

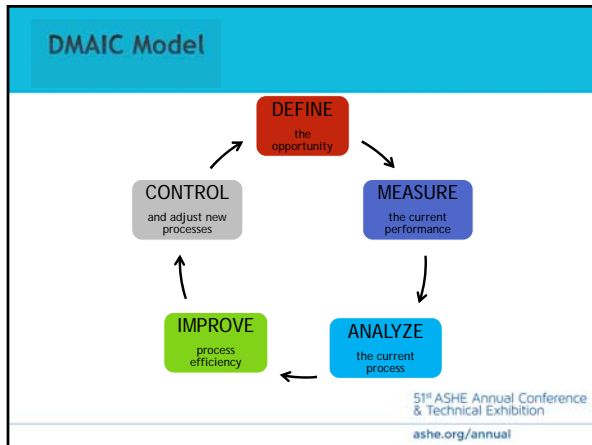
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Reduce Temperature Variation for Inpatient Rooms

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SURVIVAL
For **FITTEST**



DEFINE STAGE

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DEFINE STAGE

VOICE OF THE CUSTOMER

- High Volume Hot/Cold Calls to 3-5000
- Inconsistent Press Ganey Scores
- Difficult to Provide Maintenance

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DEFINE STAGE

SIPOC

SIPOC for Patient Room Temperature Control

Suppliers	Inputs	Process	Outputs	Customers
Monitoring Services	Room temp	Patient Room Temperature Control	Good room temp control	Press Ganey score
Mgt/Tech	BAS information		Patient Feedback	Recounting Patient Rooms
BAS	Customer or PCA inputs		Nursing Feedback	HCAHPS
Infrastructure	Tech knowledge		Mgt/Lead Tech share Results	Clinical staff
Doctors/Patient Family	Patients		Management Review	MOACG

Current Process Steps

Customer Call	Locate call	BAS check, set priority, check TEC review	Decision: Control or equipment issue	Control change or tech troubleshooting	Complete service or call regarding scheduling	Final tuning	Completion of the service
Process Start		End Process					

