Figure A30-1
Arrowhead to Weston
Calculated Audible Noise Data

345-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	10.5	39.0	35.5
-200 feet	12.5	41.0	37.5
-150 feet	13.9	42.4	38.9
-100 feet	15.9	44.4	40.9
-50 feet	19.2	47.7	44.2
-25 feet	21.1	49.6	46.1
Centerline	21.9	50.4	46.9
25 feet	21.1	49.6	46.1
50 feet	19.2	47.7	44.2
100 feet	15.9	44.4	40.9
150 feet	13.9	42.4	38.9
200 feet	12.5	41.0	37.5
300 feet	10.5	39.0	35.5

345-kV Single Circuit H-Frame Parallel with 161-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	12.1	40.6	37.1
-200 feet	14.5	43.0	39.5
-150 feet	16.5	45.0	41.5
-100 feet	19.5	48.0	44.5
-50 feet	22.6	51.1	47.6
-25 feet	22.2	50.7	47.2
Centerline	20.6	49.1	45.6
25 feet	18.9	47.4	43.9
50 feet	17.7	46.2	42.7
100 feet	15.3	43.8	40.3
150 feet	13.7	42.2	38.7
200 feet	12.5	41.0	37.5
300 feet	10.8	39.3	35.8

345-kV/161-kV Double Circuit, Single Pole

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	12.7	41.2	37.7
-200 feet	14.8	43.3	39.8
-150 feet	16.2	44.7	41.2
-100 feet	18.1	46.6	43.1
-50 feet	20.9	49.4	45.9
-25 feet	22.5	51.0	47.5
Centerline	22.2	50.7	47.2
25 feet	20.5	49.0	45.5
50 feet	19.1	47.6	44.1
100 feet	16.9	45.4	41.9
150 feet	15.3	43.8	40.3
200 feet	14.0	42.5	39.0
300 feet	12.2	40.7	37.2

345-kV Single Circuit H-Frame Parallel With 115-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	11.9	40.4	36.9
-200 feet	14.4	42.9	39.4
-150 feet	16.3	44.8	41.3
-100 feet	19.4	47.9	44.4
-50 feet	22.6	51.1	47.6
-25 feet	22.1	50.6	47.1
Centerline	20.4	48.9	45.4
25 feet	18.4	46.9	43.4
50 feet	16.9	45.4	41.9
100 feet	14.8	43.3	39.8
150 feet	13.3	41.8	38.3
200 feet	12.2	40.7	37.2
300 feet	10.5	39.0	35.5

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.

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Figure A30-2
Arrowhead to Weston
Calculated Audible Noise Data

345-kV/115-kV Double Circuit, Single Pole

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	12.5	41.0	37.5
-200 feet	14.6	43.1	39.6
-150 feet	16.0	44.5	41.0
-100 feet	18.0	46.5	43.0
-50 feet	20.7	49.2	45.7
-25 feet	22.3	50.8	47.3
Centerline	22.0	50.5	47.0
25 feet	20.3	48.8	45.3
50 feet	18.8	47.3	43.8
100 feet	16.6	45.1	41.6
150 feet	15.0	43.5	40.0
200 feet	13.8	42.3	38.8
300 feet	12.0	40.5	37.0

345-kV Single Circuit H-Frame Parallel With 69-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	27.3	45.7	36.5
-200 feet	30.1	48.4	39.3
-150 feet	32.0	50.4	41.3
-100 feet	35.0	53.4	44.3
-50 feet	38.1	56.3	47.3
-25 feet	37.5	55.9	46.8
Centerline	35.9	54.3	45.1
25 feet	34.0	52.4	43.3
50 feet	32.6	51.0	41.8
100 feet	30.4	48.8	39.7
150 feet	28.8	47.2	38.1
200 feet	27.5	45.9	36.8
300 feet	25.5	43.8	34.7

345-kV/69-kV Double Circuit, Single Pole

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	27.9	45.8	37.0
-200 feet	30.4	48.2	39.4
-150 feet	31.9	49.8	41.0
-100 feet	33.9	51.8	43.0
-50 feet	36.6	54.4	45.7
-25 feet	38.0	55.8	47.1
Centerline	37.7	55.6	46.8
25 feet	36.2	54.0	45.2
50 feet	34.8	52.6	43.8
100 feet	32.5	50.4	41.6
150 feet	30.9	48.7	39.9
200 feet	29.5	47.4	38.6
300 feet	27.3	45.2	36.4

345-kV Single Circuit H-Frame Paralleling 345-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	14.2	42.5	39.0
-200 feet	16.2	44.7	41.2
-150 feet	17.8	46.3	42.8
-100 feet	20.5	49.0	45.5
-50 feet	23.0	51.5	48.0
-25 feet	22.6	51.1	47.6
Centerline	22.5	51.0	47.5
25 feet	23.3	51.8	48.3
50 feet	24.0	52.5	49.0
100 feet	21.4	49.9	46.4
150 feet	18.4	46.9	43.4
200 feet	16.6	45.1	41.6
300 feet	14.3	42.8	39.3

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.

