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G-7(14)

Annual Report on the Administration
of the Indian Electricity Act, 1910
for the year 1939



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OFFICE OF THE CHIEF ELECTRICAL INSPECTOR AND ELECTRICAL
ADVISER TO THE GOVERNMENT OF ASSAM

—
No.18i-E.

FROM

W. ALLSUP, Esq., M.I.MECH.E., M.I.E.I.,
CHIEF ELECTRICAL INSPECTOR AND ELECTRICAL ADVISER
TO THE GOVERNMENT OF ASSAM,

TO

THE CHIEF SECRETARY TO THE GOVERNMENT OF ASSAM.

Dated Shillong, the 17th January 1941.

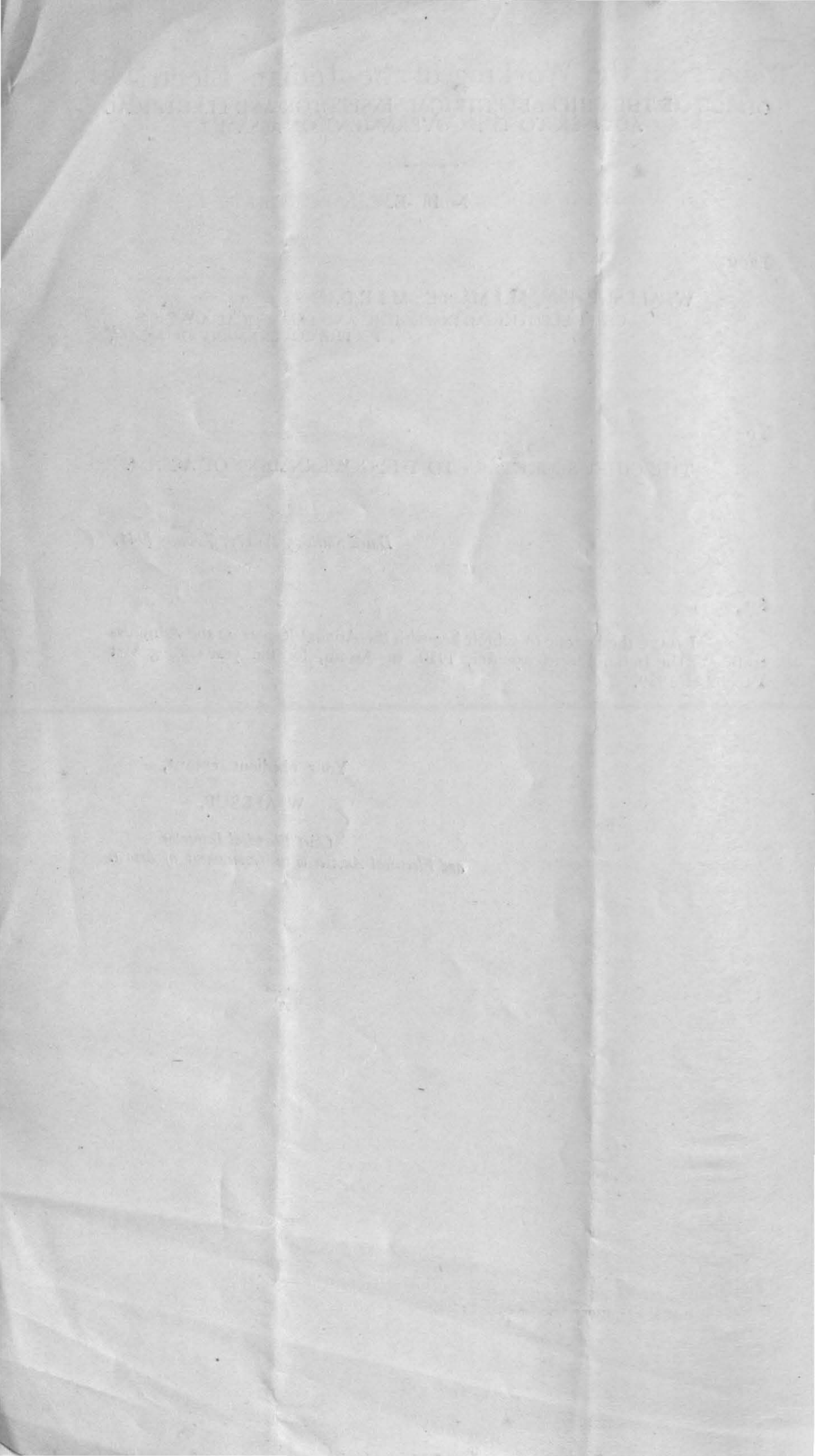
SIR,

I HAVE the honour to submit herewith the Annual Report on the Administration of the Indian Electricity Act, 1910, in Assam, for the year ending 31st December 1939.

Your obedient servant,

W. ALLSUP,

*Chief Electrical Inspector
and Electrical Adviser to the Government of Assam.*



Report on the Working of the Indian Electricity Act in Assam for the year 1939

1.—GENERAL WORKING OF THE INSPECTORATE

There was no major contract for electrification of Government premises during the year. Attempts were made to increase touring by the staff in order to cope more frequently with the testing of electrical installations in Government premises and, more particularly, the testing of Explosives Magazines under the Indian Explosives Rules.

Staff.—This remained unchanged: it being considered impossible to grant the increase of staff recommended in previous years.

2.—SPECIAL APPLICATION OF THE ACT OR RULES

The annual meeting of the Indian Electricity Board was attended in January at New Delhi. It is impracticable to detail here the numerous changes in the Indian Electricity Rules decided upon, or published in Provincial Gazettes for the information and submission of objections or views, if any, by users of electrical energy. Users should take careful note of all such Gazette Notifications. The writer of this Report as Member for Assam on the Board will always be pleased to receive constructive suggestions whether on publication of such a notification or otherwise, since misunderstandings can sometimes thus be removed before a formal objection goes to the Secretary of the Board. When again any user believes that some point which, so far as he knows, has not been examined by the Board requires consideration, he should write to the undersigned.

Rule 7.—See ensuing Section regarding new Scale of Fees for Testing.

Rule 48.—In previous Reports the hope has been expressed that the Electrical Contractors of the Province would, in their own interests equally with those of the general public, form an Assam Electrical Contractors' Association. With improved communications its Headquarters could be in Shillong and thereby matters affecting the safe use of energy be easily discussed with the writer. Far too much price-cutting still exists and whilst it is not in the public interest unduly to limit the number of electrical contractors, it should be remembered that Government can at any time specially apply Rule 48 if necessary, and so put out of business any but Contractors approved under the Rule. No doubt some firms would like to see this happen, counting on obtaining approval themselves, but this assumption might be unwarrantable.

3.—GENERAL WORK

Testing.—As stated above and in previous Reports, each year sees an attempt at giving more regular tests of Government electrified premises and of Lightning Conductors. Conductors on Explosives Magazines have to be tested annually on behalf of the Chief Inspector of Explosives, India. It is satisfactory that Government has at last sanctioned the appointment of a third Electrical Tester.

Though a revised Scale of Fees for inspections by the Inspectorate was sanctioned in July 1940 under the Rules, distances in Assam make it impracticable for such tests to be a routine affair. The Inspectorate will always be pleased to meet demands for tests on payment up to the capacity of its testing equipment, either at site or in the Shillong Test Room. As far as possible distant tests will be combined with normal touring to minimise expense. It is suggested that it would pay factories in particular to ask for tests of their factory wiring, this can be done with easily carried instruments and is on a different footing from tests on generators, motors, etc., producing power, which it is not the function of the Inspectorate to undertake. When testing premises for safety of its circuits an insulation test of power units could readily be also undertaken and faults thus detected before a possible breakdown occurs.

Test Room.—The ordinary small domestic type of Meter can now be tested in the Shillong Test Room or by portable test-meters at site. It is regrettable that owners do not make more use of this facility.

With the rise in cost of materials and instruments due to the war, it is more important than ever from the financial point of view, quite apart from that of safety, that existing cables and equipment should be maintained in the best condition and expensive replacements thus avoided.

ELECTRICAL INSTRUCTION FACILITIES

The Prince of Wales' Technical School has further extended its electrical accommodation and equipment. It is suggested that the School, though it cannot be authorised to carry out inspectorial functions, would benefit and be able to give the students more experience were apparatus sent in for overhaul and for such tests as the school can make.

Not much progress could hitherto be made in this line of instruction at the Government Technical School at Sylhet. Here again, however, increased patronage of the School would no doubt lead to suitable equipment being supplied.

The writer's suggestion for the formation of an Advisory Board on Vocational Education, which was approved by Government some time ago, has not yet been implemented.

4.—ELECTRIC LICENSEES

The following licenses were in operation during the year under review, *viz.* :—

- The Shillong Hydro-Electric, Limited ;
- The Gauhati Electric Supply Corporation (1927), Limited ;
- The Jorhat Electric Supply, Limited ;
- The Tezpur Electric Supply Company, Limited ;
- The Silchar Electric Supply, Limited ;
- The Dibrugarh Electric Supply Company, Limited ;
- The Sylhet Electric Supply, Limited ;
- The Dhubri Electric Supply Company, Limited ;

i.e., there was no change.

Licenses granted.—The Tinsukia Electric License was granted on the 3rd January 1939.

Licenses revoked, transferred or applied for but refused.—None. In 1939 the patience of the authorities over the failure of the Tinsukia License to progress came to an end and caused its revocation, but the applicant later applied for the revocation to be cancelled and this was done. The rise in costs due to war has had its inevitable effect but it is necessary to state without equivocation that this is not a real excuse for delays in grant of licenses or for lack of progress after grant. The delays are due to the slipshod manner in which applications are made in the first place, to lack of adequate financial guarantee, and to rivalry: the last is a new development in Assam but a very regrettable one, since it is far better for those interested in electrical development to combine and remove possible sources of future friction than to seek to work selfishly on borrowed capital, which entails a high rate of interest and outside control.

