Next Activity Report: 8/30/13

I. Summary of the INRF and BiON Facility Infrastructure Issues:
For the last three years the INRF has had various infrastructure issues.  Ranging from Power, Chill water, Compressed air, and exhaust problems.  The most recent issue occurred last April when an odor was smelled which was caused by Aluminum etch.  The INRF was shut down for a period of time to investigate the problem.  EH&S and Facilities had consultants look into the problem.  It was determined the exhaust was inadequate, meaning insufficient exhaust flow.  Some of the chemical laminar flow hoods that deal with hazardous materials such as acids were de-activated.  This process has been moved to the BiON after repair and certification.  These benches are Laminar flow chemical benches.  Users have been trained, as there is a new standard operating procedure, now that the Laminar flow has been activated.  The HF bench also has an HF monitor installed.

The INRF and BiON had been dealing with humidity issues the last few months.  In the INRF the humidity was so high the smoke detectors were going off.  The percentage was over 70%.  Some of the components are experiencing build up of Oxide or rust and causing the tools to fail.  In the BiON in some areas the humidity was over 65% and the humidifier reservoirs would overflow and leak from the ceiling and in some cases onto lab equipment or very close.  Recently facilities replaced the make-up water that was industrial water with water softener water to remove the alkaline build up from the water so the Alkaline will not affect the valve components.  They are also planning to fabricate over flow pans in case the drain valves fail.

EH&S and consultants have reviewed the SOPs and chemicals used for Lithography and electroplating processing.  Permission to restart these processes was given.  As for bringing all the benches back online in the INRF, I met with facilities and the design firm is presently working out the design issues.  The contractors are planning to start the interim fix the first of December and finish the second of January 2014.  This work will impact portions of the lab periodically.  The completion of this project is planned for the end of April 2014.  This project will also include and improve the CDA (clean dry air) that support the pneumatics on various tools in the INRF.  Presently the pneumatics has water and oil in the system, which is causing the evaporators, aligners and sputtering systems to fail.

II. Action Lab Infrastructure Equipment Upgrade:
Started on the upgrade for the STS August 5th.  Replaced the Turbo model TB 900 to a turbo TB 1500 due to no longer manufacturer support for the TB 900.  Finished installing the pump by the end of the week.  Established base pressure and ran etch processes.  Will be installing the Trinity operating system starting August 12th.  If everything goes well we should be verifying existing recipes the week of the 19th.  If no major changes need to be made the tool should be available on August 21st.

Installing temperature controlled distilled chill water system for the new STS oxide etcher located in the BiON.  This system will be duplicated in INRF to give us the capability of a set point and improve conductivity of the chill water.  This will reduce build up of condensation on high voltage RF lines and contamination within the cooling system and arcing.  Installing various components to give computer visibility for system condition.
III. Regular Equipment Updates

Summary for the INRF Clean Room
All metal evaporation and sputtering systems
CHA E-beam 1 is UP:
CHA Mack 50 is UP:
CHA E-beam 2 is DOWN: System under repair pneumatic issues due to water and oil contamination. High voltage power supply needs looked into for E-GUN.

Thermal evaporator in STAND-BY:
PE 2400 A sputter (dielectric) in STAND-BY:
PE 2400 B sputter (metal) is DOWN: The J-arm has a water leak inside the chamber, needs to be located and repaired.

Lithography Aligners
FEI E-beam writer is DOWN: System column and Ion pumps need baked out for regeneration due to power interruption.
MA6 is UP:
MJB3 Off Line:
Quintel Off Line:
Kasper is Off Line:
Oriel Flood exposure system is DOWN: Due to high voltage power supply issues. Repaired need installed.
Cannon i4 Stepper staff tool is Off Line: Shut down due to CDA contaminated with oil and water. Concern for optic and air bearing being damaged.

