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# Successfully Using an Agile Methodology for Level of Effort Tasks

Transformation through Partnerships

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April 20, 2012

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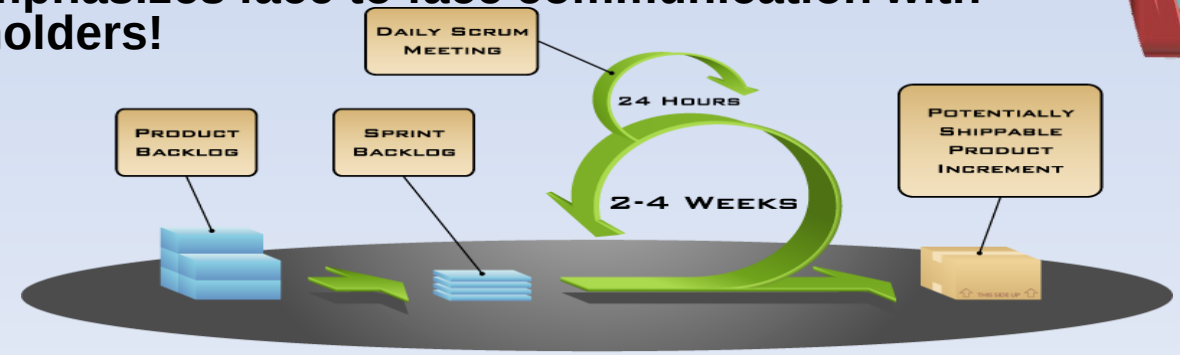
# What is the AGILE Methodology

- ✓ **Each iteration passes through a full cycle, including:**
  - **planning,**
  - **Continuous requirements gathering and analysis,**
  - **design,**
  - **unit tests, Quality Assurance testing,**
  - **working product to stakeholders.**

- ✓ **"Documentation , assuring repeatability and re-generation**
- ✓ **Strong team discipline is required**

- ✓ **At the end of each iteration, stakeholders re-evaluate project priorities**
- ✓ **Agile emphasizes face to face communication with all stakeholders!**



# Using Agile for Level of Effort Tasks

- **Level of Effort Tasks (LOE)**


**Operations Maintenance (IM 10 and 40)**

**Dissatisfaction**

**Agile Practices Tailored for LOE**

- **Results**
- **Benefits**
- **Lessons Learned**

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# Sequence of Events

- Management dissatisfaction over incomplete maintenance tasks
- No understanding of tasks being worked
- Team was always busy
- Recurring tasks increasing in number
- Response to Help Desk issues

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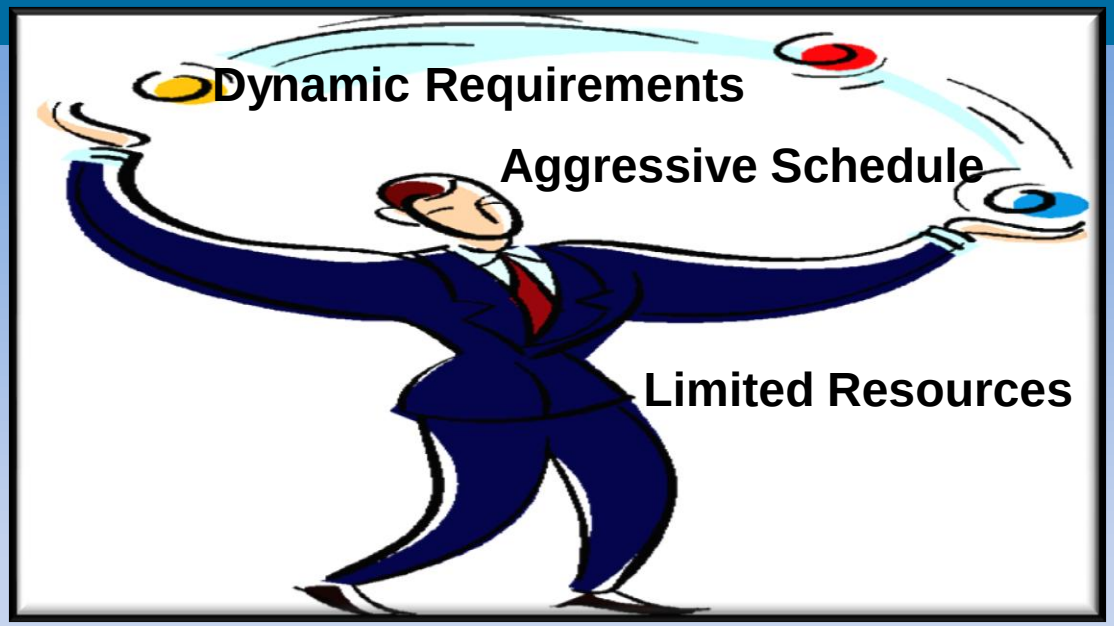
# Why??
# Agile Methodology for LOE




