

1 Q. Re: 2013 Capital Projects 200,000 and Over but less than 500,000:
2 Explanations, pages D-142 through D-147 Replace Insulators:
3 Please provide the manufacturer's recommendations to replace older insulators
4 manufactured before the mid 1970's.

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7 A. The background information and recommendation concerning insulators
8 manufactured before the mid 1970s was provided by Shigeru Toyama, Executive
9 Vice President and General Manager for NGK Insulators of Canada, Ltd.

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11 It reads:

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13 *"Back in those early days, COB and some other insulator manufacturers applied*
14 *Portland cement based on construction/building standards as it is to insulators.*
15 *After time, porcelain cracks have developed and been found on those insulators, and*
16 *investigation concluded those were due to expansion of cement. ANSI, CSA*
17 *standards have specified to limit the expansion coefficient rate to less than 0.12% to*
18 *countermeasure this issue.*

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20 *It is important to avoid cracks on insulator because it is critical factor to failure of*
21 *loss of insulation and mechanical strength. Therefore, it is important to replace*
22 *such insulators using high expansion rate cement.*

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24 *NGK have originally applied cement with low expansion rate from the beginning and*
25 *never had been an issue to our insulators."*

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27 Source: S. Toyama (email communication, September 6, 2012)