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MEASURE STAGE

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MEASURE STAGE

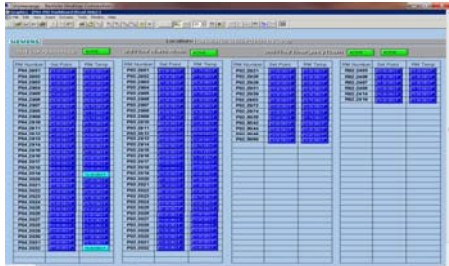
TEMPERATURE DASHBOARD – ALKEK BUILDING



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MEASURE STAGE

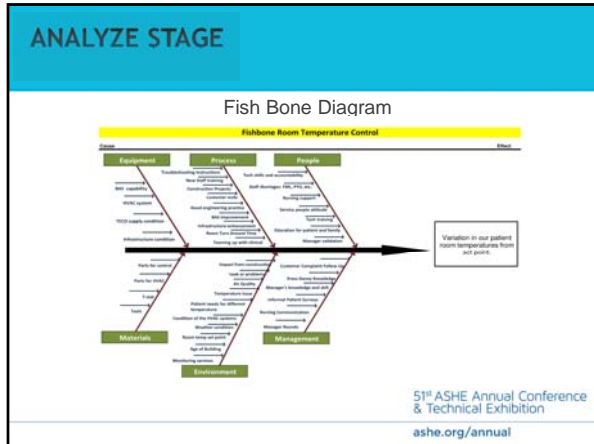
TEMPERATURE DASHBOARD – LUTHERAN BUILDING

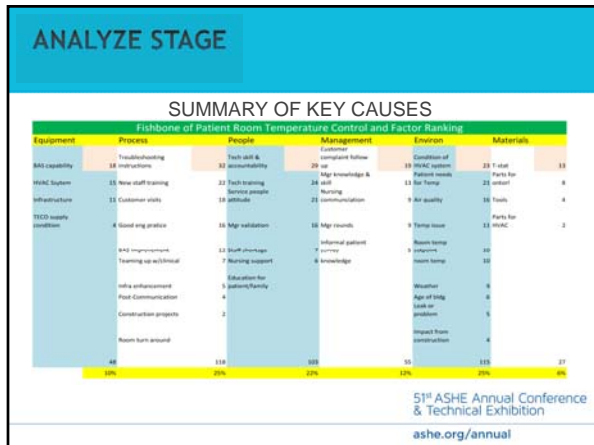


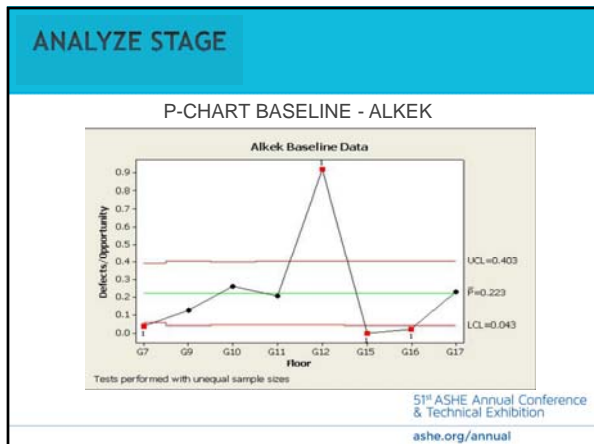
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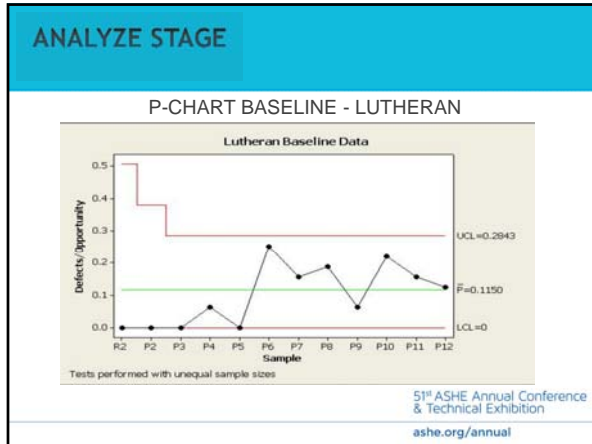
ANALYZE STAGE

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IMPROVE STAGE

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IMPROVE STAGE

QUICK HITS

- Investigated and Corrected System Level HVAC Issues
- Investigated and Corrected Component Level HVAC Issues
- Examined BAS System Operation

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IMPROVE STAGE

SET TEMPERATURE RANGE

- Industry Standard
- System Capabilities/Limitation
- Reasonable Level of Comfort
- Locked in Temperature Range 68-78 Degrees
- Accuracy of Data

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IMPROVE STAGE

STANDARDIZE SERVICE CALL PROCESS

- Developed Process for Proactive Review of Room Temperatures
- Identified Owners of Areas
- Modified Process for Demand Call Response

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IMPROVE STAGE

EDUCATION OF MAINTENANCE STAFF

- Reviewed System Level Educational Needs
- Component Level Troubleshooting
- In-Service on New Process

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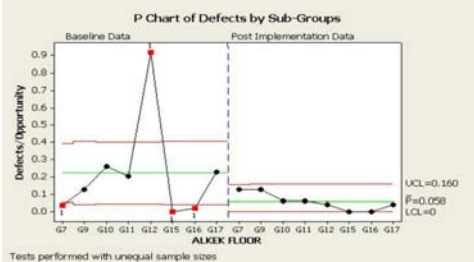
IMPROVE STAGE



