CNC Router End of Shift Shutdown and Cleanup Procedure

1.0 Maintenance Objective & Frequency

The objective of this procedure is to perform a systematic end-of-shift shutdown and cleanup of the CNC router to prevent dust and debris accumulation on critical components, reduce spindle bearing contamination, and ensure the machine is ready for the next shift. This PM is to be performed at the end of every shift or after the last production run of the day.

2.0 Lockout/Tagout (LOTO) & Safety

- Electrical Isolation: Turn off the main disconnect switch and apply a personal lockout tagout device. Verify zero energy state with a voltmeter.
- Pneumatic Isolation: Close the main compressed air supply valve and bleed residual pressure from the system using the manual bleed valve on the regulator.
- Mandatory PPE: Safety glasses, cut-resistant gloves, and a dust mask (N95 minimum) to protect against fine wood dust or composite particles.

3.0 Required Tools, Parts & Lubricants

- Industrial vacuum with HEPA filter and crevice tool attachment
- Lint-free microfiber cloths (pack of 10)
- Isopropyl alcohol (99% concentration) in a spray bottle
- Spindle bearing grease (OEM specified, e.g., Mobil Polyrex EM)
- Small brush (1-inch nylon bristle brush)
- Torque wrench (0-30 Nm range) with appropriate bit
- Personal lockout tagout kit (lock, hasp, tag)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO: Turn off the main disconnect switch, lock it out, and tag it. Close the compressed air supply valve and bleed the pneumatic system. Verify zero energy state.
2. Remove all tooling from the spindle collet. Use a wrench to loosen the collet nut and remove the cutting tool. Clean the collet and collet nut with a lint-free cloth and isopropyl alcohol.
3. Vacuum the machine table and T-slots thoroughly, removing all chips, dust, and debris. Pay special attention to the T-slot channels and any threaded inserts.
4. Vacuum the spindle housing and motor vents. Use the crevice tool to remove dust from the cooling fins and fan intake area. Do not blow compressed air into the spindle as it can force debris into bearings.
5. Clean the linear rails and ball screws using a lint-free cloth lightly dampened with isopropyl alcohol. Remove all accumulated grease and debris. Inspect for any nicks or damage.

6. Apply a thin, even coat of spindle bearing grease to the collet taper and the inside of the collet nut. Do not over-grease; a single drop is sufficient.

7. Inspect the dust shoe and brush skirt. Remove any tangled chips or debris. If the brush skirt is worn or missing bristles, replace it per OEM specifications.

8. Check the coolant or mist lubrication system (if equipped). Ensure the nozzle is clear and the fluid level is adequate for the next shift. Wipe any coolant residue from the machine surfaces.

9. Close and secure all access panels and doors. Ensure the machine is in a clean, dry state. Remove LOTO devices only after confirming all personnel are clear.

5.0 Verification & Return to Service

1. Restore power and compressed air. Remove LOTO devices and re-energize the machine.

2. Perform a dry run: Home the machine axes and jog through the full travel range at 50% rapid speed. Listen for any unusual noises from the spindle or linear motion system.

3. Run a test program on a scrap piece of material to verify spindle operation and tool change (if applicable). Confirm that the dust extraction system is functioning properly.

4. Sign off on the PM work order in ServiceGrid, noting any anomalies or parts that may need replacement before the next scheduled maintenance.