Licenses under consideration.—Negotiations for further licenses dragged their weary way along owing to the apparent inability of rival applicants to combine and form a really strong body of local men. The Nowgong Licensee (granted in 1938) was unable to obtain the necessary financial cover until a mortgage could be arranged, and the Tinsukia Licensee (granted late in 1938 but not gazetted until the 3rd January 1939) made no progress at all throughout the year. The former has since been allowed to obtain funds on mortgage and constructional work was begun in 1940 but not much was done until very late in that year.

Licenses for the municipal areas of the Towns of Karimganj and Habiganj were granted and notified late in 1940 and would not normally be mentioned in a report for the year 1939. As this Report has unavoidably been so long delayed, however, they are mentioned here to show that some progress, at least upon paper has been made in providing further electrical amenities for the public of the Province,

PROGRESS MADE IN LICENSES NOW IN FORCE

In previous Reports the need for doing everything possible to obtain "off peakhour" loads (industrial motor and heating, electric welding and such like) was emphasised. Any intending industrial user should always put his proposal to the Licensee, and not merely decide on the basis of comparison of the formal tariff of electrical charges with oil-engine costs. There is unfortunately far more propaganda for oil-engines than for electrical supply.

It is pleasing to note that one or two licensees have offered attractive tariffs for industrial loads with some success, but one town whose licensee did this proceeded to bar the construction of further "factories" within the municipal area. The inevitable effect of such obstacles does not require stressing. If ratepayers prefer factory-free conditions they cannot complain if they have to pay for electrical amenities on a "luxury-town" basis. It is obvious that, electrical energy being clean and quiet, it avoids the smoke and noise nuisance and there is little ground for such an attitude as that of the town mentioned.

Assisted wiring.—Nothing has resulted from suggestions for this desirable method of assisting the poor man to enjoy electrical amenities in his home and shop. Apart from application of this system to internal wiring and electrical equipment (particularly for such necessities as fans and cooking appliances), it can easily be applied by licensees to the cost of service connections. Licensees are not asked to breach the requirements of the Indian Electricity Act—that there is to be no "favoured customer" treatment—but a scale of repayments can be got out with perfect fairness to *all* would-be consumers.

Street lighting.—The war rise in prices for materials may account for the generally slow improvement in this. It is quite obviously a matter in which most of our towns, in some cases even for the principal streets, lag far behind what is now reasonable even for small towns such as are found in Assam. One or two towns are however ahead of the others.

Voltage Regulation.—A great deal still remains to be done. Gauhati installed Power Factor Correction Condensers during the year, in this following the sister A. C. distribution system in Sylhet with its poor power-factor due to the inductive fan-load. The later paragraphs of this report on individual licenses show the improvement made by running heavier sections of copper distributing mains and service connection lines, and by replacing old feeders by new, and old wooden poles by steel or new wooden or reinforced-concrete poles.

Owing to the war it was necessary from late in 1939 to sanction wooden poles for the Compulsory Works of new licenses and new lines. This incidentally benefits the Forest Department and goes somewhat to compensate for the enhanced cost of plant and mains due to war-prices. In the end the wooden poles will have to be replaced long before weather—and insect—resisting materials would require it, but that is unavoidable; the need is now to carry on as efficiently as possible.

Town water supply.—The desirability, nay the necessity, for this to be done from electrical source is obvious if the general public expects the licensee to grant "cheap" domestic, general and street lighting rates. Yet Silchar and Dhubri continued to be the only towns so supplied. Tezpur took almost the last step for the same, and was awaiting a loan from Government. Then came the war and that stopped—or was used as an excuse for stopping—further progress. This is particularly regrettable in Tezpur as it is practically impossible for the licensee to modernise his plant on the existing load income. Gauhati will have to do something soon if supply is to continue, let alone be improve; likewise Sylhet. It is staggering to see that Dibrugarh, otherwise one of the progressive towns of the Province, has no public water-supply whatever!

As usual nothing was done before costs rose and now presumably the 1940 or still higher future price levels will be an excuse for doing nothing, or as little as may be; in other words people neglecting to modernise "whilst the going was good" now have to face the same situation which occurred with those who failed similarly before the pre-1914 price-level was lost for ever!

The electrification of the large new Cantonment, sited about three miles from the centre of Shillong at Happy Valley, came to nothing. It is the old story of seller *versus* buyer. The result is that the local licensee did not secure this desirable load nor did the Defence Department put in their own electric water-pumping and lighting plant, as was proposed before the outbreak of war.

Annual Accounts.—The position remains the same. The Shillong Hydro-Electric at last replied to the queries of Government and agreed, amongst other things, to publish the Accounts under section 11 of the Act in the same "Statement" form as that in which they are presented for Government scrutiny.

Consequent on discussion with the Managing Agents, who also control the sister License of Gauhati, a rebate of one anna per unit was given in Gauhati in 1940.

