MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt.Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV Bhopal)
DEPARTMENT ELECTRICAL ENGINEERING

Event Report

Expert Lecture topic: **Modern Transformer manufacturing, and commissioning**
Name of Expert: Er. R K Mohapatra, former GM, BHEL, Jhansi
Date: **23.1.2022**, 11.30-1.30 pm (Sunday)

Major Objectives of the Event:
The objective of organizing expert lecture on "Modern Transformer manufacturing, and commissioning" was to give brief introduction of the:

- Transformer Manufacturing Processes
- Types and applications of Power Transformer
- Various types of tests performed on the Transformer

Major points of discussion:
Major key points of discussion in the expert lecture are:

- Most common types of power transformers are:
  - 2 windings HV/LV
  - 3 windings HV/LV1/LV2
  - with D.T.C. in HV, typically ± 2x2.5%
  - normally no L.T.C.
  - Connection: Wye/Delta
  - typical LV: 10, 20, 25 kV
  - typical HV: 33, 69, 115, 138, 161, 230, 345, 500 kV
  - Single-phase
  - Three-phase

- Manufacturing Process:
  Use (Varies from Manufacturer to Manufacturer):
  –1 or 2 layers
  –Up to 325 kV BIL for single-layer windings
  –Up to 200 kV BIL for two-layer windings
  –Axial cooling ducts in the winding or with zigzag cooling depending on the kind of helix
  –Preferably with at least one turn between successive transpositions
  Advantages:
  –Cheap winding
  –No radial overbuild at the transpositions depends on Boomerang type
  Disadvantages:
  –One brazing per transposition on Boomerang type
  –Cannot be used for zigzag cooling without radial overbuilds on Giron and Double

The expert also discussed about various fault diagnosis methods of transformer

- Turns Ratio Testing
  Turns ratio transformer testing is commonly used to ensure that the winding ratio between the primary and secondary coils are aligned to recommended specifications. This type of transformer testing also ensures the transformer will provide either step-up or step-down voltage. A step-down transformer, for instance, comprised of 100 primary turns and 10 secondary turns will work to reduce the voltage by a factor of 10 — corresponding to the secondary coil — while multiplying the current by 10 as well.

- Insulation Resistance Testing
  Insulation resistance transformer testing, also known as the Megger test, is used to determine the quality of insulation within the transformer itself. These tests are conducted with a megohmmeter, one of the necessary transformer test instruments, that operates similar to a multi-meter. In order to pass the test, the insulation of a transformer must be determined to have a greater resistance than defined by international standards for that transformer type. If it measures any lower it could signify an issue with the insulation which may require replacement.

