1.0 PURPOSE:

The Locus Ultra provides high quality images with contrast-to-noise, resolution and dose performance optimized for preclinical imaging. It is controlled by a flat-panel VCT that acquires real-time images of a specimen. The images are then acquired and reconstructed on a host console that is connected to the flat-panel VCT.

2.0 SCOPE:

-ask Jen- about her training. X-ray Awareness training? Biosafety?
The flat-panel VCT is a permanent part of the Locus Ultra CT scanner. Operations of the flat-panel VCT are confined to an X-ray operation area. Only someone who has had proper X-ray training can operate it in the midst of a scan inside the operating area. The laboratory area where the scans are performed will vary between a Containment Level 1 or Containment Level 2 laboratory depending on the specimen being scanned. Analysis methods and techniques on full-resolution reconstructed regions of interest will not be outlined.

3.0 RESPONSIBILITIES:

Who is responsible for performing the work as described? Who is responsible for reporting the work? Are there special training or certification requirements? Name specific job titles of those ultimately responsible for this procedure being carried out effectively.
There is no special training or certification required unless the person is operating the flat-panel VCT during a scan when x-rays are being fired.

4.0 DEFINITIONS:

Explain any terms, acronyms, or abbreviations used that might not be commonly understood by a person new to procedure.

5.0 REFERENCES:

List any previously published procedures and/or documents used for guidance or reference material to assist in performing the SOP. List any applicable standards or codes of external origin to which the SOP applies.

6.0 MATERIALS and/or EQUIPMENT:

List any material/equipment that is required for the procedure. Examples include equipment, reagents, compounds, chemicals, disposables, etc. Pay particular attention to safety equipment needs.

7.0 PROCEDURES:

7.0.1 START UP

1. Right click to open new terminal window.

2. Type *vncviewer stator*.
3. Password: debug.
4. Double click on Runstc.bat.
5. Go to second workstation space and click on “vCT console” (or gnome icon) to open GUI interface.
6. Click on Login when prompted, listen for click (this turns the scanner ON, the noise will come from the scanner).
7. Click on *release interlock*.
8. Press the green lit Start button on the back of the scanner (this turns off the E-Stop sign).
9. On touch screen of scanner (Stc screen), click on register table (should stop at 450.0)
10. Put in specimen on scanner bed.
11. Click on Toggle laser and use Advance/Retract button to position specimen in the appropriate position (you can use the External or Internal laser mark).
    NOTE: The laser crosses at the middle of imaged object with ~2.5 cm on either side so total length of ~ 5cm.
12. After positioning, click on set External or Internal on the touch screen. Close door and goto host console outside scanning room.

7.0.2 SCANNING

1. Go to Scan subscreen and press select protocol to select the appropriate one.
2. If this is the first scan of the day or if the last scan was over 2 hours ago, a warm up is needed to condition the detector.
3. Select WarmUp from the protocol list and do 2x at 80kVp, 40mA, 2x at 80kVp, 60mA, 2x at 80kVp, 200mA.
4. For anatomical scans, select 4 second (600 views, 300 slices) or 8 second (1000 views, 360 slices).
5. For perfusion scans, select 1 second (416 views, 80 slices) or 2 second (512 views, 120 slices).
6. Run a scout scan, scan will show up on right screen.
7. Click on the cross (+) in the middle of the scout box to move it so that it covers the area to be scanned.
8. Click on *Confirm all ROI’s*.
9. Perfusion scans need to be conditioned beforehand, 2x at 80kVp, 60mA, 1x at 80kVp, 200mA, in order to saturate the detector.
10. Also for perfusion scans, do a Bright Dark scan right after conditioning and do the actual perfusion scan right after that.
11. Run a bright-dark scan at the **same** kVp and mA as the sequence to be scanned at (record the file name as this will be needed for reconstruction).
    NOTE: For anatomical scans this can be done at the beginning or at the end of the experiment and only needs to be done once for each experiment.
12. Run anatomical/perfusion scan (record the file name as this will be needed for reconstruction)
13. Click on wanted sequence, then confirm sequence, and press Start scan button on keyboard when lit.

