A qualified user should be able to:

- Identify personal safety hazards associated with the tool and what precautions are taken to prevent an accident from occurring.
- Identify hazards to the tool and what precautions are taken to prevent an accident from occurring.
- Operate the tool safely and proficiently.
- Recover from simple errors.
- Demonstrate knowledge of the processes performed with the tool.

PHILIPS 525SEM

- **Personal Safety Hazards**
  - **Radiation** - This equipment can produce low levels of radiation. Do not operate tool if any covers are not in place.
  - **High Voltage** - The SEM employs voltages that are dangerous and may be fatal to personnel. Do not attempt to defeat protective interlock systems.
  - **Mechanical Hazards** - Drive assemblies in the chamber have sufficient power to cause injury. Keep hands, fingers, clothing and tools clear of moving parts.

- **Hazards to the Tool**
  - **Sample Loading** - Use caution when loading samples in the chamber. If the sample is loaded too high, it may damage the final aperture. When the sample stage is pushed in, be careful not to hit the screen that covers the detector.
  - **Stage Operation** - The stage is a manual stage. Always make small adjustments and then refocus on the sample. Check the working distance each time the stage is moved to ensure the sample does not damage the final lens.
  - **Contamination** - No SU8 is allowed in the SEM. Other organic materials need staff approval, require a lower kV setting and a gold coating. No adhesives are allowed in the chamber except for the carbon pads and carbon paint. Other adhesives will contaminate the column and damage the tool. Gold coated samples should not be used in other process equipment or the cleanroom.
  - **Chamber Vacuum** - Do not open the V1 valve until the green vacuum ready light illuminates and V1 flashes on Panel 9. Always close V1 before turning off the console and never leave V1 open when the tool is unattended.

- **Operating Tool**
  - A qualified user should be able to:
    - Prepare a sample (mount to stub, gold sputter)
    - Vent the chamber and load a sample
    - Pump down the chamber
    - Obtain an image
    - Optimize the image
    - Capture an image
    - Shut the tool down
    - Remove a sample
    - Fill out log sheet
  - Reservations - If not present at stated start time, tool is reserved for 15 minutes and is then considered open for general use.
- **Simple Errors**
  - Call equipment engineer if any problems are encountered.

- **Processes**
  - Qualified users should have knowledge of the general theory of operation.

- **Appropriate Uses of the Tool**
  - Avoid contaminating the column- only approved samples may be used.
  - No out-gassing materials such as adhesives are allowed.
  - Organic materials must be coated with gold.