## Using an Agile Methodology to Manage LOE tasks

| | |
|---|---|
| Dynamic Requirements<br>Recurring Tasks<br>Un-Anticipated Tasks | Immediate effect of changing customer priorities & direction |
| Aggressive Schedule | Work performed on a fixed LOE |
| Limited Resources | New Projects Created |

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# Background

- Software Applications Development team
  - Uses Agile Methodology for Application Development. (3-4 yrs)
  - Has collaboration within the teams
  - Has a high level of task accomplishment
- Project Knowledge Team
  - ScrumMasters
  - Project Managers
  - CMMI experience
  - BA and QA

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# Implementation

- Two teams piloted in Operations
- Tailored the Agile process to best fit maintenance tasks,
- Built and maintained teams to work and communicate effectively, and
- Began integrating work into the enterprise as a whole.

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# Results of Pilots

- Visualization of maintenance tasks by management;
- Prioritization of help requests;
- Faster response times for help requests;
- Fewer unscheduled maintenance tasks, and
- Better anticipation of required recurring maintenance tasks;

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# Results of Pilots

- Collaboration
  - Accomplishing prioritized tasks within set time frame
  - More straight forward Management
  - Tracking actual hours
- Ability to join forces
- Assuming responsibility for specific tasks
- Manage resources

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# Results of Pilots

- Because the results from the pilots were so impressive, all operations projects are applying the Agile methodology.

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# Process Improvement

| | |
|---|---|
| **LOE Maintenance is NOT fighting fires or "just in time solutions."** | • **Better way to do work**<br>• **Actions taken to identify, analyze and improve processes** |
| **Reduce variation.** | • **Remove activities that have no value**<br>• **Improve customer satisfaction** |
| **Recognize and document best practices.** | • **Provide lessons learned**<br>• **Encourage staff members to contribute!** |

# Strategy

Operations management tools

Aggressive schedule

Dynamic Requirements


Daily Scrums

Burn Down (MS Excel)

White Boards
Peer Reviews – Impromptu & Team Programming

Agile Method Engineering Techniques

CMMI-DEV Management Support from ScrumMaster

Project Management

Project Management and Control

Measures

Structured Decisions



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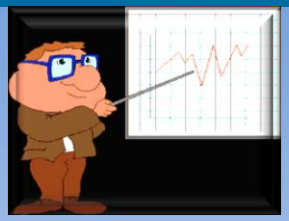
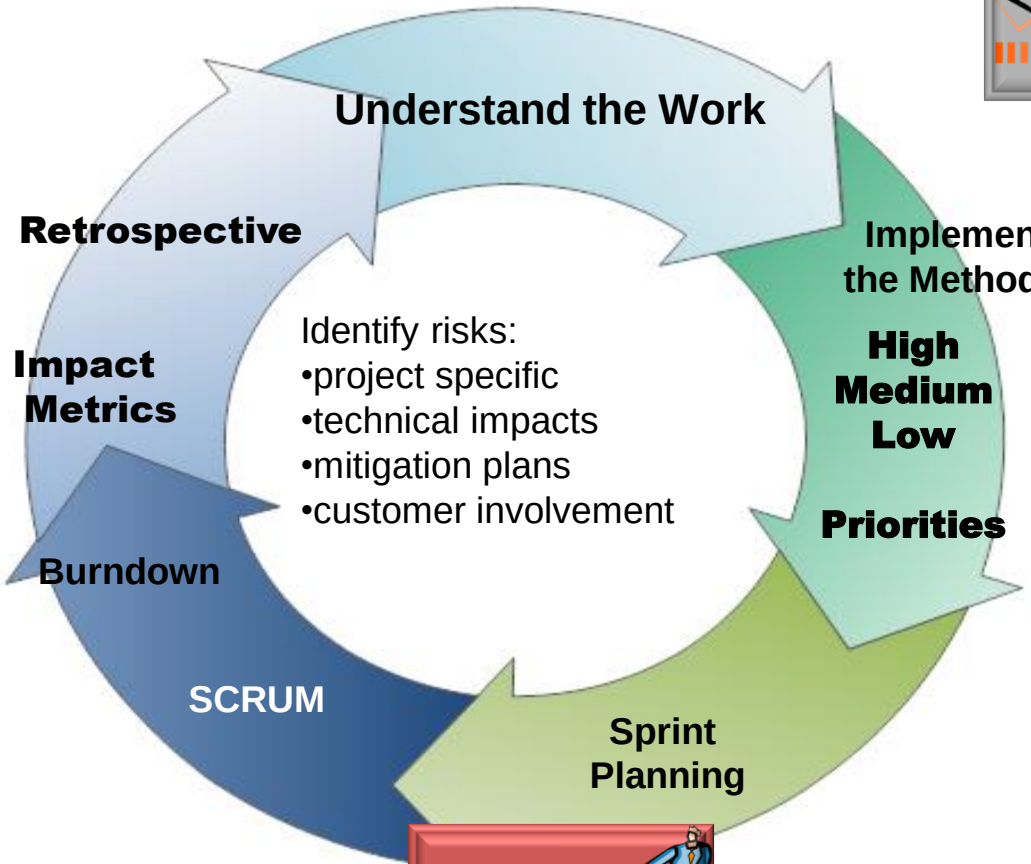
# Agile LOE Management



