



BRITISH-AMERICAN TOBACCO COMPANY LIMITED

TO: Gerry Arthurs
REF: GAR/pr
FROM: Graham Read
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SUBJECT: Technical Summary in Support of T&A fees
recovery from Pakistan

(i) Biological Research and Information

The BTC undertakes research and maintains a scientific resource base and expertise to ensure that all materials and additives used by the Group in the processing of tobacco and manufacture of cigarettes meet current and future internationally accepted standards for use. This includes the provision of advice on the application and use of agrichemicals used in the production of tobacco for and on behalf of the Company. The R&D Centre funds and monitors external research in response to the S&H issues management. The Centre provides a technical service to ensure that all operating companies can maintain the highest standards of leaf and factory hygiene consistent with company policy.

(ii) Product Research

The BTC undertakes novel and innovative research into cigarette design and the product's physical performance characteristics. This includes filter, cigarette paper, ventilation and all cigarette design variables including leaf blending know-how that is utilized in the continuous improvement of the product and to ensure that the operating company maintains its competitive position. The Company holds a wide portfolio of patented know-how in this area which is available to operating companies. There is a specific 1:1 link between the BTC and each operating company to ensure technology transfer.

(iii) Smoker Research

The R&D Department undertakes research to determine how cigarettes are physically smoked by the consumer and to determine the relationship between product sensory attributes and its perceived smoking quality. This area of activity is underpinned by leading edge chemosensory research and involves the use of consumer and panel assessment techniques, statistical methodology development and behavioural science and electronic data recording system, innovation and development.

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(iv) Process and Engineering Research

The R&D Department has undertaken in excess of 25 years research into the processing of tobacco and manufacture of cigarette products. These include stem processing technologies to achieve cost and quality improvements in the finished product, cutting, drying and casing technological development and process optimisation. R&D has been involved in the development of technologies for expanding tobacco to improve its fill value as well as investigate the aspects of the primary processing techniques that impact on product, physical and smoking qualities. R&D is responsible for analysing and resolving local operating company processing and manufacturing difficulties and providing innovative solutions to defined problems. An R&D process for processing whole leaf is currently being evaluated to overcome GLT processing limitations. R&D department has a wide portfolio of patented technologies currently available to operating companies which is transferred via the R&D operations liaison division.

R&D is responsible for advising, evaluating and developing technologies to satisfy the Company's policy on factory environmental practices including the control of gaseous emissions and any effluent discharge.

(v) Smoking Material Research

The R&D department is actively involved in cost reduction measures during the use of extrusion techniques used in waste tobacco management. These techniques are covered by patents and available for use by operating companies. In addition, work is being conducted to develop and improve the smoking quality of products through the use of reconstituted tobacco sheet techniques and treatments. A series of novel materials are being studied as a means of enhancing smoking quality in low delivery products.

The R&D work programme is formally revised and agreed annually and progress is reviewed and reported each six months in the form of status review notes that are available to operating companies. All R&D departmental projects are formally reported on completion and form the basis of our know-how and technology resource for the group.

G.A. Read

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