The old criticism must be repeated, that it is essential to built up Reserve and Depreciation Reserve Funds. If any member of public doubts the wisdom of this and still holds that the price to the public should be cut to the bone, the rise in war prices should show him in what a position he would be were a licensee unable to replace faulty equipment. In most of the Assam licenses unfortunately this Reserve Fund is merely a matter of hope, not of fact.

The following individual paragraphs are given practically in the several licences' own words.

THE SHILLONG LICENSE

Some Distribution Mains have been increased in size to deal with further load connection. Some single Phase Lines have been converted into 3 Phase Lines. Continuous earth wires have been drawn in some areas. Large amount of copper had to be added in order to deal with the Distribution System. Some *sal* poles have been replaced by steel poles in H. T. and L. T. lines.

The number of consumers are as follows :—

High Pressure—2, no change.

Medium Pressure—48, an increase of 1.

Low Pressure—810, an increase of 60.

Actual rates charged during 1939 are as follows :—

Nett tariffs :—

(a) For lights and fans rate per unit is annas 8 less a rebate of annas 3, giving a nett rate of annas 5 per unit.

No further deduction in rate is under consideration.

(b) For Industrial Motors rate per unit is annas 4 less rebate of annas 2, giving a nett rate of annas 2 per unit.

No change in the rate has been made during the year. There is hardly any demand for industrial Motor load.

THE GAUHATI LICENSE

Low tension distribution mains have been strengthened in several places. Three phase L. T. mains have been laid in places where the load has been increased. Continuous earth wires have been drawn in several streets and the distribution system has been strengthened. Static condensers have been installed at Sub-stations to improve the power factor.

In the power House two second-hand Babcock and Wilcox boilers economiser, etc., and one second-hand Belliss and Morcom Triple Expansion Engine have been installed, but have not been brought on commission yet as the dynamo is not available.

The number of consumers are as follows :—

Medium Pressure—28, an increase of 2.

Low Pressure—546, an increase of 21.

Actual rates charged during 1939 are as follows :—

For lights only, rate per unit is 8 annas less a rebate of one anna per unit allowed from July, 1940. The charge, therefore, is annas 7 per unit nett.

For lights and fans combined, charge per unit is annas 6 nett, *plus* the connected load charge of Rs. 5 per K.W. of connected load.

This rate works out usually on an average at a charge of between 6 annas to 7 annas per unit according to consumption, nett.

For Industrial motors, charge per unit is annas 4 less a rebate based on Load-factor and for prompt payment, which works down to one anna per unit nett.

For Meter rent, the charge per meter is made at Re.1 per meter less a rebate of annas 8 for prompt payment. Nett charge comes to annas 8 per meter.

THE SILCHAR LICENSE

The main line in Janiganj Road has been remodelled with steel poles in place of wooden poles all through and heavier section of copper has been used in place of former wire. All replacements of wooden poles have been carried out with steel poles in different parts of the town. A 90 K.W. set has been installed to cope with the increased maximum demand during 1939. Many old wooden poles still remain to be replaced by better types or, owing to the increase in cost of steel poles and difficulty in supply, by good straight wooden poles.

The number of consumers are as follows:—

Medium Pressure—4, a decrease of 1 ;

Low Pressure—393, an increase of 57 ; viz.—

For Domestic purposes—392.

For Industrial purposes—5.

Nett tariffs:—

	Gross Charge	Less rebate earned during 1939	Nett.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
(a) Lights and Fans	0 8 0	0 1 6	0 6 6
(b) Lights only	0 9 0	0 1 6	0 7 6
(c) Fans only	0 7 0	0 1 6	0 5 6
(d) Industrial Motor	0 4 0	0 1 6	*Other rebates not earned due to insufficient consumption.
(Large consumption)	0 4 0	0 3 9	0 1 3 (Under special contract).
Water Works—Under Special Contract.			
(e) Battery Charging, Frigidaire, etc.	0 5 0	0 1 6	0 3 6
(f) Cinema (Arc and Convertor.)	0 5 0	0 1 6	Rs. as p. Plus 0 0 6
The cheapest rate which—			
(a) a domestic consumer can earn for a few lights and fans is			0 6 6
(b) an industrial consumer can earn for industrial load is			0 1 0

THE DIBRUGARH LICENSE

Constructional improvements:—

(i) The proposed separate feeder line for Industrial area only has been laid out.

(ii) For the improvement of the voltage, the conductors have been replaced by heavier section.

(iii) Paid special attention to the adherence of Rule 51 and earthing system.

The number of consumers are:—

	Domestic	Industrial
(a) Low Pressure	452	5, an increase of 23.
(b) Medium Pressure	22	8, no change.

THE TEZPUR LICENSE

The height of Transmission lines was much lower than 20 feet. A considerable portion has been raised to proper height. Wooden poles have been replaced by iron and concrete poles. The section of conductors has been increased where necessary. The building of the Power House has been considerably improved.

A 50 K. W. generating set was ordered last winter. Of this the prime mover, an 80 B. H. P. engine, arrived in September last but the dynamo has not yet arrived. As soon as the dynamo arrives the set will be installed.