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IMPROVE STAGE

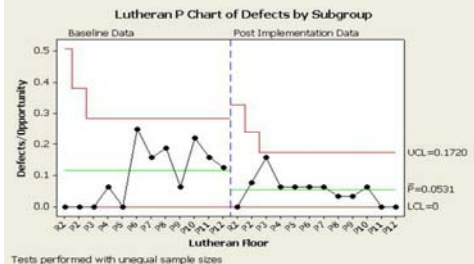
P-CHART POST IMPLEMENTATION - ALKEK



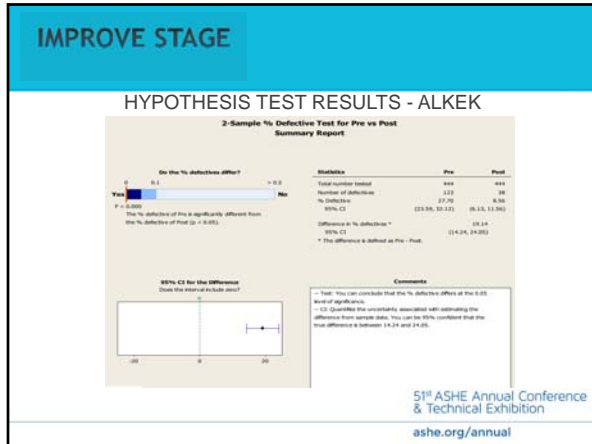
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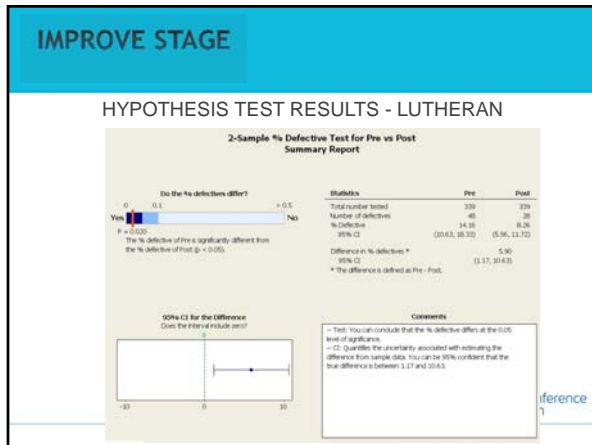
IMPROVE STAGE

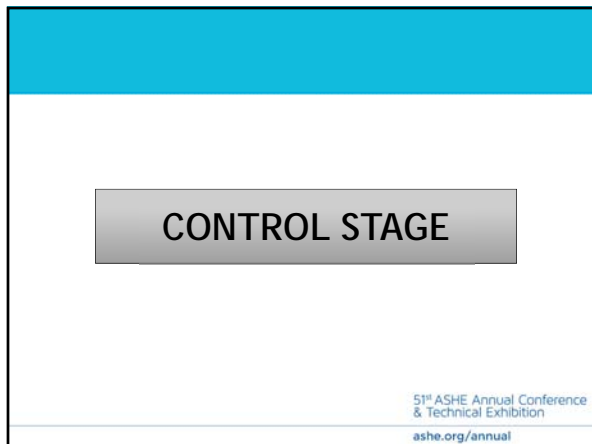
P-CHART POST IMPLEMENTATION - ALKEK



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CONTROL STAGE

ROOM TEMPERATURE CONTROL PLAN

Building Care and Operations

Inpatient Room Temperature Satisfaction CONTROL PLAN

Process	Frequency	Metric	Review Information	Key Indicator(s)	Where Documented	How Reviewed
Room Response Process	Annual	N/A	Inpatient Rooms	Valid Document Concurrence	Departmental Guidelines	Annual Review of Guidelines
P-Chart of Defects	Monthly	No more than Previous month	Inpatient Rooms	Minibid Software Calculations	Departmental Portal	Departmental Leadership Meeting
Dashboard Review	Daily	zero defects	Inpatient Rooms	Temperatures outside +/- 2 degree fan setpoint	Manager Software	Manager In-charge
Education of Staff	Annual	Completed/ completion of training items	Inpatient Rooms	Minimum of 75% for pass with 100% after re-training on issued items	Employee File/MHR	Annual Learning Performance Review
Education of End Users	Continuous	N/A	Inpatient Rooms	Patient Satisfaction	Poss Query	Departmental Leadership Meeting

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CONTROL STAGE

STANDARDIZE PROCESSES

Room Temperature Issue Management/Control Process Flowchart

```
graph TD; Start([Start]) --> Step1[Identify Issue]; Step1 --> Step2[Investigate Cause]; Step2 --> Step3[Develop Solution]; Step3 --> Step4[Implement Solution]; Step4 --> Step5[Verify Solution]; Step5 --> Step6[Document Solution]; Step6 --> Step7[Communicate Solution]; Step7 --> Step8[Review Process]; Step8 --> End([End]);
```

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CONTROL STAGE

CONTINUE TO IMPROVE SYSTEM LEVEL ISSUES

- Issues Found to Date:
 - Fans Running on Low Speed
 - Critical Alarming Mislabeled in BAS
 - Thermostats not Working Properly
 - Motors not Operating
 - Dampers Not Functioning Properly
- Continue to Resolve System Issues
- Develop Preventative Maintenance Schedule