## Lessons Learned

- ✓What did we do well?
- ✓Where were we lucky?
- ✓What do we need to improve?

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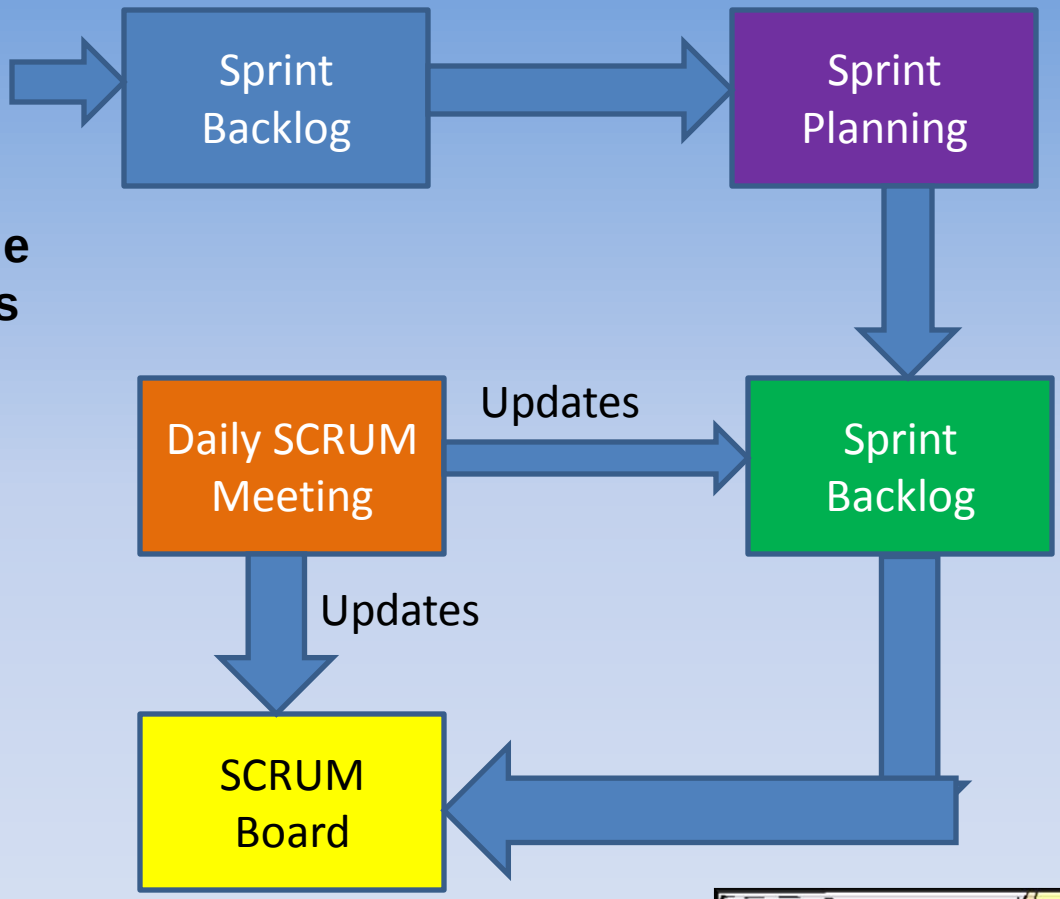
# Sprint Planning/SCRUM