Number of consumers (it is a Low Pressure supply system):—

Domestic	...	...	...	...	186, and increase of 9.
Industrial	...	...	...	...	1,
					Rs. a. p.
The nett amount of rebate allowed in 1939 is					1,751 0 9
The cheapest nett rate for—					
(a) domestic consumers	...	...	...	...	0 7 0 per unit metered,
(b) industrial (small motors)	...	...	...	...	0 4 0 " " "

THE JORHAT LICENSE

This licensee has not reported the improvements carried out during the year under review.

The number of consumers are as follows:—

Medium Pressure	...	...	...	...	6, an increase of 1.
Low Pressure	...	...	...	...	377, an increase of 50.
					Rs. a. p.

Actual rebate allowed for the year 1939 40 is 5,980 7 9

The cheapest rate which—

- (a) a domestic consumer can earn for a few lights and fans is ... 7 annas per unit.
 (b) and industrial consumer can earn for his industrial load is... 2 " " "

THE DHUBRI LICENSE

The year under review is the first full year of operation of this license. The third set in the Power House, which will be of 93K. V. A., has not yet been installed as the load demanded has not shown much improvement.

The number of consumers are as follows:—

- (a) Medium Pressure 2 (Industrial).
 (b) Low Pressure 130 (Domestic), an increase of 99.

Nett tariffs:—

(a) For fans and lights combined—

Gross rate	...	...	...	...	7.5 annas per unit.
Rebate	...	...	...	...	1.0 anna " "
Nett	...	...	...	...	6.5 annas " "

(b) For fans only—

Gross rate	...	...	...	...	7.0 annas per unit.
Rebate	...	...	...	...	1.0 anna " "
Nett	...	...	...	...	6.0 annas " "

There is now a rate for Battery charging, Arc welding and Electro Medical apparatus as follows—

Gross rate	...	...	...	...	4.0 annas per unit.
Rebate	...	...	...	...	1.0 anna " "
Nett	...	...	...	...	3.0 annas " "

A further reduction in the cinema rates has been made which is as follows:—

Motor Generator—

Gross rate	...	...	...	...	3.5 annas per unit.
Rebate	...	...	...	...	1.0 anna „ „
Nett	...	...	...	...	2.5 annas „ „

Projector, Amplifiers, etc.—

Gross rate	...	...	...	...	3.5 annas per unit.
Rebate	...	...	...	...	1.0 anna „ „
Nett	...	...	...	...	2.5 annas „ „

The sum of Rs. 10,000 was sanctioned in the 1940 Assembly Session for the electrification of the principal Government premises in Dhubri: this will reduce the handicap which this license has had to face during the two previous years. The electrification work is now in hand so that it can be completed before the coming hot weather.

MANIPUR STATE

The writer was not asked to visit this during the year. The Testers however went up to test the Government installations in the British Reserve in Imphal City and to test lightning conductors there and at Kohima.

ELECTRICAL AMENITIES FOR RAILWAY TRAVELLERS

The Assam-Bengal Railway Engineering Department has kindly informed of the following additions and amenities for railway passengers carried out since the last report:—

1939	Badarpur Station	...	...	Lights and fans fitted in the Hindus and Mohammedan Refreshment Rooms.
	Sylhet Bazar Station	...	...	Car parking ground lit.
1940	Mariani	...	...	Light point in the Tea Estate Emigrant Labour Feeding shed.
	Pandu	...	...	Improved lighting for boat and gangway for the Brahmaputra Steam Ferry serving Amingaon-Pandu stations on the Assam-Bengal and Eastern Bengal Railways.
	Sylhet Bazar station	...	...	Three powerful lights fitted and also some fans.

ELECTRICAL INSPECTION OF CINEMAS

This was done as four visits for other work permitted. Practically all have now been inspected twice. It is still disheartening to see the leisurely manner in which things are attended to. A main source of complaint has been over "temporary" connections. Not only do the Indian Electricity Rules not recognise these but in reality such lines become in effect "permanent" failing action by the Inspectorate. Pressure of work and small gazetted staff has prevented electrical safety inspection by the technical inspectors of more than very few Club premises having cinema entertainments. One such was found to be functioning without a license and the District Magistrate, who had newly taken over the District, served a notice upon the Directors on his attention being drawn to this.

5.—ELECTRIC INSPECTION IN FACTORIES

This was done whilst visiting for Factory and Wages Act purposes. Constructional work commenced upon the large Cement Works at Chhatak, in the Sylhet district. It was not ready for an electrical plant inspection during the year under review as the High and Medium electrical equipment which had been ordered from Germany before war was undelivered and some of the plant was lying in German ships in Neutral Ports in India whilst much was still in Germany.

The Assam Oil Company continued its electrical extensions on the Digboi Oilfield. This was visited in May, primarily about Factory and Wages Act matters and the then existing strike. This labour disorganisation upset most of the Company's works programme for the year including housing and housing-lines electrification.

At the Annual Planters' Meetings in Jorhat and Silchar the opportunity was taken to address the meetings, principally on the electrical side of the Inspectorate's duties and electrical short-comings in tea factories.

