Identifying Number | Region | Case No. | A / B

I   To be completed by the UKCCS: Details of Household / School

Phase I Measurement

Date: [Day | Month | Year]

Time: [Hours | Minutes] *to* [Hours | Minutes]
Please use 24 hour clock   Please use 24 hour clock
Start Time   Two Hours Later

Year of Interest

From: [Day | Month | Year]

To: [Day | Month | Year]

Regional UKCCS Contact: Prof. Ray Cartwright, LRF Centre for Clinical Epidemiology,
17 Springfield Mount, Leeds LS2 9NG.   Tel. (0113) 233 3909.

Address of Interest: Home / School
(circle as appropriate)

If school, type of measurement: Single / Multiple Classroom
(circle as appropriate)

If single classroom, has a sketch
of its location been attached? Please tick: ☐ Yes   ☐ No   ☐ Don't Know

Postcode: [ ][ ][ ][ ] [ ][ ][ ]

Grid Reference: (to 10m)

100 km Grid Square	Easting	Northing	OS Map Sheet No. (1:50 000 series)
[ ][ ]	[ ][ ][ ]	[ ][ ][ ]	[ ][ ][ ]

Date form sent to NGC [Day | Month | Year]

Date returned by NGC [Day | Month | Year]

Date copy sent to NRPB [Day | Month | Year]

Transmission Line Location Details:

1) Was a transmission cable, line or substation identified on the 1:50 000 OS
maps supplied by National Grid Company?   Please tick: ☐ Yes   ☐ No   ☐ Don't Know

If yes: Please enter the no. of lines within 400m ☐   cables within 100m ☐   substations within 100m ☐

2) Did the REC identify a Transmission Company line or cable?
Please tick: ☐ Yes   ☐ No   ☐ Don't Know

3) Did the REC send a copy of a 1 : 2 500 (or less) map?
Please tick: ☐ Yes   ☐ No   ☐ Don't Know

If yes to 2) and 3) above then: Please ensure that a photocopy of the "NGC lines and cables" section on p.
4 of the REC questionnaire, and REC map, are sent with this form to NGC.

For single classroom schools: If a sketch was attached (see above) please send a copy of this with the
form too.

II   To be completed by the Transmission Company: Distance of Interest

This section is used to determine the *maximum distance of interest*. This is how close the home or school has to be to the line or cable for line load data to be required.

All cable/line distances should be perpendicular from the line/cable to the centre of the home or school (multiple measurements) / classroom (single measurement where sketch provided). For multiple school measurements, where there are many school buildings of similar size, the reference point for distances should be an estimate of the geographical centre of the buildings.

If there is more than one cable or line, please photocopy the relevant sections.

A) Maximum distance of interest for *Separated Phase Cables* (132 kV and above).

For separated phase cables of ≥ 132 kV, the maximum distance of interest is 20m.

A1)   During Phase I measurements, or at any time during the year of
       interest, were there any separated phase cables of ≥ 132 kV   *Please tick:*   Yes   No   Don't
       within 20m of the centre of the home / school building / classroom?   Know

If yes: Please supply a sketch showing the relative location of conductors, with distance of centre line from
         home / school building / classroom, distance separating conductors and phases.

B) Maximum distance of interest for *Overhead Transmission Lines* (132 kV and above).

Here, the distance of interest is calculated from design constants, current and phasing.

B1)   From information supplied by the REC, and from the 1:50 000 maps of England and Wales (for
       NGC), or from other maps as appropriate, determine the route reference for the line:

       _____ (e.g. ZN)

B2)   Please enter the names of the circuits and their GSM reference numbers

       Circuit 1 (nearer to the address)   Name: _____   Ref:

       Circuit 2 (further from the address)   Name: _____   Ref:

B3)   Determine the perpendicular distance (in metres) from the centre of the address to the
       centre line of the transmission line? This can be determined from the detailed map,
       supplied by the REC.

       Where this distance is less than 30m, give the height of the lowest conductor above the floor of the
       lowest normally-occupied level of the address. This can be measured or obtained from records. If
       the lowest conductor is below this level, the height is negative.

       Please select height (m):   < 10   /   10-15   /   15-20   /   20-25   /   > 25
       (circle as appropriate)

II   To be completed by the Transmission Company: Distance of Interest (cont.)

B4) Use the appropriate system drawing supplied to determine the tower design for the relevant section of line.

Answer:_____ [e.g. L6 Balfour Beatty, L3/1, L4(M)]

B5) Determine the line design constants K_2 and K_3 from the table*:

Line Type	L2	L3	L4	L6	L7	L8	L9	L12	L66	Other 132 kV on steel towers	L34	L132	Other 132 kV on steel towers	Wood pole - portal	Wood pole - trident
K_2	0.89	0.79	0.62	1.00	0.65	0.95	0.73	0.96	0.83	0.62	1.04	0.78	0.69	0.71	0.51
K_3	0.80	0.68	0.53	1.00	0.56	0.88	1.35	0.90	0.77	0.55	Single circuit designs				

*If the line is not included above, then contact Dr. David Renew (tel. 01372 383831)

Enter the design constants here: K_2_____ K_3_____

B6) Find the current for each circuit in kA. Ideally, this should be the measured annual average current. If this is not available, then it is estimated by half the average of the seasonal pre-fault ratings for the circuit.

