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भारत सरकार

Government of India

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय नई दिल्ली - 110016

18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016

No. NRPC/SE(O)/Iny. Commtt./Recomm./2011 दिनांक 19.06.2011

To,

-As per List-

Sub: Meeting of Sub-Group to prepare a discussion paper on banning Brick Kiln and polluting industries in the vicinity of 220 kV and above Transmission Lines.reg.

Sir,

Kindly refer to the recommendations of Inquiry Committees constituted by CEA for analyzing the Grid Disturbances of 27th January, 2007, 7th and 8th March, 2008 and 02nd January, 2010. One of the recommendations is issuing of notifications by the respective state government that no brick kiln or any industrial unit or biomass or diesel based power plant having chimney height up to 30 meters be set up within 0.5 km of the 220 kV or higher voltage transmission lines. Based on the discussion in NRPC, a sub-group was constituted to prepare a discussion paper on banning Brick Kiln and polluting industries in the vicinity of 220 kV and above Transmission Lines.

First meeting of this sub-group shall be held on 25.07.2011 at 16:00 hrs at NRPC, New Delhi. A background paper and extract of notification issued by Department of food and supplies are attached as Annexure-I and Annexure-II.

Kindly make it convenient to attend the meeting.

-Sd-
(Ajay Talegaonkar)
SE(O) and Member Convener

Annexure-I

EFFECT OF POLLUTION ON THE RELIABILITY OF TRANSMISSION SYSTEM

The gravity and importance of the problem of insulator pollution is directly related to the possible effects on the electric power system due to the flashover of insulators caused by surface pollution. For high degrees of pollution, the reduction in the withstand characteristics may be high enough as to cause failure of insulation, even at rated operating voltage. A whole series of faults may occur and in some cases, even result in a real breakdown of important sections of the transmission and distribution system. The importance of a correct design for outdoor insulation in polluted areas becomes evident when a successive reclosing of the system after a failure caused by pollution flashover fails.

Although, these problems are old (began at the time of the first electric installation), their importance have grown steadily in nearly all countries in recent years, tending to be far more acute than in the past. The principal reasons for this are shown in the following.

* The ever-growing development of industrial areas, urban areas and the considerable increase of use of chemical compound in the agriculture have led to a fairly considerable growth (in term of extension) of areas of pollution that may affect the existing electrical transmission and distribution lines. Besides, big load centres as large industries and urban areas, have to be supplied through lines and sub-stations whose insulators are situated in the heart of the polluted areas particularly in critical conditions.

* For meeting the requirement of power transmission from large thermal stations, located in sites more convenient both for fuel supplies and for ample water availability for cooling and remote hydra stations to the load centres, higher voltage levels in the AC (Alternate Current) transmission systems (700 kV and above) were introduced, with related higher electric stresses on the insulation. Field experience, laboratory and analytical studies have demonstrated that the contamination problem becomes more acute as the transmission voltages are increased into the UHV range (Ultra High Voltage : 700 k V and above).

* The basic objective to develop an optimal power system consistent with the required level of reliability and security has stimulated a significant growth of HVDC (High Voltage Direct Current) transmission systems, more attractive with respect to HVAC (High Voltage Alternate Current) because of the following main reasons: the lower cost of overhead transmission lines for the same transmitted power; the absence of stability problem, typical of long AC lines; the possibility of inter-connecting AC networks with different frequencies or with different regulation limits; the easy control of the transmitted power. On the other hand, the exploitation of HVDC systems has not always been fully satisfactory and it is now recognized that the performance of the external insulation subjected to the effect of the atmospheric agents, is one of the weak points of system reliability.

The pollution flashover poses serious threat to the reliability of the system when the line is closed after a pollution flashover, the flashover may repeat after some delay causing the line outage for a prolonged duration. The line will have to be closed only after the prevailing weather conditions are cleared. Therefore, the reliability of the system mainly depends on the pollution performance of the system in the time sense, since auto-reclosing may be employed for switching and lightning over voltage problems.

In order to arrive at optimum design values, the extrapolated values form the lower transmission system data have to be compared with the experimental results obtained at UHV research centres. This is very much necessary because the pollution flashover voltage values are non-linear with respect to the string length. The values are non-linear with respect to the string length. The flashover voltage has a tendency to saturate at higher string lengths, consequently more number of insulators are required than the number obtained from the extrapolation of results of the lower voltage systems Therefore, experimental research is very much necessary for the design of insulation system at UHV levels. The creepage length of the insulator string is decided by the pollution severity. The maximum withstand salinity value depends upon the risk of failure to be chosen and the maximum site pollution severity. Therefore, determination of pollution severity at sites is very important and precise knowledge of pollution severity at site is necessary.

Instances of grid failure due to pollution flashover have come to notice on a 400 kV single circuit line during fog condition. In such instances, the line has been put to operation after identifying the location of a failure and taking remedial action which has resulted in outage for a long period of time.

In recent years, flashovers have been experienced in ± 500 kV DC lines and in sub-stations. In sub-stations, the failures were mainly on support insulators. These failures were seasonal and can be attributed to pollution owing to the fact that they have occurred in morning hours of the day while there were fog. Though the problems have not been satisfactorily resolved, temporarily a solution has been found by applying silicone grease on the surface of the insulators. Application of this technique for combating pollution in lines is more complicated. Hence, the design of the system itself should be looked into. Though not many flashovers are reported in 400 kV AC systems, it is feared that in 800 kV AC systems for which plans have already been made in India, the problems have to be tackled in the design stage itself. Considering the current rate of growth and the socio-economic impact on the energy sector in India, priorities should be carefully assigned for removing the shortcomings due to pollution on external insulation so that it is possible to find satisfactory solutions very quickly. In this context, in our country, there is no acceptable experience in facing and managing a so bulky activity in the quickest possible manner. Besides, indigenous experience in the project and in construction of appropriate pollution monitoring devices is not adequate at present.

<u>Options relating to banning of brick kilns in the vicinity of EHV Transmission lines</u>

Northern region power system passes through many of the industrial and agricultural belts of the country. Brick kilns are one of the major sources of pollution which are the main cause of pollution source resulting in the outage of the system.

Presently there is no legislation to curb the pollution emitted from the brick kiln vis-à-vis transmission lines. One of the options is that in future no brick kiln should be allowed near the transmission lines. For this purpose, a minimum distance or minimum height of chimney can be specified. If this option is to be exercised, the agency which would issue such notification will have to be identified. This can be done either following the example of Haryana, wherein Department of Food and Supplies has issued such notification under Brick Supply Order 1972. However, it is to be seen as to how effective is such ban in Haryana.

Alternatively, the issue of such ban can be taken up with Central Pollution Control Board (CPCB). In fact, CEA has already taken up the matter with Ministry of Power for further refereeing the matter to CPCB. A meeting was held in Ministry in this regard, wherein NRPC was advised to look at all the option and submit a Base Paper to Ministry. Accordingly, this group has been created for preparing the Base Paper.

There is an apprehension that if such rule is made, it would adversely affect construction of new lines. This is so because, in case of existing brick kiln, the newly planned transmission line will have to be rerouted. However, this difficulty can be overcome by going for polymer insulators in the stretch near existing brick kilns.

In cases where brick kiln is already present in the vicinity, the insulators should be closely monitored. If situation cannot be managed by frequent cleaning of porcelain insulators, these should be replaced with Polymer insulators.

List of Members

1) Dr. N. Vasudev, Joint Director, CPRI, Fax No. 080-23601213
2. Chief Engineer (PPM), RVPNL , Rajasthan, Fax- 0141-2740920 with a request to nominate an officer for the group and advise him to participate in the meeting(Pl. refer to our earlier correspondence of even no dated 30.05.2011)
3. Sh.Rajesh Kumar, CM, NRLDC, Fax-011-26852747
4. Sh.S.K.Jha,Manager(OS), POWERGRID, Fax No. 0124-2571914
5. Sh. N.K.Makkar, EE, HVPNL, Mob No. 9466219042, Fax No-
6. Chief Engineer(SO&C), PSTCL, Fax No. 0175-2367490 with a request to nominate an officer for the group and advise him to participate in the meeting(Pl. refer to our earlier correspondence of even no dated 30.05.2011)

(Sub Clause (iii) of Clause 4 amended vide notification dated 15-9-2008)

"(iii) The District Magistrate may grant or renew or refuse to grant or refuse to renew a license for reason to be recorded in writing, provided that site of the Kiln is situated at distances not less than those indicated below:-

Category	Distance	Measurement of Distance	Maximum relaxation if any, to be allowed under clause 21.
1	2	3	4
(a) By pass (b) Scheduled roads (c) Other district pucca road (d) Village link road	(a) 100 meters (b) 30 meters (c) 30 meters (d) 30 meters	Distance is to be measured from the nearest edge of the road reservation.	(a) Not relaxable (b) Not relaxable (c) Not relaxable (d) Not relaxable
(e) Municipal limits for A and B class cities and C class cities/town	A Class- 3 kilometer B Class- 2 kilometer C Class- 800 meters	Distance is to be measured as the crow flies from the nearest portion of the Municipal limits.	(e) Maximum upto 20% each
(f) Village abadi	800 meters	Distance is to be measured as the crow flies from the nearest portion of the outer edge of Phirni and where there is no Phirni the distance is to be measured from the outer edge of the Abadi.	(f) Maximum upto 20%
(g) School/Dispensary and Hospital (h) Other Educational and Public Utility Institutions (i) Public Park	One kilometer each.	Distance is to be measured as the crow flies from the nearest portion of the boundary line/ wall.	(g) Maximum upto 20% (h) Maximum upto 20% (i) Maximum upto 20%
(j)Garden/Nursery/ Forest Nursery (k) Reserve Forest	East-West and North-South One kilometer each.	Distance is to be measured as the crow flies from the nearest boundary line, wall of the institution.	(j) Maximum upto 10% (k) Maximum upto 10%
(l)Electricity Transmission Lines (not less than 220 kilowatt)	600 meter (on both sides from the transmission line)	Distance is to be measured as the crow flies from the nearest transmission line	(l) Maximum upto 20%