Whilst several concerns have continued to instal electricity in their factories and in the staff quarters and hospitals, the war has had its hindering effect here too. Progress is however continuing and on the day when this paragraph was being written the Visiting Agent of one of the larger Tea Concerns informed the writer that his Company had just decided to electrify all estates hitherto using out-of-date oil-lamp and pull-punkha methods.

Full details of electrification progress were given in the Annual Factories Report for 1939. The importance of good lighting is becoming recognised. Enough was said about this in the previous report, particularly concerning bad lighting and accident incidence.

The Safety First Association of India, Bombay, has issued Industrial Safety Service pamphlets Nos. 57 and 58 on Industrial Lighting. The Inspectorate will loan these or any other of the numerous pamphlets which it obtains as a subscriber to the Association to any enquiring factory or installation, the borrower being responsible for careful use and return. It is urged that factories, etc., become subscribing members and so obtain all publications free and at the same time support the drive for general safety measures.

Fires due to electricity.—In view of the apparent condition of wiring in many particularly the smaller factories, and in small rice and oil mills in particular, it is astonishing to have none reported. It would seem that fires are ignored unless someone is burnt or possibly even then in some cases.

Defects found on inspection.—The same as previously, *i.e.*, dirty and neglected cables and fittings, *kutchha* methods of support. The darkest place in an engine room or some room of the factory seems to be considered the most suitable place for the switchboard and very often the dustiest for the dynamo in the rice and oil mills.

Aerial lines.—These are much improved after a full ten years of inspection. Any user of electrical energy and any intending user should possess a copy of the latest edition of the Indian Electricity Rules, and keep a sharp look out for amendments notified in the Official Gazette. These, it should be observed, are the result of careful examination by the Central Electricity Board. No electricity of any commercial utility can be started in a factory or in any place where one hundred or more persons may ordinarily assemble without at least seven clear days' prior notice of the intention to use it to the District Magistrate. Similarly no one can take a line along or across a public road without obtaining permission from the local or repairing authority, or of the Posts and Telegraphs Department if a telegraph or telephone line already run there and has to be crossed or closely approached. In both these cases the intending user should also notify the undersigned so that unsound methods will not have to be pulled down and needless expense incurred. The Act obviously should order the matter to be referred to the Provincial Chief Electrical Inspector as he is the authority primarily concerned with the public and private electrical safety.

Electricity in Oilfields.—As stated in the previous Report the writer is specially authorised for electrical inspection responsibility in Oilfields. Sufficient has been said about the Digboi Field electrical development in the paragraph about factories. It is at present the largest scheme in the Province.

Electric Welding.—This method is slowly extending and has, as in the previous year, been a principal source of enquiry not only under the requirements for electrical but also for safety (accidents) under the Factories Act, as carelessness can result in eye injury from the short waves of the arc. Constant use of the prescribed safety-goggles or safety-glass screens in good condition is absolutely essential. The eye trouble is really an industrial disease rather than an accident in the strict sense of the word.

6.—ELECTRICAL ACCIDENTS

Accidents on licensed schemes.—One only was reported—injuries to head by fall from a ladder whilst attending to an aerial line connection.

Accidents not in factories.—(1) One slight accident—mechanical injury—whilst attending to a dynamo under a railway coach on the Assam-Bengal Railway at Pandu, Assam.

(2) Body injuries from fall from an overhead oil storage tank at the Assam-Bengal Railway Power Station at Tinsukia Railway Station.

Accidents in private installations (domestic).—One fatal case, fully described in the previous year's Report so as not to delay public knowledge of the risks involved in domestic installations. The deceased was an electrical contractor's labourer who was allowed to go up and do a skilled man's job—cut a wire with pliers—the wire was live at 230 volts alternating current and his being on a galvanised roof which was, as it happened, touching a water pipe, he received a severe shock and suffered severe burns to the bones of his right hand holding the pliers. The roof being a sloping one he was probably also holding on by his left hand to the earthed bearer wire of the cable he was trying to cut. The employer has denied liability and Workmen's Compensation Act action is still in hand.

Thus it will be seen that no cases were reported from any factory and no cases of shock were reported by any licensee as occurring from shock to employees! No doubt shocks were sustained, but either the employee did not report or the employer did not think them worth reporting.

7.—TOURING

The Chief Inspector visited every licensed area at least once except Dhubri and Tezpur. The Electrical Inspector visited every area at least once. As previously remarked the increase in office work renders touring by the writer more and more difficult. In addition many hundreds of factories, some half of the Assam factories are electrified, were inspected.

8.—PROSECUTIONS

One was sought to be taken in connection with the electrocution in 1939 of an electrical contractor's unskilled workman—fully commented upon in the last Report—because of the lessons it taught but the circumstances read with the Rules caused the idea to be dropped. Incidentally the contractor disclaimed responsibility for Workmen's Compensation to the deceased's dependents (mother). Consequently he has not been given any Government electrical contracts.