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Figure A30-3
Arrowhead to Weston
Calculated Audible Noise Data

345-kV/345-kV Double Circuit, Single Pole

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	13.3	41.8	38.3
-200 feet	15.2	43.7	40.2
-150 feet	16.5	45.0	41.5
-100 feet	18.3	46.8	43.3
-50 feet	20.8	49.3	45.8
-25 feet	22.3	50.8	47.3
Centerline	23.0	51.5	48.0
25 feet	22.6	51.1	47.6
50 feet	21.1	49.6	46.1
100 feet	18.5	47.0	43.5
150 feet	16.7	45.2	41.7
200 feet	15.3	43.8	40.3
300 feet	13.4	41.9	38.4

345-kV/345-kV Double Circuit, Single Pole Parallel With 46-kV Wishbone Type

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	13.9	42.4	38.9
-200 feet	16.1	44.6	41.1
-150 feet	17.7	46.2	42.7
-100 feet	20.0	48.5	45.0
-50 feet	22.7	51.2	47.7
-25 feet	23.0	51.5	48.0
Centerline	22.0	52.5	47.0
25 feet	20.6	49.1	45.6
50 feet	19.2	47.7	44.2
100 feet	17.2	45.7	42.2
150 feet	15.7	44.2	40.7
200 feet	14.6	43.1	39.6
300 feet	12.8	41.3	37.8

46-kV Single Circuit Horizontal Line Post

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	0.0	0.0	0.0
-200 feet	0.0	0.0	0.0
-150 feet	0.0	0.0	0.0
-100 feet	0.0	0.0	0.0
-50 feet	0.0	0.0	0.0
-25 feet	0.0	0.0	0.0
Centerline	0.0	0.0	0.0
25 feet	0.0	0.0	0.0
50 feet	0.0	0.0	0.0
100 feet	0.0	0.0	0.0
150 feet	0.0	0.0	0.0
200 feet	0.0	0.0	0.0
300 feet	0.0	0.0	0.0

345-kV Single Circuit H-Frame Parallel with 115-kV Davit Arm

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	11.2	39.7	36.2
-200 feet	13.6	42.1	38.6
-150 feet	15.5	44.0	40.5
-100 feet	18.4	46.9	43.4
-50 feet	21.8	50.3	46.8
-25 feet	21.7	50.2	46.7
Centerline	20.3	48.8	45.3
25 feet	18.2	46.7	43.2
50 feet	16.6	45.1	41.6
100 feet	14.4	42.9	39.4
150 feet	12.9	41.4	37.9
200 feet	11.7	40.2	36.7
300 feet	10.0	38.5	35.0

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.

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Figure A30-4
Arrowhead to Weston
Calculated Audible Noise Data

115-kV/115-kV Double Circuit Single Pole

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	0.0	10.2	6.7
-200 feet	0.0	12.2	8.7
-150 feet	0.0	13.6	10.1
-100 feet	0.0	15.5	12.0
-50 feet	0.0	18.4	14.9
-25 feet	0.0	20.4	16.9
Centerline	0.0	21.8	18.3
25 feet	0.0	20.4	16.9
50 feet	0.0	18.4	14.9
100 feet	0.0	15.5	12.0
150 feet	0.0	13.6	10.1
200 feet	0.0	12.2	8.7
300 feet	0.0	10.2	6.7

115-kV Single Circuit Davit Arm Parallel to 115-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	0.0	8.5	5.0
-200 feet	0.0	10.6	7.1
-150 feet	0.0	12.1	8.6
-100 feet	0.0	14.2	10.7
-50 feet	0.0	18.0	14.5
-25 feet	0.0	20.4	16.9
Centerline	0.0	20.0	16.5
25 feet	0.0	18.6	15.1
50 feet	0.0	16.6	13.1
100 feet	0.0	13.6	10.1
150 feet	0.0	11.7	8.2
200 feet	0.0	10.3	6.8
300 feet	0.0	8.3	4.8

115-kV Single Circuit Davit Arm

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	0.0	4.6	1.1
-200 feet	0.0	6.7	3.2
-150 feet	0.0	8.1	4.6
-100 feet	0.0	10.1	6.6
-50 feet	0.0	13.4	9.9
-25 feet	0.0	15.8	12.3
Centerline	0.0	16.6	13.1
25 feet	0.0	14.7	11.2
50 feet	0.0	12.5	9.0
100 feet	0.0	9.6	6.1
150 feet	0.0	7.8	4.3
200 feet	0.0	6.4	2.9
300 feet	0.0	4.5	1.0

115-kV Horizontal Line Post With 25-kV Distribution Underbuild

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	0.0	6.5	0.0
-200 feet	0.0	8.9	0.0
-150 feet	0.0	10.4	0.0
-100 feet	0.0	12.3	0.0
-50 feet	0.0	15.0	0.0
-25 feet	0.0	16.7	0.0
Centerline	0.0	17.5	0.0
25 feet	0.0	16.4	0.0
50 feet	0.0	14.7	0.0
100 feet	0.0	12.1	0.0
150 feet	0.0	10.2	0.0
200 feet	0.0	8.7	0.0
300 feet	0.0	6.4	0.0

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.

