

SANDIA REPORT

SAND2015-6151
Unlimited Release
July 2015

Value Stream Mapping: Foam Collection and Processing

Christian M. Sorensen

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Approved for public release; further dissemination unlimited.



Sandia National Laboratories

Issued by Sandia National Laboratories, operated for the United States Department of Energy by Sandia Corporation.

NOTICE: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof, or any of their contractors or subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof, or any of their contractors.

Printed in the United States of America. This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from

U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Telephone: (865) 576-8401
Facsimile: (865) 576-5728
E-Mail: reports@osti.gov
Online ordering: <http://www.osti.gov/scitech>

Available to the public from

U.S. Department of Commerce
National Technical Information Service
5301 Shawnee Rd
Alexandria, VA 22312

Telephone: (800) 553-6847
Facsimile: (703) 605-6900
E-Mail: orders@ntis.gov
Online order: <http://www.ntis.gov/search>



SAND2015-6151
Unlimited Release
July 2015

Value Stream Mapping: Foam Collection and Processing

Christian M. Sorensen
Waste Management and Pollution Prevention
Sandia National Laboratories
P.O. Box 5800
Albuquerque, New Mexico 87185-MS1117

Abstract

The effort to collect and process foam for the purpose of recycling performed by the Material Sustainability and Pollution Prevention (MSP2) team at Sandia National Laboratories is an incredible one, but in order to make it run more efficiently it needed some tweaking. This project started in June of 2015. We used the Value Stream Mapping process to allow us to look at the current state of the foam collection and processing operation. We then thought of all the possible ways the process could be improved. Soon after that we discussed which of the “dreams” were feasible. And finally, we assigned action items to members of the team so as to ensure that the improvements actually occur. These improvements will then, due to varying factors, continue to occur over the next couple years.

ACKNOWLEDGMENTS

Thanks to the Value Stream Mapping team for their immense contributions to this project which ultimately allowed this project to succeed!

CONTENTS

1. Introduction	7
1.1. Current State Mapping.....	6
1.2. Ideal State Mapping.....	6
1.3. Future State Mapping	7
1.4. Moving Forward	8
2. Action Items.....	9
3. Conclusions.....	11
4. Resources	12
Distribution	18

FIGURES

Figure 1. Current State Map.....	6
Figure 2. Current State Map.....	6
Figure 3. Ideal State Map	7
Figure 4. Ideal State Map	7
Figure 5. Future State Map	8
Figure 6. Future State Map	8

1.0 INTRODUCTION

The foam collection/processing operation at Sandia National Laboratories is a worthwhile, beneficial, and interesting process. It allows Sandia to collect and gather foam, densify it, and ship it to vendors who will be able to reuse the foam rather than send the foam to a landfill. Even though this process is an incredible one, it could use a little tweaking, hence, the Value Stream Mapping process. Through Value Stream Mapping any business or company can evaluate a process and find forms of waste that can be reduced or even eliminated. Value Stream mapping also provides a way to have members of the workforce brainstorm new ideas that could improve the process. These ideas and changes are then implemented to make a more successful and efficient process. This is exactly what we did with the foam collection/processing operation.

1.1. Current State Mapping

We began the Value Stream Mapping process by going to the “Gemba”, or the place where the work occurs. While on the foam collection runs with John Thompson, the field technician who is responsible for the foam collection/processing, we listed all the steps that occur to collect and process the foam we collect which includes #4, #6, Polyurethane foam, and Packing Peanuts. We then created the current state map (See figures 1 and 2). This allowed us to visualize every step along with how long it takes to complete each step (Takt time). The current state map also makes it very easy to see all the steps that create waste in the process. Some of the steps that we saw created waste in the foam collection/processing operation included going to different locations to drop off the different types of foam. For example, when examining the takt time of the foam collection route, we found that it took about 19 hours to collect foam from all of the Mixed Paper dumpsters and place the foam in their proper containment units. After finishing the current state map we moved onto the ideal state map.

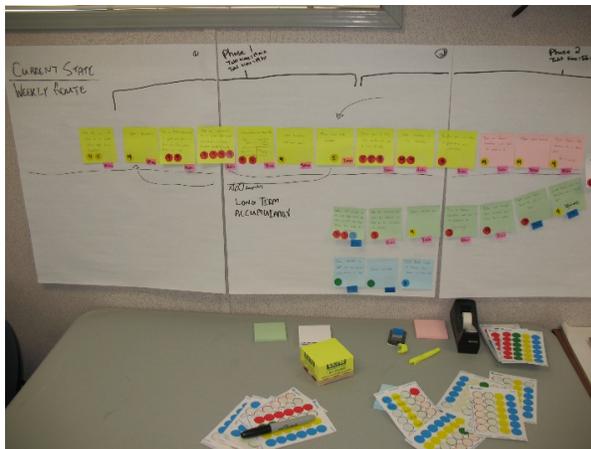


Figure 1. Current State Map (left)



