

Meeting Agenda: P11411

Meeting Location:	Kelly Room
Date:	4-8-11

Attendees:		Attendees:	
Sergey Chiripko		Wayne Evans	
Kelsey McConnaghy		Allison Schneider	
Andrew Thistle		Dylan Connole	
Gerry Garavuso		Dr. Ed Hensel	

Y=Attended; A=Absent; E=Excuse

Meeting Objective:

Update Customer and Guide on MSDII Progress and Status

Meeting Agenda:

1. Update on Conferences (AMSE Old Guard and upcoming ASEE) - Dylan, Sergey, Andy
2. Status of Orders (BOM) - Sergey
3. Theoretical Models - Team
4. Options for Solar Collection - Kelsey
5. Manufacturing Plans - Andy, Wayne
6. CPC Assembly – Team

Meeting Discussion:

	Item	Summary of Discussion	Actions Required
1	Update on Conferences (AMSE Old Guard and upcoming ASEE)		
2	Status of Orders (BOM)		
3	Theoretical Models		
4	Options for Solar Collection		
5	Manufacturing Plans		

6	CPC Assembly		
7			
8			

Round Table Team Discussion:

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Additional Items/Notes:

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Theoretical Models

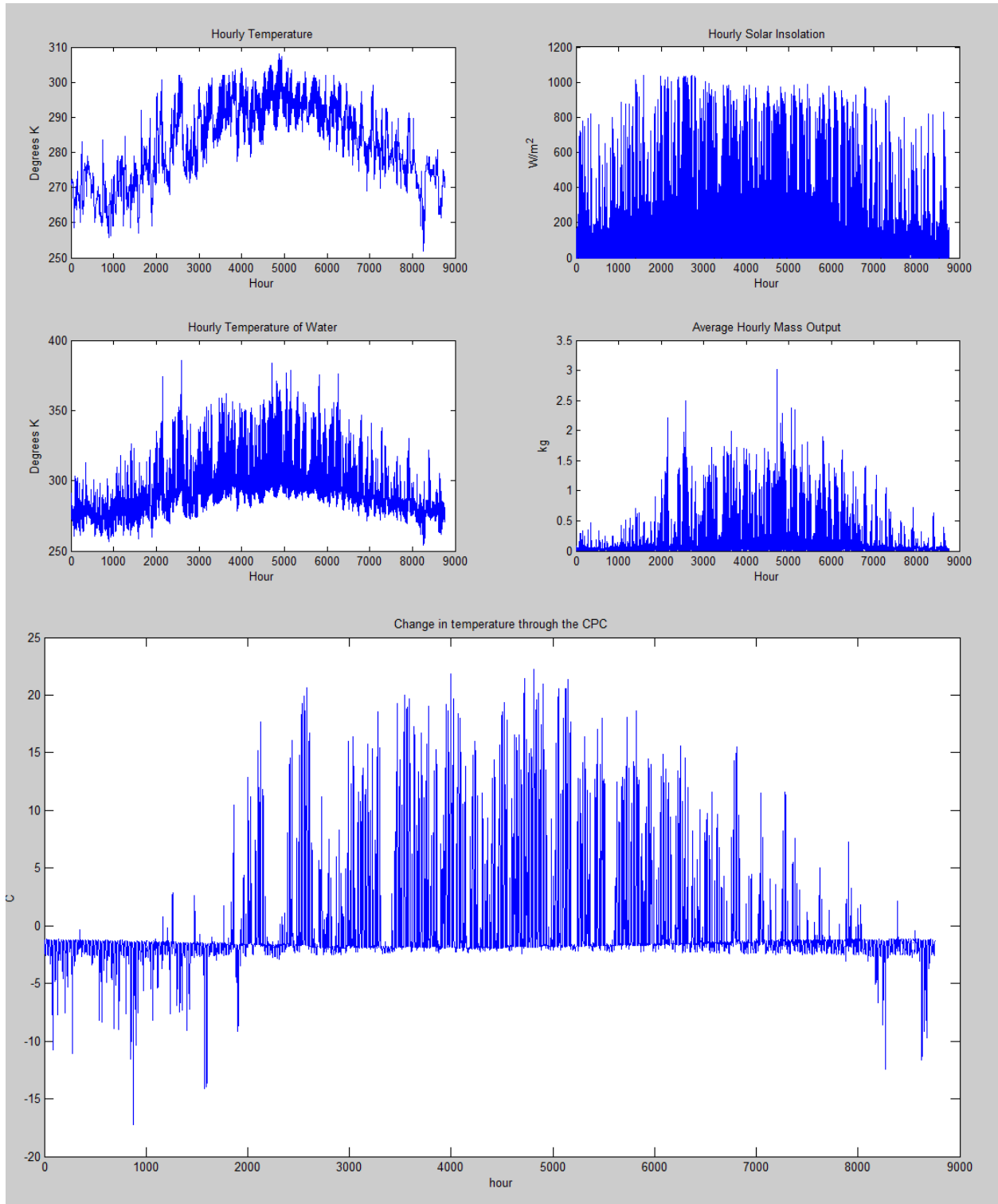


Figure 1. Combined Model Outputs Over a Year

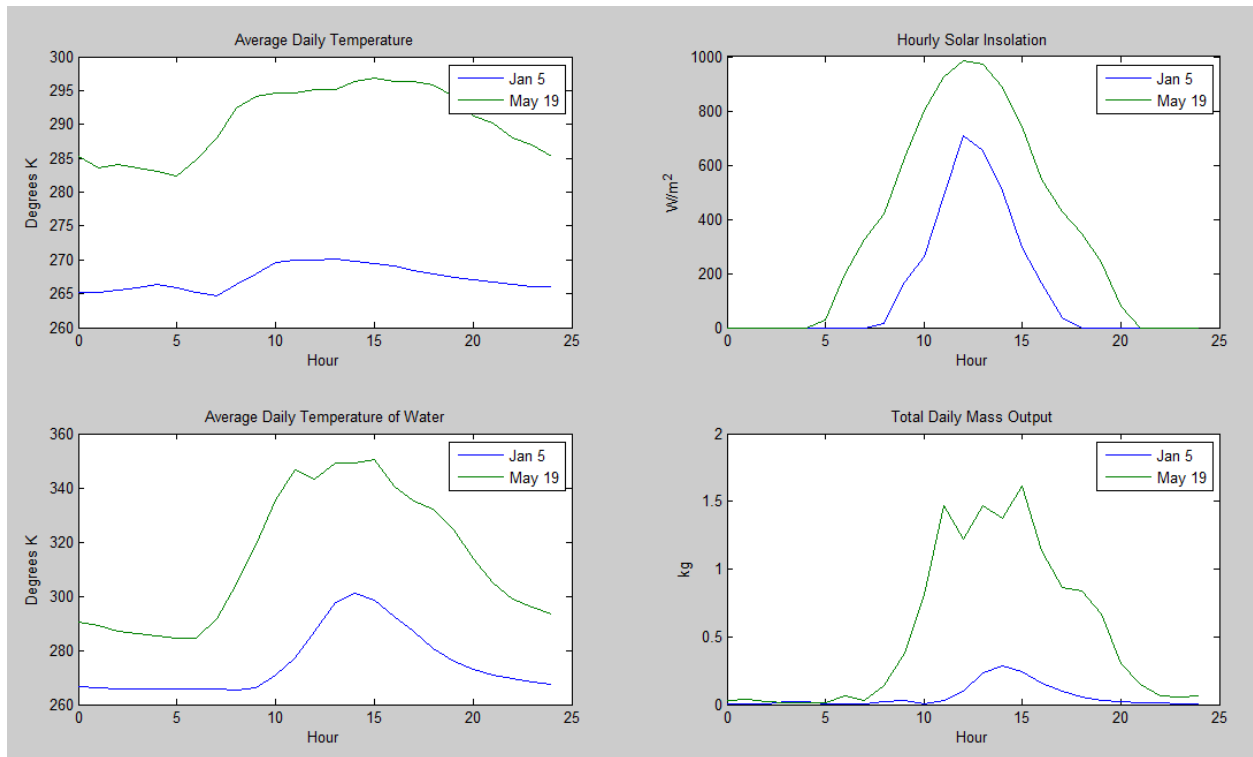


Figure 2. Daily Model Outputs

	Still Only	Still and CPC	% Diff
Average Mass Output per Day	2.5891	3.8845	50%
Mass Output Jan 5	1.4187	1.4187	0%
Mass Output May 19	6.2466	12.8307	105%

Table 1. Comparison of Still vs. Still and CPC

Manufacturing Plans

Solar Still

Solar Still Manufacturing Plan | 3/29/2011

