

b) Following Type tests on insulator strings assembly for 345kV or above Voltage transmission lines with 160kN or above electromechanical strength insulators:

- Power Frequency Voltage withstand test (Wet)
- Switching Surge Voltage Withstand test (Wet)
- Lightning Impulse Voltage Withstand test (Dry)
- Radio Interference Voltage Test (Dry)

c) Accelerated ageing test of 5000hrs as described in Appendix-C of IEC 61109 or Test at Multiple stresses of 5000 hrs as described in IEC 62730 or Annex-B of IEC 62217.

2.5.2 For a manufacturer, not meeting the requirements specified at 2.5.1(i) (A) & 2.5.1(ii) of its own, he should be a qualified Licensee of a qualified manufacturer meeting the above specified requirements and also meeting the conditions stipulated at 2.43.

2.5.3 In case the cumulative requirement of insulators indicated in the BOQ is less than 4000nos, the bidder/ Contractor may supply the entire requirement from supplier(s) (with a maximum of 2000 nos. from each) meeting the Technical requirement indicated at 2.5.1 (i) (B) and other mandatory requirement specified at 2.5.1.

2.5.4 In case the cumulative requirement of insulators indicated in the BOQ is more than 4000nos, the bidder/ Contractor may supply cumulatively not more than 15% with a maximum of 2000nos of the requirement from a supplier meeting the Technical requirement indicated at 2.5.1 (i) (B) and other mandatory requirement specified at 2.5.1. For balance 85% quantity, the supplier shall meet the Technical requirement indicated at 2.5.1 (i) (A) and other mandatory requirement specified at 2.5.1 or Technical requirement indicated at 2.5.2.

2.6 Composite Insulators for 400kV voltage level transmission lines with Triple Snowbird or Twin Lapwing or Twin HTLS configuration and having upto 210kN rating Insulator

2.6.1 The Qualified Manufacturer's experience should include the following:

i) (A) QR Criteria for suppliers for 85% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos.

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 2000 nos. of 160kN or above rating Composite long rod insulators for 345kV or above voltage transmission lines/ sub-stations and the

same should have been in satisfactory operation^{\$} for a minimum period of two years as on date of NOA.

(B) QR Criteria for suppliers for 15% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos. and for packages where cumulative quantity requirement indicated in BOQ is less than 4000 nos.

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 150 nos. of 160kN or above rating Composite long rod insulators for 345KV or above voltage transmission lines/substations and the same should have been in satisfactory operation^{\$} for a minimum period of two years[@] as on date of NOA.

@ If the Qualified manufacturer is not meeting the stipulated two years operational experience requirements specified at 2.6.1i) (B), he shall furnish a legally enforceable undertaking for extended warranty of additional two years over and above the warranty period specified under the package.

- ii) The Qualified manufacturer should also have successfully completed at least the following tests on insulator units and insulator strings (of Composite long rod insulators) as on date of NOA.
 - a. Tests on individual units of 210 KN or above rating as per IEC 61109-1995 or IEC 61109-2008.
 - b. Following Type tests on insulator strings assembly for 345kV or above Voltage transmission lines with 210kN or above electromechanical strength insulators:
 - Power Frequency Voltage withstand test (Wet)
 - Switching Surge Voltage Withstand test (Wet)
 - Lightning Impulse Voltage Withstand test (Dry)
 - Radio Interference Voltage Test (Dry)
 - c. Accelerated ageing test of 5000hrs as described in Appendix-C of IEC 61109 or Test at Multiple stresses of 5000 hrs as described in IEC 62730 or Annex-B of IEC 62217.

2.6.2 For a manufacturer, not meeting the requirements specified at 2.6.1(i) (A) & 2.6.1(ii) of its own, he should be a qualified Licensee of a qualified manufacturer meeting the above specified requirements and also meeting the conditions stipulated at 2.43.

2.6.3 In case the cumulative requirement of insulators indicated in the BOQ is less than 4000nos, the bidder/ Contractor may supply the entire requirement from supplier(s) (with a maximum of 2000 nos. from each) meeting the Technical requirement indicated at 2.6.1 (i) (B) and other mandatory requirement specified at 2.6.1.

2.6.4 In case the cumulative requirement of insulators indicated in the BOQ is more than 4000nos, the bidder/Contractor may supply cumulatively not more than 15% with a maximum of 2000nos of the requirement from a supplier meeting the Technical requirement indicated at 2.6.1 (i) (B) and other mandatory requirement specified at 2.6.1. For balance 85% quantity, the supplier shall meet the Technical requirement indicated at 2.6.1 (i) (A) and other mandatory requirement specified at 2.6.1 or Technical requirement indicated at 2.6.2.

2.7 Composite Insulators for 220kV voltage level transmission lines

2.7.1 Composite Insulators for 220kV voltage level transmission lines with Single Zebra configuration

2.7.1.1 The Qualified Manufacturer's experience should include the following:

- i) **(A) QR Criteria for suppliers for 85% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos.**

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 2000 nos. of 120kN or above rating Composite long rod insulators for 220 kV or above voltage transmission lines/ sub-stations and the same should have been in satisfactory operation^s for a minimum period of two years as on date of NOA.