Lithography Ovens
Soft and Hard Bake Ovens are all is UP:
Yes HMDS Oven is UP:
Photoresist Spinners are all UP:

Ashers
Technics 500 II Plasma Asher system is DOWN: Problems with RF power supply will not generate a plasma.
Gasonics L3500 Plasma system is UP:

PECVD
PlasmaTherm PECVD is UP:
BMR PECVD low-T nitride/oxide staff tool is DOWN: Having software or hardware issues. Will not vent properly.
Anicon 150mm low-T nitride/oxide staff tool is DOWN: Experiencing high temperature problems. Heating element okay, slave and set point controllers working properly. Looking at low voltage Interface cards that drive the high voltage power supply for the heating elements.
EasyTube 3000 First-nano Furnace is UP:
ASM- LPCVD System:
Nitride tube – Off-line.
Poly tube – Off-line.
Needs new operating system
Oxide tube – Off-line.
Cambridge Nanotech (ALD) System is UP:
RIE
Plasma Therm RIE is UP:
STS ICP staff tool is UP:
TRION ICP/RIE is UP:
XeF2-Etching System is DOWN: Mechanical pump out for repair. Will be set up for synthetic oil. ECD – 8/15/13
Ion Milling System is DOWN: Experiencing gun power supply issues. Low emission current. No ECD.

SEM
Hitachi S-4700 SEM is DOWN: System column and Ion pumps need baked out for regeneration due to power interruption.
Hitachi S-520 is off-line:
Tool is not being used.
K&S 780 dicing saw is DOWN: Spindle flange damaged. Sent out for repair, received 8/7/13. Needs installed and system checked out. ECD 8/16/13
Tempress 602 Dicing saw is DOWN: alignment problem with blade and stage. No ECD.

Furnaces and Ovens
Wet Oxidation Tube is UP:
Dry Oxidation Tube is UP:
Boron Diffusion Tube is UP:
Stabilization Tube is UP:
Long Anneal Tube is UP:
Sinter Tube is UP:
Mini Brute Tube is UP:
RTP Rapid Thermal Process is off line: Due to chill water pump needing replaced or repaired. No ECD
Blue M Oven GS 600c Inert Oven is DOWN: system will not operate at high temperature. Either the heating element or controller is not engaging. Operates at low temperature but ramp rate slow.
Blue M Oven SPX 400c Inert Oven is UP
Lindberg Nanotude furnace is UP:

Wire Bonders
K&S 4124 Ball Bonder is UP:
MECH-EL TU-907 Wedge bonder is UP:
MECH-EL 827 Ball Bonder is UP:
Bond Strength Tester Microtester MCT22 is UP:

Characterization tools
Dektak 3 Profilometer is UP:
Dektak XT Profilometer is UP:
Ellipsometer Gardner is UP:
Ellipsomter Ruddph Auto El is UP:
Filmetrics Thin-Film Analyzer is UP:
Stress Measurement Tencor is UP:
H-S Optical Profiler 150 OP is UP:
Summary for the BiON Clean Room

All metal evaporation and sputtering systems
CHA E-beam Model SCL-600-RAP Tool needs to be installed
MRC sputter (metal) Model 8667 Tool needs to be installed

Dielectric Evaporation
Parylene Evaporator Model PPS 2010 is UP:

Molecular Vapor Deposition
Applied (MST) MVD 100 is UP: Just finished installing re-circulating pump on chiller unit 8/6/13. Dry pump failed due to high temperature. Need to install flow and temperature sensors that will shut down dry pump if chiller fails. Fortunate dry pump did not get damaged.

Aligners Lithography
Karl Suss Mask Aligner Model MA56 is UP:
AB&M Flood exposure system is UP:
Quintel Mask Aligner BiON is UP:
Angtech LTD Model SP100 Plasma Asher system is UP:
Laurel Spinners for SU-8 and Photoresist are all UP:

Lithography Ovens
Soft and Hard Bake Ovens all UP:
Vacuum Oven UP:

Ashers
Harrick Plasma asher is UP:
Anatech LTD-SP100 Plasma Asher is DOWN: Timer on system malfunctioning. Ash time cannot be lengthened or shortened. Needs replaced.
Technics II 500 is DOWN: Power supply for RF will not start up when required. Communication error.

PECVD System
Tylan 1000 PECVD system BiON Tool needs to be installed.

Dry Etching System
Plasma Technology Model 800-MP-RIE Tool needs to be installed.
Plasma Technology Model DP-800-UP Deep RIE Tool needs to be installed.

Ablation Tool
Resonetics RapidX250 Ablation laser off Line: Due to the chiller removed and reinstalled on the Nanoimprinter.

Embossing Tools
Jenoptik HEX03 Nanoimprinter is UP:
AIT Pressing Equipment Model 1210P is UP:
GEO Knight Pressing Equipment is UP:

Cell Culture Tools
Forma Scientific CO2 water Incubator is UP:
Laminar Flow Bio hoods are UP:

Characterization tools
Dektak 3 Profilometer is UP:
Alpha-Step 200 Profilometer is UP: