Navgan Shikshan Sanstha Rajuri (N)

Mrs. Kesharbai Sonajirao Kshirsagar Alias Kaku Art ,Science & Commerce College Beed –431122

Energy Audit Manual

2022-2023

ISO 50001:2018 Energy Management System

ISO 50001:2018 Certificate Of Registration

Geotek Global Certification Pvt. Ltd.

hereby certify that the organization

Navgan Shikshan Sanstha, Rajuri (N.)
Mrs. Kesharbai Sonajirao Kshirsagar
Alias Kaku Arts, Science & Commerce College, Beed

Address : Beed 431122, Maharashtra, India

has implemented and maintains an **Energy Management System** for

Scope :

To Evolve and Impart Comprehensive Higher Education to the Students of Under Graduation, Post-Graduation, Diploma Courses, Certificate Courses & Doctoral Degrees in Arts, Commerce & Science.

An audit was performed and proof has been furnished that the management system fulfils the requirements of international standard detailed below ...

Standard	**: ISO 50001:2018**
Certificate No.	**: 21.GGCS.IN.500135**
Certification Date	**: 31st January 2022**
Cert. Expiry Date	**: 30th January 2025**

Geotek Global
Certification Pvt. Ltd.

imab
International Management Accreditation Board

Reg. No. IN/EnMS10/0523

Chief Executive Officer
Geotek Global Certification Pvt. Ltd.
102, Raj Legacy, Near Bramhand Phase 5, Off. GB Road,
Thane (West), Pin 400607, Maharashtra, India

Geotek Global Certification Pvt. Ltd. is accredited by International Management Accreditation Board (Singapore)
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The continual validity of the certificate is conditional to compliance with the terms and the conditions of Geotek Global Certification Pvt. Ltd. - Certification Scheme Regulation. Validity of the certificate may be verified on following websites : ***www.geotek.co.in*** and accreditation body's website : ***www.imach.com***

Geotek Global Certification Pvt. Ltd.
Office No. 102, Raj Legacy, Near Bramhand Phase 5, Off. GB Road,
Thane (West), Pin 400607, Maharashtra, India
Website : www.geotek.co.in , e mail : info@geotek.co.in

1st Surveillance Audit Report (29.01.23)
ISO 50001:2018- Energy Audit
General Observations About Surveillance Audit And Improvement Areas

Strength:

Highly qualified & experienced faculty.
Eminent scientists & scholar academicians are visiting
Good Infrastructure,
Energy Policy nicely defined.
Evidenced the Constitution of Energy Committee record.
Periodic energy conservation programme for staff, students and society are conducted periodically and records are maintained.
Scope of energy audit is defined.
Energy audit methodology
System study during energy audit.
Identified Energy saving opportunity
Average Cost of Power is worked out.
Tariff category comparison study has done.
Analysis of Connected Load in Campus Other Than Motive Poweris carried out.
Energy Saving Opportunity Details
Relief in Load on Split Air conditioner in instrument lab(senior)
Solar power plant
Awareness program & sign Board Display near switch board
Power & Harmonics measurement of computer Laboratory
Power Losses measured in operation of UPS
Illumination measurement & study
List Of Instrument used for measurement in Energy Audit

Observations:

1- Energy Policy not displayed.
2- Solar panels are fitted on the roof however no technical data is collected.

Recommendations:
Since there is no major non conformities observed during the certification audit, we recommend the KSK Arts,Science & Commerce College,Beed for ISO 50001:2018 Certifications.
Observations raised in this audit shall be reviewed in next surveillance audit.
First surveillance audit shall be planned on or before 25th Jan. 2024.

R.M.Jain
Lead Auditor

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Certification Pvt. Ltd.

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ASSESSMENT REPORT: ISO 50001:2018

Geotek: Certification / ~~Supplementary/1st surveillance/recertification~~ e Report & Report Acceptance

The assessment of Navgan Shikshan Sanstha, Rajuri (N.)
Mrs. Kesharbai Sonajirao Kshirsagar Alias Kaku
Arts, Science & Commerce College, Beed was completed,

. Geotek through its Team Leader / Lead Auditor confirms the Confidentiality of the information received, Observed and Reported by the Team Geotek.

Team Leader / Lead Auditor by signing this sheet confirm the Non Conflict of Interests with the Organization.

This report and its full contents are completely understood and accepted.

Please sign below confirming acceptance of the assessment report's contents

Signed for & on behalf of Geotek.
Name: R.M.Jain
Date: 29.01.23

Signed for on behalf of the client
Name: Principal
Mrs.K.S.K.Alias Kaku Arts,
Science & Commerce College
Date: 29.01.23

Geotek Global Certification Pvt. Ltd.
Office No. 102, Raj Legacy, Near Bramhand Phase 5, Off. GB Road,
Thane (West), Pin 400607, Maharashtra, India
Website : www.geotek.co.in , e mail : info@geotek.co.in

Ref: ISO/GGCPL/23-24/13 Date: 30.01.2023

M/s
Navgan Shikshan Sanstha,Rajuri(N)
Mrs. Kesharbai Sonajirao Kshisagar Alias Kaku
Arts,Science & Commerce College,
Beed.

Sub.; Continuation of ISO 50001:2018 Certificate

Dear Sir,

We are pleased to inform you that upon verification of reports of First Surveillance of ISO 50001:2018 Audit of your Organization KSK Arts, Science & Commerce College, Beed, conducted by us on 29.01.2023, your corrective action plan and based on the acceptance of Certification Decision Committee we hereby confirm that your Certificate of Compliance bearing # 21.GGCS.IN.500135 issued on 31.01.2022 will stand continued till 30.01.2024.

We take this opportunity to congratulate you and your team for all efforts in effectively implementing and maintaining the documented system.

Thanking you and assuring to provide best of our services at all times.

Your next audit shall be conducted on or before January-24.

Thanks & warm regards.

Rajendramjain
R.M.Jain
Lead Auditor

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Introduction

Mrs. Kesharbai Sonajirao Kshirsagar Alias Kaku Art ,Science & Commerce College Beed in Maharashtra state. This college is affiliated with Dr. Babasaheb Ambedkar Marathwada University Aurangabad.This college is established in 1971 which has been imparting higher education up to UG level in Art,science & Commerce faculty. College campus consists of buildings named as Main Bulding- A, Library - B, Sport Hall –C, Hostel- E, Canteen-F in which administrative office , various HOD cabins ,staff rooms , classrooms , various laboratory like Physics, chemistry, botany,micro biology as well as Music and Drama departments are functioning with basic motto to impart quality , employment, entrepreneur and Agro oriented higher education to mostly rural as well as marginal urban student. This college also provides gymkhana facility to student undergoing through various type of physical education. There is also beautiful library building Block- D where student studying in various branches have facility to refer books. The college developed garden & teak wood plantation in campus.

Electrical Maintains Committee

1.	Shri. Gonde G.D.	Chairman
2.	Shri. Vanjare V.S.	Member
3.	Dr. Jamdade Deepak	Member
4.	Shri. Jadhav A.D.	Member
5.	Shri. Gange A.H.	Member

Acknowledgement

Department of Physics Navgan Shikshan Sanstha Rajuri (N)

Mrs. Kesharbai Sonajirao Kshirsagar Alias Kaku Art ,Science & Commerce College Beed is very much thankful to Vice President Dr.D.B. Kshirsagar and Principal Dr.S.V. Kshirsagar for motivating us for energy audit