- (B) QR Criteria for suppliers for 15% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos. and for packages where cumulative quantity requirement indicated in BOQ is less than 4000 nos.**

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 150 nos. of 120kN or above rating Composite long rod insulators for 220 kV or above voltage transmission lines/substations and the

same should have been in satisfactory operation^s for a minimum period of two years[@] as on date of NOA.

@ If the Qualified manufacturer is not meeting the stipulated two years operational experience requirements specified at 2.7.1.1(i) (B), he shall furnish a legally enforceable undertaking for extended warranty of additional two years over and above the warranty period specified under the package.

ii) The Qualified manufacturer should also have successfully completed at least the following tests on insulator units and insulator strings (of Composite long rod insulators) as on date of NOA.

- a. Tests on individual units of 120 KN or above rating as per IEC 61109-1995 or IEC 61109-2008.
- b. Following Type tests on insulator strings assembly for 220kV or above Voltage transmission lines with 120kN or above electromechanical strength insulators:
 - Power Frequency Voltage withstand test (Wet)
 - Lightning Impulse Voltage Withstand test (Dry)
 - Radio Interference Voltage Test (Dry)
- c. Accelerated ageing test of 5000hrs as described in Appendix-C of IEC 61109 or Test at Multiple stresses of 5000 hrs as described in IEC 62730 or Annex-B of IEC 62217.

2.7.1.2 For a manufacture, not meeting the requirements specified at 2.7.1.1(i) (A) & 2.7.1.1(ii) of its own, he should be a qualified Licensee of a qualified manufacturer meeting the above specified requirements and also meeting the conditions stipulated at 2.43.

2.7.1.3 In case the cumulative requirement of insulators indicated in the BOQ is less than 4000nos, the bidder/Contractor may supply the entire requirement from supplier(s) (with a maximum of 2000 nos. from each) meeting the Technical requirement indicated at 2.7.1.1 (i) (B) and other mandatory requirement specified at 2.7.1.1.

2.7.1.4 In case the cumulative requirement of insulators indicated in the BOQ is more than 4000nos, the bidder/ Contractor may supply cumulatively not more than 15% with a maximum of 2000nos of the requirement from a supplier meeting the Technical requirement indicated at 2.7.1.1 (i) (B) and other mandatory requirement specified at 2.7.1.1. For balance 85% quantity, the supplier shall

meet the Technical requirement indicated at 2.7.1.1 (i) (A) and other mandatory requirement specified at 2.7.1.1 or Technical requirement indicated at 2.7.1.2.

2.7.2 Composite Insulators for 220kV voltage level transmission lines with Twin Moose configuration

2.7.2.1 The Qualified Manufacturer's experience should include the following:

- i) **(A) QR Criteria for suppliers for 85% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos.**

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 2000 nos. of 160kN or above rating Composite long rod insulators for 220 kV or above voltage transmission lines/ sub-stations and the same should have been in satisfactory operation^s for a minimum period of two years as on date of NOA.

- (B) QR Criteria for suppliers for 15% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos. and for packages where cumulative quantity requirement indicated in BOQ is less than 4000 nos.**

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 150 nos. of 160kN or above rating Composite long rod insulators for 220 kV or above voltage transmission lines/substations and the same should have been in satisfactory operation^s for a minimum period of two years[@] as on date of NOA.

@ If the Qualified manufacturer is not meeting the stipulated two years operational experience requirements specified at 2.7.2.1(i) (B), he shall furnish a legally enforceable undertaking for extended warranty of additional two years over and above the warranty period specified under the package.

- ii) The Qualified manufacturer should also have successfully completed at least the following tests on insulator units and insulator strings (of Composite long rod insulators) as on date of NOA.
- Tests on individual units of 160 KN or above rating as per IEC 61109-1995 or IEC 61109-2008.
 - Following Type tests on insulator strings assembly for 220kV or above Voltage transmission lines with 160kN or above electromechanical strength insulators:

- Power Frequency Voltage withstand test (Wet)
- Lightning Impulse Voltage Withstand test (Dry)
- Radio Interference Voltage Test (Dry)

c. Accelerated ageing test of 5000hrs as described in Appendix-C of IEC 61109 or Test at Multiple stresses of 5000 hrs as described in IEC 62730 or Annex-B of IEC 62217.

2.7.2.2 For a manufacture, not meeting the requirements specified at 2.7.2.1(i) (A) & 2.7.2.1(ii) of its own, he should be a qualified Licensee of a qualified manufacturer meeting the above specified requirements and also meeting the conditions stipulated at 2.43.