HYDRO-ELECTRIC POSSIBILITIES

In the Christmas holidays of 1939 the Hon'ble Prime Minister discussed the Simsang River Project possibilities with the Hon'ble Prime Minister of Bengal when in Calcutta. In May 1940 one of the Bengal Ministers and his Parliamentary Secretary visiting Shillong discussed this with the writer and with the consent of the Assam Government the writer put up a note to Bengal about it. Nothing has yet resulted.

Advantage was taken of the Puja holidays of the first-half of October 1940 for the writer to tour the West Khasi Hills, accompanied by Mr. T. T. S. Hayley, I.C.S., to prospect the possibilities of the Umkynshi and the Um Ngi Rivers which possess good catchment areas and, from the map, were seen to fall down considerable drops towards the Sunamganj-Chhatak area of the district of Sylhet. Expectations were more than satisfied. The tour was made during a very dry spell, yet ample water, excellent natural dams or foundations for carrying dams, considerable reservoir areas requiring very little height in the way of dams to impound a large volume of water and a good drop and, in the case of the Um Ngi, a good site for a Power House at the foot of a 550 foot drop were found. Needless to say a thorough survey would be necessary before anything concrete could be proposed, and a line survey of the foothill route to the above-mentioned plains areas some 20 miles distant.

A few particulars:—

(1) The Um Kynshi, one-inch Map sheets 78^o and 78^o, close to Nongsynriang Village—say three hours' march from Nongstoin. Nongstoin has an Inspection Bungalow and is four days' march from Mawphlang or three days if a long day's march is made the first day from Mawphlang by avoiding Mairang and its Inspection Bungalow and going direct to Nongkynshi and its Inspection Bungalow and next day to Markasa and its Inspection Bungalow. This stream rises far back, almost to Mairang.

The Kynshi River forks a few miles above the larger or West Fall. This fall is at 4270 feet above sea level and the stream falls through splendid rocks down a high fall of several hundred feet and thence down a deep precipitously-walled gorge to an estimated height of 3600 feet, above sea level, *i.e.*, there is an available head of some 600 feet.

Within a couple of miles' march eastwards the second or East Fall is reached at 4,300 feet above sea level. This also falls among splendid rocks for approximately 100 feet and then the stream joins the other branch at approximately 3,600 feet above sea level some miles down.

It was estimated that there was some 13,000 K.W. in the West Fall and some 2,000 in the East Fall with the water in its then state, not reckoning in the case of the latter fall the further drop in the stream bed some way below the fall since time before nightfall did not permit exploration of the East Gorge.

For some way above both falls the stream falls very gradually among rounded hillocks, and a fair reservoir area should not be difficult to obtain, without expensive dams. Further, the stream having two branches, the erection of works in one or other would be simplified as the bulk of the river could be diverted down the other branch. Also the flow down the selected branch could be increased by blocking the unused branch's outflow.

Approximate distances from the Plains Towns.—Sunamganj 28 miles. Chhatak 40 miles.

(2) *The Um-Ngi.*—Four marches eastwards—turning the Gorges falling towards Sylhet district by a detour to the north *via* Pambriew—we reach this splendid site. Map Sheet 78₁₁^o.

This is an easy two days' march from Mawphlang. There seems no great difficulty in making a road to the top of the gorge from Mawphlang and a branch over a col in the left-bank above and down to the Power House site.

The Ngi River drains a considerable area to the north, though not so extensive a one as the Kynshi.

For a good three miles above the gorge head the stream bed rises only some 35 feet according to the 1 inch map. A considerable reservoir area would therefore be easily obtained by erecting a low dam on the solid rocks at the head of the drop from the gorge head. In fact a natural solid rock dam already practically blocks the stream at this point, as in the Um Kynshi.

Thence, from a map-level of 4,550 feet above sea level the stream falls down a Gorge to map-level 4,000 feet above sea level where there is a site for a Power House safe from floods, rock-falls and landslides. Solid rock walls form the sides of the gorge along which the pipeline could be taken.

At the Power House site a considerable stream, the Phud Symper, falls say 1,000 feet from the East, draining the high ground around Lum Symper, 5,827 feet above sea level.

A camp was made at the gorge head and a day given to prospecting the stream bed above the gorge. Measurements of stream-flow taken with the means at our disposal showed, about one-third through the month of October and after a ten days' completely dry spell, that some 26,000 K.W. were available, reckoning a head of 500 feet to the turbines in the Power House.

Distances.—Sunamganj 24 miles. Chhatak 26 miles.

While, as previously stated, a detailed survey and rainfall and stream measurements over a considerable period would be necessary, it is quite evident that here we have two considerable possibilities, which should be considered not only in themselves but as at some date forming a link in a chain of hydro-electric development ranging from the Simsang Project further to the West, North of the Mymensingh district of Bengal, to the high-head possibilities of the hill-streams falling down the Southern Face of the Khasi Hills escarpment as far East as the longitude of Jaintiapur.

In view of criticism on the ground of earthquake risk which has been expressed in certain quarters, it should be noted that no enormous dams are necessary and the small and low dams that would probably be constructed would be founded on solid rock: this has obviously been *in situ* for countless ages and has resisted for instance the historic 1897 earthquake.

