

TENTNET STP

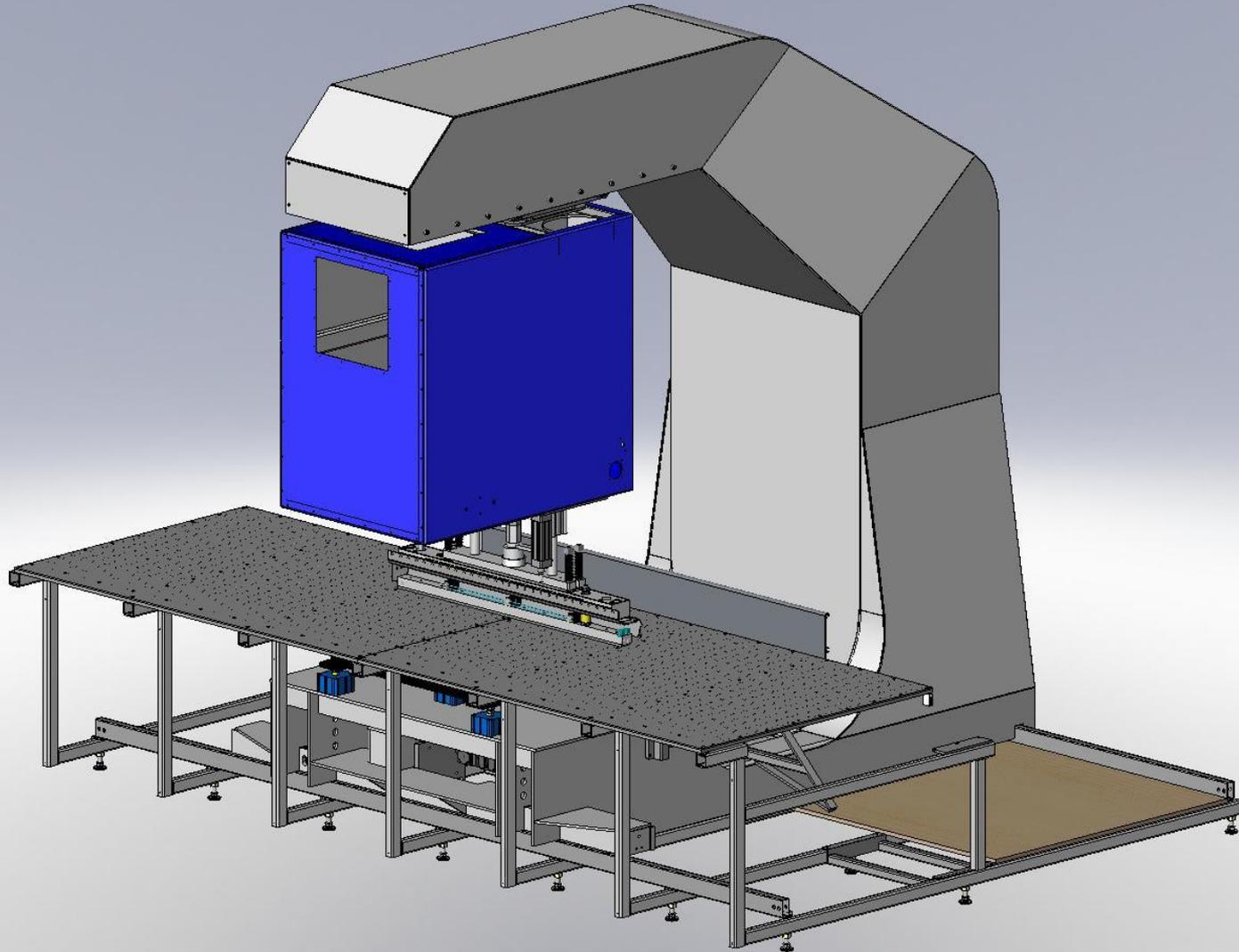
Optimum Surge Production Module

Clemson University
Clemson Apparel Research
AC Fabricated Products
November 4, 2009

TENTNET STP Goals

- Optimize large component manufacturing surge capacity through automation and optimization of pacing production equipment (RF welding) and supporting materials handling equipment.
- Minimize skilled and unskilled labor requirements and training times through automated equipment.
- Track key operational and financial metrics & produce a creditable business case to justify roll-out of demonstrated capabilities industry-wide.

Flexible Welder



Mass Production vs. Unit Production



Partners and Tasks

TENTNET Partners:

- Clemson University and AC Fabricated Products.

Industry Partners:

- Eton, JTE, and Henderson Sewing.