Required Supplies

Require Materials

Material	Dimensions/Specifications	Quantity
304 Stainless Steel Sheet	20 gauge x 60" x 40"	1
Low Iron Glass	46"x34"	1
Through Wall Compression Fittings	½" Barb	5
Draw Latches	100 lbs compression	2
Neoprene Gasket Material	1/8"x1/2"x160"	Required Length
Nylon Strap Blocks	1"x.5"x.25"	6
Nut, Cap Screws, Washer/Sealing Washer Assembly	¼" x 20	20
Float Valve		1

Required Tools

Tool	Use
Sheetmetal Break	Bending Sheet to desired angles and sizes
Protractor	Ensure accuracy of Break
Utility Knife	Constructing the Neoprene Gasket
Caulking Gun	Sealing any gaps in still frame
Table Saw	Cutting acrylic accurately
Bandsaw	Cutting metal & acrylic components
Screwdrivers & Wrenches	Tightening chosen bolt assemblies

Pre Work

Assemble Neoprene gasket according to [\(SS Gasket\)](#)

Cut ratchet strap support triangles

Cut Acrylic Sides to size according to [\(SS ClearSides\)](#)

Use a removable adhesive to attach nylon blocks to glass according to [\(SS GlassCover\)](#)

Drill holes in SS angle according to [\(SS CornerAngle\)](#)

For Basin Sheetmetal Body Assembly

Cut necessary material for front (Component 1) of still and back (Component 2) of still per drawing (DRAWING #). Also cut Component 4, the collection trough, from provided material according to [\(SS_CollectionTrough\)](#)

Drill acrylic attachment holes in 2" lip on Component 3.

For basin still front(Component 1):