A Cine Film was taken of all three falls. Unfortunately the two aneroids with the party were not functioning very well; two others had been down for overhaul and calibration to Calcutta and were not received in time for the tour. It is proposed to revisit the Um Ngi during the next few weeks to see the state of the water during the period of maximum drought and minimum stream-flow.

It was also proposed to visit the Simsang River Project, already mentioned in previous Reports and fully described in the Hydro-Electric Survey, Assam, publication of 1923, but enquiries showed that several marches on foot would be necessary to cover the last few dozen miles of hill road to the gorge foot after passing Tura, the administrative centre of the Garo Hills, and so time was too short for the tour to be done during the Christmas Holidays so that other work would not suffer.

The writer would be glad to receive information about likely hill streams, particularly those not too far from areas where factories or communities already exist. There must be many known to herdsmen and *shikars*, but careful questioning by an educated man speaking the language of the man with the local knowledge would be essential, so that misleading information about the possible "head" volume and seasonal-periodicity of the stream, its catchment area, rainfall and difficulty of access will not be obtained. Here is a hobby for young men anxious to add to our knowledge of possibilities for developing the Province's resources, at present scarcely tapped. Control of hill-streams would also reduce the damage due to floods, which at present cause destruction, loss and misery to an extent which, capitalised or regarded as an annual charge in loss of land revenue etc., would go far to pay the charges for a really thorough investigation into Assam's immense and potential hydraulic resources. Photographs would be particularly welcomed as a proof that there was something there worthy of further investigation. We must have "cheap power" if Assam is to prosper and enjoy other than merely agricultural resources. Even agriculture would benefit by the use of power at site for milling and like operations, and cottage-industries, if they are not to become mere drudgery under unhygienic working conditions, depend upon cheap power. Were Assam a droughty Province, no doubt something on the lines of the United Provinces Tube Well Electrification system would have developed ere now.

There is a definition of "Civilisation" running as follows:—

"The improvement of social life, the development of society and of the relations of men towards each other; the increasing production of sources of wealth and well-being among a population, and a more equitable distribution of these; the development of individual life, of man himself and of his faculties and ideas". Electricity plays or can play its part in the above and the extended use of electricity is an essential aid to the development of civilisation.

W. ALLSUP,

Chief Electrical Inspector
and Electrical Adviser to Government,

The 16th January, 1941.

APPENDIX I

Particulars of licensed electrical undertakings in Assam

Name of undertaking	Nature of supply	Units sold	Number of consumers at—			Total connected load with K. Ws.	Plant capacity in K. Ws.	For the year	Remarks
			Low pressure	Medium pressure	High pressure				
1	2	3	4	5	6	7	8	9	10
1. The Shillong Hydro-Electric, Limited.	A. C. 3 phase/ single phase 2200/400/230 volts.	903,313	810	48	2	808	550	1939	
		762,611	750	47	..	779	550	1938	
2. Jorhat Electric Supply Company, Limited.	D. C. 440/220 volts.	155,291	377	6	..	368	150	1939	
		124,951	327	5	..	340	150	1938	
3. Gauhati Electric Supply Corporation (1927), Limited.	A. C. 3 phase/ single phase 3300/400/230 volts.	312,181	546	28	..	402	288	1939	
		324,909	525	26	..	395	288	1938	
4. Silchar Electric Supply, Limited.	D. C. 440/220 volts.	227,085	393	4	..	272	206	1939	
		191,802	336	5	..	225	116	1938	
5. Dibrugarh Electric Supply Company, Limited.	D. C. 400/220 volts.	327,913	457	30	..	458.8	325	1939	
		239,361	429	30	..	415	150	1938	
6. Tezpur Electric Supply Company, Limited.	D. C. 220 volts	75,666	187	..	..	104	94	1939	
		66,617	177	..	..	89	94	1938	
7. Sylhet Electric Supply, Limited.	A. C. 3300/400/ 230 volts.	188,647	479	25	..	322.5	190	1939	
		168,270	422	22	..	299	190	1938	
8. Dhubri Electric Supply Company, Limited.	A. C. 400/230 volts.	54,236	130	2	..	61.5	108	1939	

Owing to differing "financial years" of the Licenses the figures in column 3 are not in all cases "Calendar Year" figures. They do, however, show the figures over a period of 12 months.

APPENDIX II

Generators and Motors Installed in Registered Factories and unregistered industrial establishments, excluding petty plants

Voltage	Number of generators	Generators K. Ws.	Number of Motors	Motors K. Ws.	Remarks
1	2	3	4	5	6
3300 A. C.	3	800 K.V.A.	23	400	Same as last year.
600 A. C.	2	314 "	11	406	Ditto.
400 A. C.	2	80 "	15	64	Ditto.
440 D. C.	4	170 "	11	396	Ditto.
220 D. C.	52	731 "	16	110	Ditto.
110 D. C.	268	1,942 "	31	111	An increase of 20 K.Ws.
Below 110 D. C. ...	56	35 "	6	10	Same as last year.

