**MACHINE PHASE**

**Laboratory Experiment #5**

**Procedure:**

In a radiology department with both phases of equipment, make three exposures as listed below on a knee or skull phantom, using a 400-speed screen in the Bucky tray. Determine a good technique and list it below for a single-phase machine. When changing to a three-phase machine, be sure to use the same collimation, distance, speed, and focal spot size. Label your films.

Phantom Used: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Film #1: Single-Phase Technique: \_\_\_\_\_ mAs at \_\_\_\_\_ kVp

Film #2: Three-Phase Technique: \_\_\_\_\_\_ mAs at \_\_\_\_\_ kVp

Film #3: Three-Phase, One-Half mAs: \_\_\_\_\_ mAs at \_\_\_\_\_ kVp

**Analysis:**

Select a fairly homogeneous, small area on the phantom image and circle it on each film. Using a densitometer, measure the density on each and record it. (Note: Film #1 is recorded second in the middle.) Calculate the density change ratio by dividing the Film #1 density into the other two, and record.

1. Note the change ratio between Film #1 and Film #2. On Film #2, did density increase or decrease when changing from a single-phase to a three-phase machine?
2. Note the density change ratio between Film #1 and Film #3. On Film #3, did cutting the mAs to one-half, when changing to a three-phase machine, restore the density to within 25 percent of the original single-phase density?
3. What rule can you make for maintaining radiographic density when changing from a single-phase to three-phase machines and vice versa?
4. Can you visually detect a difference in contrast between Film #3 and Film #1? If so, circle it. (You may take actual measurements if you wish.)
5. Can you detect any change in sharpness of detail between Film #1 and Film #3.
6. Select two or three procedures from the technique charts for each machine and compare the total technique from the single phase to the total technique from the three phase (suing the 15 percent rule to adjust for kVp differences). Do the charts roughly follow the rule you wrote in Question #3?