Set break to 90 degrees. Bend Component 1 front edge according to line [\(SS_Basin\)](#)

Set Break to 10 degrees. Bend Component 1 according line [\(SS_Basin\)](#)

For basin still rear (Component 2):

Set break to 10 degrees

Bend Component 2 according to line [\(SS_Basin\)](#)

Bend 2" sides of still basin on remaining sheetmetal (Component 3) [\(SS_Basin\)](#)

Assemble welding jigs and basin layout.

Weld Component 1 and Component 2 onto Component 3 according to [\(SS_Basin\)](#)

Test Location of ratchet strap supports. Weld ratchet strap supports in place

Drilling Auxiliary Holes & Adding Components

Mark pure water drainage hole (1/2") on both Component 4 and front of still (previously Component 1 according to drawing [\(SS_Basin\)](#)

Drill both holes and set Component 4 aside.

Mark and drill CPC Water Exchange Holes on front of still (Previously Component 1) according to [\(SS_Basin\)](#)

Tighten through wall compression fittings into CPC Water Exchange Holes

Mark and drill Float Valve Hole on rear of still (Previously Component 2) according to [\(SS_Basin\)](#)

Tighten Float Valve into Float Valve Hole.

Drill Overall Flow Hole on rear of still, (Previously Component 2) at approximately 1.5 inches above basin bottom as seen on [\(SS Basin\)](#)

Align holes from Component 4 and the pure water drainage hole on front of still (Previously Component 1) and clamp Component 4 at slight angle (Downhill is the drainage hole). Leave 1/2" aligning plug in drainage hole.

