

## Form of Written Discussion at the 26th ITTC Conference

<b>Discusser:</b>	
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<b>Affiliation</b>	

<b>Name of Technical Committee or Group to be discussed</b>	Resistance Committee
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**Written Discussion** (within 1,000 words of length):

The comment by the committee that the uncertainty in form factor is more important than uncertainty in friction line is misleading. The study by Toki(2008) which showed that scatter in powering did not change appreciably with change in choice of friction line is not surprising since the same set of data was used with each line/extrapolator. The propulsion committee (p101) refer to work on uncertainty in powering (Bose&Malloy,2009) using a Monte Carlo approach that showed that uncertainty in powering was more sensitive to uncertainty in friction line. This is because variation in form factor changes the form factor increment above the friction line at model and full scale. A large percentage variation in form factor has less effect than the change in slope in friction line, the extrapolator, has on uncertainty in powering.

*Response:*

*While the committee agrees with Prof Bose that it is the slope of the extrapolator that determines the actual baseline skin friction at full scale this is a function of the actual extrapolation formula applied, which for the ITTC '57 line is fixed (and includes a built in value of form factor) and is thus certain. The measurement of form factor at model scale using a Prohaska type process or an alternative method will thus contain all the uncertainty associated both with the use of measurement and all the implicit scaling that assumes form factor has little dependence on Reynolds Number.*