


## Assessment Declaration

No.: ZW19104.02-ver02

<b>Issued to</b>	<b>Wölfel Wind Systems GmbH</b> Max-Planck-Straße 15 97204 Höchberg Germany				
<b>Issued for</b>	<b>Procedure of "SHM.Tower" for determining wind turbine tower loads used for life-time extension assessment</b>				
<b>Scope of assessment</b>	<ul style="list-style-type: none"><li>• Review of the procedure of deriving tower loads from tower top acceleration measurements</li><li>• Comparison of loads derived from strain gauge and SHM.Tower measurements (8 months) performed synchronously at an Enercon E70 wind turbine</li></ul>				
<b>Basis of assessment</b>	Evaluation Report for the review of the procedure of "SHM.Tower" for determining wind turbine tower loads used for life-time extension assessment, No. ZW19104.01-ver01, from 05.08.2020				
<b>Declaration</b>	<p>The damage equivalent loads derived by SHM.Tower for a position close to the tower bottom were validated based on synchronously determined loads from strain gauges. In the stationary tower coordinate system the damage is slightly underestimated by SHM.Tower:</p> <table><tr><td>Damage augmentation <math>D_{A,x}</math> for <math>M_x</math>:</td><td>0.941</td></tr><tr><td>Damage augmentation <math>D_{A,y}</math> for <math>M_y</math>:</td><td>0.987</td></tr></table> <p>A value of 1 would mean that the same damage as with the strain gauges would be accumulated.</p> <p>The procedure of SHM.Tower for determining damage equivalent loads is found to be plausible and to determine the damage equivalent loads according to this assessment in a reasonable degree of accuracy.</p>	Damage augmentation $D_{A,x}$ for $M_x$ :	0.941	Damage augmentation $D_{A,y}$ for $M_y$ :	0.987
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<b>Validity</b>	This assessment declaration will accompany the SHM.Tower system, assuming that no modifications in the system or functionality concerning the design or specification are performed and the quality management system is up-do-date.				

Varel, 29.10.2020



  
Dipl.-Ing. F. Weise