IN-SERVICE RESULTS FROM ESKOM DISTRIBUTION LINES: BPS PRODUCED "SUPERPOLES"

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In 1995 Eskom's Distribution Technology (DT) division wanted to install 300 substandard poles on distribution lines at Umbumbulu, KwaZulu Natal. Unknown to this writer, the then Head of the Timber Division at SABS, Mr. Sakkie Burger, refused to approve the use of the substandard poles because instead of having the Standard retention of 130kg/3 creosote they had only 80kg/m3, and instead of having the Standard creosote penetration of 16mm they had only 11mm, and all 300 of the poles would therefore have rotted and failed in service. DT responded that there were no other poles available and requested that approval be given for their use. Also unknown to this writer, Mr. Burger had read about the Biotrans Pole Sleeve (BPS) and he consented to DT's use of the substandard poles providing BPS were fitted to them. The first time that this writer heard of the situation was when DT thereafter contacted his company to fit BPS to the 300 poles, which was done when they were installed alongside Standard non-BPS poles in distribution lines at Umbumbulu at the end of 1995.

After one year's service this writer and DT together inspected the BPS poles and found that creosote penetrations and retentions in the critical ground line zones had increased. This trend continued into the 2-year, 4-year and six-year intervals, by which time period all of the 300 previously-substandard poles had creosote retentions and penetrations that exceeded those specified in the National Standard. These findings were published as formal Documents at the annual meetings of the International Research Group on Wood Preservation (IRG) and as journal articles in the mainstream scientific press.

In 2005 two of the Umbumbulu distribution lines containing BPS poles were then independently inspected by Eskom-approved pole inspectors and those findings confirmed that all but one of the previously-substandard BPS poles had become Class 1 poles (i.e., they were within Specification and required no remedial treatment) during the ten-year inspection cycle. Specifically, **Fig.1a** shows the analysis of the inspectors' results for the Richmond Beaumont NB 63 distribution line, which had 907 non-BPS poles and 28 BPS poles in it. The overall failure rate of this line was 3%, all of which poles were previously Standard non-BPS poles. In contrast, **Fig. 1b** shows the analysis of the same inspectors' results for the Richmond Beaumont NB 22 LV distribution line, which had 110 non-BPS poles and 190 BPS poles in it. The failure rate among the previously Standard non-BPS poles was the normal 3%, however the overall failure rate of the whole line was only 1% because approximately two thirds of the poles in it were BPS poles that had become Class 1 poles during the ten year service period. These findings prove categorically that BPS usage slashed the normal pole failure rate when mixed with non-BPS poles, in spite of the fact that the non-BPS poles were all Standard ones while the BPS poles were all substandard ones when the distribution lines were erected in 1995.

In 2009/10 the present writer again visited the Umbumbulu distribution lines and reconfirmed these findings at the 15-year interval. Eskom therefore has distribution lines in service that categorically prove that BPS-usage produces "superpoles" from substandard poles when the creosote migrates downwards and soaks into previously-untreated internal wood when its loss to the soil is prevented by the BPS.