2.7.2.3 In case the cumulative requirement of insulators indicated in the BOQ is less than 4000nos, the bidder/Contractor may supply the entire requirement from supplier(s) (with a maximum of 2000 nos. from each) meeting the Technical requirement indicated at 2.7.2.1 (i) (B) and other mandatory requirement specified at 2.7.2.1

2.7.2.4 In case the cumulative requirement of insulators indicated in the BOQ is more than 4000nos, the bidder/ Contractor may supply cumulatively not more than 15% with a maximum of 2000nos of the requirement from a supplier meeting the Technical requirement indicated at 2.7.2.1 (i) (B) and other mandatory requirement specified at 2.7.2.1. For balance 85% quantity, the supplier shall meet the Technical requirement indicated at 2.7.2.1 (i) (A) and other mandatory requirement specified at 2.7.2.1 or Technical requirement indicated at 2.7.2.2.

2.8 Composite Insulators for 132kV voltage level transmission lines with Single Panther configuration

2.8.1 The Qualified Manufacturer's experience should include the following:

- i) **(A) QR Criteria for suppliers for 85% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos.**

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 2000 nos. of 90kN or above rating Composite long rod insulators for 110kV or above voltage transmission lines/ sub-stations and the same should have been in satisfactory operation^s for a minimum period of two years as on date of NOA.

(B) QR Criteria for suppliers for 15% of cumulative quantity under packages where cumulative quantity requirement indicated in BOQ is more than 4000 nos. and for packages where cumulative quantity requirement indicated in BOQ is less than 4000 nos.

The Qualified Manufacturer should have designed, manufactured, tested and supplied minimum 150 nos. of 90kN or above rating Composite long rod insulators for 110 kV or above voltage transmission lines/substations and the same should have been in satisfactory operation\$ for a minimum period of two years@ as on date of NOA.

@ If the Qualified manufacturer is not meeting the stipulated two years operational experience requirements specified at 2.8.1 i) (B), he shall furnish a legally enforceable undertaking for extended warranty of additional two years over and above the warranty period specified under the package.

- ii) The Qualified manufacturer should also have successfully completed at least the following tests on insulator units and insulator strings (of Composite long rod insulators) as on date of NOA: -
 - a. Tests on individual units of 90 KN or above rating as per IEC 61109-1995 or IEC 61109-2008.
 - b. Following Type tests on insulator strings assembly for 110kV or above Voltage transmission lines with 90kN or above electromechanical strength insulators: -
 - Power Frequency Voltage withstand test (Wet)
 - Lightning Impulse Voltage Withstand test (Dry)
 - c. Accelerated ageing test of 5000hrs as described in Appendix-C of IEC 61109 or Test at Multiple stresses of 5000 hrs as described in IEC 62730 or Annex-B of IEC 62217.

2.8.2 For a manufacturer, not meeting the requirements specified at 2.8.1 (i) (A) & 2.8.1 (ii) of its own, he should be a qualified Licensee of a qualified manufacturer meeting the above specified requirements and also meeting the conditions stipulated at 2.43.

2.8.3 In case the cumulative requirement of insulators indicated in the BOQ is less than 4000nos, the bidder/Contractor may supply the entire requirement from supplier(s) (with a maximum of 2000 nos. from each) meeting the Technical requirement indicated at 2.8.1 (i) (B) and other mandatory requirement specified at 2.8.1

2.8.4 In case the cumulative requirement of insulators indicated in the BOQ is more than 4000nos, the bidder/ Contractor may supply cumulatively not more than 15% with a maximum of 2000nos of the requirement from a supplier meeting the Technical requirement indicated at 2.8.1 (i) (B) and other mandatory requirement specified at 2.8.1. For balance 85% quantity, the supplier shall meet the Technical requirement indicated at 2.8.1 (i) (A) and other mandatory requirement specified at 2.8.1 or Technical requirement indicated at 2.8.2.

2.9 Disc/ Porcelain Longrod Insulators for 400 kV voltage level transmission lines with Twin/ Quad Moose configuration

2.9.1 The Qualified manufacturer shall be a manufacturer of Insulators of similar nature for the last five years. The manufacturer's experience should include the following:

The qualified manufacturer should have designed, manufactured, tested and supplied 120 KN & 160 KN or above electro-mechanical strength of disc insulators/ long rod insulators for 110/132 KV or above voltage transmission line of quantities not less than 50,000 nos. disc insulators /6520 nos. long rod insulators of each rating and the same should have been in satisfactory operation for a minimum period of two years as on date of NOA.

Further, the manufacturer should also have successfully completed at least the following tests on insulator units and insulator strings (of # Standard &/Anti-fog disc insulators/ long rod insulators as the case may be) as on date of NOA: -

- a) Tests on individual units.
- b) Following type tests on insulator strings assembly for 345/ 400 KV or above voltage transmission lines with 120 KN & 160 KN or above electro-mechanical strength insulators: -
 - Power frequency Voltage withstand test (Wet)
 - Switching Surge Voltage Withstand test (Wet)
 - Lightning Impulse Voltage withstand test (Dry)
 - Radio interference voltage test (dry)

Either Standard or Anti-fog or both depending on scope

2.9.2 The proposed manufacturer can also be a qualified licensee of a qualified manufacturer meeting the above specified requirements at 2.9.1 and also meeting the conditions stipulated at 2.43.