1. To study present level of Energy Consumption

Hall No.	Department	CFL/ Panal	Tube	LED Tube	LED Bulb	Fan	Inverter	Computer	Printer	Freez	A.C	Xerox	Focus	Exort	Oven	T.V.	Pump
0	Principal Office	52	4	3		12				1	3					1	
1	Office	2	2		9	6		9	8								
2	Vice Principal	1	3		1	2	3	1						1			
3	Chemistry		1		5	3				1							
4	Chemistry Lab			15	5	7								8			
5	Exam Section		1	3	1	1								1			
6	Inward, outward		1		3	1	1	1	1								
7	Economics Dept				3	2	1	1									
8	Physics Lab		4		1	1											
9	Zoology lab		1	1	2	2											
10	Zoology Dept		2			1		1	1	1							
11	Zoology lab		1	3	3	1									2		
12	Zoology lab		3			1											
13	Physics Lab		3		1	1											
14	Physics Dept.		4		2	2		1	1					1			
15	IQAC		4		3	4	1	1	1					1			
16	Xerox Centre		1	1		1						2					
17	Seminar Hall		8		1	5	1										
18	Reader scribe		2		2	1											
19	Health care		1		2	1											
20	MCVC		1	2		2		2									
21	Computer		4		2	4	1	19	1								
22	Theory Hall		3			1											
23	commerce		1	1		2											
24	commerce Dept		2	3		2	1	10	1								
25	Home sci.		4			2		1									
26	Home sci. Dept		4	2		2		1	1								
27	Microbiology lab		5	1		2									1		
28	Microbiology lab		1	3		2	1	2	1								
29	Botany Dept.		1			2											
30	Botany Lab.	2		5		5		1	1	1							
31	Botany Lab.		4	2		2				1							
32	Microbiology lab			2	4	2									1		
33	English Dept.	1	4			3	1	18		1							
34	Geography	1	1			3											
36	Geography Dept.		2	3		3	1										
37	Mathematics		3		1	2		1	1								
38	Physical Dept.	2	2			1		1									
39	Music Dept.		1	6		3		1	1								
40	Music Dept.																
41	Theory Hall			3													
42	Theory Hall			4		2											
43	Political Science		1	1		1		1									
44	Sociology		1	1	2	1		1									
45	History		1	1	2	1		1									
46	Urdu			2		1		1									
47	Marathi			2		1		1									
48	Hindi			2		1		1									
49	Theory Hall			2		1		1									
50	Theory Hall			2		1											
51	Theory Hall		2			1											
52	Vocational		2	2		2											
53	Theory Hall																
54	Theory Hall		1	3	4	1		1	1								
55	Theory Hall		1	3		1											

56	Theory Hall		2	1		1											
57	Theory Hall		1	2		1											
58	Theory Hall		3	1		1											
59	Theory Hall			3		1											
60	Theory Hall		1	2		1											
61	Theory Hall		2	1		1											
61	Theory Hall		2	1		1											
	Hostel			8	150	60	1										
	Sport Hall				20	12		1	1								1
	Record Room	2	6			3											
	YCMU		1		2	2	1	2	1								
	Canteen				10	5											
	Porch												8				2
	Total	17	32	103	251	221	15	113	23	6	3	2	8	12	4	2	3

2. Electrical Devices Wise Load

Electrical Devices	Total No.	Watt	Total Watt
LED PANAL	52	12	624
CFL	17	15	255
LED Bulb	251	9	2259
Fluorescent TUBE	132	40	5280
LED TUBE	103	20	2060
FAN	221	90	19890
COMPUTER	113	60	6780
PRINTER	23	250	5750
A.C.	3	1440	4320
INVERTER	15	325	4875
Exhaust FAN	12	45	540
FREEZ	6	100	600
OVEN	4	1860	7440
T.V.	2	110	220
FOCUS	8	100	800
XEROX	2	1250	2500
		Total	64193

PUMP 5HP	1	746	3750
MOTOR2HP	1	746	1492
MOTOR 1 HP	1	746	746
		Total	5988
		Total Watt	70181
		Total KWH	70.181

Total Load =70KWH

STUDY OF ELECTRICAL ENERGY CONSUMPTION

Electrical Bill Analysis- 2020-2021

There is Five number of various type of electricity connection being power supplied by MSEDCL. Monthly electricity bill is served by MSEDCL against electricity used & is paid by college

A cost of power is worked out by summing up total KWH of all connections & their amount over the year 2021-2022. By dividing total amount by total KWH works out average cost of power per KWH.