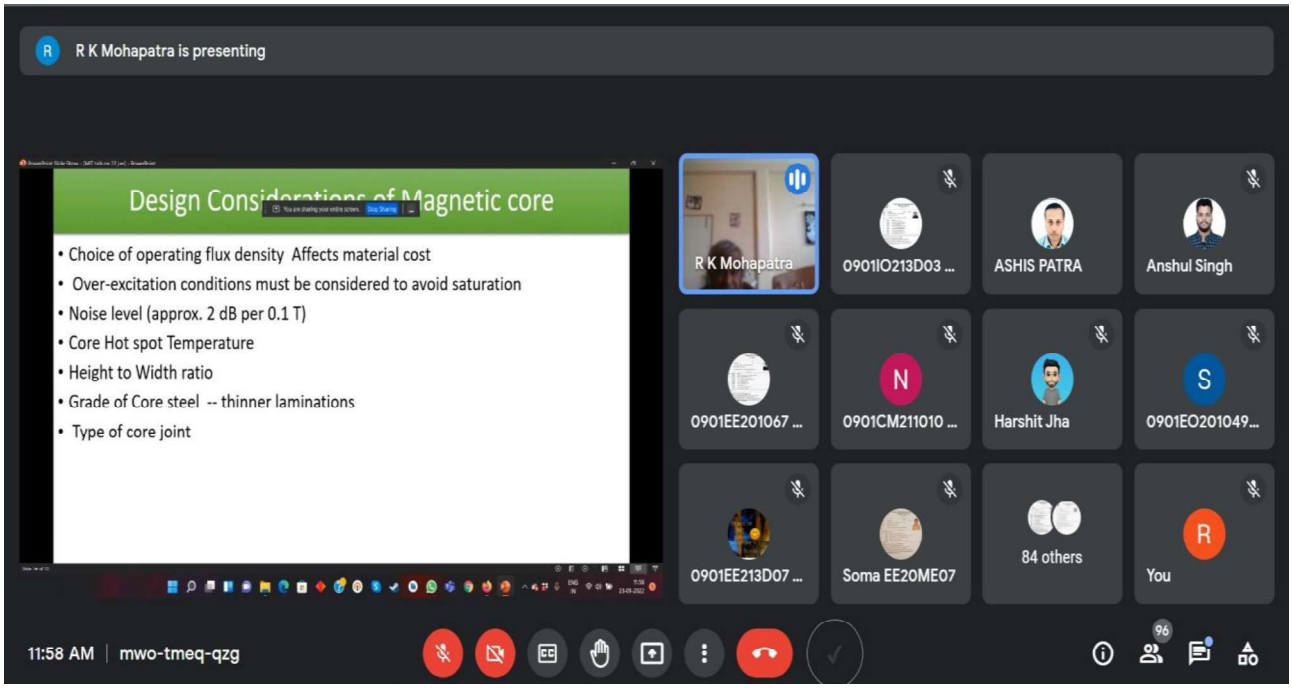
- Power Factor Testing
  Power factor transformer testing is the process wherein the power loss of the insulation system is tested by measuring the angel the resulting current of power that occurs when AC voltage is applied. For the test results to be optimal, the angle of the current should measure 90 degrees; however, more often than not, insulation is never perfect. As a rule, the closer to 90 that the current is, the better the insulation is.

  This test is completed with a power factor test kit, and it can be completed regularly throughout the life of the transformer. This can help detect deteriorating or malfunctioning insulation over time and give you an idea of when the transformer will need to be replaced.

- Resistance Testing
  This type of transformer testing once a transformer has been left to settle at the same temperature of the surrounding air. The reason for this is to check for any differences between the opens and windings within the transformer. This helps ensure that all the circuits are still wired and connected correctly. This test is conducted using an ohmmeter.

  Overall there are eight types of transformer testing; however, these are four of the most common. All of these tests are critical for maintaining the integrity of the transformer and without them, the operation can be severely hindered.

Event Photograph:



Attendance:

Total 99 students were present in the Expert lecture.

S.No	Enrollment number	Student Name	Pursuing Year
1	0901EE191053	JISHA GUPTA	Third year
2	0901EE191027	Anurag Singh	Third year
3	0901EE201037	Danish singhal	Second year
4	0901EE191090	Rishika Namdeo	Third year
5	0901EE191092	Ritul Shrivastava	Third year
6	0901EE191129	Varun A Mahurkar	Third year
7	0901EE193D01	Anish kumar mahor	Forth Year
8	0901EO201049	Saksham Singh	Second year
9	0901EE201051	Harshit Kumar Jha	Second year
10	0901EE191121	suraj shakya	Third year
11	0901EE191075	Pallavi Singh	Third year
12	0901EE201098	RAJAY AJAY JAIN	Second year
13	0901CM211017	Shourya upadhyay	First Year
14	0901EE191124	Tanya Gupta	Third year
15	0901CM211012	Richa Garg	First Year
16	0901EE203D04	Arti Singh	Third year
17	0901EE191058	Kaushal Kumar	Third year
18	0901EE191085	RAJMAL VARMA	Third year
19	0901EE203D03	Ankit Kumar Tripathi	Third year
20	0901EE213d02	Mantavy Kishor Sandal	Second year
21	0901IO213D03	Parag singh gaur	Second year