- ✓ **Sprint Planning/Plan**
  - **Determine sprint timeline**
  - **Determine available Resources – Risks**
- ✓ **Scrum**
  - **What done**
  - **What Planned**
  - **Obstacles – Risks**
- ✓ **Who, what, how**
  - **Requirements**
  - **Baselines**
  - **Documentation**
- ✓ **Deliverable**
  - **Deployment to Users**

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# Sprint Planning

- Sprint Planning/Plan
  - Determine sprint timeline
  - Determine available resour
  - Planning Poker
- Who, what how
  - Requirements
  - Baselines
  - Documentation
- Deliverable
  - Demonstration to stake holders

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# Gathering and Reviewing the Requirements

**Requirements Definition**

**Requirements Review**

**Requirements tied to activities**

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# SCRUMMING


- Project Plan
  - Overall Design
- Sprint Planning
- Daily Scrum

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# Agile
# Navigating Class IV Rapids

- Agile maintenance methods minimize risk by working in multiple 'iterations' of short time frames
- Agile projects use SCRUM Boards, Burndown charts and other project and working artifacts
- Face to face communication and reviews ensure peer review.
- At the end of each iteration, stakeholders re-evaluate project priorities and risks.

# Metrics

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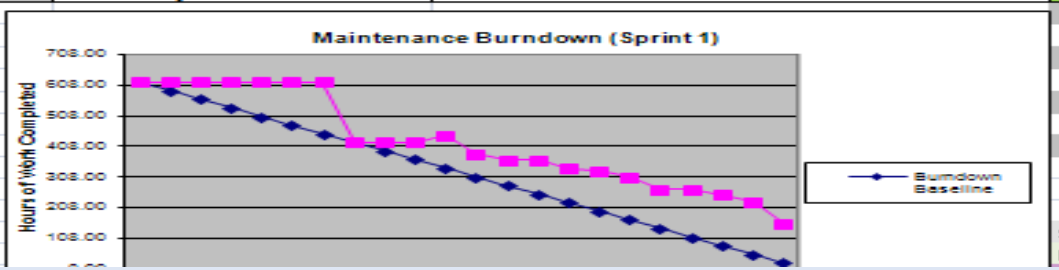
# Monitoring and Controlling Sprint Burn down Charts

| | |
|---|---|
| Obstacle #1 | Mike Baisden to respond with information on removal of T1 |
| Obstacle #2 | Purchase Software |

***Maintenance Backlog (Sprint 1)*** *Objectives*

| Area | Req ID | Requirement Description | Item Status | Hours (Est) | Hours of Work Remaining 1-Jun 1 | 2-Jun 2 | 3-Jun 3 | 4-Jun 4 | 7-Jun 5 |
|---|---|---|---|---|---|---|---|---|---|
| Development | ALO Migration | Generate a list of all anticipated services to ID | Complete | 4 | 4 | 4 | 4 | 4 | 4 |
| | | Removal of Archive folder on ALSTS1 | Complete | 3 | 3 | 3 | 3 | 3 | 3 |
| | | CIIRN Account Maintenance | Complete | 2 | 2 | 2 | 2 | 2 | 2 |
| | | Monthly MS Patching | Complete | 4 | 4 | 4 | 4 | 4 | 4 |
| | | Thin Client Maintenance | Working | 40 | | | | | |
| | CIIRN Maintenance | Build CIIRN Print Server | Complete | 24 | 24 | 24 | 24 | 24 | 24 |
| | Data Transfer Project | FRED Recovery and Sanitize | Complete | 80 | 80 | 80 | 80 | 80 | 80 |
| | ESN Maintenance | ESN Administration | Complete | 8 | | | | | |
| | | Install Layer 3 stop gap switches supplementi | Complete | 20 | 20 | 20 | 20 | 20 | 20 |
| | | IOS Updates | Complete | 5 | 5 | 5 | 5 | 5 | 5 |
| | | ACS Config Central Admin | Complete | 5 | 5 | 5 | 5 | 5 | 5 |
| | | Cyber VLAN | Complete | 40 | 40 | 40 | 40 | 40 | 40 |
| | | Remove Chugach T1 | Obstacle | 8 | 8 | 8 | 8 | 8 | 8 |
| | | Install and Migrate ACS Applicances | Complete | 10 | 10 | 10 | 10 | 10 | 10 |
| | | Foia Xpress Upgrade | Working | 20 | 20 | 20 | 20 | 20 | 20 |
| | | Versatile Maintenance | Complete | 3 | 3 | 3 | 3 | 3 | 3 |
| | | Application Deployments | Complete | 20 | 20 | 20 | 20 | 20 | 20 |
| | | Build system and Install Greenhopper/JIRA | Obstacle | 40 | 40 | 40 | 40 | 40 | 40 |
| | | Monthly MS Patching | Complete | 20 | 20 | 20 | 20 | 20 | 20 |
| | | WUG Maintenance | Complete | 5 | 5 | 5 | 5 | 5 | 5 |
| | | Smartnet Renewal Verify | Complete | 3 | | | | | |
| | | Script Maintenance | Complete | 4 | | | | | |
| | | NA 65 SharePoint Site | Complete | 8 | 8 | 8 | 8 | 8 | 8 |
| | NSN Maintenance | Event Log Script | Working | 40 | 40 | 40 | 40 | 40 | 40 |
| | PAMS NR | PAMS NR Account Maintenance | Complete | 5 | 5 | 5 | 5 | 5 | 5 |
| | | OIG 64B Standalone | Working | 25 | 25 | 25 | 25 | 25 | 25 |
| | | Imaging Standard | Complete | 25 | 25 | 25 | 25 | 25 | 25 |
| | Standalone Maintenance | Bi-Annual Standalone Patching | Working | 80 | 80 | 80 | 80 | 80 | 80 |
| | Transfer Station Project | Distribute Pilot II Systems | Working | 40 | 40 | 40 | 40 | 40 | 40 |
| | | HEAT Migration | Complete | 8 | 8 | 8 | 8 | 8 | 8 |
| | | SQL Encryption | Working | 20 | 20 | 20 | 20 | 20 | 20 |
| | | Test Backup and Restore Encrypted Database | Complete | 20 | 20 | 20 | 20 | 20 | 20 |
| | | SharePoint Database Migration to NSN | Working | 30 | 30 | 30 | 30 | 30 | 30 |
| | WSU Project | iLinc | Complete | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | Burndown Calc | | 618.00 | 589.91 | 561.82 | 533.73 | 505.64 |




| | |
|---|---|
| Hrs/Day Baseline | 28.0 |
| Labor Hours | 105 |
| Hours Not Used | 38 |
| Secure Ops | 704 |
| Net Ops | 176 |

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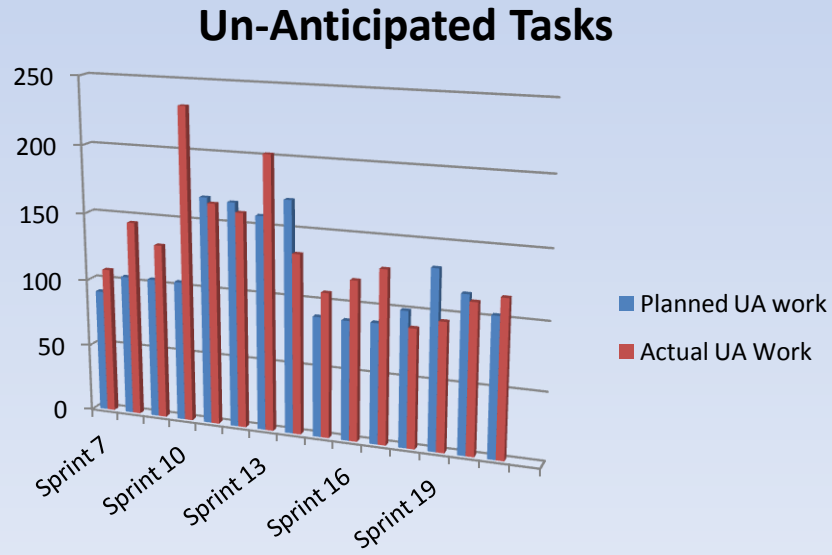
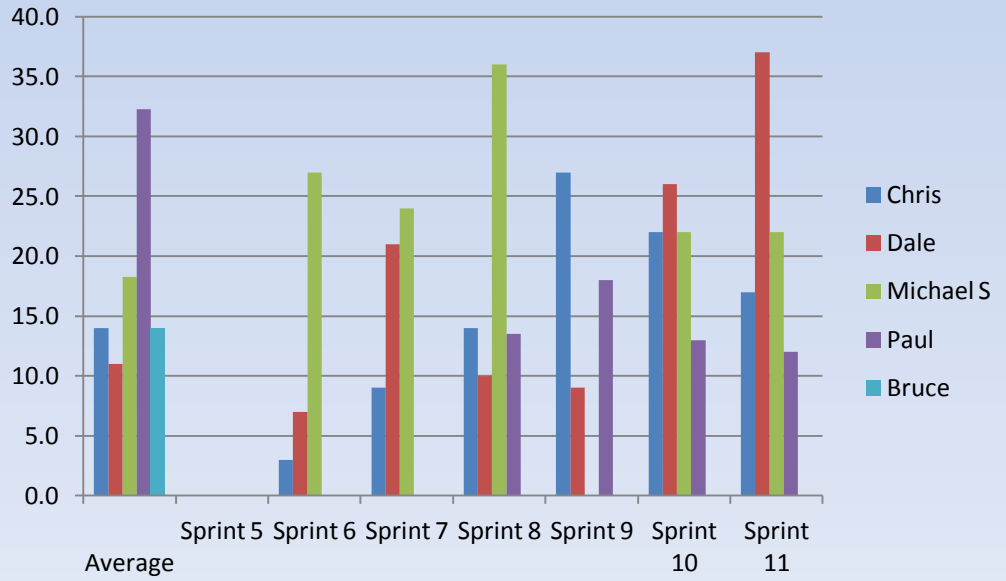
# Process Improvement
# Un-Anticipated Tasks Actual Hours