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CONTROL STAGE

HANDS ON TRAINING MODULE

- Three Different Systems in the Patient Rooms
- Creating Mock Up of These Systems
- Continuous Learning for Our Staff
- Training for New Staff

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CONTROL STAGE

EDUCATION OF END USERS

- Provide Information to Customers on Temperature Range
- Install Easy to Read Digital Thermometers in Patient Rooms
- Provide Tent Cards for Customers

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NEXT STEPS

- Future Opportunities to Link other Software
- Future Effort with Admissions
- Trial Results for System Operational Responses
- Future Projects in Outpatient Exam Rooms
- Additional Major Energy Savings Opportunities
- Dashboard Enhancements

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CONCLUSION & SUMMARY

REVIEW AIM STATEMENT

- Goal: Improve by 30%
- Actual Improvement – 61%
 - 69% Alkek
 - 42% Lutheran
- Exceeded Goal by 31%

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CONCLUSION & SUMMARY

SIGMA LEVEL ANALYSIS				
	ALKEK		LUTHERAN	
	PRE-DATA	POST-DATA	PRE-DATA	POST-DATA
Defects	123	38	48	28
Opportunities	444	444	339	339
Defects/mil	277,027	85,586	141,593	82,596
Sigma level	2.1σ	2.9σ	2.6σ	2.9σ

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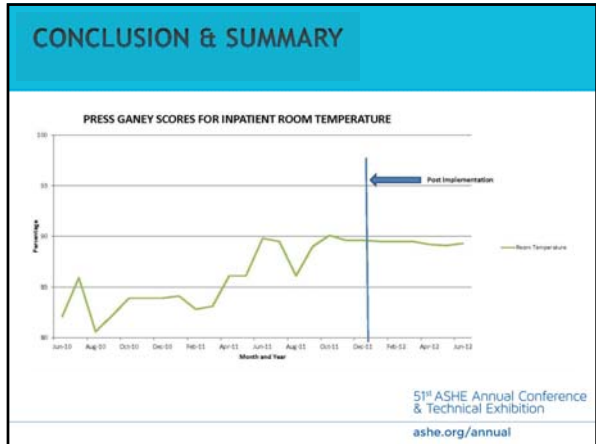
CONCLUSION & SUMMARY

FINANCIAL ASSESSMENT

Energy Assessment		
	Alkek	Lutheran
Energy costs/yr	\$7.75	\$8.33
Estimated Energy/room	1%	1%
Savings per room /yr	\$0.79	\$0.47
Average Sqft per room	392	379
Number of rooms/Plant	88	92
Total savings	\$6,918	\$3,588
Total Energy Savings: \$7,804		

Hot/Cold Call Assessment		
	Alkek	Lutheran
Avg time to respond per call (hours)	1.5	1.5
Avg FTE hourly salary (with benefits)	\$39	\$38
Avg number of HVAC calls per implementation	25.8	1.85
Avg number of HVAC calls /hrk implementation	328	143
Avg Cost Per Implementation	\$14,473	\$7,485
Avg Cost /hrk implementation	\$13,494	\$8,084
Minimum Monthly Savings	\$1,435	\$,989
Minimum Labor Savings: \$17,100		
Total Project Related Savings: \$24,904		