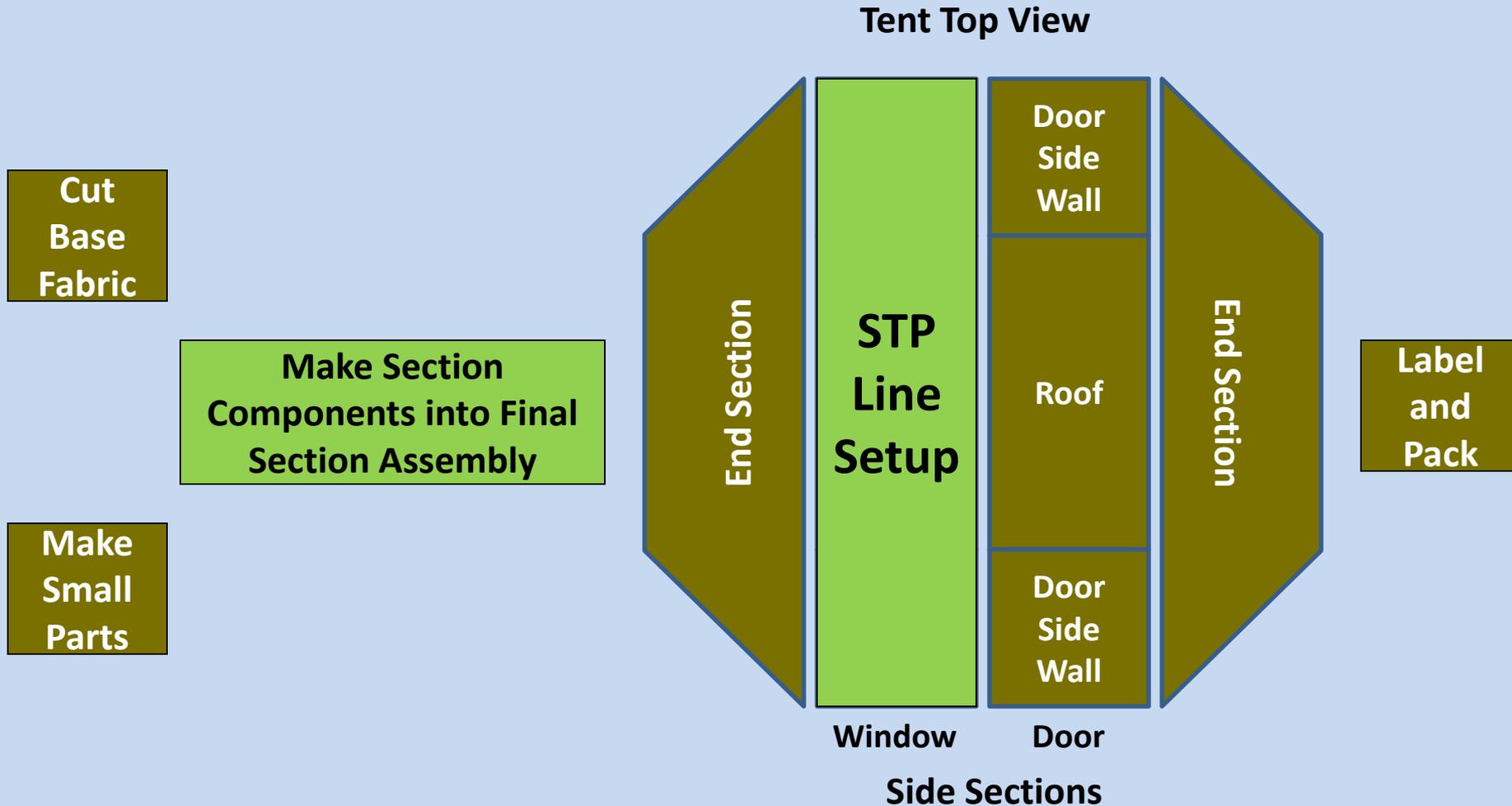
Major Tasks:

- Complete production setup plan in detail, order equipment, and capture baseline metrics.
- Run module, capture performance metrics, and construct roll-out business case.