22	0901ee191052	Jay Kumar Sahu	Third year
23	0901EE191009	Akash kushwah	Third year
24	0901EE201070	Mohit Asthana	Second year
25	0901EE191127	Unnati Yadav	Third year
26	0901EE203D09	Nikhil Rajpoot	Third year
27	0901EE201101	Riddhi bansal	Second year
28	0901EE191089	Rishabh Rajput	Third year
29	0901EE201118	Shruti Rajput	Second year
30	0901EE191065	Mridul Gupta	Third year
31	0901EE201092	Priya Singh	Second year
32	0901EE19086	Rashmi Kumari	Third year
33	0901EE201021	Ankush Agrawal	Second year
34	0901EE203D08	MOHIT LONKAR	Third year
35	0901EE201100	Ram Gupta	Second year
36	0901EE201083	Nitish Sengar	Second year
37	0901EE201038	Devkant Sharma	Second year
38	0901CM211012	Richa Garg	First Year
39	0901EO201023	gauri singhal	Second year
40	0901EE201091	priya patel	Second year
41	0901EE201050	Harshit Gupta	Second year
42	0901EE201132	Vipin Sharma	Second year
43	0901EE191049	Harshit Rajput	Third year
44	0901ee191073	NIKITA SIKARWAR	Third year
45	0901EE201061	Karan Yadav	Second year
46	0901EE191067	Mukul Savita	Third year
47	0901EE201006	Abhishek Kushwaha	Second year
48	0901EE191069	Nandnee Yadav	Third year
49	0901EE201022	Anshu Gurjar	Second year
50	0901EE191109	Shivam Mahawar	Third year
51	0901CM201044	Gunika Sharma	Second year
52	0901EE203D07	Mohd Shahbaz khan	Third year
53	0901EE191087	Rekha Bisen	Third year
54	0901EE191128	Vaibhav Rajoriya	Third year
55	0901EE191021	Ankit kumar patel	Third year
56	0901EE213D04	Sanjay Sanodiya	Second year
57	0901EE181013	Akash Singh	Forth Year
58	0901EE191017	Aman Thakur	Third year
59	0901EE201067	Kunal Jolly Saxena	Second year
60	0901EE201040	Divya pandre	Second year
61	0901EE191061	Kushagra Mishra	Third year
62	0901EE201084	OAM SHANKAR A	Second year
63	0901EE201056	HIMANSHU ARYA	Second year
64	0901EE201014	Aditya Sharma	Second year
65	0901EE201060	Jasvendra kumar ahirwar	Second year
66	0901EE203D12	Riya pal	Third year
67	0901EE201106	Sanidhya Mudgal	Second year
68	0901EE191015	Aman khan	Third year
69	0901EE201109	Sanjay gautam	Second year
70	0901EE201001	Aaditya ahirwar	Second year

71	0901ee191119	Smriti Singh	Third year
72	0901EE201075	Namrata tekchandani	Second year
73	0901EE191007	Aditi Jain	Third year
74	0901EE191096	Sakshi Savita	Third year
75	0901EE201078	Neel kamal	Second year
76	0901EE201025	Anushka Jain	Second year
77	0901EE193D02	Anshul Singh	Forth Year
78	0901EE201020	Ankit Sharma	Second year
79	0901EE191048	Harshit Agrawal	Third year
80	0901EE191116	Shruti Shrivastava	Third year
81	0901EE201042	Divyansh Agrawal	Second year
82	0901EE191081	Priyanshi Yadav	Third year
83	0901EO201014	Aryan Soni	Second year
84	0901Ee20115	Shivam Yadav	Second year
85	0901EE201076	Nandani	Second year
86	0901EE201112	Satyam.Bhargav	Second year
87	0901EE201113	Shakti Pandey	Second year
88	0901EE201140	Chinmay Gupta	Second year
89	0901EE213D01	Anurag Yadav	Second year
90	0901EE201139	Yohan singh	Second year
91	0901EE201039	Dhurvi Goyal	Second year
92	0901EE201082	Nitin Dwivedi	Second year
93	0901EE201043	Divyansh sharma	Second year
94	0901EE191077	Pracheta Sharma	Third year
95	0901EE201017	Akshat	Second year
96	0901EE201090	Pritam kumar barpete	Second year
97	0901EE201124	Suraj maitoliya	Second year
98	0901EE201032	Ashutosh Dandotiya	First Year
99	0901EE201055	Hemang rawat	Second year