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *Maintenance Backlog (Sprint 11)* | | | Number of Days left in Sprint: 1 | | Sprint End Date: April 29 | | |
| Area | Req ID | Priority | Project | Assigned To | Requirement Description | Item Status | Hours (Est) | total | Act Hrs |
| | R-19 | R Recurring | | BC | Thin Client Maintenance | Working | 10 | | 21.5 |
| | R-20 | R Recurring | | BC | CIIRN Maint - weekly tape rotations | Working | 4 | | 2.5 |
| | R-21 | R Recurring | | BC | CIIRN Maint - Monthly inventory | Working | 2 | | 3 |
| | R-22 | R Recurring | | BC | StandAlone Classified Updates | Working | 20 | 36 | 31 |
| | R-23 | R Recurring | | PD | SharePoint Admin | Working | 4 | | 16 |
| | R-24 | R Recurring | | PD | Thin Client Maintenance | Working | 10 | 14 | 17 |
| | U-1 | 4 Medium | Unanticipated Work | Secure Desktop | Bill Carroll | Working | 27 | | 33.5 |
| | U-2 | 4 Medium | Unanticipated Work | Secure Networking | Craig | Working | 18 | | 37 |
| | U-3 | 4 Medium | Unanticipated Work | Secure Networking | Mike H | Working | 18 | | 24 |
| | U-4 | 4 Medium | Unanticipated Work | Secure Operations | Dale | Working | 17 | | 12 |
| 0.5 | U-5 | 4 Medium | Unanticipated Work | Secure Operations | June | Working | 30 | | 20 |
| | U-6 | 4 Medium | Unanticipated Work | Secure Operations | Michael S | Working | 27 | | 22 |



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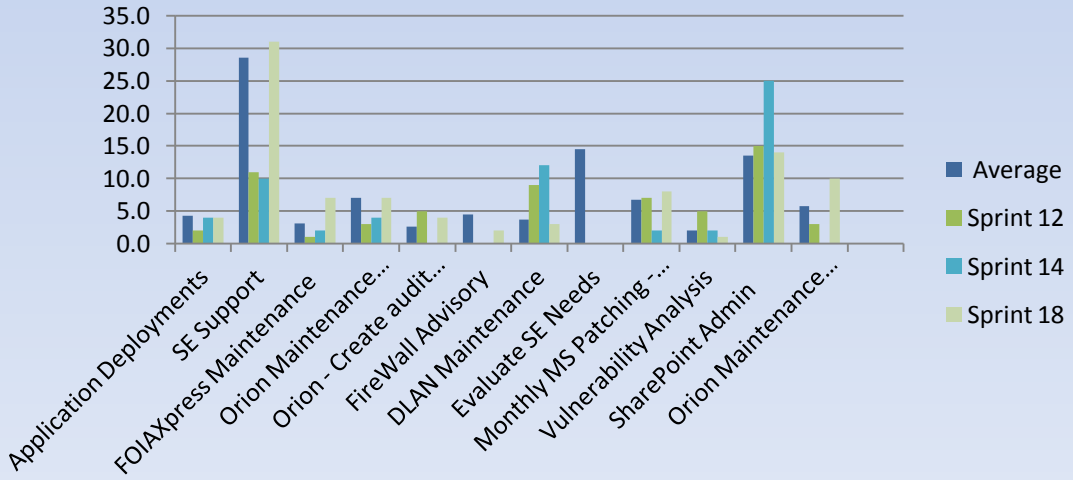
# Process Improvement
# Average Actual Hours – Recurring Tasks

| | | Average | Sprint 10 | Sprint 11 | Sprint 12 | Sprint 13 | Sprint 14 | Sprint 15 | Sprint 16 | Sprint 17 | Sprint 18 | Sprint 19 | Sprint 20 | Sprint 21 | Spri |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R-1 | Application Deployments | 4.3 | 7.5 | 8 | 2 | 2 | 4 | 5 | 6 | 2 | 4 | 7 | 2 | | |
| R-2 | SE Support | 28.5 | | 21 | 11 | 3 | 10 | 40 | 9 | 20 | 31 | 35 | 31 | 17 | |
| R-3 | FOIAXpress Maintenance | 3.1 | 4 | 2 | 1 | 2 | 2 | | 1 | 2 | 7 | 2 | 2.5 | 1 | |
| R-4 | Orion Maintenance (Network) | 7.0 | 7 | 10 | 3 | 3 | 4 | 3 | 2 | 3 | 7 | | | | |
| R-5 | Orion - Create audit templates | 2.7 | | 10 | 5 | 3 | | 1 | 6 | 2 | 4 | | 3 | 1 | |
| R-6 | FireWall Advisory | 4.5 | | | | | | 2 | 2 | | 2 | 3 | 10 | 3 | |
| R-7 | DLAN Maintenance | 3.7 | | 1 | 9 | 13 | 12 | 11 | 16 | 5 | 3 | 7 | | 1 | |
| R-8 | Evaluate SE Needs | 14.5 | | | | | | | | | | | 5 | 24 | |
| R-9 | Monthly MS Patching - NSN | 6.8 | 7 | 6 | 7 | 4 | 2 | 14 | 11 | 12 | 8 | 6 | 5 | 8 | |
| R-10 | Vulnerability Analysis | 2.0 | 4 | 5 | 5 | 4 | 2 | 2 | 3 | | 1 | 2 | 3 | 2 | |
| R-11 | SharePoint Admin | 13.5 | 12 | 16 | 15 | 32 | 25 | 21 | 10 | 9 | 14 | 27 | 1 | 12 | |
| R-12 | Orion Maintenance (Server) | 5.8 | 2 | 10 | 3 | | | | 3 | 2 | 10 | 6 | 3 | 4 | |
| | | | | | | | | | | | | | | | |
| | Chris | 14.0 | 22 | 17 | 33 | 46 | 20 | 32 | 20 | 56 | 22 | 5 | 24 | 5 | |
| | Dale | 11.0 | 26 | 37 | 10 | 12 | 10 | 13 | 21 | 10 | 5 | 15 | 4 | 20 | |
| | Michael S | 18.3 | 22 | 22 | 19 | 18 | 15 | 22 | 40 | 32 | 32 | 5 | 20 | 16 | |
| | Paul | 32.3 | 13 | 12 | 23 | 42 | 12 | 30 | 24 | 30 | 29 | 25 | 48 | 27 | |
| | Bruce | 14.0 | | | | | | | | | | 5 | 15 | 22 | |

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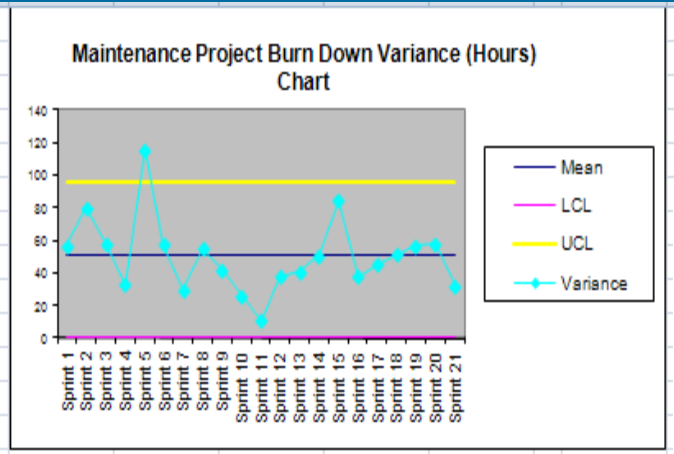
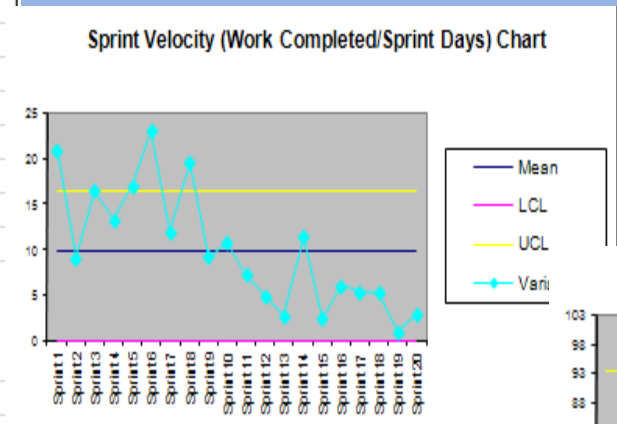
# Process Improvement Tracking Across Sprints