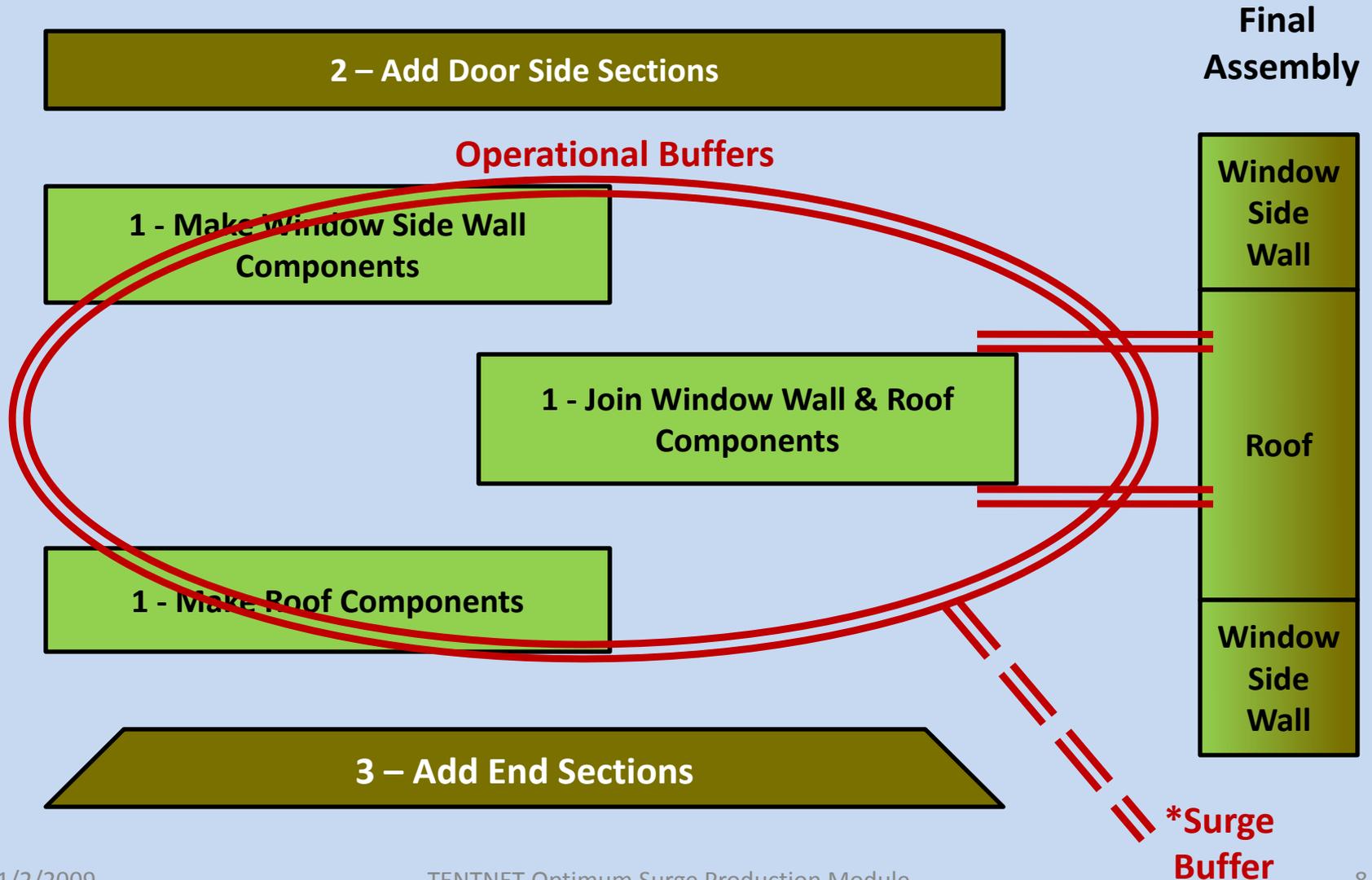
STP Surge Optimization Areas

- Surge Requirements (Synchronized Up-ramp):
 - Personnel
 - Facilities
 - Equipment
 - Military unique components
- Peacetime Facilitation Requirements:
 - Surge plan
 - SC-wide strategic buffers & Synchronized product flow
 - Flexible production
 - Fast-turn production
 - Standardization (features, components, methods)

Temper Tent Optimum Surge Module



Optimum Surge Production Module





STP Module Best Practice Application

- ✓ Constraints Management – Address the welding constraint and prevent relocation within the module with **protective capacity**. (Expect the constraint to move to parts production or cutting.)
- ✓ Equipment Optimization – Modify the most flexible and productive welding, other make, and move equipment available to maximize welding output and minimize labor waste while providing **peacetime and wartime protective capacity**.
- * Lean Teamwork Optimization – Potential for about 20% more output from better ideas, motivation, and **ownership** – parallel initiative by AC Fabrication.

Expected Improvements

- Improve output 200% on single shift basis.
- Improve 24/7 surge *potential* 800% or more as *limited by constraints outside of the module*.
- Minimize skill requirements and training times.
- Improve production lead-time, labor, space, and WIP by 50 to 90%.
- Lower production costs by 5 to 20%.
- *Make full 24/7 production possible at a cost of less than \$800k with an ROI of 18 months or less.*

Project Management

Optimum Surge Production STP		Phase:	I	*M1 = May. M8 = Dec.						II							
Task	Task Description	Who	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15
1	Plan Layout & Equipment Details	CAR/All	*	(Phase I funding sufficient to complete detailed planning in month 1.)													
2	Order Movement System	Eton		*	(Assuming movement system funding in month 2.)												
3	Prepare Facility for Equipment	AC/Eton					*	*									
4	Receive & Install Move System	Eton/AC						*									
5	Relocate Current Processes	AC/Eton							*								
6	Train Operators on Move System	Eton/AC							*	Run Production w Movement System							
7	Order RF Welding Equipment	JTE			*	(Assuming Welding Equipment funding in month 3.)											
8	Receive, Install, & Train RF Weld	AC/JTE								*							
9	Modify Production Processes	CAR/All								*	Run with RF Welding Added						
10	Order Secondary Equipment	HSM				*	(Assuming secondary equipment funding in month 4.)										
11	Install/Train Secondary Equip	HSM									*	Run with All Equipment					
12	Collect Operational Data	AC/CAR							*	*	*	*	*	*	*	*	*
13	Manage, Reports, & Bus Case	CAR/AC		*			*			*			*			*	FR

Planning & Administrative

Movement System

RF Welding

Secondary Equipment