Participant's Feedback:

Enrollment number	Student Name	How was the expert lecture given by Er. R K Mohapatra (overall rating, on a scale of 5, 1 being low & 5 being highest)	How was the knowledge imparted	In which area do you think, future expert lectures must be organized	what are the key take aways from this lecture? (what you learnt)
0901EE191053	JISHA GUPTA	4	Very useful	.	.
0901EE191027	Anurag Singh	5	Very useful	Yes	Detailed in power transformers
0901EE201037	Danish singhal	3	Useful	Knowledgeable	Good

0901EE191090	Rishika Namdeo	5	Very useful	the new research areas in electrical core	very much
0901EE191092	Ritul Shrivastava	5	Useful	Career options in Electrical engineering	3 phase 3limb transformer
0901EE191129	Varun A Mahurkar	5	Useful	College will take better disicion.	Mainly about Transformer.
0901EE193D01	Anish kumar mahor	5	Very useful	Electrical	We are learned deeply about transformer
0901EO201049	Saksham Singh	3	Useful	Transmission of Electricity	Knowledge about transformer
0901EE201051	Harshit Kumar Jha	5	Very useful	Control systems	Development and various necessary aspects of developing transformer
0901EE191121	suraj shakya	4	Very useful	Transformers	transformer limbs
0901EE191075	Pallavi Singh	5	Very useful	Power System	Transformer and its classification
0901EE201098	RAJAY AJAY JAIN	5	Very useful	Must be industrial work related to our course.	Learning of transformer working in the industry and much more.
0901CM211017	Shourya upadhyay	4	Useful	In higher collage level education	About transformer
0901EE191124	Tanya Gupta	4	Useful	3 phase machines	Thorough knowledge about transformer
0901CM211012	Richa Garg	4	Useful	Various subjects	Different types of transformers and transformers working explanation
0901EE203D04	Arti Singh	4	Very useful	Gwalior	Transformer
0901EE191058	Kaushal Kumar	5	Useful	Cloud computing	Transformer construction considerations
0901EE191085	RAJMAL VARMA	5	Very useful	POWER GENERATION	TANSFORMER
0901EE203D03	Ankit Kumar Tripathi	5	Useful	Transformers	Designing of machines
0901EE213d02	Mantavy Kishor Sandal	5	Very useful	Solar Power generation and pv cell manufacturing	About transformers and it's manufacturing

0901IO213D03	Parag singh gaur	5	Very useful	Cyber security	Limb transformer core and other topics
0901ee191052	Jay Kumar Sahu	4	Very useful	Solar energy	About Transformers
0901EE191009	Akash kushwah	4	Useful	Power generation station	About various transformer
0901EE201070	Mohit Asthana	3	Useful	None	Everything
0901EE191127	Unnati Yadav	5	Useful	Any useful topic in core	Thorough knowledge of Transformer
0901EE203D09	Nikhil Rajpoot	5	Very useful	Power system	Menufectring of transformer
0901EE201101	Riddhi bansal	3	Useful	Regarding nuclear energy (try to call experts from BARC)	Different ways to export Transformers
0901EE191089	Rishabh Rajput	5	Very useful	Internship session	Understanding of transformer
0901EE201118	Shruti Rajput	3	Useful	Any	There are so many key to take aways
0901EE191065	Mridul Gupta	4	Useful	Internships	.
0901EE201092	Priya Singh	5	Very useful	It should be organised on electricity power generation.	By this lecture I get to know about the manufacturing of transformer in detail.
0901EE19086	Rashmi Kumari	4	Very useful	Power plants	About transformers.
0901EE201021	Ankush Agrawal	4	Useful	How to deal with the pressure and how to focus maximum for particular purpose	Taken knowledge of the topic and to apply in future job of this
0901EE203D08	MOHIT LONKAR	5	Very useful	In my subject	manufacturing of transformer
0901EE201100	Ram Gupta	5	Very useful	.	.

