ✓ I asked the students to think about pro and con of CTs and PTs for 1 minute.
- ✓ Then I told them to create a grid with pros and cons of electromagnetic relay in white board (4 minute)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	3	2	1	1	1	1	2	1	1

(1 – Low 2 – Moderate 3 – High)



- **PO / PSO mapped:**

Innovative practice	PO12
	2
Justification for correlation	Due to this activity student's lifelong learning will be improved. So it is mapped moderately

- **Images / Screenshot of the practice:**



- **Reflective Critique:**

- ❖ **Feedback of practice from students and other stakeholders:**

Students were asked me to conduct such activities for forth coming classes.

- ❖ **Benefit of the practice:** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

- ✓ The assessment of effectiveness of the activity was felt good when written most of the points by students.
- ✓ While conducting the activity, I understood that the students will be able to recollect the points about electromagnetic relays.

- ❖ **Challenges faced in implementation:**

- ✓ Time utilization for this activity



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Innovative Practice Description

- **Unit / Topic:** Unit IV / Numerical Protection
- **Course Outcome:** CO4
- **Topic Learning Outcome:** TLO10
- **Activity Chosen:** Ungraded Quiz
- **Justification:**

The topic plays vital role in power system protection. Since, most of the industries adopted numerical protection for the apparatus protection. After teaching the concept, I thought of conducting this activity for making the students to understand the numerical protection of power apparatus which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 5 Minutes

- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the concept, give students one or two minutes to think about the topic.

Total Strength is 33

Reporter: Myself

At the end the Class (Last 8 minutes)

- ✓ I asked the students to think about numerical protection.
- ✓ Then I told them to attend the quiz which is ungraded (5 minute)
- ✓ Finally I collected the responses from each students

- **CO – PO / PSO mapping:**

CO	PO1	PO4	PO12	PSO1
CO1	3	2	2	1

(1 – Low 2 – Moderate 3 – High)



• **PO / PSO mapped:**

Innovative practice	PO12
	2
Justification for correlation	Due to this activity student's lifelong learning will be improved. So it is mapped moderately

• **Images / Screenshot of the practice:**



• **Reflective Critique:**

❖ **Feedback of practice from students and other stakeholders:**

Students were asked me to conduct such activities for maximum topics.

❖ **Benefit of the practice:** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

- ✓ The assessment of effectiveness of the activity was felt good when correct answer given by most of the students.
- ✓ While conducting the activity, I understood that the students will be able to recollect the points about numerical protection.

❖ **Challenges faced in implementation:**

- ✓ Time utilization for this activity

References:

- ❖ Sunil S.Rao, 'Switchgear and Protection', Khanna Publishers, New Delhi, 2008.
- ❖ Badri Ram, B.H. Vishwakarma, 'Power System Protection and Switchgear', New Age International Pvt. Ltd Publishers, Second Edition 2011.

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Innovative Practice Description

- **Unit / Topic:** Unit V / Vacuum Circuit Breakers
- **Course Outcome:** CO5
- **Topic Learning Outcome:** TLO12
- **Activity Chosen:** Field Visit
- **Justification:**

The topic circuit breaker has different types, since each type has used for different voltage level and applications. After teaching the constructional, I thought of conducting this field visit for making the students to give the input about vacuum circuit breaker which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 45 Minutes

- **Details of the Implementation:**

(A brief content about how the practice was followed)

After teaching the concept, students were took to the RIT – Power House Switch gear yard and ask them to think about the constructional features of circuit breakers.

Total Strength is 33,

Photographer: one student - Mr. Permkumar (interested in photography)

Reporter: Myself

At the end the visit (Last 5 minutes)

- ✓ I asked the students to think about various parts of circuit breaker for 2 minutes.
- ✓ Then I told them to Pair with their neighbors and discuss about the construction and operation of circuit breaker for another 1 minute.
- ✓ Finally, I randomly asked students about the construction parts and operation of circuit breaker.(2 minutes)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO8	PO9	PO10	PO12	PSO1
CO1	3	2	1	1	1	2	1

(1 – Low 2 – Moderate 3 – High)



- **PO / PSO mapped:**

Innovative practice	PO7
	1
Justification for correlation	Due to this activity student's will understand the impact of technical solution on environment. So it is slightly correlated.

- **Images / Screenshot of the practice:**



Reflective Critique:

- ❖ **Feedback of practice from students and other stakeholders:**
Students were asked me to conduct such activities for maximum topics.
- ❖ **Benefit of the practice:** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)
 - ✓ The assessment of effectiveness of the activity was felt good when I am asking the question most of the points shared by students.
 - ✓ While conducting the activity, I understood that the students will be able to recollect the points about circuit breakers.
- ❖ **Challenges faced in implementation:**
 - ✓ Time utilization for this activity

References:

- ❖ Sunil S.Rao, 'Switchgear and Protection', Khanna Publishers, New Delhi, 2008.
- ❖ Badri Ram, B.H. Vishwakarma, 'Power System Protection and Switchgear', New Age International Pvt. Ltd Publishers, Second Edition 2011.

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