7.0.3 RECONSTRUCTION

1. Go to Reconstruction subscreen and click on Update.
2. Select the scan to be reconstructed and the respective bright-dark scan.
3. Click on the + besidce the directory of the scan to be reconstructed and then click on Default.
4. Details of the reconstruction are shown on the right panel, which can be changed if necessary.
5. Half FOV means only the middle 512x512 pixels will be reconstructed at 0.15mm pixel size.
6. Half resolution means the whole 1024x1024 pixels will be reconstructed at 0.30mm pixel size.
7. Then click on Start to start reconstruction, this will prompt for a name for the study (do not include any spaces in the name!!!)
8. The study being reconstructed should appear in the queue window, additional reconstructions can be added to the queue in the same manner as described above.
9. If the recon queue locks up or to kill a reconstruction in the queue, login to the recon cluster by typing in a terminal window: slogin recon
10. Password: vct
11. Type: ps –ef | grep lam
12. Find the number of /usr/bin/lamd and then type: kill ##### (of /usr/bin/lamd).
13. To check on the reconstruction progress, g to a new empty workstation space and open a new terminal
14. Go into /vol/data/vct/2004_10_07…(scan file) directory and then into the directory you named the reconstruction under, type ls.
15. This lists all the slices that have been reconstructed so far.
16. When the reconstruction is finished, the study should disappear in the queue window and Display Volume should appear on the GUI if the study is selected.
17. Click on Display Volume to view the reconstructed image on the right screen.

7.0.4 SHUT OFF/REBOOT

1. Right click on the bottom bar and click Task Manager
2. Click on Stc.exe and selected execute
3. Close Task Manager window
4. Go to the workstation with the GUI interface
5. Alt + tab until terminal window is showing.
6. Ctrl + C to close GUI window and terminal window.
7. Double click on Runstc.bat.
8. Start a new GUI interface and listen for click (this means the scanner has shut down).
9. Click Login when prompted.

7.0.5 TRANSFER TO GE AW

1. Go to Archive Tool subscreen and click on update.
2. Select the study to be transferred.
3. Host name is 192.168.12.100.
4. AE Title is preclin-aw2.
5. Exam ID has to be unique number (i.e. can’t be one that already exists on the GE AW)
6. Enter Series number (this can be anything).

7. Click on Start to start transfer.
8. Transfer status shows how many slices have been transferred so far.

7.0.6 LOADING IMAGE INTO MICROVIEW

1. Go to File and select Import image…
2. Select the scan that you want to view, double click on the reconstructed directory (whatever name you gave it when reconstructed), then double click on the slice0000.dat (this fills in all the parameters in the box).
3. Change x, y, z spacing to 0.15.
4. Select raw data, change to signed short, change to 512x512 if the scan was reconstructed at 512x512.
5. Click on import (this takes a while since these scans are quite large)

7.1 DETECTION LIMITS:

Upper and lower control limits, if applicable.

7.2 SAMPLE STORAGE AND HOLDING TIMES:

How shall time limits be monitored and maintained? By whom?

7.3 RISKS TO PERSONNEL AND PRECAUTIONS FOR RISK REDUCTION:

7.3.1 Always wear appropriate protective clothing for the protective clothing.

7.3.2 Commonly encountered difficulties or errors, situations that can increase the danger to personnel.

7.4 ANALYSIS:

7.4.1 Data analysis: what values will be collected and how will they be used?

7.4.2 Step by step analytical procedure.

7.5 CALCULATIONS:

State method of making any calculations in the procedure. Provide examples of calculations where appropriate.

7.6 ACCEPTANCE RANGES:

List specifications, limits, requirements or acceptance criteria.

7.7 CONTINGENCIES:

List any anticipated problems that may arise and course of action to be taken, including person (by job title) to consult when each contingency arises.

8.0 REPORTING AND DOCUMENTATION:

List information required for report, method of recording, and name and numbers of form(s) to use. Information may include the results of positive and negative samples, standard

preparations, calibrations, and equipment monitoring values – that is, any controls that help to ensure that the procedure was performed as specified.

9.0 REVIEWS AND REVISIONS:

This procedure shall be reviewed for compliance and effectiveness and revised as necessary (or at a specified interval).

10.0 ATTACHMENTS and REFERENCE FORMS:

List attached documents, manuals, sample forms, etc. in the following format:

ATTACHMENT A. (Name)

ATTACHMENT B (Name)