Figure 2. Current State Map (right)

1.2. Ideal State Mapping

The ideal state map is a version of the process that only contains steps that add value and don't create waste. For the "ideal state" of the foam collection/processing operation we met with all of the members of the MSP2 team to write down all the possible ideas that we thought could make the foam collection/processing operation better (See figures 3 and 4). For example, we captured how ideally we would have two foam densifiers to eliminate the piece of log that is contaminated and no longer usable when switching from #4 foam to #6 or vice versa. After writing down all the possible ideas we had, no matter how big or infeasible, we moved onto the future state map.

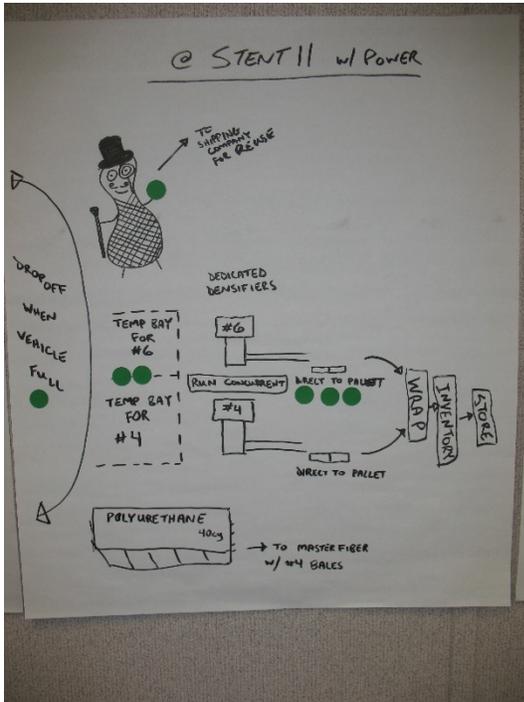


Figure 3. Ideal State Map



Figure 4. Ideal State Map

1.3. Future State Mapping

The purpose of the future state map is to take all of the ideas that were generated in the ideal state meeting and see which ones are feasible, and if so, how to implement them. The first step we took in our future state map meeting was to vote on the different ideas with green and blue colored stickers. By looking at the major groupings of dots we could easily see which ideas we all agreed with, which ideas we all thought were negative, and which ideas created varying opinions. After everyone had placed their stickers we reordered the ideas (written on sticky notes) in order of highest to lowest number of stickers (See figures 5 and 6). We then proceeded to talk about each idea and what we would do to accomplish them. The ideas everyone thought were positive were then turned to action items and the other ideas were discussed and either added to the list of action items or put aside as negative and/or unnecessary. Part of this process is assigning the action items to various members of the team. In our case we assigned certain action items to certain people because of their previous experience in the area, relevance to their position, and their interest in the idea.



Figure 5. Future State Map

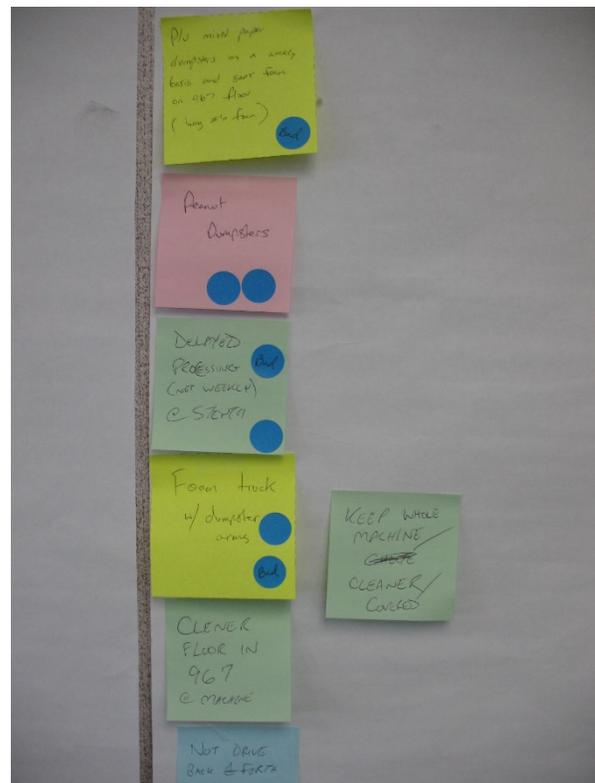


Figure 6. Future State Map

1.4. Moving Forward

Moving forward is the most important step in the Value Stream Mapping process. If the members of the workforce don't proceed to try and implement the ideas that have been made into action items, the entire mapping process has been done for naught. Therefore the team lead and sponsor of the Value Stream Mapping event are responsible to check in and ensure that the action items that were assigned are being completed. Through the Value Stream Mapping process we were able to come up with multiple action items that, if completed properly, will dramatically increase the efficiency and success of the foam collection/processing operation. This Value Stream Mapping project has made an immense impact on the foam collection/processing operation and will continue to impact the processes we do here in MSP2.