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CONCLUSION & SUMMARY

PRESS GANEY SCORES

MD Anderson Cancer Center 6/1/2012 - 8/31/2012

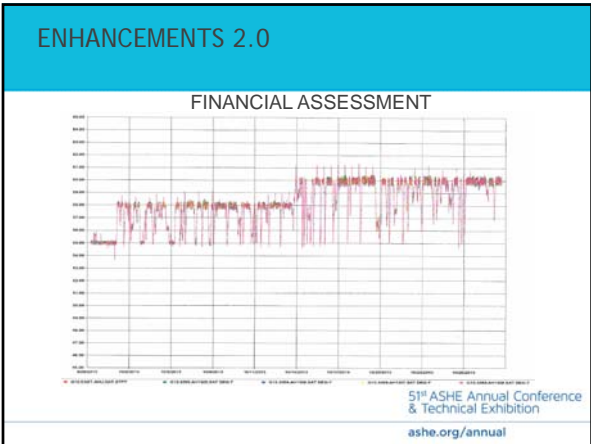
INPATIENT SUMMARY REPORT

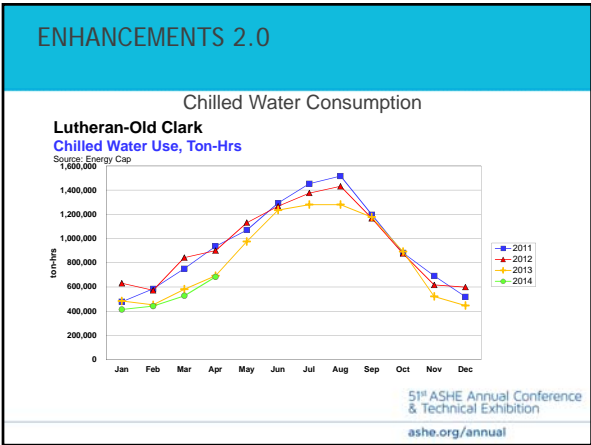
5.0 Greatest Increase in Scores by Question

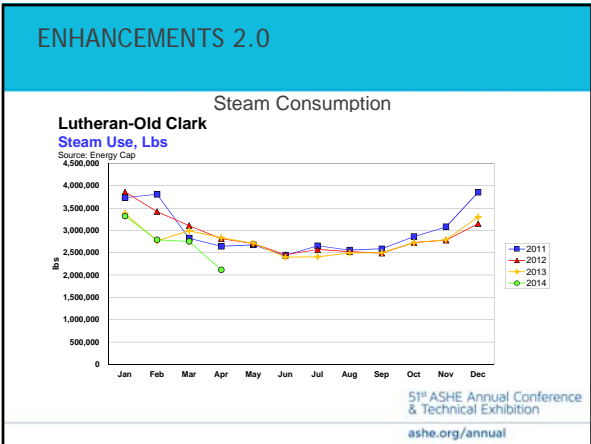
n	Question	Last Mean Period Score (n=1501)		This Period (n=1562)		Academic Peer (n=253)		Official CQI (n=19)		Official NCCN (n=17)	
		Trend	Mean	Change	Mean	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank	
931	Attrn to special/personal needs ¹		92.1	+1.5	93.6*	N=7	N/A	N=7	N/A	N=7	N/A
941	Staff concern comfort in prep-ORR ¹		92.6	+1.3	93.9	N=7	N/A	N=7	N/A	N=7	N/A
1,455	Explanations happen during T&T ²		88.7	+1.0	89.7	> 86.0	95	88.7	83	88.6	88
1,409	Courtesy of person admitting		92.7	+0.7	93.4	> 80.2	93	92.1	78	92.3	75
1,509	Room temperature		84.0	+0.7	84.7	> 80.6	90	> 81.1	99	> 81.8	94

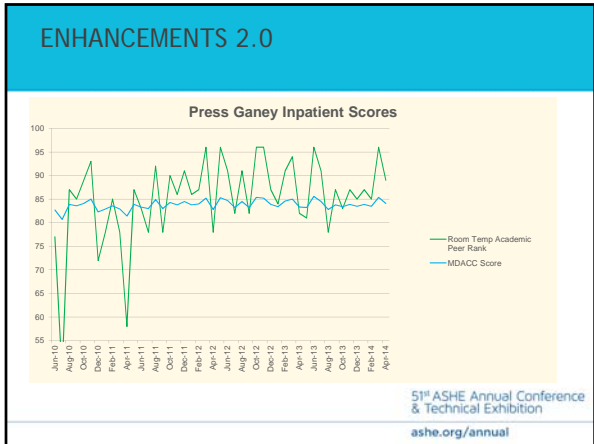
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- ### CONCLUSION & SUMMARY
- #### LESSONS LEARNED
- Six Sigma Process
 - Stick to One Project
 - Ensure Data Analysis Techniques are Correct
 - Define Data Storage Strategies Early
 - Be Prepared for Data Losses
 - Future Effort with Admissions
 - Don't Underestimate What You Will Discover
 - You Don't Know What You Don't Know!
 - Leverage Technology
 - Team Ownership
 - Opportunities May Blossom Beyond Your Project
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- ### CONCLUSION & SUMMARY
- THANK YOU!
- Maintenance Team
 - BAS Team
 - Exceeded Goal by 31%
 - Leadership in Engineering Quality Group
 - Black Belt Mentor
 - Administrative Support Team
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QUESTIONS

SURVIVAL
OF THE **FITTEST**

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