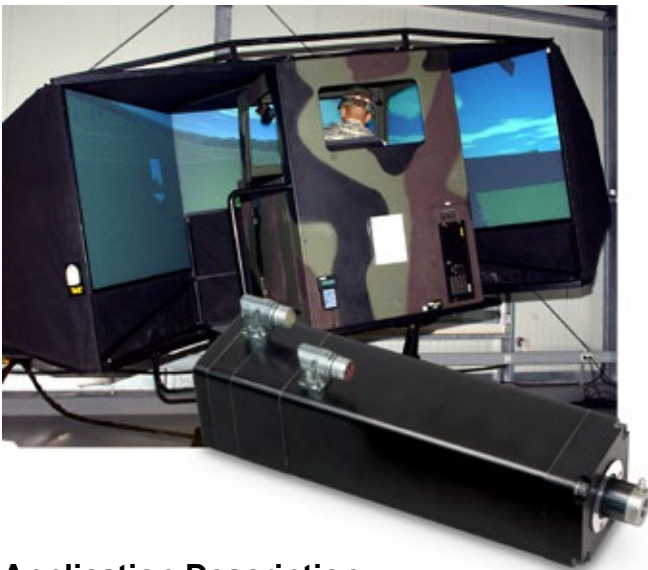


**APPLICATION SOLUTION: Motion Simulation**

**Product Family:** Electric  
**Product Used:** IMA Linear Servo Actuators  
**Product Type:** Modified Standard

**Application Requirements:**

**Stroke:** 25 mm (1")

**Acceleration:** 4Gs

**Thrust:** 4,448 N peak (1,000 lbf)

**Orientation:** Mounted at angle

**Application Description:**

High frequency motion simulation.

**Challenge:**

A manufacturer of motion simulator machines wanted to replace an existing hydraulic system with an electric actuator to simulate vibrations (frequencies from 30-50 Hz) and other disturbances experienced in real world situations in aerospace and defense applications. Although the hydraulics could achieve the aggressive high frequency moves, the hydraulic system tended to leak, require regular maintenance and could be too loud in the training environment. Additionally, the manufacturer required an electric actuator solution without the use of external cooling systems such as water or oil to remove heat from the actuator.

**Tolomatic Solution:**

Traditional rod style actuators require a motor coupling or a belt/pulley systems and can't achieve the required high frequency moves due to mechanical compliance issues. Tolomatic's IMA linear servo actuator design eliminates motor coupling with an integral roller screw and servo motor design which rigidly couples the two components enabling high frequency moves into one robust assembly. Additionally, the IMA44 servo actuator was tested in Tolomatic's engineering lab at the customer's specifications to ensure acceptable actuator temperature limits and lubrication intervals to meet the aggressive high frequency moves. Furthermore, with the compact design of the IMA, the customer was able to displace the hydraulic cylinder without major mechanical design differences.

**Customer Benefit:**

- High performance, highly dynamic electric actuator that could achieve the aggressive 30-50Hz cycle rate
- Longer life than traditional electric actuators utilizing roller screws and rigid screw / servo motor coupling
- Replacing hydraulics eliminated leaks, minimized maintenance and significantly reduced noise