2. ACTION ITEMS

- Action Items assigned to:
 - Matt Kuhl
 - Look into a new hopper cover for the foam densifier
 - Look into a new spindle cover for the foam densifier
 - John Thompson
 - Investigate composting the cornstarch peanuts
 - Provide reports of specific and consistent foam generation locations to Ralph
 - Identify locations to put labels on dumpsters that have weird angles
 - Ralph Wrons
 - Work with John to identify a scale for STENT 11
 - Work with Sam to identify a place for a dedicated #4 rolloff in TA1
 - Sam McCord
 - Look into getting power at STENT 11
 - Look into putting an epoxy coat on the #4 rolloff bottoms
 - Look into repainting the #4 rolloff bottoms
 - Look for vendors that would take the cornstarch peanuts
 - Sam, Matt, and John
 - Identify locations that have serious foam contamination issues
 - Identify the Mixed Paper dumpsters that are always full
 - Figure out a way to fix the issue of contamination being on top of the foam

3. CONCLUSIONS

This Value Stream Mapping project is going to have many positive ramifications in Organization 4144. If they are performed correctly and taken full advantage of, the ideas that have been made into action items will provide improved infrastructure (Power in STENT 11), find new ways to deal with recyclable items (Investigating composting cornstarch peanuts), and identify and assess other projects that may need to be looked at (Rolloff refurbishment, new dumpster labels, etc.). This project has created a wonderful example for any other processes that are in need of some tweaking. It has allowed for incredible growth and change that will stand as a beacon to all other projects and processes that need to go through the Value Stream Mapping Process. This project was a complete success and sets a high bar for other Value Stream Mapping projects that will be done in the future.

4. RESOURCES

1. George, Michael L., Rowlands, David, Price, Mark, Maxey, John, 2005, *The Lean Six Sigma Pocket Toolbook*, The McGraw-Hill Co., New York, NY
2. Sayer, Natalie J., Williams, Bruce, 2007, *Lean For Dummies*, Wiley Publishing, Inc., Indianapolis, IN

Charter Summary for: Foam Recycling Value-Stream Mapping

Problem Statement:

- The problems that are occurring in the event of recycling foam are that time and energy is being wasted in the 1) rework of the already processed foam 2) separating the foam from other contaminants in the MP dumpsters and 3) the unnecessary transportation of the materials
- By fixing these issues we will 1) minimize rework 2) minimize the time it takes to complete the collection route 3) reduce workload on techs during collection route and 4) minimize wasted time due to transportation

Objectives:

- (S) Reduce the number of bursting logs per pallet to 0
- (M) Multiply our output of foam per month by 1.5
 - Current monthly output:
 - Foam #4= 1148 lbs.
 - Foam #6= 244 lbs.
 - Polyurethane Foam= 200 lbs.
 - Output multiplied by 1.5
 - Foam #4= 1722 lbs.
 - Foam #6= 366 lbs.
 - Polyurethane Foam= 300 lbs.
- (A) Agreed upon....
- (R) Reduce time per finished pound of recyclable foam by at least 33%
- (T) Finish the project within six weeks

SIA Scope Information:

- From the moment the custodians let go of the foam to the shipping of the foam to our vendors

Strategic/Business Objective Tie:

- John Thompson stating that the foam densifying process is not as efficient as it could be.
- By making the foam densifying process more efficient we would be able to increase the capture of foam and help Sandia become zero waste by 2025.

SIA Dates: 6/9/15 – 7/21/15

Champion: Jeff Jarry

Sponsor: Samuel McCord

Team Lead: Christian Sorensen

SIA Facilitator: Samuel McCord

Team Members:

- Jeff Jarry
- Ralph Wrons
- Matthew Kuhl
- John Thompson
- Samuel McCord
- Christian Sorensen

DISTRIBUTION

1	MS0184	Carolyn Holloway	11010
1	MS1117	Jeffrey Jarry	4144
1	MS1117	Matthew Kuhl	4144
1	MS1117	Samuel McCord	4144
1	MS1117	Christian Sorensen	4144
1	MS1117	John Thompson	4144
1	MS1117	Ralph Wrons	4144
1	MS0899	Technical Library	9536 (electronic copy)



Sandia National Laboratories