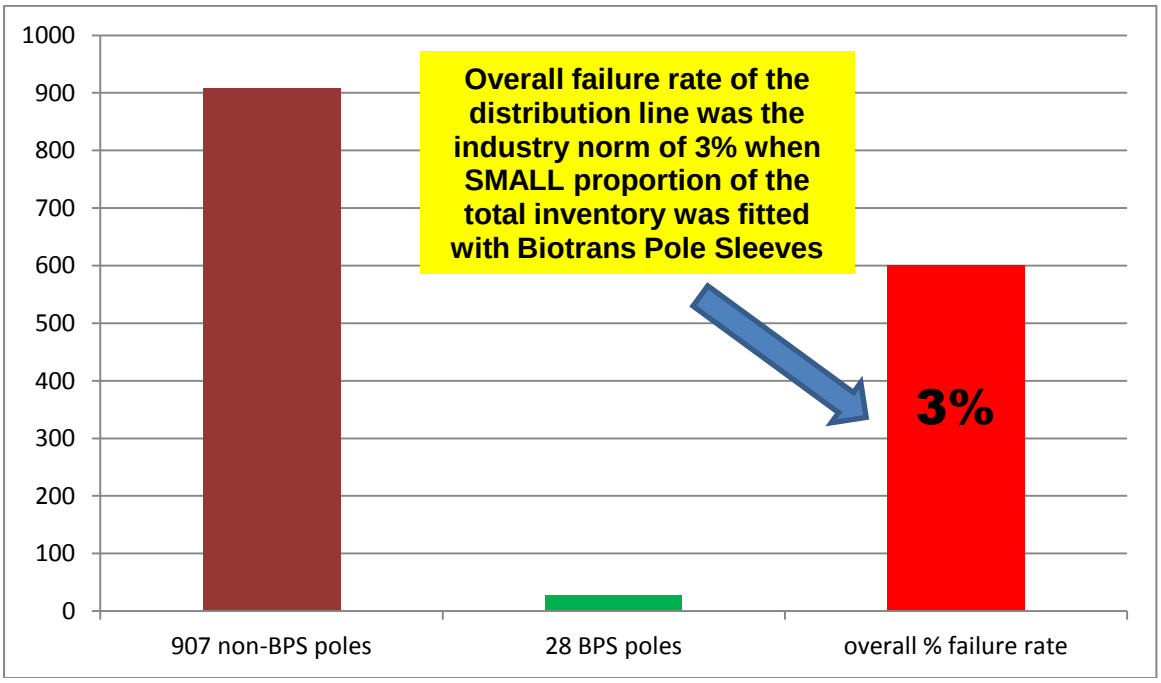

Figure 1a: Eskom-approved inspectors' findings in 2005 on Richmond Beaumont NB 63 distribution line after 10 years' service: overall failure rate among all 935 poles was 3% (although the failure rate among the 28 BPS poles was 0%)

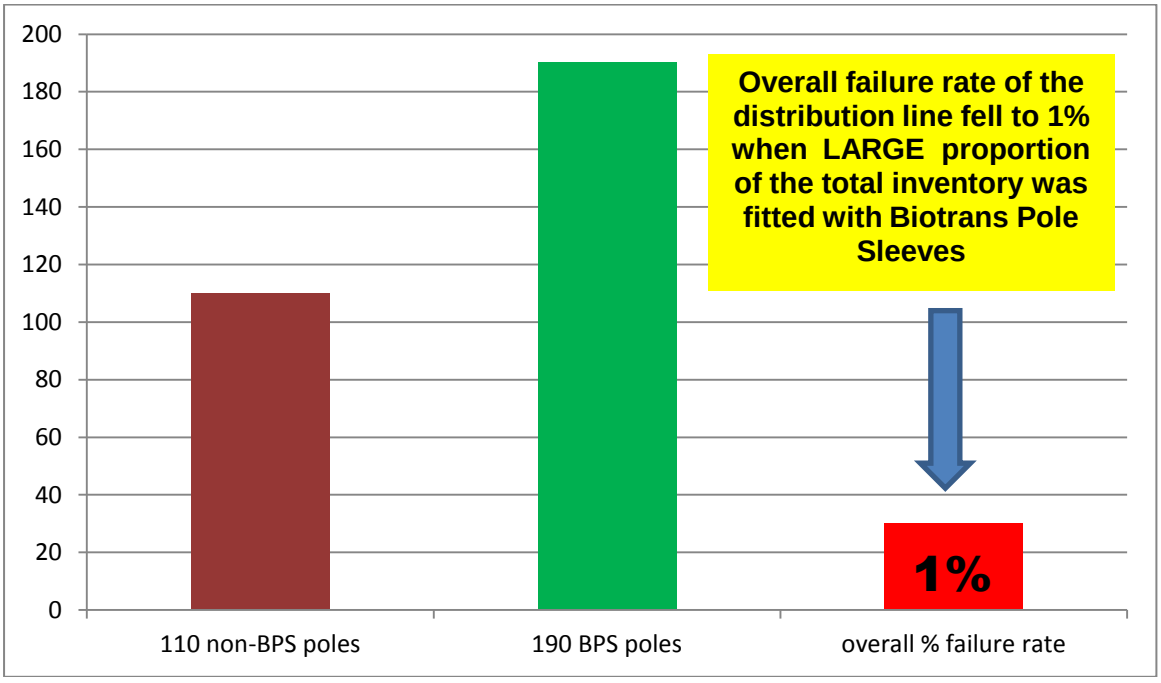

Figure 1b: Eskom-approved inspectors' findings in 2005 on Richmond Beaumont NB 22 LV distribution line after 10 years' service: overall failure rate among all 300 poles was 1% (although the failure rate among the 110 non-BPS poles was the normal 3% while among the 190 BPS poles only 1 of them had not become a Class 1 pole)