Drill 4 holes according to [\(SS Basin\)](#) and tighten Component 4 onto Still front using nut, bolt, and rubber washer assembly

Remove 1/2" aligning plug. Thread and tighten 1/2" through wall compression fitting into place

Assembling Still

Place acrylic sides into still basin. When fixed firmly in place against rear of still, mark hole locations based on holes previously drilled in still basin 2" lip.

Mark holes for vertical support at all corners from pre-drilled SS angle .

Clamp wood on either side of acrylic. Drill holes as marked for both horizontal and vertical supports. (Or other best practice manufacturing strategy)

Place acrylic back into still. Tighten acrylic along 2" lips of basin with nut, bolt, and gasket/washer assembly. Use same assembly for vertical angle supports.

Use silicone caulking at this point for any visible gaps.

Place Neoprene seal on 1/4" lip upper lip of still

Line up J pull clamps (2) on front of still and rear according to [\(SS Basin\)](#). Use block of wood to simulate thickness of glass on top of gasket. Thread clamp to approximate tightness and mark holes for base. Remove Clamp.

Drill holes in solar still front and back, (Previously Components 1 and 2

Attach clamps using nut, bolt, washer/gasket assembly at drilled holes.

Place Solar Still Glass on top of still

Solar Still Manufacturing Plan | 3/29/2011

Run ratchet straps over nylon runners and tighten simultaneously. (Align ratchet strap supports, remove ratchet straps, and weld supports at this point)

Manufacturing of CPC

Required:

1	4' X 8' X 7/16" sheet of OSB
1	4' X 8' X 2" sheet of foam board insulation
2	1/8" X 5.5" X 9 2/3" Masonite
2	120" 90 deg angle bracket
1	34" X 29" solar glass

Tools	
Circular saw	boxcutter
Foam Bow	Laser cutter
Chop saw	Drill
2.125" hole saw	3M Spray Adhesive
Hammer	

- 1) Starting with the OSB, cut out the parts in 'Backboard' drawing.
- 2) Cut an Angle bracket into 4, 5" sections, 2, 20" sections and 2, 40" sections
- 3) Center 20" angle brackets on shorter ends of backboard, nail down (2X)
- 4) Do the same with the longer brackets on the long side of the backboard.(2X)
- 5) Take the longer sides (OSB) and nail to the bracket on the long side
- 6) Take the shorter sides (OSB) and drill three holes in each for receivers Per 'Backboard' Drawing, use a hole saw.
- 7) Nail shorter sides (OSB) to bracket on the shorter sides of the backboard
- 8) Place 5" brackets on all of the corners ensuring dimensions are held, nail down.(4X)
- 9) Take the Masonite rectangle and laser cut the parabolic shape into it (2X) per 'bracket foam' drawing.
- 10) Take the foambord insulation and cut it into strips 5.5" X 48" use the Masonite square for sizing.
- 11) Cut the strips into 4 9 2/3" X 5.5" pieces each. Only 51 are needed the rest are in case of mistakes.

- 12) Apply 3M glue to one side (with writing) of one of the foambord blocks and stick another block to it, taking care to line up the edges see 'foam assembly drawing'. Continue to glue foam until the stack is 17 pieces high (34"). Repeat 3X.
- 13) Tape Masonite pattern to each end of Masonite block. Ensure tape is placed on the 5.5" side and Masonite lines up with the foam.
- 14) Warm up foam bow and move it across the top of the Masonite pattern ensuring an even cutting in the shape of a parabola. Repeat 3x
- 15) Apply 3m glue to trough geometry and carefully lay reflective mylar on it. (3X)
- 16) Place troughs in box lining troughs up with receiver holes.(3X)
- 17) Thread receivers through holes leaving an inch on each side.(3X)
- 18) Drop glass on top of receivers sitting flat with the rim of the box.
- 19) Tack on brackets to hold glass in place.