If the measured annual average current is available:

Please enter it here:

Circuit 1 _____ kA   Circuit 2 _____ kA

OR IF it this not available, please give the annual average pre-fault rating:

Circuit 1 _____ kA   Circuit 2 _____ kA

and multiply these numbers by 0.5:

Circuit 1 _____ kA   Circuit 2 _____ kA

B7) Ascertain whether the currents are normally in the same direction or opposite directions or both of these at different times *(please tick)*:

Same ☐   Opposite ☐   Both occur at different times ☐   Not known ☐

B8) Find the circuit phasing by referring to the System Phasing Diagram.

Enter phasing in the form BYR / BRY: _____

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II   To be completed by the Transmission Company: Distance of Interest (cont.)

B9) Determine which class of phasing this is (examples given for RYB on first named circuit):

Class of Phasing				
Untransposed	Forward Staggered	Reverse Staggered	Transposed	Single Circuit
RYB / RYB	RYB / YBR	RYB / YRB	RYB / BYR	RYB / -
	RYB / BRY	RYB / RBY		

Phasing: *(please tick one)*:

Untransposed ☐   Forward Staggered ☐   Reverse Staggered ☐   Transposed ☐   Single Circuit ☐

B10) Referring to the answers to questions B7 and B9, use this table to decide which action (A, B or C) to adopt in the next question, B11.

Circuit Phasing	Currents in the two circuits are normally in the same direction	Currents in the two circuits are in opposite or both directions or not known
Untransposed or reverse staggered	A	B
Transposed or forward staggered	B	A
Single circuit operation	C	C

Which action has been chosen? *(please tick)*:   A ☐   B ☐   C ☐

B11) This question determines the maximum distance of interest (r), using the design constants K_2 and K_3 from question B5), the currents in B6) and the action chosen in question B10).

If A was selected in question B10:

Add together the two currents from question B6.

Enter the answer here: _____ kA

Find its square root: _____

And multiply by 184 x K_2: _____ = r

II   To be completed by the Transmission Company: Distance of Interest (cont.)

If B was selected in question B10:

Select the *smaller* of the two currents from question B6.

Enter the answer here: _____ kA

Find its cube root: _____

And multiply by 110 x K_3: _____ = r_t

Select the *larger* of the two currents from question B6.

Enter the answer here: _____ kA

Find its square root: _____

And multiply by 184 x K_2: _____ = r_s

Divide the smaller current by the larger (the result will be between 0 and 1)

Enter the answer here: _____

And multiply it by 0.8: _____ = **ab**

Fill in the blanks from above, and evaluate the required distance:

$$r = [\quad ab \quad \times \quad r_t \quad] \quad + \quad [\quad (1 - ab) \quad \times \quad r_s]$$
$$r = [\_\_\_ \times \_\_\_] \quad + \quad [\_\_\_ \times \_\_\_]$$

Enter the answer here: _____ = **r**

If C was selected in question B10:

Select the only current from question B6.

Enter the answer here: _____ kA

Find its square root: _____

And multiply by 184 x K_2: _____ = **r**

B12) If the address is closer to the line than the maximum distance of interest **(r)**, obtained in question B11), line load data are needed for this line.

Compare the distance from the address to the line - given in question B3) - to the distance of interest **(r)** from question B11). Are line load data required?   *Please tick:*   Yes [ ]   No [ ]

If line load data are needed: Please complete section III.

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Region   Case No.

[| | | |] [A / B]

III   To be completed by the Transmission Company: Details of line load data

If you have answered "yes" to section II, question A1 and/or B12, then line load data are required:

Are line/cable load data available for the Phase I measurement
date and time?

Please tick: ☐ Yes   ☐ No   ☐ Don't Know

Are line/cable load data available for the year of interest?

Please tick: ☐ Yes   ☐ No   ☐ Don't Know

Are line/cable load data available for the most recent year*?

Please tick: ☐ Yes   ☐ No   ☐ Don't Know

*Note: Load data for the year of interest are preferred, but it is accepted that data for the most recent year might be all that are available, and this is adequate. If no line load data are available, please estimate load(s) with any marked variation over time, and enter in additional information (page 7).

If yes to load data available:

Two files of data are needed: one for the time of Phase I measurement, and the other containing one year's data (either the year of interest or the most recent year). If possible, please supply the line load data as follows:

- As ASCII files on a 3½" floppy disk.
- Disks to be labelled with NGC & the identifying no. (on top RH corner of this form), plus the file name(s) as stated below.
- Half hourly measurement intervals are sufficient.
- One file line per measurement interval, each line being identified by the date and time.
- If the load currents in the circuit(s) are available, then no other quantity is needed.
- If the current is *not* available, then values of MW are required, and, if possible, MVar and Voltage.

Phase I: File name: _____   Line no. of first line of data: _____

Description of each field on a line of data: _____

_____

_____

One year's data: File name: _____   Line no. of first line of data: _____

Description of each field on a line of data: _____

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Additional Information: _____