Month	Connection No & Tariff category									
	LT con. No-576010168766		LT con. No-576010542943		LT con. No-576010048302		LT con. No-576017460276		LT con. No-576017460268	
	Tariff-LT VII B	Load KVA-1	Tariff-LT II COMM	Load KVA-1.43	Tariff-LTVII B I	Load KVA-3	Tariff-LT VII B	Load KVA-1	Tariff-LT VII B	Load KVA-1
	KWH	Bill amount Rs	KWH	Bill amount Rs	KWH	Bill amount Rs	KWH	Bill amount Rs	KWH	Bill amount Rs
June-22	267	4050	386	6990	602	4780	163	2250	271	3000
July	267	2460	179	2390	522	4200	45	790	292	2650
Aug	267	2460	533	6080	677	5330	55	870	334	2960
Sep	808	500	366	4360	906	6970	103	1220	375	3270
Oct	202	1960	0	-3590	1099	15420	30	660	311	2750
Nov	202	1970	0	-3180	1897	14130	63	270	340	3010
Dec	202	1980	366	1180	1971	14670	63	920	340	3010
Jan-23	202	1970	366	4360	0	0	63	20	340	3010
Total	**2417**	**17350**	**18590**	**18590**	**7674**	**65500**	**585**	**7000**	**2603**	**23660**

132100/ 15475=8.534

Average cost of power per KWH works out to be Rs- 8.54/KWH

Analysis of Connected Load in Campus Other Than Motive Power :-

As Viewed from below table, it understands that lighting & fan load has dominance in total load mix & shares more electrical consumption. This load has most potential to identify energy saving opportunity.

Type	**No**	**Total KW**	**% Load**
Lighting Load	557	11.498	17.91
Fan Load	233	20.430	31.82
Computer Load	113	6.780	10.56
AC & Freeze	9	4.920	7.66
Inverter	15	4.75	7.39
Printer & Xerox	25	8.250	12.85
Oven	4	7.440	11.58
Total	**956**	**64.068**	**99.77**

Analysis of connected load of motive power

PUMP 5HP	**1**	**746**	**3750**
MOTOR2HP	**1**	**746**	**1492**
MOTOR 1 HP	**1**	**746**	**746**
		Total	**5988**

Total power consumed for motive power =5.988 KWH

Identified Energy Saving opportunity

A) Energy Saving Opportunity Details – There is major load of lighting & fan in college campus. Hence it is focused for identification of energy saving opportunity. Energy saving & conservation opportunities are identified which are mentioned below with cost benefit analysis based on revised average cost of power. Lowest pay back option shall be implemented on priority.

Existing equipment details				**Proposed replacement with**				**Saving in**		**Capital investment in Rs**	**Pay back period in years**
Equipment	No	Watt per No	Total Watts	Equipment	No	Watt per No	Total Watts	KWH per year	cost Rs		
Fluorescent TUBE	132	40	5280	LED Tube	132	20	2640	4752	38016	39600	1
CFL	17	15	255	LED Bulb	17	9	153	183.6	1468.8	2550	1.5
Ceiling FAN	221	90	19890	Atom berg ceiling fans	221	28	6188	24663	197304	66300	3
Total	**370**	**145**	**25425**		**370**	**57**	**8981**	**29598.6**	**236788.8**	**108450**	**5.5**

Energy Savings from Motion Sensor Proposal

To install motion sensor at Principal Office ,Seminar Hall, Sport Hall

Energy saving	
Total Lighting & Fan load of Principal Office ,Seminar Hall, Sport Hall kW)	**2.000**
Existing operating Hours per day	**4**
Assumed operating hours After installing motion Sensor per day	**3**
Total annual Existing Energy Consumption in kWh/ Annum for 300 working days	**2400**
Total annual Proposed Energy Consumption in kWh/ Annum for 300 working days	**1800**
Total annual Existing Energy Consumption in Rs for 300 working days and taking (9.0 Rs /kWh)	**21600**
Total annual Proposed Energy Consumption in Rs for 300 working days and taking (9.0 Rs /kWh)	**16200**
Total annual energy Saving by using motion sensor in kWh	**600**
Total annual energy Saving by using motion sensor in Rs	**5400**
Total Amount of investment for 1 no. of Motion Sensor in Rs. (Rs 1000}	**3000**
Payback Period in months only	**7**
Estimated Life of proposed system in year	**3**

All the information given mentioned above in this file is true, hence certified.

Co-Ordinator
Internal Quality Assurance Cell
Mrs. K.S.K. College, Beed, (M.S.)

N.S.S.R.(N.) Mrs.K.S.K.Alias Kaku Arts, Science and Commerce College ☆ Beed 431122

Principal
N.S.S.R.(N.) Mrs.Kesharbai
Sonajirao Kshirsagar Alias Kaku
Arts, Science and Commerce
College, Beed.