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Figure A30-5
Arrowhead to Weston
Calculated Audible Noise Data

345-kV Single Circuit Davit Arm

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	11.5	40.0	36.5
-200 feet	13.5	42.0	38.5
-150 feet	15.0	43.5	40.0
-100 feet	17.0	45.5	42.0
-50 feet	20.2	48.7	45.2
-25 feet	22.0	50.5	47.0
Centerline	21.6	50.1	46.6
25 feet	20.2	48.7	45.2
50 feet	18.6	47.1	43.6
100 feet	16.1	44.6	41.1
150 feet	14.3	42.8	39.9
200 feet	13.0	41.5	38.0
300 feet	11.1	39.6	36.1

345-kV Single Circuit Davit Arm Parallel to 161-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	12.0	40.5	37.0
-200 feet	14.3	42.8	39.3
-150 feet	15.9	44.4	40.9
-100 feet	18.2	46.7	43.2
-50 feet	21.3	49.8	46.3
-25 feet	22.5	51.0	47.5
Centerline	21.3	49.8	46.3
25 feet	19.6	48.1	44.6
50 feet	18.3	46.8	43.3
100 feet	15.8	44.3	40.8
150 feet	14.2	42.7	39.2
200 feet	12.9	41.4	37.9
300 feet	11.1	39.6	36.1

345-kV Single Circuit Davit Arm Parallel to 115-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	11.8	40.3	36.8
-200 feet	14.1	42.6	39.1
-150 feet	15.7	44.2	40.7
-100 feet	18.1	46.6	43.1
-50 feet	21.3	49.8	46.3
-25 feet	22.3	50.8	47.3
Centerline	20.9	49.4	45.9
25 feet	19.0	47.5	44.0
50 feet	17.5	46.0	42.5
100 feet	15.3	43.8	40.3
150 feet	13.8	42.3	38.8
200 feet	12.6	41.1	37.6
300 feet	10.8	39.3	35.8

345-kV Single Circuit Davit Arm Parallel to 69-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	27.2	45.5	36.4
-200 feet	29.8	48.1	39.0
-150 feet	31.5	49.8	40.7
-100 feet	33.8	52.1	43.0
-50 feet	36.8	55.0	46.0
-25 feet	37.9	56.0	47.1
Centerline	36.8	54.8	45.9
25 feet	35.0	53.1	44.1
50 feet	33.5	51.6	42.7
100 feet	31.2	49.4	40.4
150 feet	29.6	47.8	38.8
200 feet	28.2	46.4	37.4
300 feet	26.1	44.3	35.3

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.

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Figure A30-6
Arrowhead to Weston
Calculated Audible Noise Data

345-kV Single Circuit Davit Arm Parallel to 345-kV Single Circuit H-Frame

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	14.2	42.7	39.2
-200 feet	16.2	44.7	41.2
-150 feet	17.6	46.1	42.6
-100 feet	19.6	48.1	44.6
-50 feet	22.1	50.6	47.1
-25 feet	23.0	51.5	48.0
Centerline	23.3	51.8	48.3
25 feet	24.0	52.5	49.0
50 feet	24.3	52.8	49.3
100 feet	21.3	49.8	46.3
150 feet	18.6	47.1	43.6
200 feet	16.8	45.3	41.8
300 feet	14.6	43.1	39.6

345-kV Single Circuit Davit Arm Parallel to 115- kV Single Circuit Davit Arm

Distance	L50 Fair Estimate (dB)	L5 Rain Estimate (dB)	L50 Rain Estimate (dB)
-300 feet	11.3	39.8	36.3
-200 feet	13.5	42.0	38.5
-150 feet	15.1	43.6	40.1
-100 feet	17.3	45.8	42.3
-50 feet	20.4	48.9	45.4
-25 feet	21.7	50.2	46.7
Centerline	21.0	49.5	46.0
25 feet	19.1	47.6	44.1
50 feet	17.5	46.0	42.5
100 feet	15.2	43.7	40.2
150 feet	13.6	42.1	38.6
200 feet	12.3	40.8	37.3
300 feet	10.5	39.0	35.5

Assumptions: Bottom conductor height 30.0 feet; Normal Peak Transmission power flows, current magnitude and phase angle from PSEE load flow case 3jsraa.uvg04Y4.954.sav; normal transmission power flows and current magnitude 80% of peak.