0901EE201083	Nitish Sengar	5	Useful	Electric machines	A transformer is an electrical device which, by the principles of electromagnetic induction, transfers electrical energy from one electric circuit to another, without changing the frequency.
0901EE201038	Devkant Sharma	5	Very useful	Power plant , Solar energy	Learn about industrial application , manufacturing and testing of transformer.
0901CM211012	Richa Garg	4	Useful	In various subjects	All about Transformers types of transformers working of transformers
0901EO201023	gauri singhal	4	Very useful	-	-
0901EE201091	priya patel	5	Very useful	pSU's	consistency
0901EE201050	Harshit Gupta	3	Useful	About appreciate to be a engineering	His story
0901EE201132	Vipin Sharma	4	Useful	On placements	Lecture was useful for us and it has improve our knowledge
0901EE191049	Harshit Rajput	4	Useful	Artificial intelligence	What they taught us
0901ee191073	NIKITA SIKARWAR	5	Very useful	In any topic related to electrical machines	Transformers
0901EE201061	Karan Yadav	3	Useful	Transformers	Transformers

0901EE191067	Mukul Savita	4	Useful	More about core	1) Like what is the use of 5 limb Transformers to reduce the height 2) cropping slitting Mitering of transformer 3) efficiency of transformer 99.5% because no moving parts so rotation losses are less
0901EE201006	Abhishek Kushwaha	4	Useful	machines	From this lecture, I came to know about different types of Transformers and it's construction.
0901EE191069	Nandnee Yadav	4	Useful	Solar Power Satellite	nothing
0901EE201022	Anshu Gurjar	5	Very useful	Renewable Energy	A lot about transformer.
0901EE191109	Shivam Mahawar	4	Useful	Gate exam	Learnt in depth about transformers
0901CM201044	Gunika Sharma	4	Useful	Transmission of electricity	Knowledge about transform
0901EE203D07	Mohd Shahbaz khan	5	Very useful	manufacturing of alternator	ppt material is very useful. we cannot get this type of knowledge from a textbook.
0901EE191087	Rekha Bisen	4	Useful	IoT and renewable energy resources	About transformer
0901EE191128	Vaibhav Rajoriya	3	Useful	Future lectures can be organized on the career of electrical engineers of the opportunities they can get.	Major take aways was about the learning of transformer especially core and the materials
0901EE191021	Ankit kumar patel	5	Very useful	Computer science	Transformers
0901EE213D04	Sanjay Sanodiya	4	Very useful	Working of Substation	Construction of transformers
0901EE181013	Akash Singh	5	Very useful	INDUCTION MOTOR	Practical transfomer design

