

# DIN ISO 22266-1:2024-08 (E)

## Mechanical vibration - Torsional vibration of rotating machinery - Part 1: Evaluation of steam and gas turbine generator sets due to electrical excitation (ISO 22266-1:2022, Corrected version 2022-08)

<b>Contents</b>		<b>Page</b>
National foreword .....		3
National Annex NA (informative) Bibliography .....		4
Foreword .....		5
Introduction .....		6
<b>1</b> <b>Scope</b> .....		<b>7</b>
<b>2</b> <b>Normative references</b> .....		<b>7</b>
<b>3</b> <b>Terms and definitions</b> .....		<b>7</b>
<b>4</b> <b>Abbreviated terms and symbols</b> .....		<b>10</b>
4.1    Abbreviated terms .....		10
4.2    Symbols .....		10
<b>5</b> <b>Shaft train modelling and uncertainties</b> .....		<b>11</b>
5.1    General .....		11
5.2    Modelling of the shaft train and the electrical system .....		11
5.2.1    General .....		11
5.2.2    Elastic blade modelling .....		12
5.2.3    Modelling generator rotor windings .....		12
5.2.4    Grid/excitation modelling .....		12
5.2.5    Damping modelling .....		13
5.2.6    Gear box modelling .....		13
5.2.7    Flexible coupling modelling .....		13
5.3    Design element uncertainties .....		13
5.4    Determination of calculation uncertainties .....		14
<b>6</b> <b>Shaft train evaluation</b> .....		<b>15</b>
6.1    General .....		15
6.2    Natural frequency assessment .....		17
6.2.1    General .....		17
6.2.2    Torsional frequency margins .....		19
6.2.3    Natural frequency criteria .....		20
6.3    Stress assessments .....		22
6.3.1    General .....		22
6.3.2    Expertise criterion .....		23
6.3.3    Stress/fatigue criterion .....		23
<b>7</b> <b>Calculation of shaft train torsional vibration</b> .....		<b>23</b>
7.1    General .....		23
7.2    Calculation data .....		23
7.3    Calculation results .....		24
7.4    Calculation report .....		24
<b>8</b> <b>Measurement of shaft train torsional vibration</b> .....		<b>24</b>
8.1    General .....		24
8.2    Method of measurement .....		24
8.3    Measurement report .....		25
<b>9</b> <b>General requirements</b> .....		<b>25</b>
9.1    Supplier and customer responsibilities .....		25
9.2    Acceptance criterion .....		26
<b>Annex A</b> (informative) <b>Torsional vibration measurement techniques</b> .....		<b>27</b>
<b>Annex B</b> (informative) <b>Frequency margin examples relative to grid and twice grid frequencies for shaft train modes</b> .....		<b>38</b>
<b>Annex C</b> (informative) <b>Commonly experienced electrical faults</b> .....		<b>40</b>
<b>Bibliography</b> .....		<b>44</b>