$$A(t) =$$ (1.60)

$$\boldsymbol{B}(t) = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}, \quad \boldsymbol{z}(t) = \begin{pmatrix} \dot{m}(t) \\ \dot{\bar{\boldsymbol{q}}}_{\mathrm{B/A}}(t) \\ \dot{\bar{\boldsymbol{q}}}_{d_{\mathrm{B/A}}}(t) \\ \dot{\bar{\boldsymbol{\omega}}}^{\mathrm{B}}_{\mathrm{B/A}}(t) \\ 0 \\ \dot{\bar{\boldsymbol{\nu}}}^{\mathrm{B}}_{\mathrm{B/A}}(t) \\ 0 \\ \dot{\bar{\boldsymbol{F}}}^{\mathrm{B}}(t) \\ 0 \\ \dot{\bar{\boldsymbol{T}}}^{\mathrm{B}}(t) \\ 0 \\ \ddot{\bar{\boldsymbol{F}}}^{\mathrm{B}}(t) \\ 0 \\ \ddot{\bar{\boldsymbol{T}}}^{\mathrm{B}}(t) \\ 0 \end{pmatrix} - \boldsymbol{A}(t) \begin{pmatrix} \bar{m}(t) \\ \bar{\boldsymbol{q}}_{\mathrm{B/A}}(t) \\ \bar{\boldsymbol{q}}_{d_{\mathrm{B/A}}}(t) \\ \bar{\boldsymbol{\omega}}^{\mathrm{B}}_{\mathrm{B/A}}(t) \\ 0 \\ \bar{\boldsymbol{\nu}}^{\mathrm{B}}_{\mathrm{B/A}}(t) \\ 0 \\ \bar{\boldsymbol{F}}^{\mathrm{B}}(t) \\ 0 \\ \bar{\boldsymbol{T}}^{\mathrm{B}}(t) \\ 0 \\ \ddot{\bar{\boldsymbol{F}}}^{\mathrm{B}}(t) \\ 0 \\ \ddot{\bar{\boldsymbol{T}}}^{\mathrm{B}}(t) \\ 0 \end{pmatrix} - \boldsymbol{B}(t) \begin{pmatrix} \ddot{\bar{\boldsymbol{F}}}^{\mathrm{B}}(t) \\ 0 \\ \ddot{\bar{\boldsymbol{T}}}^{\mathrm{B}}(t) \\ 0 \end{pmatrix} \tag{1.61}$$

1.4.2. Virtual Control

Linearisation of the dynamics can lead to the introduction of infeasibility in the solution space even if the original nonlinear problem is feasible. This situation is called *artificial infeasibility*. This undesirable infea-