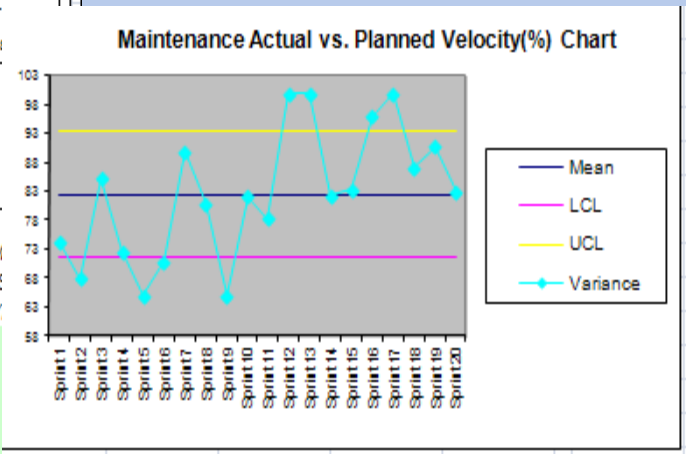

Increase in variation indicates need for better tasking – which was incorporated in following sprints. For this chart – the lower the variance the better

| Sprint # | Burndown Variance (Percent) | Mean (Avg) | UCL | LCL | Monthly Status (RYG) |
|---|---|---|---|---|---|
| Sprint 1 | 56.86 | 50.39 | 95.92 | 0 | G |
| Sprint 2 | 80.05 | 50.39 | 95.92 | 0 | G |
| Sprint 3 | 57.81 | 50.39 | 95.92 | 0 | G |
| Sprint 4 | 32.69 | 50.39 | 95.92 | 0 | G |




This chart should be steady – showing that the team has developed a cadence – and is working smoothly

| Sprint # | Velocity (Est. Work/Days) | Mean (Avg) | UCL | LCL |
|---|---|---|---|---|
| Sprint 1 | 20.91 | 9.75 | 16.30 | 0 |
| Sprint 2 | 9.10 | 9.75 | 16.30 | 0 |
| Sprint 3 | 16.50 | 9.75 | 16.30 | 0 |
| Sprint 4 | 13.30 | 9.75 | 16.30 | 0 |




In this chart – the higher the variation is better – means – got work done faster.

| Sprint # | Planned vs Actual % | Mean (Avg) | UCL | LCL | Monthly Status (RYG) |
|---|---|---|---|---|---|
| Sprint 1 | 74.43 | 82.54 | 93.53 | 72 | G |
| Sprint 2 | 67.97 | 82.54 | 93.53 | 72 | G |
| Sprint 3 | 85.20 | 82.54 | 93.53 | 72 | G |
| Sprint 4 | 72.70 | 82.54 | 93.53 | 72 | G |

# Lessons Learned in Managing LOE Using Agile

Management of complexity requires process discipline WHILE

Management of change requires rapid adaptability.

SCRUM (Agile) enhances adaptability and commitment.

# Lessons Learned in Managing LOE Using Agile

Understand that all process improvement opportunities, as with all investments, have costs and risks. Introducing Agile, as with any new technology, needs the advocacy of all project stakeholders.

Participation of key staff members in planning practice implementation is needed to understand the continuity and costs and identify the key risks, such as customer culture.

The Agile method emphasizes on-going requirements, daily SCRUMS with customer participation and team “espirit de corp”. The Agile emphasis on these activities provides practices that reduce risks in maintaining tasks.

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# How do we Know this Works???

**We have been doing this for over four years in multiple departments**

**Six Software Engineering Projects**
**Software Engineering Maintenance**
**Operations Maintenance**
**Operations Island Stand Up**
**Cyber Corrective Action Plans**
**Operations D-Lan**

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# The End

**You have just seen key benefits of using Agile to Manage tasks in Maintenance Operations from the "28,396 foot" level.**

**Questions or Comments ?**


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