0901EE191017	Aman Thakur	5	Very useful	Personality development and communication	Manufacturing of transformers
0901EE201067	Kunal Jolly Saxena	4	Very useful	On power system	Transformer basics
0901EE201040	Divya pandre	4	Very useful	Guidence In electrical engineering field	I learnt More about transformer, and
0901EE191061	Kushagra Mishra	4	So so	None	None
0901EE201084	OAM SHANKAR A	4	Useful	Communication	It is very difficult to transport a transformer
0901EE201056	HIMANSHU ARYA	5	Very useful	Virtual visit on how to transformer manufacture in industries	In lecture I have learnt about the full details about transformer single phase 3 phase or many more and how to manufacturer
0901EE201014	Aditya Sharma	4	Useful	Electrical machines	Voltage variesion
0901EE201060	Jasvendra kumar ahirwar	1	Useful	3 times	Many things
0901EE203D12	Riya pal	4	Very useful	Leads to Fewer Discipline Problems	Understand different points of view.
0901EE201106	Sanidhya Mudgal	4	Very useful	Career guidance	Technical knowledge
0901EE191015	Aman khan	5	Very useful	Placement specially (it placement)	A lot of things
0901EE201109	Sanjay gautam	1	Useful	Per week one lecture it should be perfect	Much thing just like eddy current transformer and many more
0901EE201001	Aaditya ahirwar	1	Useful	Par week one lecturer it should be perfect	Many more things just like transformer, eddy current, voltage, inductor, core loss etc
0901ee191119	Smriti Singh	5	Useful	Power plants and distribution units	NA
0901EE201075	Namrata tekchandani	5	Very useful	In software engineering	Practical testing of transformer
0901EE191007	Aditi Jain	3	Useful	Internet of things	Applications of instruments in industrial areas.

0901EE191096	Sakshi Savita	4	Very useful	Emerging areas in electrical engineering	The lecture was very useful.
0901EE201078	Neel kamal	5	Very useful	NA	Working and construction of transformer
0901EE201025	Anushka Jain	3	Useful	2nd year	Knowledge
0901EE193D02	Anshul Singh	4	Very useful	Synchronous machine	Transformers
0901EE201020	Ankit Sharma	4	Useful	Mits	Transformers
0901EE191048	Harshit Agrawal	5	Very useful	Related to industry experience	Industrial Aspects for manufacturing of good transformer
0901EE191116	Shruti Shrivastava	5	Very useful	yes	knowledge about transformers, manufacturing, maintenance and fault finding and also about jobs in this field.
0901EE201042	Divyansh Agrawal	3	Useful	Don't now	,
0901EE191081	Priyanshi Yadav	5	Useful	From various public sectors like ongc gail etc.	Everything was knowledgeable.
0901EO201014	Aryan Soni	4	So so	Noida	They taught us too much
0901Ee20115	Shivam Yadav	5	Very useful	.	.
0901EE201076	Nandani	5	Very useful	Industrial environment to adapt	Concept
0901EE201112	Satyam.Bhargav	5	Very useful	Transformer voltage regulation and efficiency.	Learn about how to set up transformer in indusrty
0901EE201113	Shakti Pandey	3	Useful	Electrical Machines	I have learnt so many things from this lecture
0901EE201140	Chinmay Gupta	5	Useful	In power system	Now i better understand transformer how to manage electricity what precautions should be do
0901EE213D01	Anurag Yadav	5	Very useful	In my course	.
0901EE201139	Yohan singh	4	Useful	Every where	Be improve myself
0901EE201039	Dhurvi Goyal	4	Useful	Renewable energy	About Transformers

0901EE201082	Nitin Dwivedi	4	Very useful	Latest technologies	Actual practically in industry how transformer is manufactured & how electrical power is distributed in grid.
0901EE201043	Divyansh sharma	4	Useful	Future of AI in finance	How useful artificial intelligences is
0901EE191077	Pracheta Sharma	4	Useful	The need of electrical engineers in sustainable development.	Things like different power system, the transformers and its core, power transformer core, mitering, etc.
0901EE201017	Akshat	4	Useful	More related to branch	how transformer is manufactured
0901EE201090	Pritam kumar barpete	4	Useful	Electric vehicles	More
0901EE201124	Suraj maitoliya	5	Useful	Yes	Manufacturing transformer
0901EE201032	Ashutosh Dandotiya	4	Useful	For IES	...
0901EE201055	Hemang rawat	5	Very useful	H	H

Prof. Ashish Patra
(Coordinator)